# Outside Looking In

## GENDERED PERSPECTIVES IN WORK AND EDUCATION

Edited by Connie G. Bayudan-Dacuycuy

**PIDS**

**Philippine Institute for Development Studies**
*Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas*

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# Foreword

Since 2006, the Philippines has remained the most gender-equal country in Asia, according to the annual *Global Gender Gap Report* of the World Economic Forum. This paints a picture of a country that embraces gender parity and women empowerment, particularly in terms of wages, political opportunities, and educational attainment.

Lurking behind this seeming global success, however, are realities on the ground confronting both our men and women. Their narratives include persistent gender gaps in education, employment, and wages among the poor and agricultural workers. They only show that our hard-won advances, no matter how great, will prove to be futile if the government fails to timely respond to concerns of those in the margins.

As the foremost policy think tank in the country, the Philippine Institute for Development Studies (PIDS) has once again assumed a prominent role in steering the Filipinos toward an evidence-based analysis of gender issues in the Philippines. Gathered in this book are insights written by PIDS staff and distinguished researchers on matters relating to gender issues arising from various sectors of our society. An important highlight has been given to the apparent lag in the education of boys, undocumented housework, and persistent wage gap between male and female agricultural workers.

The Institute hopes that the recommendations raised in this book may stimulate further researches and discussions on this issue.

**CELIA M. REYES**
President

# Preface

The Magna Carta of Women was signed into law on August 14, 2009. Ten years after, the country has achieved significant advancements in its efforts toward gender and development. The *Global Gender Gap Report 2018* of the World Economic Forum reports that the Philippines is 8th in the global ranking of gender parity. This is two notches higher than in 2017, an indication of the country's continuous improvement. Further, the country is the only Asian economy in the ranking's top 10.

Notwithstanding achievements, challenges remain. However, no obstacles endure or are big enough in a cognizant and learning community. We, as a community of learners, must not rest on our laurels and be complacent with the country's success. Rather, we need to keep working to ensure that both men and women equally enjoy the fruits of development.

As the Institute celebrates the 10th year of the Magna Carta of Women and the country's achievements in gender and development, it strives to put together salient challenges and pressing issues confronting men and women today. This book forges inputs that are important in shaping narratives and mindsets. In the process, it helps deepen and widen the public's appreciation of the importance of gender issues. Indeed, this book is a testament to the Institute's mandate to serve the public through policy research.

**CONNIE G. BAYUDAN-DACUYCUY**
Senior Research Fellow

# Acknowledgment

# List of Acronyms

| | |
|---|---|
| 4Ps | – *Pantawid Pamilyang Pilipino* Program |
| AFMA | – Agriculture and Fisheries Modernization Act |
| AFMP | – Agriculture and Fisheries Modernization Plan |
| AGENTA | – Ageing Europe: An Application of National Transfer Accounts for Explaining and Projecting Trends in Public Finances |
| ALS | – Agricultural Labor Survey |
| APIS | – Annual Poverty Indicators Survey |
| ARMM | – Autonomous Region in Muslim Mindanao |
| ASEAN | – Association of Southeast Asian Nations |
| BPS | – Bukidnon Panel Survey |
| CA | – Census of Agriculture |
| CALABARZON | – Cavite, Laguna, Batangas, Rizal, and Quezon |
| CAR | – Cordillera Administrative Region |
| CARP | – Comprehensive Agrarian Reform Program |
| CCT | – conditional cash transfers |
| CEDAW | – Convention on the Eradication of All Forms of Discrimination Against Women |
| CHED | – Commission on Higher Education |
| CHR | – Commission on Human Rights |
| CPH | – Census of Population and Housing |
| DSWD | – Department of Social Welfare and Development |
| ECCD | – Early Childhood Care and Development |
| FAO | – Food and Agriculture Organization |
| FIES | – Family Income and Expenditure Survey |
| FLEMMS | – Functional Literacy, Education and Mass Media Survey |
| GAD | – gender and development |
| GDP | – gross domestic product |
| GGGR | – Global Gender Gap Report |
| HGC | – highest grade completed |
| IDRC | – International Development Research Centre |
| IEE | – intergenerational educational elasticity |
| ILO | – International Labour Organization |
| ISSP | – International Social Survey Program |
| LFS | – Labor Force Survey |
| LFP | – labor force participation |
| LFPR | – labor force participation rate |
| LGU | – local government unit |

| | |
|---|---|
| MCW | – Magna Carta of Women |
| MIMAROPA | – Mindoro, Marinduque, Romblon, and Palawan |
| MSMEs | – micro, small, and medium enterprises |
| NCR | – National Capital Region |
| NEDA | – National Economic and Development Authority |
| NGO | – nongovernment organization |
| NSO | – National Statistics Office |
| OECD | – Organisation for Economic Co-operation and Development |
| NTA | – National Transfer Accounts |
| NTTA | – National Time Transfer Accounts |
| PCW | – Philippine Commission on Women |
| PDP | – Philippine Development Plan |
| PHP | – Philippine peso |
| PIDS | – Philippine Institute for Development Studies |
| PPGD | – Philippine Plan for Gender-Responsive Development |
| PSA | – Philippine Statistics Authority |
| RA | – Republic Act |
| RCT | – randomized control trial |
| RDD | – regression discontinuity design |
| RH | – reproductive health |
| SC | – Supreme Court |
| SOCCSKSARGEN | – South Cotabato, Cotabato, Sultan Kudarat, Sarangani, and General Santos |
| TAWR | – Trends in Agricultural Wage Rates |
| TIMSS | – Trends in Mathematics and Science Study |
| UN | – United Nations |
| UNGEI | – United Nations Girls Education Initiative |
| UPSE | – University of the Philippines School of Economics |
| USD | – US dollar |
| WB | – World Bank |
| WEDGE | – Women's Empowerment, Development and Gender Equality |

**Chapter 1**

# Introduction

Connie G. Bayudan-Dacuycuy

*"Ohana means family.*
*Family means nobody gets left behind or forgotten."*

- Lilo (Lilo and Stitch, Disney)

All over the world, the contribution of women to society is acknowledged. They help in achieving development outcomes such as zero hunger, food security, and poverty reduction, which means that women, as much as men, have roles to play in the achievement of national targets as outlined in the *Philippine Development Plans,* long-term aspirations as elaborated in the *AmBisyon Natin 2040*, and international commitments such as those outlined in the United Nations Sustainable Development Goals.

Without a doubt, the Philippines has substantial achievements toward gender equality. A testament to this is the consistent ranking of the country in surveys such as those found in the World Economic Forum's *Global Gender Gap Report*, which shows the country as the only Asian economy to have made it in the top 10 in terms of gender parity. At the education front, data from the Commission on Higher Education in 2018

show that female enrollments at all levels, including Masters and PhD programs, are higher than those of males as well. The 2013 Functional Literacy, Education and Mass Media Survey data indicate that female functional literacy rate is also higher. If it is any consolation, the consistent underperformance of boys is not unique to the Philippines since reversals are also observed worldwide.

In the Philippines, the apparent lag in the education of boys has raised concerns among various stakeholders. And rightly so. In the Implementing Rules and Regulations of the Magna Carta of Women, the guiding principles state that all individuals are equal and no one should be discriminated against on the basis of economic, social, political, and geographic origins. The same document has recognized gender equality to mean the equality of men and women and their right to reach their full potential.

Remaining true to the Gender and Development approach, one that seeks to ensure that both men and women equally benefit from development, Chapter 2 argues the need for a nuanced understanding of the reasons why boys are underperforming in education. The chapter shares that the reversal of the fortune of boys in the education front has already been predicted even before the 1970s. Factors to this reversal include social expectations, intergenerational transfers, and employment opportunities. The chapter elaborates why the interaction effects of economic conditions and the learning environments in schools are critical factors as well.

Motivated by patterns showing that there are regions in the country where men have comparable schooling years with women, Chapter 3 investigates the educational mobility of men and women and the schooling progression of boys and girls by adopting an intergenerational regional perspective. The chapter identifies regions where educational mobility and human capital accumulation are low or high. Thus, it provides information useful to the design of survey instruments aiming to understand gaps in educational investments and in practices at home and at school.

Despite the good fortune of girls and women in the education front, they are faced with persistent challenges. One such challenge is their low labor force participation rate, which has seen a meager 3-percentage points increase from 1990 to the present. This has substantial implications since women constitute 50 percent of the Philippine population and the country is missing out on the skills, knowledge, and expertise that women can offer. Turning to the Labor Force Surveys to understand the low labor force participation of women, data indicate that a large percentage of respondents have cited housework as the reason for not looking for work. Indeed, housework, nonmarket work, unpaid care work, or reproductive work becomes a social issue to the extent that it positively impacts the well-being of household members but adversely affects the productive work of those who perform the household tasks.

Recognizing the important roles of housework, Chapter 4 provides an estimate of the value of men's and women's work in the country and demonstrates that the contribution of both genders to the economy is closer to parity when housework is accounted for. The chapter also documents a strong association between parental time and child schooling outcomes, a result consistent with a growing evidence that one of housework's important contributions is to nurture both the current and future generations. This is not surprising since early life environments are crucial to a child's development and learning, an idea that Chapter 3 recognizes as well.

Chapter 5 takes a different vantage point as it demonstrates the effects of nonmarket work on the probability of working. While it acknowledges that women's contribution does not necessarily have to be in the market work, an issue emphasized in Chapter 4, Chapter 5 looks beyond the child-rearing years and recognizes the need to empower women through economic independence. The chapter also recognizes that women can face starkly contrasting realities in their homes with some doing unpaid work by choice and free will while others are forced to do so by lack of other options. While coming from different perspectives, both Chapters 4 and 5 underscore the need for policies that achieve work-life balance, improve child-care services, and anticipate demand for elderly care.

As it is, there are already work-life tensions generated by the productive and reproductive roles, and once they join the market work, women are confronted by pay gap. Chapter 6 shows that pay differential exists in the agricultural sector even for exactly the same activity that does not require physical strength. While aggregate data such as the Philippine Statistics Authority's Gender Statistics on Labor Employment show that the average daily basic pay of wage and salary workers is higher for females than for males from 2013 to 2017, Chapter 6 demonstrates that a nuanced analysis is needed to truly understand the gender pay gap.

Finally, all chapters call for further research. Chapter 2 calls for a systematic study of the factors that might adversely affect the educational performance of boys unintentionally and to test the cost-effectiveness of giving a bigger conditional grant amount for the boys of conditional cash transfer families. Chapter 3 calls for in-depth analyses through primary data collection in the regions identified by the paper to tease out differences in practices at home and at school. Chapters 4, 5, and 6 emphasize the need for disaggregated data collected at regular intervals to analyze the dynamics that occur in the family, discern critical inputs to learning, and advocate innovative policies to address work-life tensions and gender pay gap.

# Gender Equity in Education: Helping the Boys Catch Up

**Vicente B. Paqueo and Aniceto C. Orbeta Jr.**

*"You are more than what you have become.*
*You must take your place in the Circle of Life."*

- Mufasa (Lion King, Disney)

## Introduction

The struggle for gender equality has a long history. An important part of this history is the intensification and widening of the fight for women's rights after World War II. Partly due to their valuable work in factories and other activities in support of the war efforts, respect for women's rights to equality with men grew stronger. Improving the status of women became part of the agenda of many influential international organizations. In this regard, the United Nations' development programs in the 1970s included "women in development" agenda along with its partner agencies and civil society organizations. As nations confronted development challenges, world leaders increasingly valued the need to empower women, and to ensure that human beings are treated equally regardless of gender.

In many parts of the world, addressing this issue means reducing global education inequality that kept women poor and disadvantaged. This view was largely influenced by the experiences of Africa, Bangladesh, China, India, the Middle East, and other countries where girls and women are largely underprivileged. Moreover, their experiences with gender inequality in education were seen as emblematic of gender inequalities in the labor market and other dimensions of human well-being. In this light, analysts of gender issues tend to attribute gender inequality to discrimination embedded in traditional culture, institutions, and policies.

Global leaders and organizations such as the United Nations (UN), World Bank (WB), Asian Development Bank, and international NGOs also pushed for gender equality as a priority in their agenda. These institutions consider that gender gaps are largely due to discrimination against women and must, therefore, be a focus of worldwide attention.

The principle of gender equality means equality of human beings regardless of gender status. In practice, however, the concept has typically been limited to achieving gender equality by raising the status of women. This way of applying the gender equality idea is not unreasonable, given that women and girls lag behind in important indicators of social and economic well-being. Considerable progress in promoting gender equality had been achieved in many parts of the world. But many challenges, particularly in developing countries, remain. The authors' analysis of the recently released WB human capital index data reveals that the average human capital is greater for females than males in about 70 percent of countries worldwide.

The Philippines is one of the countries where female vis-à-vis male education has progressed so much that boys now need to catch up with girls. Efforts to promote gender issues in education need to be more nuanced to adhere to the original meaning of the principle of gender equality.

## Historical data on Philippine education

Male education in the Philippines during the post–World War II reconstruction period appears greater than female education as shown, for example, by college completion rates. Orbeta and Sanchez (1995) showed that the percentage of population 25 years old and over who completed four years of college education or more was initially greater on average for males than females from 1948 to 1970. But the male-female gap steadily narrowed until the mid-1970s when the proportion of college-educated women began to surpass that of men. An obvious cause for concern is that the gap has no indication of narrowing down since the crossover (Figure 1).

Figure 1. Proportion (%) of population 25 years and above who had finished college by sex: Philippines, 1948–2015
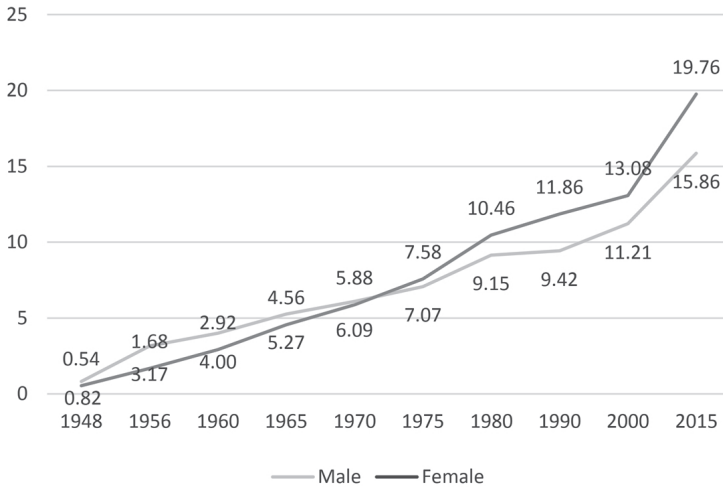


Source: Census of Population 1948, 1960, 1975, 1980, 1990, 2000, 2015 and Labor Force Survey 1956, 1965 (Philippine Statistics Authority [PSA, formerly National Statistics Office], various years)

The reason why the women-to-men student ratio in college favors women after the 1960s is likely due, at least in part, to the lower academic performance of boys relative to girls during their basic education years. The boys' lower academic performance compared to girls' in elementary and secondary education appears to be continuing.

On this score, Paqueo et al. (2011) noted that the share of youth aged 16–19 who completed elementary education (according to the 2008 Annual Poverty Indicators Survey [APIS] data) was higher for girls (94%) than boys (87%). For young adults 20–24 years old who completed secondary education, the corresponding shares for girls and boys were 78 percent and 66 percent, respectively. The same data also indicated that the completion rate gap between boys and girls was much larger among the poorest 30 percent than the richest 30 percent. Updating these figures using APIS 2016 shows similar results as shown in Table 1. Elementary completion stood at 95 and 89 percent, while secondary completion rates were at 79 percent and 64 percent for girls and boys, respectively.

According to Orbeta and Sanchez (1995), there are several possible explanations for this phenomenon as pointed out in earlier studies, namely: (1) the pressure is

Table 1. Shares (%) of youth and young adults who had completed elementary and secondary schooling: Philippines, 2016

| Sample | Overall Completion | | Girls' Completion | | Boys' Completion | |
|---|---|---|---|---|---|---|
| | Elementary | Secondary | Elementary | Secondary | Elementary | Secondary |
| Mean (full sample) | 92 | 71 | 95 | 79 | 89 | 64 |
| Richest 30 percent | 98 | 93 | 99 | 98 | 97 | 87 |
| Poorest 30 percent | 85 | 46 | 92 | 55 | 79 | 38 |

Note: The basic analysis used the first three income deciles (i.e., the 30% of households with the lowest income) to proxy "the poor", with the highest three income deciles used to proxy the most affluent or "rich" families. Estimates of elementary and secondary completion are based on attainments of 16–19 and 20–24-year-old respondents, respectively.
Source of basic data: PSA (2016)

greater for boys than girls to drop out of school to help their parents earn needed income because there are more employment opportunities in agriculture for boys (Bouis 1992), (2) daughters receive more education but less land (Quisumbing 1991), and (3) parents rely more on daughters than sons to study conscientiously, keep stable jobs, and provide more consistent support in their old age (Lynch and Makil 1968; Hollnsteiner 1970; King and Domingo 1986).

With regard to learning achievement outcomes, data also reveal that the functional literacy rate among children aged 10–15 years is lower for boys (55.5%) than for girls (63.0%). Moreover, the mean percentage scores of grade 6 students in the National Achievement Tests appear to be uniformly higher for girls than for boys in subjects such as Filipino, Math, English, Science, and Hekasi (Paqueo et al. 2011).

Meanwhile, Tan et al. (2011) probed deeper into why boys are falling behind girls in education. Elaborating on previous explanations, they estimate and compare male and female rates of return to education. The study articulates four reasons why women in the Philippines pursue education more intensely than men. In addition to the great expansion of education institutions and growth of job opportunities for women, they also cite traditional culture that keeps girls at home where they acquire greater discipline and allows them to study better, as the economic historian and professor Amado Castro argued earlier (Paqueo and Orbeta 2017). The study also finds that the rate of returns to women's education is higher relative to men's. This empirical evidence is consistent

with the standard economic theory of human capital accumulation. Women's education is more intense because its return is higher compared to men's.[1]

## Recognizing gender bias against boys

The authors tried to call attention to this reverse gender inequality phenomenon on various occasions in the Philippines and in a few international fora. Paqueo, for example, in discussing a research report on Northeast Brazil (a poor region) in the 1990s asked for explanations about its finding showing that the educational status of boys was lagging behind that of girls—pointing out in the process that a similar phenomenon has been observed in the Philippines. In another forum, he asked whether there were similar experiences in other countries (perhaps in their subpopulation groups) to find out the importance of the phenomenon found in the Philippines and Northeast Brazil. Disappointingly, the forum participants showed no curiosity at all about the question, conceivably oblivious to the true meaning of gender equality.

For decades, the development community benignly ignored observations that boys in some areas of the world actually lag behind girls in educational achievement. This attitude is understandable in light of the feminist agenda and the perception that ensuring fair treatment of boys is not a priority issue, given the huge global challenge of raising women's status toward parity with men's.

In the last 10 years, there appears to be some change in attitude. Some analysts have come to recognize the importance of understanding education inequality not just from the girls' but also from the boys' perspective. The United Nations Girls Education Initiative (UNGEI n.d.), for example, recently examined the above questions in a report titled, "Why are Boys Under-performing in Education? Gender Analysis of Four Asia-Pacific Countries". In developed countries, there also appears greater awareness and concern about males lagging in education, particularly in college. On this point, Terrier (2016) writes that boys are increasingly lagging behind girls at school in Organisation for Economic Co-operation and Development (OECD) countries. Citing OECD data, she revealed that the shares of women and men who entered a university program in 2009 were 66 percent and 52 percent, respectively—and the gap continues to grow (OECD 2012).

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[1] Controlling for the types of higher education institutions they graduate from and other variables, preliminary findings by Paqueo et al. (forthcoming) using 2013 APIS data, indicate that the rate of increase in earnings of males associated with college education is significantly higher than that of females. A possible explanation is that in controlling for college education rate of return, there are other unaccounted factors that favor higher earnings for males compared to females.

It is noteworthy that some policy analysts are rediscovering the argument that if education is indeed a universal human right, unfair gender bias, regardless of whether it is detrimental to the education of a boy or a girl, should not be acceptable. One has to be careful that the observed gender gap is not the result of voluntary decisions of individuals and families who optimize their well-being within the bounds of legitimate constraints and employment opportunities.

In regard to the UNGEI study, the question on boys' lower academic performance relative to girls was analyzed in four case studies involving Malaysia, Mongolia, Philippines, and Thailand. These are countries where boys' educational achievements are less than girls'. The report is relevant to this paper's discussion of the gender equality issue concerning males for two reasons. First, the report confirms the authors' observation that the lower academic performance of boys relative to that of girls is not rare and unique to the Philippines. The authors observed it in Northeast Brazil (previously mentioned), and other Asian countries recently reported it as well. Second, the report provides interesting hypotheses about the factors that appear to work against boys' right to quality education. Those hypotheses, culled out mostly from key informants and focus group discussions, are worth verifying and complementing with quantitative analyses using more rigorous causal models.

UNGEI reports specifically the following findings: (1) Families play a central role in children's educational achievement; (2) Poor families tend to withdraw boys from school because they seem to be unresponsive to learning, and because boys have more diverse work opportunities than girls; and (3) The nature of school environment itself is not gender-neutral, and stereotypes (and gender bias) impede boys' potential and achievements.

On the last point, UNGEI observes that the four-country studies identified a common notion that school "is for girls". It reports, for example, the finding of Thai researchers that the formal education system caters primarily to girls who are perceived to be academically superior. They were told by participants in group discussions that boys become "the group of students in the back of the room that the teachers often ignore and don't show much interest in their learning, in contrast to the more attentive girl students in the front rows who normally get greater attention from the teachers" (UNGEI n.d., page 2).

Terrier (2016) confirms that female teachers can be an important factor adversely affecting boys' academic achievement. Starting off from the hypothesis now widely discussed in the literature that teacher biases can be a significant factor adversely affecting gender equality, Terrier explores teacher's favoritism in grading students' examination answers. Employing rigorous quantitative causal modeling on a French

data set and using a combination of blind and nonblind test scores, Terrier reports that middle-school teachers favor girls during the grading period. This favoritism has long-term consequences. Measuring their national evaluations three years later, Terrier estimates that male students make less progress than their female counterparts. The study also calculated that 21 percent of boys falling behind girls in math during middle school is accounted for by gender-biased grading. Interestingly, girls who benefit from gender bias in math are more likely to select a science track in high school. These provocative findings should inspire Filipino researchers to do a similar study (adapted) in the Philippines where teachers in basic and college education are predominantly women.

To further enrich the discussion in this section, this paper presents a summary of a paper by Mulji (2016). The authors highlight Mulji's study to illustrate the teacher's gender effects on students of schools in low- versus high-income communities. The interesting finding in this paper is the interaction effect of the community's economic condition and the teacher's gender on the sex-specific learning achievement scores of boys and girls.

Using Trends in Mathematics and Science Study (TIMSS) data and fixed effect regression analysis, Mulji examines the effect of female teachers on the academic performance of male and female grade 8 students in math and science. The study finds that female teachers increase the test scores of students.

But the effect depends on the income level of the school's vicinity. In low-income areas, the test scores of girls are significantly raised when taught by a female teacher, while the boys lose out when taught by female teachers. In contrast, students in high-income areas improved their test scores regardless of gender. Why such gender effects differ in schools between low- and high-income communities is a question that calls for further investigation. It could be that school children in low-income communities in Tunisia are heavily influenced by traditional culture regarding male-female interactions. In high-income communities, school children may be comfortable with their teachers regardless of gender.

## Gender equity across income groups

As mentioned, it is commonly believed that the pressure on boys to drop out of school to help their parents earn needed income is greater than on girls because there are more employment opportunities in agriculture for boys (Bouis 1992). If the hypothesis is true, then one would expect that the education gap between boys and girls would

Figure 2. Female-male difference in enrollment rate by income quintile,
6–24 years old: Philippines, 2017
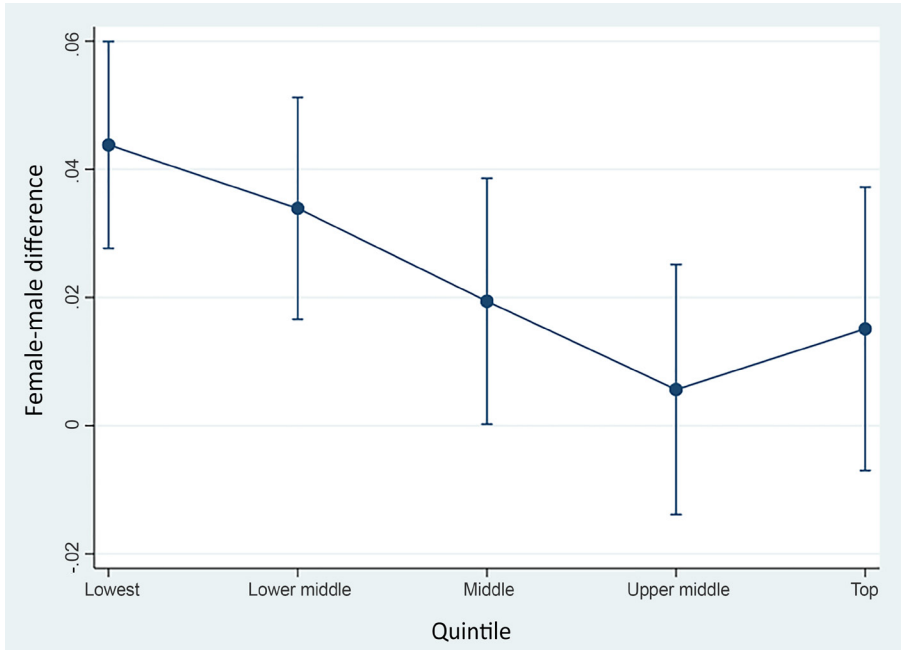


Source: Authors' computation using 2017 Annual Poverty Indicators Survey (PSA 2017)

be smaller as household income increased, as it becomes less of a binding constraint on children's education, other things being equal.

This hypothesis is strongly supported by comparing the enrollment rate in the 2017 APIS across income groups. Appendix 1 provides a detailed analysis. The results show that the disparity in enrollment rates is indeed higher in lower-income groups. For all school-aged children (6–24 years old), the disparity for those in the lowest quintile is more than 4-percentage points going down to a little over 2-percentage points in the middle quintile, and not significantly different for the upper 2 quintiles with confidence intervals crossing zero (Figure 2). The analysis by age groups shows that the difference lies in secondary age groups including both junior (12–15 years old) and senior high school students (16–17 years old). It is noted that there is no significant difference for the elementary (6–11 years old) and beyond secondary (18–24 years old) across the different income groups.

## *Pantawid Pamilyang Pilipino* Program and gender equality

The *Pantawid Pamilyang Pilipino* Program (4Ps) provides conditional cash grants to poor households satisfying specific requirements. The conditions include school attendance of children for 85 percent of the school days, regular health checkups for mother and children, and attendance in family development sessions. In 2014, the education grant provided to children aged 0–14 years was extended to children aged 18 years, while the monthly cash grant was increased from PHP 300 per child regardless of school level to PHP 500 per child in secondary level. Unlike in other countries, such as Mexico, where different cash grants are provided to boys and girls, the grants in the Philippines are the same for boys and girls. Under the 4Ps, up to three children per household are provided cash grants, given to the mother. It would be interesting to know whether the cash grants produce a dent on the educational gap between boys and girls. Survey data collected to evaluate 4Ps provides an indication of narrowing the education gap between male and female children of poor households because of the program. The question is: If other factors were kept the same, would cash transfers to poor households such as 4Ps result in a significant reduction in boy-girl education gap? Interestingly, randomized controlled trial of 4Ps indicates that the favorable effect of conditional cash transfer on the education outcomes between boys and girls are the same in the case of enrollment for all age groups, but higher for boys in terms of school attendance for children 6–11 years old, and similar for other age groups (DSWD and WB 2014). The second wave of evaluation using regression discontinuity design also showed similar results with no difference in enrollment rates impact for boys and girls for all age groups, but significantly higher school attendance rates for boys in the elementary (6–11 years old) age group (DSWD 2014). This indicates that while undifferentiated cash transfers between boys and girls may have no differential impact on the enrollment between boys and girls, it can improve the frequency of school attendance of boys, leading to better education outcomes for them.

However, it is worth noting that in Mexico, the conditional cash transfer (CCT) program has a significantly larger effect on the education of poor girls whose secondary education enrollment rate is lagging behind boys. Part of the reason is that Mexico's CCT program provides households more education grant for girls than for boys. The idea behind this differential is to motivate households to keep their children enrolled in secondary schools (Parker and Todd 2017; Parker and Vogl 2018). It also probably helps that Mexico's CCT amount per student is relatively substantial compared to the Philippines' 4Ps. The bottom line is that by providing a higher amount of cash transfers

for girls' education, the government sends a strong signal and economic incentive for households to enroll them in secondary education.

## Conclusion

To conclude, the authors recall Professor Amado Castro's concern about gender equality in education and his advocacy that the University of the Philippines School of Economics (UPSE) should recalibrate its selection process for applicants in its graduate program. While Castro's immediate concern focused on UPSE, his arguments led the authors to reexamine the assumptions and interpretations of the development communities' call for increased educational status of females to close the education gender gap.

In remembering Castro's gender equity concern, the authors revisited previous economic-demographic work and looked at recent developments in gender inequality and current understanding of its determinants. In the authors' view, there is indeed a need for broader and more informed conversation about the gender gap issue, specifically on ways to fine-tune how it is being addressed. The authors' call for such conversation is a reasonable view despite claims that (1) the reason why women exceed men's education could be that the latter overcompensate for labor market discrimination; and (2) the female educational advantage does not translate into increases in earnings and the wiping out of male-female market wage differential. These are interesting claims. It is worth noting, however, that after years of women being paid lower wages than men, average earnings now appear to be higher for women than men (David et al. 2018). The point is that the above claims need further research and empirical validation, and these should be part of future conversation being advocated by this paper.

Rounding out the paper, the authors share with the readers the following thoughts. First, there should be greater clarity about the meaning of gender equality objective in education for situations where boys are lagging behind girls. Second, how to achieve this more inclusive objective also needs to be clarified. On this, more evidence-informed strategies and policy tools are needed. Third, reducing the gender gap should mean, in practice, improving the educational status of the educationally disadvantaged gender group (albeit, males in the Philippines) at a faster rate than the increase in academic achievement of the opposite sex.

In light of the low academic achievement of Filipino boys and girls, however, it is clearly important to ensure that raising the academic performance of one gender group should not be at the expense of the other gender. That this unintended

consequence could happen is a lesson drawn from the above-cited studies of Terrier (2016) and Mulji (2016).

Fourth, a mix of interventions to modify household, teacher, and school attitudes, and norms and practices should be pursued to eliminate unfair gender biases that unjustifiably impede children's right to good education. In short, the country should go for gender equality strategies that would, on the whole, produce win-win results for boys and girls. Failure to effectively pursue above win-win strategies and reduce gender biases means that the country is foregoing valuable opportunities to raise equity and economic returns on its investment in education.

Fifth, more and better ideas based on analytically sound empirical research are needed to find, design, and implement a win-win mix of interventions. On this score, more studies should be undertaken on the gender gap issue from the lens of the educational development of Filipino males who are currently disadvantaged on average. To make sure, however, that those interventions would lead to desired results, more experimental and quasi-experimental impact evaluation methods should be employed to complement currently available studies that are mostly qualitative and correlation analyses. For this purpose, a good place to start would be studies that would examine the sex-specific impact of teachers' characteristics and gender biases on the academic performance of students.

Finally, in relation to the above points, the authors specifically recommend the conduct of (1) a systematic study of the female teacher dominance of Filipino classrooms and other aspects of school and class environment that might adversely affect the educational performance of boys unintentionally and (2) a pilot study to test the cost-effectiveness of giving a bigger amount of conditional grant  for boys of CCT recipient families. These proposals draw from the experiences and empirical studies mentioned previously.

It is hoped that this research would lead to greater awareness among parents, teachers, and school authorities about the social, cultural, and economic factors that hurt (perhaps unintentionally) the well-being of the young simply by virtue of being a boy or girl. Equally important, the goal is to find tools that are proven to work cost-effectively to enable and motivate the boys to catch up with girls in education, even as the latter continue to advance.

# References

Bouis, H. 1992. Adolescents in farm households: Their nutrition, education and contribution to family welfare. Paper presented to the IFPRI-World Bank Conference on Intra-Household Resource Allocation: Policy Issues and Research Methods, February 12–14, Washington, D.C.

David, C., J. Albert, and J. Vizmanos. 2018. Sustainable development goal 5: How does the Philippines fare on gender equality? PIDS Research Paper Series No. 2018–04. Quezon City, Philippines: Philippine Institute for Development Studies.

Department of Social Welfare and Development (DSWD). 2014. Keeping children healthy and in school: Evaluating the Pantawid Pamilya using regression discontinuity design. Processed. Quezon City, Philippines: DSWD.

Department of Social Welfare and Development (DSWD) and World Bank (WB). 2014. Philippines conditional cash transfer program impact evaluation 2012. Report Number 75533–PH, Washington, D.C.: DSWD and WB.

Hollnsteiner, M. 1970. The Filipino family confronts the modern world. In *Responsible parenthood in the Philippines*, edited by V. Gorospe. Manila, Philippines: Ateneo Publications.

King, E. and L. Domingo. 1986. The changing status of Filipino women across family generations. *Philippine Population Journal* 2:1–31.

Lynch, F. and P. Makil. 1968. *High-ed, low-ed, family and religion*. Quezon City, Philippines: Ateneo de Manila University Institute of Philippine Culture.

Mulji, N. 2016. *The role of teacher gender on students' academic performance*. Lund, Sweden: Lund University Publications.

Orbeta, A.C. and M.T. Sanchez. 1995. Population change, development and women's role and status and development in the Philippines. ESCAP Population and Development, Asian Population Studies Series No. 136. New York: United Nations.

Organisation for Economic Co-operation and Development (OECD). 2012. *Education indicators in focus*. Paris, France: OECD Publishing.

Paqueo, V.B. and A.C. Orbeta. 2017. Amado Castro and gender equity in education. Special issue in Honor of Amado A. Castro, *The Philippine Review of Economics* 54(2).

Paqueo, V.B., A.C. Orbeta Jr., and J.R.G. Albert. 2011. A critical look at the education sector: Achievements, challenges, and reform ideas. In *PIDS 2011 Economic Policy Monitor: Education for development.* Quezon City, Philippines: Philippine Institute for Development Studies.

Paqueo, V.B., A.C. Orbeta, and K. Melad. (forthcoming) Rates of return to higher education in the Philippines: Is there a difference by institution type?

Parker, S. and P. Todd. 2017. Conditional cash transfers: The case of Progresa/Oportunidades. *Journal of Economic Literature* 55(3):866–915.

Parker, S. and T. Vogl. 2018. Do conditional cash transfers improve economic outcomes of the next generation? Evidence from Mexico. NBER Working Paper 24303 (February 2018). Cambridge, MA: National Bureau of Economic Research. https://www.nber.org/papers/w24303 (accessed on December 9, 2019).

Philippine Statistics Authority (PSA). Various years. Annual Poverty Indicators Survey 2008, 2016. Quezon City, Philippines: PSA.

———. Various years. Census of Population 1948, 1960,1970, 1975, 1980, 1990, 2000, 2015. Quezon City, Philippines: PSA.

———. Various years. Bureau of Census and Statistics Survey of Household Bulletin: Labor Force Survey with Education Attainment Data 1956, 1965. Quezon City, Philippines: PSA.

Quisumbing, A. 1994. Intergenerational transfers in the Philippine rice villages: Gender differences in traditional inheritance customs. *Journal of Development Economics* 43(2): 167–195.

Tan, E.A., K.S. Canales, K.G. Cruz, and J.C.B. Punongbayan. 2011. Why are boys falling behind girls in schooling? UP School of Economics Discussion Paper No. 2011–12, November. Quezon City, Philippines: University of the Philippines School of Economics.

Terrier, C. 2016. Boys lag behind: How teachers' gender biases affect student achievement. IZA Discussion Paper No. 10343. Bonn, Germany: Institute for the Study of Labor.

United Nations Girls Education Initiative (UNGEI). n.d. Why are boys under-performing in education? Gender analysis of four Asia-Pacific countries. Bangkok, Thailand: East Asia and Pacific UNGEI Secretariat.

## Appendixes

These appendixes describe the estimation of the disparity in enrollment rates by sex across per capita income quintiles using 2017 data. The data set has information on enrollment and sex of all household members as well as household per capita income.

**Estimation**
To compute the difference in enrollment by sex and by income quintile, the following regression was estimated:

$$enroll = F\left(\beta_1 + \beta_2 * sex + \sum_{i=1}^{4} \gamma_i \, Inc_i + \sum_{j=1}^{4} \delta_j \, Inc_j * sex + \beta_3 * age + \beta_4 * age^2 + \epsilon\right)$$

where:
enroll = enrollment dummy
sex = sex dummy
Inc = per capita income quintile dummies
age = age
F = logistic function

$\frac{\partial F}{\partial sex}$ provides an estimate of the difference in enrollment rates by sex at $Inc_j$ per capita income quintile $j$. These are computed using margins routine in Stata and plotted using marginsplot.

The estimate of the difference in enrollment rates by sex and by income quintile shows that disparity is bigger at the lower-income groups compared to higher-income groups. For instance, for the total of the school-going population of 6–24 years, the difference for the lowest per capita income quintile is more than 4-percentage points. The difference goes down to about 2-percentage points for the middle-income quintile. The differences between the upper-middle and top quintiles are no longer significantly different from zero with confidence intervals crossing zero (Figure 2).

Interestingly, it is shown that the source of the difference is in the secondary level or ages 12–15 and 16 –17 years (Appendix 1). There is no significant difference for elementary ages 6–11 years and beyond secondary or ages 18–24 years.

The estimation results are given in Appendix 2. It is noteworthy that this also shows that the coefficient of the female variable is significant for age groups 6–24, 12–15, and 16–17 years while not significant for age groups 6–11 and 18–24 years.

## Appendix 1. Estimate of the difference in enrollment rates by sex and by income quintile: Philippines, 2017



Average marginal effects of sex with 95% CIs, 6–11 yr. old, by quintile



Average marginal effects of sex with 95% CIs, 12–15 yr. old, by quintile

## Appendix 1 (continued)



Average marginal effects of sex with 95% CIs, 16–17 yr. old, by quintile



Average marginal effects of sex with 95% CIs, 18–24 yr. old, by quintile
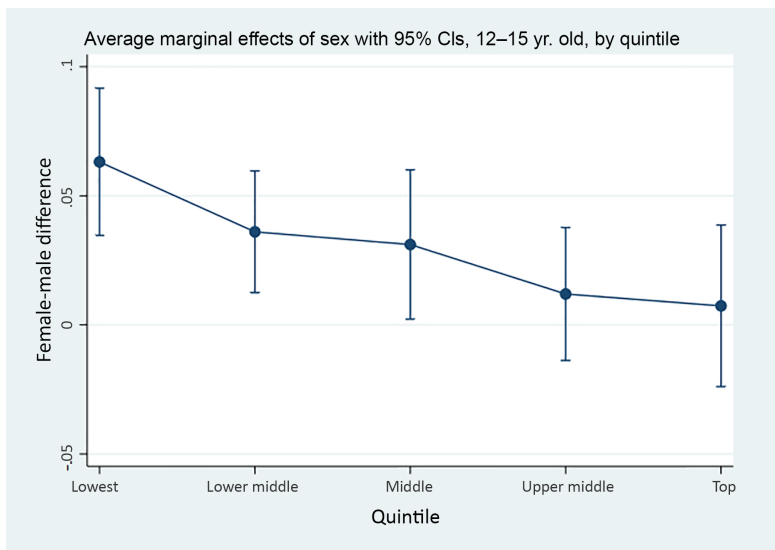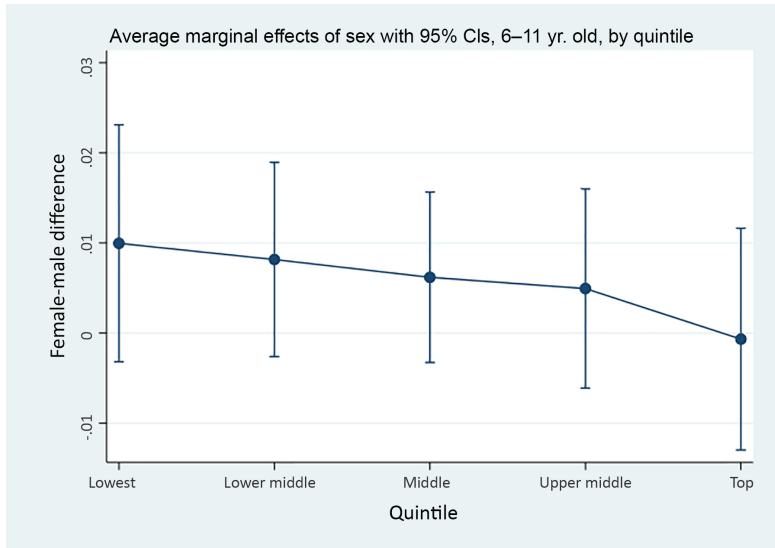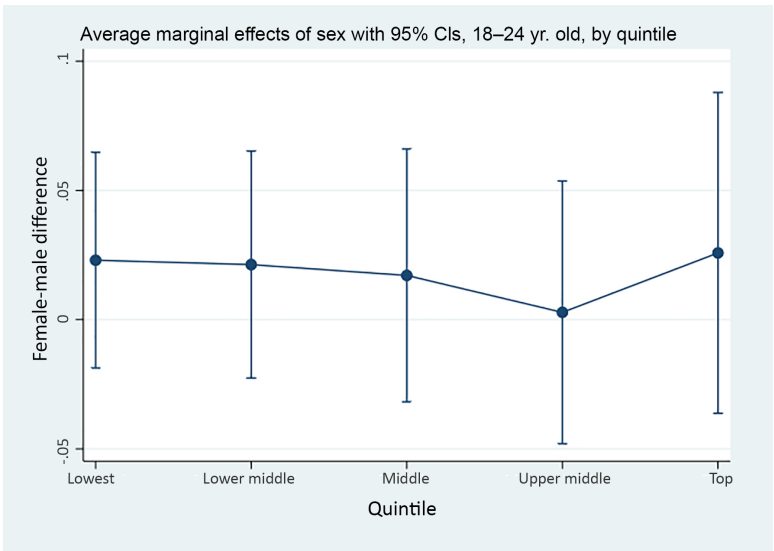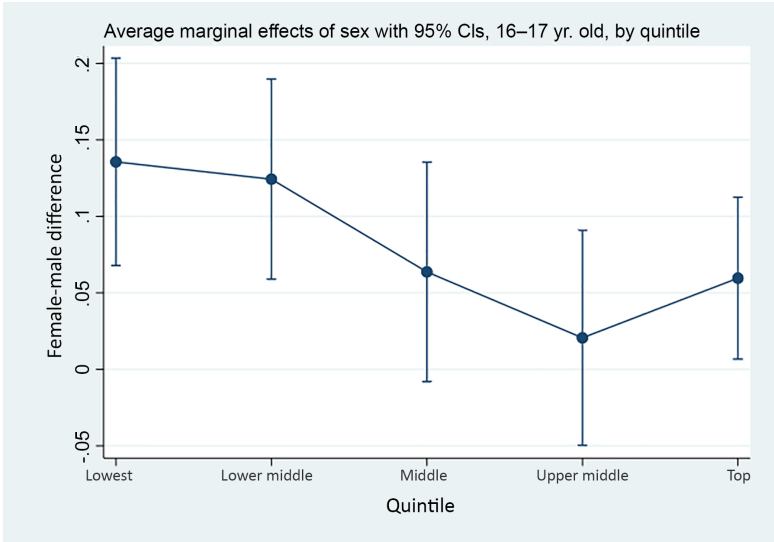
CI = confidence interval
Source: Authors' computation using 2017 Annual Poverty Indicators Survey (PSA 2017)

## Appendix 2 . Estimation results

| Variable | Age Group (in years) | | | | |
|---|---|---|---|---|---|
| | 6–24 | 6–11 | 12–15 | 16–17 | 18–24 |
| Age | 0.28261*** | 1.70668* | -2.79165 | -0.60615*** | -1.32323** |
| Age square | -0.02488*** | -0.09501* | 0.07925 | | 0.01595 |
| Lower middle | 0.35999*** | 0.79262* | 0.77979*** | 0.33034 | 0.03519 |
| Middle | 0.64088*** | 1.37726** | 0.87165** | 0.71841** | 0.27965 |
| Upper middle | 0.97364*** | 1.42481* | 1.48380*** | 1.24944*** | 0.55038*** |
| Top | 1.32775*** | 2.11129* | 1.61406*** | 1.78305*** | 0.89183*** |
| Female | 0.51140*** | 0.37317 | 0.87822*** | 0.78513*** | 0.15269 |
| Lower middle x female | -0.08750 | 0.41047 | 0.13699 | 0.11359 | -0.01239 |
| Middle x female | -0.25824 | 0.93610 | 0.03711 | -0.25620 | -0.04556 |
| Upper middle x female | -0.43413** | 0.57289 | -0.35341 | -0.55773 | -0.13579 |
| Top x female | -0.28517 | -0.52381 | -0.54150 | 1.25237 | -0.00447 |
| Constant | 3.10465*** | -3.95722 | 25.33800 | 10.85634*** | 19.14223*** |
| No. of Observations | 16,967 | 5,869 | 3,971 | 1,910 | 5,217 |

* p<0.05, ** p<0.01, *** p<0.001
Source: Authors' computation using 2017 Annual Poverty Indicators Survey (PSA 2017)

# Understanding the Educational Mobility of Men and Women and the Schooling Progression of Boys and Girls in the Philippines

Lawrence B. Dacuycuy and Connie G. Bayudan-Dacuycuy

*"I have dreams like you, no really. Just much less touchy-feely. They mainly happen somewhere warm and sunny. On an island that I own. Tan and rested and alone. Surrounded by enormous piles of money."*

- Flynn Lockwood/Eugene (Rapunzel, Disney)

## Introduction

It has always been known that the state of educational attainment of children relative to what their parents achieved acts as a useful indicator of mobility along the social status ladder. Behrman (2000) defines social mobility as a phenomenon that "refers to the dynamics of specific groups between periods in socioeconomic status indicators". As societies strive to figure out how best to address mobility, persistent inequality, and poverty concerns, lessons from educational mobility and human development literature may underscore important development strategies, prescribe effective program interventions, and offer policy insights.

One of the major motivations in educational mobility research is the desire to explain the observed correlation between income inequality and intergenerational

mobility amid economic growth and reforms (Emran and Shilpi 2012; Becker et al. 2018). Education has always been considered as a mechanism through which one can access opportunities, especially during periods of growth. It also provides pathways through which income inequality may be mitigated, especially in the face of a persistently low human capital characterizing a disadvantaged subpopulation. Since human capital is enhanced by educational mobility, economic growth may respond to significant improvements in the educational profile of the working-age population. However, economic growth may not always translate to higher social mobility, especially when the national wealth is not uniformly distributed geographically. For instance, Emran and Shilpi (2012) show that despite India's tremendous growth brought by economic liberalization, educational mobility remained stagnant except for urban-based women and those in relatively wealthy states. Such relative responses and gains indeed necessitate the examination of subgroup-specific (e.g., by region, gender) outcomes.

Focusing on subgroups, recent trends in the education front show that girls' academic performance outpaced that of boys. Narayan et al. (2018) document the following global trends: (1) Girls in high-income economies exhibit higher rates of tertiary education, a trend that is also observed in the developing world; (2) In absolute terms, intergenerational educational mobility is higher for girls than for boys; and (3) In relative terms, daughters with highly educated parents are more likely to be in the top quartile of educational attainment than sons. The likelihood of climbing out of the bottom to the top has been rising among girls relative to boys, whereas the likelihood of staying at the bottom among girls has been falling in developing economies, except in India and Nigeria where gender gap still persists.

In the Philippines, girls also fare better in terms of schooling outcomes. The Millennium Development Goals target ratios of girls to boys in primary, secondary, and tertiary education had all been achieved. In addition, the 2013 Functional Literacy, Education and Mass Media Survey (FLEMMS) indicates that functional literacy rate is higher for females than for males. This is observed across various age groups. Dropout rates[1] of girls are also lower than those of boys. Based on United Nations Educational, Scientific and Cultural Organization's database, 12.8 percent and 9.45 percent of girls (16.85% and 15.20% of boys) dropped out of elementary education in 2014 and 2015, respectively. Meanwhile, 10.79 percent and 8.33 percent of girls (16.43% and 14.54% of boys) dropped out of secondary education in 2014 and 2015, respectively.

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[1] Proportion of pupils from a cohort enrolled in a given grade at a given school year who are no longer enrolled in the following school year.

To remain true to the gender and development approach—one that seeks to ensure that both men and women equally benefit from development—it is important to investigate educational mobility through a gender lens to develop a more nuanced narrative of education policies. Doing so underscores the overlapping nature of generations and the gender roles brought by social norms and expectations. Children today are geared toward future roles both in the household and society at large. Thus, the academic underperformance of boys (e.g., high dropout rates) should be a source of great concern since it implies that they will lack the necessary skills to share in the benefits of future economic growth. In addition, their subpar academic performance will likely be transmitted to future generations. The good academic performance of girls necessitates further inquiry as to how they can put their educational attainment to good use in light of their moderate participation rate in the labor market. From 1990 to 2017, the country saw a mere 3-percentage point increase in labor force participation (LFP) of women. In 2017, around 41 percent of women were employed in the vulnerable sector.[2]

As an empirical contribution to the Philippine economic literature, this paper focuses on the gender and geographical dimensions of social mobility, which is relevant for several reasons. First, due to the importance of education,[3] understanding how parents' educational attainment affects children's educational outcomes may provide useful policy prescriptions pertaining to the target and timing of interventions, structure of programs, and formulation of other educational initiatives. This paper is particularly interested in determining whether paternal and maternal human capital have significant effects on sons' and daughters' educational attainment. Differential impacts are expected because mothers allocate a significant amount of time to child-rearing activities compared to fathers who continue to be perceived as breadwinners. The role of mothers is seen as critical since they provide inputs that aid children to adapt, learn multidimensional skills, and achieve behavioral outcomes. Francesconi and Heckman (2016) note that child

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[2] As defined in an International Labour Organization (ILO) report for the Philippines in 2017, vulnerable employment pertains to self-employed and unpaid family workers (ILO 2012).

[3] Schooling provides the mechanism through which intergenerational social mobility can be influenced (Behrman et al. 1998). As noted in Becker and Tomes (1986), Azam and Bhatt (2012), and Francesconi and Heckman (2016), highly educated parents may have more resources for shaping the educational potential of their children, sustain the development of multidimensional skills through hiring of mentors, selection of better schools, and situating children in family environments where skills are honed and developed. They are likely to invest in children's human capital, provide better learning inputs, and have the capacity to create family environments that are conducive to the production of multidimensional skills. Highly educated parents also have better social networks, which may act to increase the intergenerational heritability of advantage, thereby slowing down mobility (Galiani 2010).

development is unmistakably linked to family environments, while Heckman and Mosso (2014) link human development to social mobility, explaining that family background and parental actions have roles to play in the development and enhancement of children's multiple skills.

In the Philippines, there are several studies that seek to measure, decompose, and explain intergenerational income elasticity using location-specific longitudinal data sets. Using the Bukidnon Panel Survey (BPS), Bevis and Barrett (2015) established pathways through which parental human and physical capital can affect the incomes of children and find that the effects of maternal education are much stronger than paternal education. The study also shows that incomes of daughters tend to be correlated with incomes of parents more than that of sons. Yamauchi and Tiongco (2013) established why daughters are more educationally progressive than sons by using data from several school divisions in the Philippines. The study, guided by a game theoretic framework, shows that parents anticipate labor discrimination against women, thereby making the education of daughters more valuable.

Second, the paper extends the analysis by providing a regional perspective on the gender dimension of educational mobility. A regional perspective is needed because cultural differences, learning environments, norms, practices, and economic circumstances may have interdependent roles in determining educational outcomes. In addition, differences in barriers that limit economic opportunities may exist in varying degrees across regions. Focusing on educational mobility across regions not only accounts for heterogeneity but more importantly informs policy due to the observed high correlation between income and education. Accounting for gender gaps in educational mobility across regions may provide a way to interpret educational mobility within the context of social gender roles. For instance, highly urbanized regions may differ in terms of how social gender roles have evolved relative to predominantly agricultural areas. A regional analysis is valuable since it can help in identifying areas where an educational mobility outcome is either alarmingly low or notably high. Such information can be of great use in the targeting of educational investments and in providing guidance on the design and implementation of survey instruments to collect good learning practices at home and at school.

Specifically, within each region, this paper is interested in contrasting the respective influences of paternal and maternal educational achievements on the educational attainment of children that belong to working-age and school-age samples. When analyzing the former, importance is given to the intergenerational educational elasticity (IEE). For the latter, emphasis is given to the concept of

schooling progression and how this relates to the mother's LFP and educational attainment. The IEE, though simply measured through regression methods, is only informative if cohort-based definitions is adopted, something that is consistent with empirical methodologies done for India, Brazil, and several African and Latin American countries. Such a measure can be feasibly estimated using cross-sectional data sets, and the use of cohort-based definitions will allow one to determine whether the transmission in educational outcomes over time has remained highly persistent or not. The IEE estimate captures the variation in parents-children education and, at the same time, the relative deviation in education across generations (Leone 2017).

Third, this study, which focuses narrowly on the intergenerational transmission of education, adds to the growing number of relevant studies done to measure the educational impact of parents on children's outcomes within the broad context of social mobility. Focusing on the IEE, Lanzona (1998) uses the Bicol River Basin data set to analyze educational mobility and how it relates to the labor market. Dacuycuy (2017) reviews important trends and issues in the analysis of social mobility and examines variations in intergenerational wage elasticity in the Philippines. The paper also examines the extent to which one observes wage penalty or wage premium, either of which is related to the effects of a father's educational attainment on the wages of sons and daughters. This research intends to update empirical evidence that could serve as reference for future research on intergenerational educational mobility and its correlates.

Fourth, this paper demonstrates the feasibility of using the Census of Population and Housing (CPH) to generate data on parent-offspring pairs and facilitate interregional comparisons. Rather than using other nationally representative data sources such as the Labor Force Survey (LFS) and Annual Poverty Indicators Survey, employing the CPH is also seen as a strategy to characterize parent-offspring educational outcomes by taking advantage of its large sample size. Given this, the paper is related to several studies that focus on the empirical aspects of intergenerational educational mobility such as Azam and Bhatt (2012) who estimated the IEE in India, and Azomahou and Yitbarek (2016) who computed the IEE measure using Sub-Saharan African data and found that countries have diverse experiences. The authors emphasize the relative influence of paternal and maternal education on children's educational attainment using ordered probit model, and uncovered evidence that points to the divergence of paternal and maternal effects.

Currently, there is no nationally representative data set in the Philippines to create actual regional educational profiles from which intergenerational comparisons can be extracted. However, there are location-specific data sets such as the BPS and

LFS/select education divisions that had been used by Bevis and Barrett (2015) and Tiongco and Yamauchi (2013), respectively. This paper utilizes the 2010 CPH and project cohort-based estimates on educational attainment to presently defined regions to understand whether educational mobility across certain groups in the Philippines has been changing over time.

At this point, the authors acknowledge the various limitations of the paper, specifically the biases that the paper is not able to address. First, assortative mating and ability do matter since both are associated with the observation that women with better schooling profiles tend to marry men with better schooling profiles as well. Children from households with well-educated parents usually perform well academically and are in better position to achieve better labor market outcomes.

Second, the construction of samples based on the coresidency requirement introduces downward bias as well (Azam and Bhatt 2012). The analysis of educational mobility requires that the data be in the form of parent-offspring pairs. Unlike data sets in developed countries, those in developing economies do not track down movements of individuals. This presents a limitation since samples that belong to the same household are the ones selected. The exclusion of offspring who already moved out of the household and formed a new family will likely result in downward biased estimates (Azam and Bhatt 2012; Azomahou and Yitbarek 2016). The inherent bias is more evident in households with members who are still completing their education. This bias is also likely to happen given that educated people have more tools to advance in the labor market and, hence, positively selected to migrate. In the Philippines, there are data sets of local scope such as the BPS and the Cebu Longitudinal Health and Nutrition Survey, which tracked sons or daughters who left parental households. Since migration data are collected, these data sets provide excellent alternatives to address biases arising from coresidency restrictions.

Third, the bias may be compounded by parental motivations associated with intergenerational transfers that appear to be determined along gender lines. For example, Quisumbing (1994) identifies potential tradeoffs in the types of intergenerational transfers to sons and daughters in selected rural areas in the Philippines. Daughters of well-educated mothers are treated favorably in terms of inheritance of land and are also favored by fathers in terms of education. Estudillo et al. (2001) find that intergenerational transfers to sons and daughters function to equalize their respective current and life-cycle incomes. They find that sons are preferred in terms of land inheritance while daughters receive more educational investments. Similarly, Lauby and Stark (1998), Quisumbing and McNiven (2010), and

Yamauchi and Tiongco (2013) find that daughters have higher propensity to migrate and are more committed to sharing their incomes with parents.

Fourth, early life environments are important in explaining a variety of social outcomes such as crime, health, education, occupation, social engagement, trust, and voting (Francesconi and Heckman 2016). However, due to data limitations, the paper is not able to control for variables associated with early childhood environments, work histories of mother, progression of children toward adolescence, and other sources of information that point to the manner of multiple skill generation/accumulation and dynamic complementarities.

Despite these limitations, this research is still a worthwhile undertaking since it generates cohort-based results that can potentially trace the evolution of IEEs across regions and identify areas for targeting educational investments and understanding good practices at home and at school.

## The 2010 CPH: Some useful patterns

### Patterns of mean schooling years: National level

The 2010 CPH (Form 3, 20% sampling) was used to provide estimates on the gap of mean educational attainment between male and female offspring at the national level. The Philippine Statistics Authority (PSA) undertakes the CPH every five years to collect household data used to estimate the country's population and housing. It gathers information on the characteristics of household members such as age, sex, marital status, highest grade completed (HGC), religious affiliation, ethnicity, and disability. It also collects information on dwelling attributes such as floor area, construction materials, and year the housing was built. The 2010 CPH Form 3 includes data on labor market information such as occupation and class of workers.

The CPH does not include information on schooling years. Therefore, schooling years were generated using data on HGC and by assigning 0 to those who reported no grade school completed, 1 to those who reported grade 1, and so on. The highest value of schooling years is 15, which is assigned to those who reported to have earned bachelor's degrees.

To understand intertemporal changes in educational outcomes given the limitations of a single year data set, five-year cohorts are defined based on the working-age population (25 years old and above). These include those born within each of the following year intervals: 1960–1964, 1965–1969, 1970–1974, 1975–1979, and 1980–1984. Figure 1 shows that over a period spanning two decades, female offspring have better educational outcomes compared to their male counterparts. The respective male and

female trends on average schooling are also increasing, albeit slowly. The gap has monotonically increased from the 1960 to 1979 cohorts but has narrowed within the 1980–1984 cohort.

**Patterns of mean schooling years: Regional level**
Cohort-based statistics are more informative and relevant at the regional level due to disparities in growth and development across regions. Table 1 shows growth rates of real regional gross domestic product. The median growth rate in 2009–2010 was 5.75 percent, which is lower than the national growth rate of 7.6 percent. High poverty incidence (above 35%) is observed in Caraga, Autonomous Region in Muslim Mindanao (ARMM), Zamboanga Peninsula, and Bicol. Poor regions such as Eastern Visayas, ARMM, Bicol; SOCCSKSARGEN (South Cotabato, Cotabato, Sultan Kudarat, Sarangani, General Santos City), and Zamboanga Peninsula grew less than the median growth rate. Highly urbanized regions such as the National Capital Region (NCR), Central Luzon, and CALABARZON (Cavite, Laguna, Batangas, Rizal, Quezon provinces) grew at a faster pace relative to the median growth rate. Potentially due to natural calamities, Cagayan Valley was the only region that posted negative growth in 2009. Table 1 also shows that a significant reversal occurred in 2010–2011. The median growth rate stood at 3.25 percent, and almost all regions grew at a slower pace except for Cagayan Valley, Central Luzon, Western Visayas, Central Visayas, Davao, and Caraga. ARMM was the only region to post a negative growth.

Figure 1. Average educational attainment, by sex of offspring: Philippines
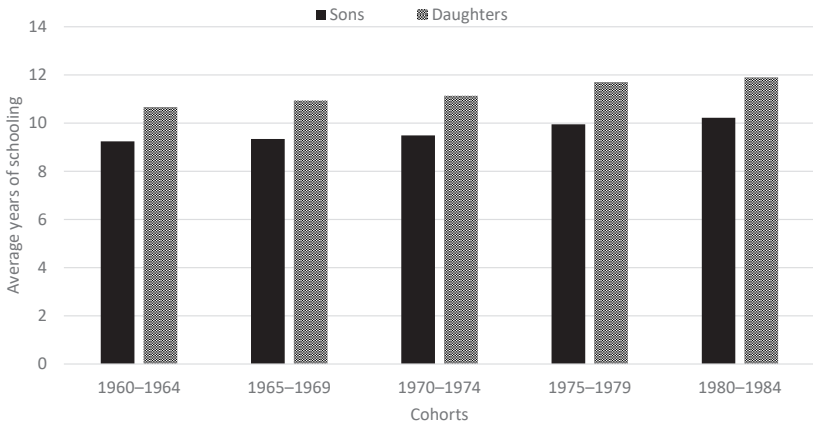


Source: Authors' computations based on the public use file of the 2010 Census of Population and Housing (PSA 2010)

Figure 2 presents the mean schooling years of daughters across cohorts and regions. It also presents intraregional intercohort variability, which measures the dispersion of estimates around the mean. There are several observations worthy of discussion.

1. Daughters in Luzon regions have higher mean schooling years relative to those in the Visayas and Mindanao regions.
2. The most recent cohort of daughters (1980–1984) has the highest mean schooling years across regions. In this cohort, daughters residing in NCR and Cordillera Administrative Region (CAR) have the highest mean schooling years at around 12.5.

Table 1. Growth rates of real regional gross domestic product: Philippines , 2007–2010

| Region | Year | | | |
|---|---|---|---|---|
| | 2007–2008 | 2008–2009 | 2009–2010 | 2010–2011 |
| Philippines | 3.7 | 1.1 | 7.6 | 3.9 |
| National Capital Region | 4.7 | -0.4 | 7.6 | 3.5 |
| CAR | 1.7 | 2.0 | 6.3 | 2.1 |
| Ilocos Region | 2.0 | -1.0 | 7.1 | 3.0 |
| Cagayan Valley | 1.7 | 1.9 | -1.1 | 5.4 |
| Central Luzon | 3.7 | -1.4 | 10.7 | 7.5 |
| CALABARZON | 1.9 | -1.6 | 11.1 | 2.6 |
| MIMAROPA | 3.0 | 0.8 | 1.1 | 2.5 |
| Bicol | 4.1 | 8.2 | 5.2 | 2.6 |
| Western Visayas | 4.3 | 5.9 | 3.7 | 5.5 |
| Central Visayas | 3.3 | 0.8 | 12.5 | 7.9 |
| Eastern Visayas | 3.4 | 1.8 | 2.0 | 1.8 |
| Zamboanga Peninsula | 2.0 | 6.8 | 3.6 | 0.1 |
| Northern Mindanao | 5.2 | 2.9 | 6.9 | 2.5 |
| Davao Region | 3.7 | 5.4 | 5.0 | 4.1 |
| SOCCSKSARGEN | 4.5 | 1.3 | 2.0 | 4.0 |
| Caraga | 2.7 | 2.7 | 7.4 | 9.6 |
| ARMM | 1.6 | 2.6 | 2.3 | -1.0 |

CAR = Cordillera Administrative Region; CALABARZON = Cavite, Laguna, Batangas, Rizal, and Quezon; MIMAROPA = Mindoro, Marinduque, Romblon, and Palawan; SOCCSKSARGEN = South Cotabato, Cotabato, Sultan Kudarat, Sarangani, General Santos City; ARMM = Autonomous Region in Muslim Mindanao
Source: PSA (various years)

3. The variability of the average schooling years across cohorts is lowest in NCR. This has not been matched by any other region, indicating NCR's unique experience in terms of minimizing dispersion in educational outcomes. Northern Mindanao and Caraga have low variabilities in mean schooling years across cohorts as well.

4. There is a relatively large dispersion in the mean schooling years across cohorts in Central Visayas, CAR, and MIMAROPA (Mindoro, Marinduque, Romblon, Palawan) with younger cohorts registering mean schooling years higher than their older counterparts.

5. Daughters in ARMM have the lowest mean schooling years and this is true across cohorts. It can be observed that the mean schooling years of the 1980–1984 cohort in ARMM (around 8.5 years) has not even matched the mean schooling years of the 1960–1964 cohort in other regions. The lowest mean schooling years of the 1960–1964 cohort is roughly 10 years. To some extent, this indicates chronic educational inequality that daughters faced in ARMM.

The mean and variability of sons' schooling years are presented in Figure 3. There are several observations worth noting as well.

1. Sons tend to have lower educational attainment relative to daughters. This observation is consistent across regions and cohorts, with the exception of NCR where the mean schooling years of sons (12 years) are similar to that of daughters (12.5 years). This potentially suggests that NCR has educational opportunities that everyone enjoys and benefits from. Similar to that of daughters', the variability of average schooling years across sons' cohorts is lowest in NCR.

2. Sons residing in ARMM have the lowest mean schooling years, and this is true across cohorts. It can be observed that the mean schooling year of the 1980–1984 cohort in ARMM (around eight years) merely matches the mean schooling years of the 1960–1964 cohort in other regions. Similar to that of daughters', this indicates chronic intergenerational educational mobility of sons within the region. In addition, while the mean schooling years of sons across cohorts are also dispersed, these are not as far apart as those observed among daughters. This implies that there are minimal improvements in mean schooling years across generations of sons.

3. Sons residing in CAR have mean schooling years that are two years lower than those of sons residing in NCR. This is in sharp contrast with the relatively similar mean schooling years of daughters belonging to younger cohorts within the two regions.

Figure 2. Mean educational attainment of daughters (in years): Philippines



◆ 1960–1964   □ 1965–1969   ▲ 1970–1974   ✕ 1975–1979   ✳ 1980–1984

Region Code: 1 = Ilocos Region; 2 = Cordillera Administrative Region; 3 = Cagayan Valley; 4 = Central Luzon; 5 = National Capital Region; 6 = CALABARZON (Cavite, Laguna, Batangas, Rizal, and Quezon); 7 = MIMAROPA (Mindoro, Marinduque, Romblon, and Palawan); 8 = Bicol; 9 = Western Visayas; 10 = Central Visayas; 11 = Eastern Visayas; 12 = Zamboanga Peninsula; 13 = Northern Mindanao; 14 = Davao; 15 = SOCCSKSARGEN (South Cotabato, Cotabato, Sultan Kudarat, Sarangani, and General Santos City); 16 = Autonomous Region in Muslim Mindanao; 17 = Caraga.
Note: Regional residence is based on the 2010 Census of Population and Housing (PSA 2010). This implies that identified cohorts of sons are assumed to have resided in regions reported in 2010. Thus, the chart shows counterfactual statistics, interpreted as the average years of schooling in prior periods given that sons have resided in 2010 identified regions.

It is also informative to investigate the statistical differences between mean schooling years of sons and daughters in each region. To do this, a simple test of differences between sons' and daughters' mean schooling years is implemented across cohorts and regions. Several observations are worth noting in Figure 4.

1. Results confirm that, indeed, NCR has one of the lowest differentials in sons' and daughters' mean schooling years (around 1 year). The magnitude of the differential lies within a narrow band across cohorts, which is indicative of a relatively equal playing field between genders across cohorts in this region

Figure 3. Mean educational attainment of sons (in years): Philippines



◆1960–1964 ■1965–1969 ▲1970–1974 ✕1975–1979 ✳1980–1984

Region Code: 1 = Ilocos Region; 2 = Cordillera Administrative Region; 3 = Cagayan Valley; 4 = Central Luzon; 5 = National Capital Region; 6 = CALABARZON (Cavite, Laguna, Batangas, Rizal, and Quezon); 7 = MIMAROPA (Mindoro, Marinduque, Romblon, and Palawan); 8 = Bicol; 9 = Western Visayas; 10 = Central Visayas; 11 = Eastern Visayas; 12 = Zamboanga Peninsula; 13 = Northern Mindanao; 14 = Davao; 15 = SOCCSKSARGEN (South Cotabato, Cotabato, Sultan Kudarat, Sarangani, and General Santos City); 16 = Autonomous Region in Muslim Mindanao; 17 = Caraga.
Note: Regional residence is based on the 2010 Census of Population and Housing (PSA 2010). This implies that identified cohorts of sons are assumed to have resided in regions reported in 2010. Thus, the chart shows counterfactual statistics, interpreted as the average years of schooling in prior periods given that sons have resided in 2010 identified regions.

2. CALABARZON, Northern Mindanao, and Caraga also have differentials that lie within a narrow band across cohorts. When compared with NCR, however, these regions have higher differentials, with daughters having 2 schooling years more than sons in Northern Mindanao and Caraga. Older cohorts in CALABARZON have around 1-year differential while the younger ones have 1.5 years.

## Figure 4. Differences between sons' and daughters' mean educational attainment: Philippines (in years)



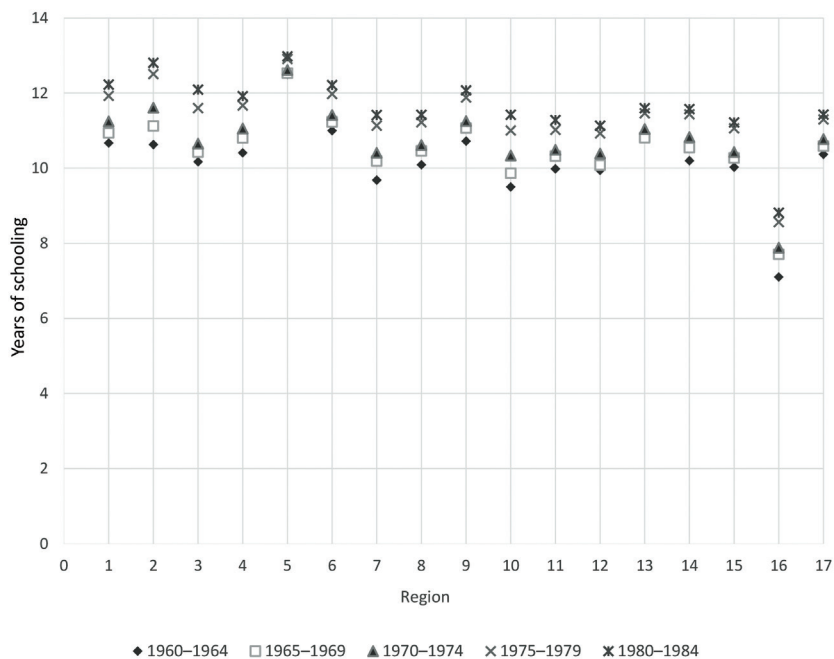Region Code: 1 = Ilocos Region; 2 = Cordillera Administrative Region; 3 = Cagayan Valley; 4 = Central Luzon; 5 = National Capital Region; 6 = CALABARZON (Cavite, Laguna, Batangas, Rizal, and Quezon); 7 = MIMAROPA (Mindoro, Marinduque, Romblon, and Palawan); 8 = Bicol; 9 = Western Visayas; 10 = Central Visayas; 11 = Eastern Visayas; 12 = Zamboanga Peninsula; 13 = Northern Mindanao; 14 = Davao; 15 = SOCCSKSARGEN (South Cotabato, Cotabato, Sultan Kudarat, Sarangani, and General Santos City); 16 = Autonomous Region in Muslim Mindanao; 17 = Caraga.

Note: Regional residence is based on the 2010 Census of Population and Housing (PSA 2010). This implies that identified cohorts of sons are assumed to have resided in regions reported in 2010. Thus, the chart shows counterfactual statistics, interpreted as the average years of schooling in prior periods given that sons have resided in 2010 identified regions.

3. ARMM has the lowest differential (close to 0) but has high variability across cohorts. Older cohorts in ARMM have the lowest differential while the youngest cohorts have the highest differential, indicating that even in ARMM, daughters have higher average schooling, although not as high as daughters residing in the rest of the regions.
4. CAR has the highest differential in sons' and daughters' mean schooling years. Tremendous gains for daughters are observed in 1975–1979, 1970–1974, and 1980–1984 cohorts.

## Empirical strategy in assessing the effects of parental education on offspring's educational outcomes

Assessing the intergenerational effects of education is typically carried out using panel data. In developing economies like the Philippines, most data sets are cross-sectional in nature. This largely explains the lack of evidence on regional educational outcomes in the country. However, recent literature shows that the use of cross-sectional data is also acceptable as long as the information on outcomes of interest such as educational attainments of parents and offspring is available. Needless to say, the data requirement itself presents some challenges, all of which are discussed in the introduction.

There are benefits of using data on schooling years for social mobility analysis. Galiani (2013) noted that data on intergenerational educational attainment can be reliably collected, and education has a high correlation with permanent income. Using parental education can also aid in appreciating the extent to which educational outcomes are determined by the transmission of heritable traits that translate into better labor market outcomes. More importantly, this provides measures of intergenerational persistence in education. In addition, education, when measured by years of schooling, is less likely to share the measurement errors associated with earnings (Azam and Bhatt 2012). There will also be less life-cycle effects as individuals are most likely done with their studies by age 25.

**Parental education and offspring's educational mobility: Linear model**
This paper's methodology of choice reflects well-established techniques in estimating the effects of parents' educational attainment on children's education outcomes. Whether linear or not, the anatomy of estimation strategies reveals a structure that uniformly follows a typical Markov process, thereby comparing the present generation's outcomes against their immediate past counterparts. The equation of interest is given by the following: $s_{i,h}^{c} = f\left(s_{i,h}^{p}; \beta\right) + \epsilon_{i,h}^{c}$

where $s^c_{i\,h}$ is the schooling achievement of the child; $f(s^p_{i\,h}; \beta)$ is a known linear function associated with parents' educational achievements, $\beta$ is a vector of estimable parameters pertaining to parental education, the index $h$ refers to the household to which both parent and child belong, and $\epsilon^c_{i\,h}$ is an identically and independently distributed (i.i.d.) disturbance term pertaining to unobserved attributes of the child.

Following Lanzona (1998) and Dacuycuy (2017), equation (1) is expanded by considering other variables that can affect educational attainment:

$$s^c_{i,h} = f\left(s^p_{i,h};\, \beta\right) + x^p_{i,h}{}'\delta_i + x^c_{i,h}{}'\eta_i + \epsilon^c_{i,h}$$

where $x^p_{i\,h}$ and $x^c_{i\,h}$ are vectors of father and child characteristics.

Simple regression techniques can be used when data on schooling are expressed numerically. Using data on parent-child pairs, the equation identifies a measure of intergenerational educational mobility, which refers to the deviation of a child's education from its mean relative to that of the parent. The parameter vector $\beta$ includes a population measure of persistence that indicates the effects of parental education on the child's educational outcome. High persistence means that if the parent has low educational attainment, the child is most likely to have low educational attainment as well. To a certain extent, the addition of maternal education may mitigate the upward bias of the paternal education coefficient since mothers exert considerable effort in raising and nurturing the child. Thus, by controlling for other factors and varying maternal education, one can also have an idea of how persistent maternal education is in influencing a child's educational outcome.

One advantage of the above specification is its high degree of parsimony, as it allows the examination of how robust the effects of father's and mother's education are on schooling achievements of the child. However, it may miss critical empirical characterizations if $f(s^p_{i\,h}; \beta)$ is highly nonlinear. One clear disadvantage is the fact that measures indicating maternal education may be correlated with unobserved characteristics associated with home environments (Carneiro et al. 2007). This implies that the maternal effect may be upwardly biased, which may indicate higher correlation with offspring's achievement. This study does not have an obvious way to resolve this, as the necessary instruments are not available in the CPH. This is a limitation that was acknowledged at the outset.

In the earnings and wage mobility literature, the effects of paternal education on sons' educational attainments are almost always investigated. This is because women's LFP is affected by childbirth and child care resulting in several types of bias, which includes sample selectivity. This is not a significant issue when analyzing

educational mobility since women in the Philippines are relatively more educated than men, and maternal education can have a significant impact on the educational outcomes of both sons and daughters. Following Lanzona (1998) and Dacuycuy (2017), the paper includes the respective ages and educational attainments (in schooling years) of fathers and mothers as part of the regressors. Household characteristics, such as the number of children, extended household indicator, household size, and the presence of an overseas Filipino worker household head are included regressors as well. For this empirical exercise, the sample is limited to working-age offspring or those aged 25 and above.

As noted in the literature on child development, the family environment is a vital component. Though not always the case, extended households are seen to play a key role in child development. A priori, such a variable is expected to be positively correlated with the child's schooling achievements, even though more information is needed such as the manner of interaction, human capital structure, child investment patterns, and other forms of parental or extended family inputs. Thus, it is seen as an imperfect proxy for the capacity of the household to facilitate child development. With the prevalent practice of migration in the Philippines, the inclusion of an indicator variable on migrant household head is necessary, as anecdotal evidence points to migration's disruptive effects on a child's schooling progression. This may have a negative effect on educational attainment, but with limited instruments, the effects may not be causal.

**Parental education and children's schooling progression: Ordered probit model**
Given the marked differences in the educational outcomes between school-age males and females, it is also important to establish the effect of parental education on children's schooling progression. The analysis of schooling progression allows us to determine the extent to which school-age children face delays, are on time, or are advancing along the schooling ladder. Therefore, this provides more useful narratives for policies aimed at improving intergenerational educational mobility.

While there is extensive literature exploring issues in the Philippine educational system, particularly in basic education, this paper's current interest is in determining its value within the context of social mobility. In contrast to the preceding empirical framework that yielded counterfactual estimates, we can now have a factual characterization of schooling progression of male and female offspring, conditional on known attributes such as own age, educational attainment of parents, and other household characteristics. Operating within Heckman's framework, schooling progression expresses the state of a child's development that may later contribute

toward social mobility (Heckman and Mosso 2014). Within the context of human capital, the presence of highly educated parents may be correlated with better schooling progression states given that the family environment is highly correlated with maternal education as shown in Carneiro et al. (2007).

On a more informative platform, the paper examines how the probability associated with the highest educational attainment varies with paternal and maternal education and other factors. The interest is geared toward establishing the impact of educational attainment of fathers and mothers, which augments studies that only focus on years of schooling as the key variable of interest.

Using a simple technique, school-age children can be categorized into three outcomes: delayed, on time, and advanced. A child's schooling progression is on time if the child's HGC is Grade 1 at age 7 or 8, or if the child's HGC is Grade 2 at age 9, and so on. A child's schooling progression is delayed if the reported HGC is lower than the preceding HGC-age pair, and advanced if the reported HGC is higher.

Given that the outcomes of interest are different states of schooling progression, the ordered probit model is used, which is a suitable estimator for analyzing ordered categorical data. When a linear regression model is employed, the assumption is that the marginal effect of the schooling years of either parent is constant throughout the support. For instance, if the coefficient estimate is 0.3 for father's years of schooling, it is uniformly applied to different schooling progression outcomes of sons or daughters. This may run counter to the observation that having a son or daughter who has advanced along the schooling ladder may lead to higher parental utility or may enhance the transmission of parental abilities and traits.

The observed progression outcomes associated with children's propensity to achieve progress are generated by an underlying latent process, $e_i^* = x_i' \beta + \epsilon_i$, where $\epsilon_i$ is a stochastic process. Following Greene (2003), all the possible values of a child's education can be mapped on $e_i^*$,

$$
\begin{aligned}
e_i &= Delayed \; e_i^* \leq 0 \\
&= On \; time \; 0 < e_i^* \leq v_1 \\
&= Advanced \; v_1 < e_i^*
\end{aligned}
$$

where $v_1$ represents the cutoff point. For this empirical exercise, the sample is limited to offspring of schooling age or those aged 6–21.

Similar to the specification above, the respective educational attainments of father and mother (in schooling years) are included as primary regressors. Based on schooling years, a categorical variable is created and assigned a value equal to 0 if the mother's HGC is at most elementary graduate, 1 if at least high school undergraduate or at most high school graduate, 2 if at least with college units,

and 3 if at least college graduate. A categorical variable to represent the father's educational attainment is constructed similarly. Other household characteristics such as the number of children, extended household indicator, household size, and the presence of an overseas Filipino worker household head are also included as regressors.

A dummy variable to represent working mothers is also included as a regressor. From the literature's standpoint, research on time use and home production documenting the effects of mother's labor market participation on children's outcomes abound. On the one hand, Stafford (1987) and Ruhm (2000) show that maternal employment negatively affects children's cognitive skills. On the other hand, within the context of gender identity or that sense of belongingness to a social category that prescribes behavioral norms (West and Zimmerman 1987; Akerlof and Kranton 2000), the intergenerational transmission of behavior happens because children typically pattern their behavior after their parents. In this setting, maternal employment can be argued to positively affect children's educational attainment through demonstration, inspiration, and aspiration.

**Data and issues**
This paper uses the 2010 CPH (Form 3, 20% sampling) collected by the PSA every five years to estimate the country's population. Using the CPH is a better alternative to minimize bias because of its large sample size. One important aspect of the data set is that the design allows for easy mapping of educational categories to schooling years, thereby facilitating the use of regression-based methods for estimating IEEs.

Due to the absence of alternative identification schemes, the paper follows the co-residence feature to extract and form data sets consisting of parents and offspring. This may entail biases, all of which are discussed in the introduction. A temporal dimension is motivated by defining several age cohorts (1960–1964, 1965–1969, 1970–1974, 1975–1979, and 1980–1984) of offspring. This will become the basis of the regression models using the working-age sample.

To constitute the parents-offspring pairs, variables that indicate the member's relationship to the household head and sex are used to separate the sons and daughters and extract parental data. These are then merged using identifiers unique to households.

The empirical exercise on intergenerational educational mobility is applied to defined cohorts of the working-age population 25 years and above. One limitation in the use of the CPH 2010 concerns the way cohorts have been defined in each region.

This poses complications since some of the regions did not yet exist as separate political entities prior to 2010.

Thus, the inferred educational policy environment is the result of a counterfactual, which may not capture the effects of urban-rural migration or interregional migration. However, one benefit of such scheme is to generate cohort-based results that can potentially trace the evolution of IEEs across regions. This is not an issue when it comes to the empirical exercise on schooling progression since the sample is limited to school-age children and cohorts are not used.

In addition, the CPH does not collect earnings data, which may be needed to identify the impact of parental education on children's schooling achievements in a structural model (Behrman and Rosenzweig 2002).

## Discussion of results

### Educational mobility of sons and daughters

Following the empirical strategy outlined in the section "Parental education and offspring's educational mobility", IEEs are estimated using OLS and are presented in Figures 4.1.1 to 4.1.4[4]. IEE estimates that are lower than the IEE mean (around 0.3) are indicative of higher mobility, while those higher than the mean are associated with lower mobility. Several observations are noted.

1. Sons and daughters are relatively more mobile than their fathers. Daughters belonging to the young cohort experienced mobility gains in Cagayan Valley, MIMAROPA, Caraga, and Zamboanga Peninsula. This paved the way for daughters from the young cohort to outperform their fathers in all regions (Figure 4.1.3). There are also more regions where sons surpassed their fathers' educational attainment than regions where sons surpassed their mothers' educational achievement (Figure 4.1.1).

2. Sons and daughters achieved high mobility across generations notably in Luzon regions. Daughters have persistently high mobility in Ilocos Region, Cagayan Valley, CALABARZON, MIMAROPA, Bicol, Eastern Visayas, SOCCSKSARGEN, and Northern Mindanao (Figure 4.1.4) while sons from young cohorts sustained high mobility in Ilocos Region, Central Luzon, NCR, CALABARZON, and SOCCSKSARGEN (Figure 4.1.2).

3. Sons and daughters have low mobility across generations notably in Mindanao and Visayas regions. Daughters have persistently low mobility in CAR, Caraga, and Central Visayas (Figure 4.1.4) while sons from young

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[4] Regional map of the Philippines is provided at http://bit.ly/phregmap.

cohorts sustained low mobility in ARMM, Zamboanga Peninsula, Caraga, and Western Visayas (Figure 4.1.2).

4. There are regions where sons from young cohorts made mobility gains notably in some Luzon and Visayas regions. Sons have become highly mobile relative to their fathers in CAR, Cagayan Valley, and Davao (Figure 4.1.1). Relative to their mothers (Figure 4.1.2), the mobility of sons from young cohort is similar to that of the old cohort, except for Central and Eastern Visayas where sons from young cohort outperformed their mothers' educational achievements.

5. There are regions where sons from young cohorts experienced deterioration in their mobility. Sons in Northern and Central Mindanao, Caraga, MIMAROPA, and Bicol have lower educational attainments relative to what their fathers achieved (Figure 4.1.1) while sons in CAR, Cagayan Valley, Eastern and Central Visayas, and Davao have lower educational attainments relative to what their mothers attained (Figure 4.1.2).

**Mobility-human capital accumulation of sons and daughters**
Mobility estimates contain information on the movement of offspring relative to their parents. However, immobility is not necessarily associated with suboptimal human capital accumulation for children, especially at high levels of parental educational attainment. In this case, children may be able to match parental education. This is immobility at the top. Neither is mobility immediately indicative of superior human capital outcomes for children, especially at low levels of parental educational attainment. In this case, children can easily improve upon their parents' educational attainment. This is known as mobility at the bottom. Hence, to make the IEE estimates more useful, scatterplots of the IEE estimates against the current mean schooling years are provided in Figures 4.2.1 and 4.2.2.

This study creates a simple classification scheme based on the 10-year schooling threshold, which corresponds to the completion of secondary schooling. In terms of mobility estimates, regions with IEE estimates higher than the IEE mean have low mobility (LM). This means that the cohort's educational attainment is similar to that of the cohort's parents. Those with values less than the IEE mean of 0.3 are considered highly mobile (HM). In terms of human capital accumulation, those to the left of the 10-year line are regions with currently low mean years of schooling (LS). This is the region of underaccumulation. Those to the right are regions with high mean years of schooling or accumulation (HS). There are four regions created, namely: LM-LS (regressive underaccumulation), LM-HS (regressive accumulation), HM-HS

Figure 4.1.1 Cohort-based IEE estimates: Father-son pairs, Philippines
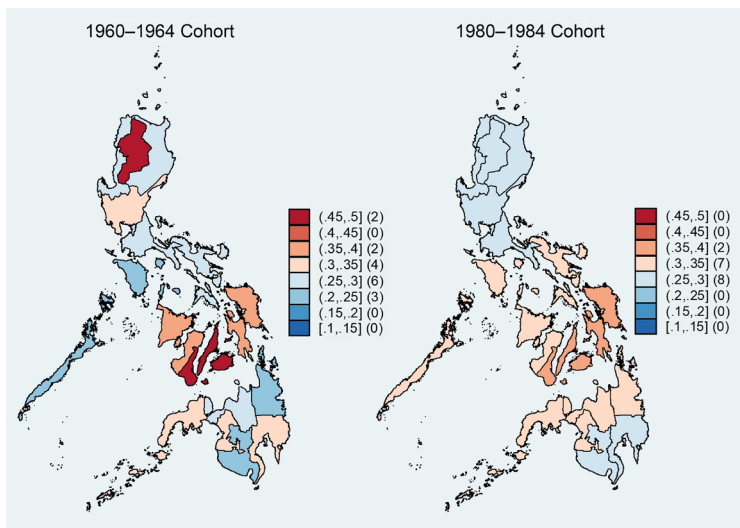


IEE = intergenerational educational elasticity
Source: Authors' computation

Figure 4.1.2 Cohort-based IEE estimates: Mother-son pairs, Philippines
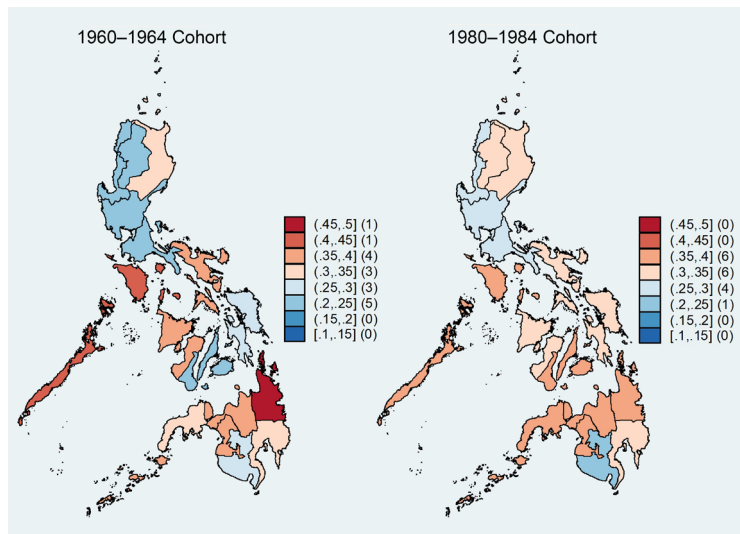


IEE = intergenerational educational elasticity
Source: Authors' computation

Figure 4.1.3 Cohort-based IEE estimates: Father-daughter pairs, Philippines
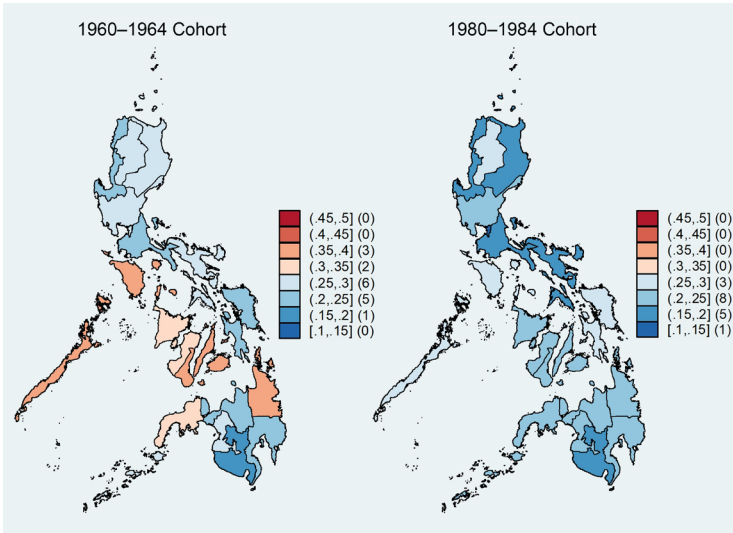


IEE = intergenerational educational elasticity
Source: Authors' computation

Figure 4.1.4 Cohort-based IEE estimates: Mother - daughter pairs, Philippines
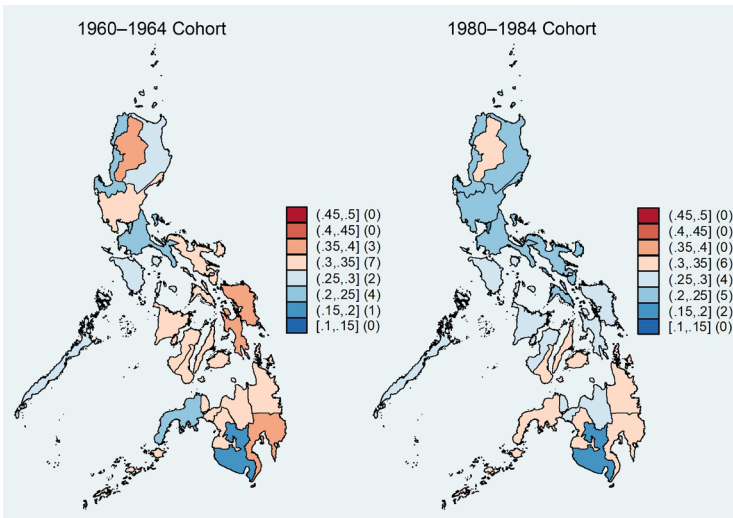


IEE = intergenerational educational elasticity
Source: Authors' computation

(progressive accumulation), and HM-LS (progressive underaccumulation). Several salient results are noted.

1. Daughters in all regions, except ARMM, have experienced improvements in terms of human capital accumulation. Daughters from the old cohort in these regions have regressive accumulation of human capital, indicating low mobility, although they have high educational attainment. Those from the young cohort have achieved progressive accumulation of human capital.

2. Daughters in ARMM have either progressive underaccumulation or regressive underaccumulation of human capital, indicating persistently low educational outcomes across generations.

3. Daughters from the young cohort in NCR have the most progressive human capital accumulation. Across generations, daughters have high educational attainment relative to their parents. Their current mean educational achievement is the highest among all the regions as well.

4. Daughters from the young cohort in CAR have regressive accumulation. This indicates high educational outcomes in CAR, so that in terms of mobility, young cohort would need an even higher educational attainment to outperform their parents.

5. Sons from across cohorts in some regions exhibit persistence in human capital accumulation.

   • In both ARMM and Zamboanga Peninsula, persistently low educational outcomes across generations are observed. Sons from the old cohort have experienced regressive underaccumulation of human capital and this is observed in young cohort as well.

   • In SOCCSKSARGEN and Caraga, cohorts of sons have remained in the progressive underaccumulation region. This suggests that although sons have higher educational attainments than their parents, their educational attainment is still low and much remains to be done to improve their human capital.

   • In MIMAROPA, Bicol, and Western/Central/Eastern Visayas, sons from young cohort have remained in the regressive underaccumulation. Much remains to be done to improve the human capital of sons in these regions as well.

   • In NCR, a progressive accumulation of human capital is observed. This means that across generations, both cohorts have high educational attainments relative to their parents.

Figure 4.2.1 IEE estimates against current mean schooling years, sons: Philippines
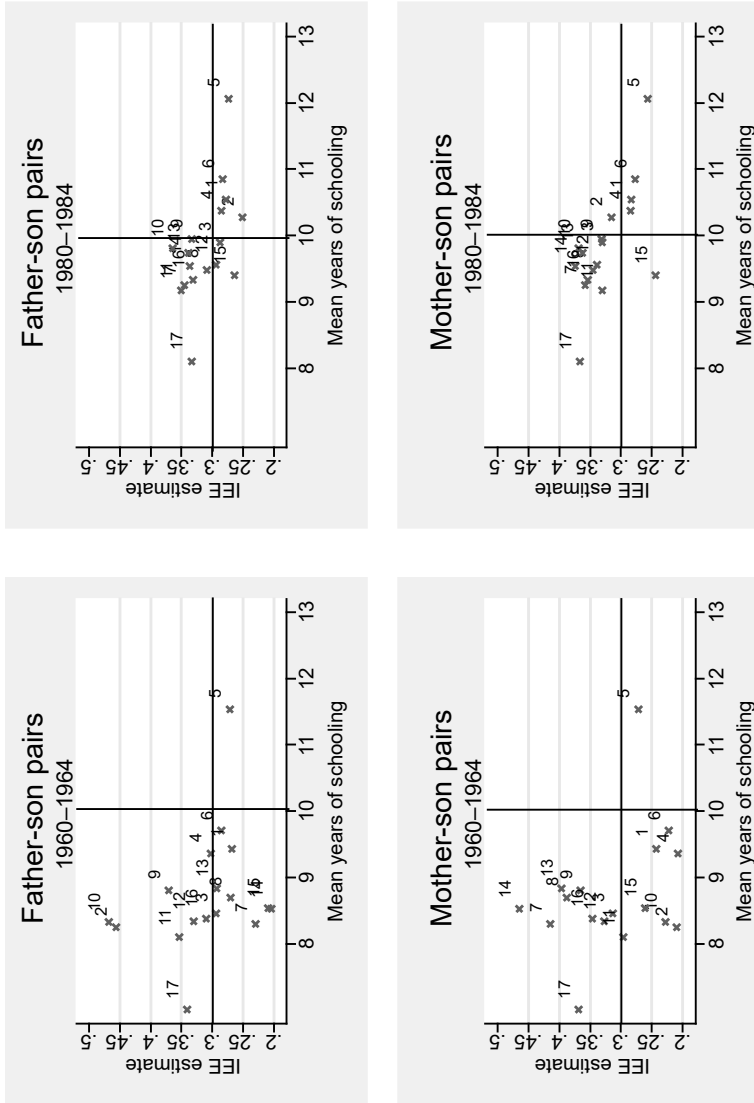


1 = Ilocos; 2 = Cordillera Administrative Region; 3 = Cagayan Valley; 4 = Central Luzon; 5 = NCR; 6 = CALABARZON; 7 = MIMAROPA; 8 = Bicol; 9 = Western Visayas; 10 = ARMM Visayas; 11 = Central Visayas; 12 = Davao; 13 = Northern Mindanao; 14 = Caraga; 15 = SOCCSKSARGEN; 16 = Zamboanga Peninsula; 17 = ARMM

IEE = intergenerational educational elasticity

Source: Authors' computation

Figure 4.2.2 IEE estimates against current mean schooling years, daughters: Philippines
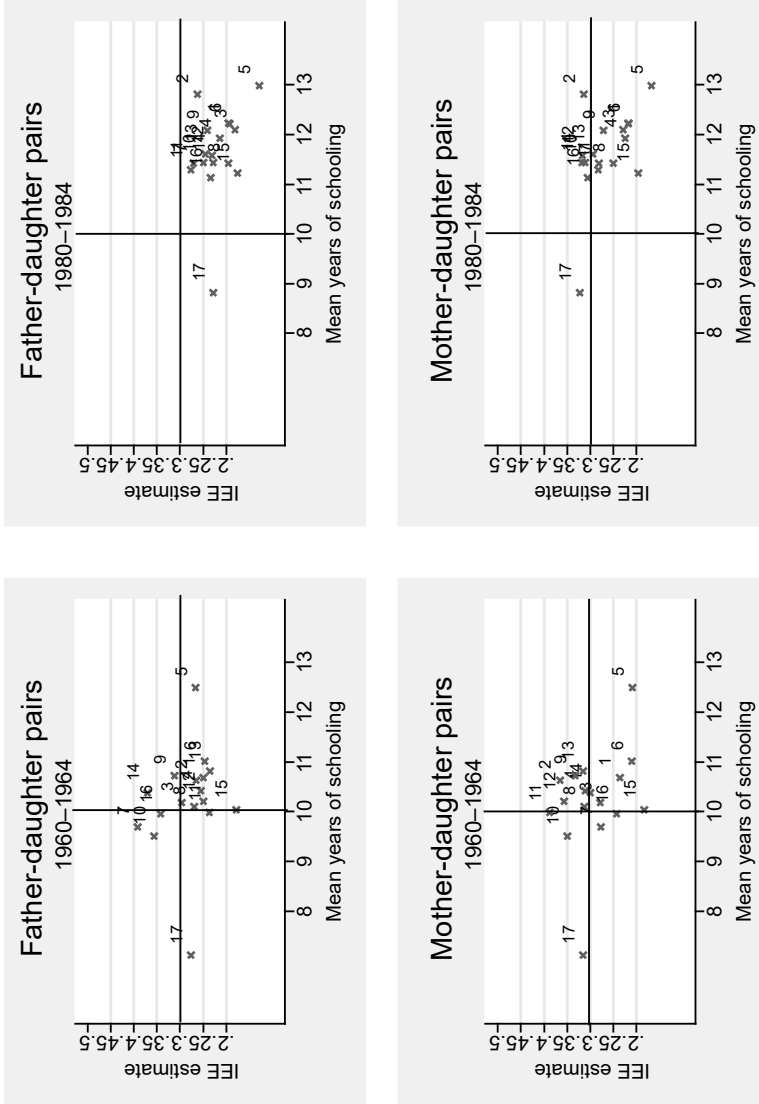


1 = Ilocos; 2 = Cordillera Administrative Region; 3 = Cagayan Valley; 4 = Central Luzon; 5 = NCR; 6 = CALABARZON; 7 = MIMAROPA; 8 = Bicol; 9 = Western Visayas; 10 = Central Visayas; 11 = Eastern Visayas; 12 = Davao; 13 = Northern Mindanao; 14 = Caraga; 15 = SOCCSKSARGEN; 16 = Zamboanga Peninsula; 17 = ARMM

IEE = intergenerational educational elasticity

Source: Authors' computation

6. Sons in some regions show improvements in the human capital outcomes when comparing the old and young cohorts.
    - Although both cohorts of sons in Ilocos Region, CALABARZON, and Central Luzon have always been mobile, the young cohorts have higher educational attainments than their old counterparts.
    - Improvements are observed in CAR with the young cohort of sons progressively accumulating higher levels of education.

**Children's schooling progression and parental education**

Based on the empirical strategy outlined in the section "Parental education and children's schooling progression" and using ordered probit models, the respective probabilities of a child's schooling being delayed, on time, and advanced are predicted. To do this, a benchmark household with the following characteristics is assumed: extended household, household size of 6, with 3 children younger than 7 years old. In addition, the father is assumed to be a college graduate and belongs to a major ethnic group. To assess the contribution of mother's education and labor market participation, predicted probabilities are computed using various assumptions on mother's HGC and labor market status. Several results are noted for sons' schooling outcomes.

1. The educational attainment of mothers has an important role in determining sons' schooling outcomes.
    - Results (upper and lower left panel of Figure 4.3.1) show that sons whose mothers are working and educated are highly likely to achieve advanced schooling (between 68% and 81%), the highest of which are in Ilocos, Cagayan Valley, and MIMAROPA and the lowest are in Western Visayas, Zamboanga Peninsula, and SOCCSKSARGEN.
    - Sons whose mothers are working and less educated are more likely to be delayed in schooling, and this is evident in all Visayas regions and some Luzon regions such as Zamboanga Peninsula, Western Visayas, and Eastern Visayas.
    - Similarly, results (upper and lower right panel of Figure 4.3.1) show that sons of nonworking and educated mothers have relatively high probabilities of advanced schooling.
    - Those whose mothers are nonworking and less educated have high probabilities of delayed schooling (between 55% and 75%), with sons

in Visayas regions and some Luzon regions such as MIMAROPA and Bicol having the highest probability of delay.

2. The LFP of mothers has an important role in sons' schooling outcomes.
   - Results (lower left versus lower right panel of Figure 4.3.1) show that sons whose mothers are working and educated have higher probabilities of advanced schooling (between 68% and 81%) than those whose mothers are nonworking and educated (between 42% and 61%).
   - In addition, results (upper left versus upper right panel of Figure 4.3.1) show that sons whose mothers are nonworking and less educated have higher probabilities of delayed schooling (between 55% and 72%) than those whose mothers are working and less educated (between 35% to 50%).

3. The LFP of mothers plays a role in determining daughters' schooling outcomes (lower left and right panel of Figure 4.3.2), and it appears that it has a higher effect on daughters' than on sons' schooling progression outcomes, with the former consistently having higher probabilities of advanced schooling across most regions. Unlike sons, daughters whose mothers are working but less educated have probabilities of advanced schooling higher than the probabilities of being on time or delayed, and this is observed in most Luzon and Visayas regions.

## Summary and concluding remarks

This paper has analyzed the effects of paternal and maternal schooling achievements on sons' and daughters' human capital outcomes. Using working-age samples, it has analyzed the IEEs of men and women. Using school-age samples, it has analyzed the schooling progression of boys and girls. Due to data limitations, however, the paper is not able to address biases arising from assortative mating and coresidency. In addition, the paper is not able to control for other attributes that could shape the family environment, identify work-nurture tensions that determine the pattern of time allocation among working mothers at different stages of a child's development, and incorporate interaction dynamics that take place within the family in terms of learning and other formative activities. In addition, the approach assumes that one can meaningfully discern critical inputs based on parents' educational attainment. Despite these limitations, results on educational mobility and schooling progression generate important insights that future research can build on.

Figure 4.3.1 Probabilities of outcomes in schooling progression, sons: Philippines



Note: Ordered probit is used to estimate the probabilities of a child's schooling progression (advanced, on time, and delayed) using region-specific samples. Regressors include educational dummies for mothers and fathers, an indicator variable for extended households, work indicator for mothers, age of father, an indicator variable for having an overseas Filipino worker household head, household size, and the number of children. The age of mother has been dropped because of its high correlation with work indicator. Stata's margins command is used to generate probabilities.

Region Code: 1= Region I (Ilocos Region), 2 = Cordillera Administrative Region (CAR), 3 = Region II (Cagayan Valley), 4 = Region III (Central Luzon), 5 = National Capital Region (NCR), 6 = Region IV-A (Cavite, Laguna, Batangas, Rizal, Quezon [CALABARZON]), 7 = Region IV-B (Mindoro, Marinduque, Romblon, Palawan [MIMAROPA], 8 = Region V (Bicol), 9 = Region VI (Western Visayas), 10 = Region VII (Central Visayas), 11 = Region VIII (Eastern Visayas), 12 = Region IX (Zamboanga Peninsula), 13 = Region X (Northern Mindanao), 14 = Region XI (Davao), 15 = Region XII (South Cotabato, Cotabato, Sultan Kudarat, Sarangani, General Santos City [SOCCSKSARGEN]), 16 = Autonomous Region in Muslim Mindanao (ARMM), 17 = Region XIII (Caraga)

Figure 4.3.2: Probabilities of outcomes in schooling progression, daughters: Philippines



Note: Ordered probit is used to estimate the probabilities of a child's schooling progression (advanced, on time, and delayed) using region-specific samples. Regressors include educational dummies for mothers and fathers, an indicator variable for extended households, work indicator for mothers, age of father, an indicator variable for having an overseas Filipino worker household head, household size, and the number of children. The age of mother has been dropped because of its high correlation with work indicator. Stata's margins command is used to generate probabilities.

Region Code: 1= Region I (Ilocos Region), 2 = Cordillera Administrative Region (CAR), 3 = Region II (Cagayan Valley), 4 = Region III (Central Luzon), 5 = National Capital Region (NCR), 6 = Region IV-A (Cavite, Laguna, Batangas, Rizal, Quezon [CALABARZON]), 7 = Region IV-B (Mindoro, Marinduque, Romblon, Palawan [MIMAROPA], 8 = Region V (Bicol), 9 = Region VI (Western Visayas), 10 = Region VII (Central Visayas), 11 = Region VIII (Eastern Visayas), 12 = Region IX (Zamboanga Peninsula), 13 = Region X (Northern Mindanao), 14 = Region XI (Davao), 15 = Region XII (South Cotabato, Cotabato, Sultan Kudarat, Sarangani, General Santos City [SOCCSKSARGEN], 16 = Autonomous Region in Muslim Mindanao (ARMM], 17 = Region XIII (Caraga)

While broad patterns at the national level show that the mean schooling years of daughters are higher across cohorts, regional patterns reveal the need for a more nuanced analysis. NCR appears to be a special case since this region exhibits the lowest variability in mean schooling years of daughters across cohorts and regions. In addition, it is the only region where the mean schooling years of both sons and daughters are relatively the same. At the other extreme, sons and daughters in ARMM have the lowest mean schooling years across cohorts. Likewise, daughters in Central Visayas, CAR, and MIMAROPA exhibit the most variability in schooling years across cohorts with the younger ones registering higher mean schooling years than their older counterparts.

Analysis of intergenerational education elasticities within a regional perspective results in a nuanced understanding of the gendered disparity in educational outcomes. Daughters from young cohorts have been found to be mobile relative to the educational achievements of their fathers and mothers. In contrast, the mobility of sons exhibits substantial variations across regions. With respect to their fathers' educational attainment, sons have become more mobile in Luzon regions (CAR and Cagayan Valley) and less mobile in Northern and Central Mindanao, Caraga, MIMAROPA, and Bicol. With respect to their mothers' educational achievement, they have become more mobile in Visayas regions (Central and Eastern Visayas) and less mobile in CAR, Cagayan Valley, Eastern and Central Visayas, and Davao.

A regional analysis of human capital accumulation indicates substantial differences between sons and daughters, with daughters notably outperforming sons. While this is the case, sons are not necessarily lagging behind, as there are regions where sons have either achieved persistently good or markedly improved human capital outcomes. The identified regions can be designated as probable targets for primary data collection to gain a full understanding of factors and processes, such as practices at home and school and sociocultural norms and traditions, all of which can help in shaping the landscape of education policies and practices. As pointed out in the FLEMMS reports, one important reason why boys underperform is that they lose interest in learning. Primary data collection can shed light on this issue.

1.  Daughters have exhibited improvements in their mobility-educational outcomes in all regions, except in Mindanao regions such as ARMM and CAR where they have low human capital accumulation that is persistent across generations.

2.  In contrast, there are regions where sons have regressive underaccumulation of human capital. These regions are MIMAROPA, Bicol, Western/Central/Eastern Visayas, ARMM, and Zamboanga Peninsula. In these regions, both parents and sons from old and young cohorts have low educational attainment.

3.  There are regions where sons have progressive underaccumulation of human capital. In SOCCKSARGEN and Caraga, old and young cohorts of sons have remained in the progressive underaccumulation region, which suggests that although sons have higher educational attainment than their parents, their educational achievements are still low and much remains to be done to improve their human capital.
4.  Luzon regions show improvements in sons' human capital accumulation. Old and young cohorts of sons in Ilocos Region, CALABARZON, and Central Luzon have been mobile, although the young cohort has higher educational attainments. Sons in CAR have been progressively accumulating human capital as well.
5.  NCR has the best achievement in human capital accumulation. Both sons and daughters have progressive accumulation of human capital, which means that across generations, they have high educational attainments relative to their parents. Their current mean educational achievement is the highest among all the regions as well.

The regional analysis of the schooling progression of boys and girls indicates a substantial variation in outcomes, and maternal education appears to play an important role. Sons of educated/working mothers have very high probabilities of achieving advanced schooling, the highest of which are in Ilocos, CAR, and Caraga, and the lowest are in MIMAROPA, CALABARZON, and SOCCSKSARGEN. In contrast, sons of low-educated/working mothers are more likely to be delayed in schooling, and this is pronounced in all Visayas regions and some Luzon regions such as MIMAROPA, CALABARZON, and Bicol.

Given that children's schooling and labor market outcomes are linked and the mobility-income inequality relationship remains robust, this result implies that the contribution of women's education goes beyond their current generation and extends to rearing future productive citizens as well. These regions can be potential targets of in-depth studies so that a more directed set of educational policies and programs to improve the boys' schooling progression can be developed.

In terms of schooling environments, there is a need for more systematic research to analyze the effects of female teachers' dominance on the educational performance of boys. This is a recommendation shared by Paqueo and Orbeta (2019) as well. This line of thinking is supported by the growing household evidence that children will most likely pattern their aspirations and behavior after the 'same-gender' parent,

consistent with ideas behind identity economics (Akerlof and Kranton 2000) and gender identity (West and Zimmerman 1987).

In terms of household environments, parents are important actors instrumental in developing children's cognitive and noncognitive skills. To enhance parental roles, early interventions enriched with home visitations, especially to disadvantaged households whose children have a high probability of dropping out of school can be explored. Interventions that prioritize both cognitive and noncognitive skills can lead to better labor market outcomes and even lower incidence of other societal problems such as criminality.

Family resources and intergenerational transfers are also important to ensure the schooling progression of the youth, especially that of the boys. As reviewed in the literature, we can learn from studies that highlight the role of intergenerational transfers on schooling outcomes (Quisumbing 1994; Lauby and Stark 1998; Estudillo et al. 2001; Quisumbing and McNiven 2010; and Yamauchi and Tiongco 2013). Results from current research show that relative to nonworking/educated, sons of working/ educated mothers have higher probabilities of advanced schooling. Relative to working/low educated mothers, a more pronounced effect of nonworking/low educated mothers on sons' delayed schooling is observed. This result is consistent with the evidence established in India showing that the probability of finishing tertiary education is conditioned by the father's earnings.

Facing credit constraints, poor households may only infuse inferior investments in human capital and plausibly provide suboptimal parental inputs and family learning environments, thereby limiting economic opportunities of children in the labor market. Dacuycuy (2017) showed that sons or daughters from nonpoor households have higher chances of completing college education relative to their counterparts from poor households. If the heritability of traits is high in such households, the effects of parents' social status may be persistent, thereby limiting educational mobility. Thus, it is important to help parents, especially those from disadvantaged backgrounds, to secure decent and stable employment. Offering program interventions in disadvantaged households that improve parenting and mentoring skills can also be explored.

While women have higher mean schooling, their LFP has been moderate. This may have consequences on the family's ability to provide more learning opportunities for children, especially for boys. As pointed out by Behrman and Rosenzweig (2002), increases in maternal schooling may not automatically lead to positive changes in children's schooling. Results of the paper point to the importance of LFP. One strategy to enhance women's LFP is to address issues about the care economy and informality, which represent factors of intermittency affecting women's LFP. Safety nets that

ensure safe, secure, and stable employment and a work environment that promotes a healthy work-home balance may incentivize women to stay in the labor force. Evidence already points to the positive effects of mandatory leaves on the education outcomes of children with low-educated mothers (Carneiro et al. 2010).

Finally, there is a need to address the persistence of income inequality by ensuring that a significant portion of the population will be able to upgrade human capital. One way to do this is to manage the growth process and to establish sustainable sources of funds to finance education programs. An important point raised by Galiani (2013) is that social mobility gains will be realized if policies are designed in such a way that they break the dependence of an offspring's educational outcomes on family background. A clear example, although not yet present in 2010, is the free tuition law for deserving college students in state colleges and universities. This will weaken the link between initial conditions and educational opportunities of children relative to their parents. A practical issue that confronts policymakers concerns the role of differential quality between elite and standard universities in social mobility (Brezis and Hellier 2016).

# References

Akerlof, G. and G. Kranton. 2000. Economics and identity. *The Quarterly Journal of Economics* 115(3):715–753.

Azam, M. and V. Bhatt. 2012. Like father, like son? Intergenerational educational mobility in India. IZA Discussion Paper No. 6549. Bonn, Germany: Institute of Labor Economics. http://ftp.iza.org/dp6549.pdf (accessed on March 3, 2018).

Azomahou, T. and E. Yitbarek. 2016. Intergenerational educational mobility in Africa. Policy Research Working Paper No. 7843. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/379961475169190879/Intergenerational-education-mobility-in-Africa-has-progress-been-inclusive (accessed on March 3, 2018).

Becker, G. and N. Tomes. 1986. Human capital and the rise and fall of families. *Journal of Labor Economics* 4(3, part 2):S1–S39.

Becker, G., S. Kominers, K. Murphy, and J. Spenkuch. 2018. A theory of intergenerational mobility. *Journal of Political Economy* 126(S1, October 2018):7–25.

Behrman, J. 2000. Social mobility: Concepts and measurement in Latin America and the Caribbean. In *New markets, new opportunities? Economic and social mobility in a changing world*, edited by N. Birdsall and C. Graham. Washington, D.C.: Brookings Institution/Carnegie Endowment for International Peace.

Behrman, J. and M. Rosenzweig. 2002. Does increasing women's schooling raise the schooling of the next generation? *American Economic Review* 92(1):323–334.

Behrman, J., N. Birdsall, and M. Szekely. 1998. Intergenerational schooling mobility and macro conditions and schooling policies in Latin America. Inter-American Development Bank Working Paper 386. Washington, D.C.: Inter-American Development Bank. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1817183## (accessed on September 11, 2018).

Bevis, L.E.M. and C.B. Barrett. 2015. Decomposing intergenerational income elasticity: The gender-differentiated contribution of capital transmission in rural Philippines. *World Development* 74(October 2015):233–252.

Brezis, E. and J. Hellier. 2016. Social mobility and higher education policy. Dondena Working Paper No. 95 (December 2016). Milan, Italy: Dondena Centre for Research on Social Dynamics and Public Policy.

Carneiro, P., C. Meghir, and M. Parey. 2007. Maternal education, home environments, and the development of children and adolescents. IZA Discussion Paper No. 3072. Bonn, Germany: Institute of Labor Economics.

Carneiro, P., K. Loken, and K. Salvanes. 2010. A flying start? Long term consequences of maternal time investments in children during their first year of life. IZA Discussion Paper No. 5362. Bonn, Germany: Institute of Labor Economics. http://ftp.iza.org/dp5362.pdf (accessed on March 3, 2018).

Dacuycuy, L. 2017. Social mobility in the Philippine labor market. Background paper prepared for the *Philippine Human Development Report*. Quezon City: Human Development Network.

Emran, M. and F. Shilpi. 2012. Gender, geography and generations: Intergenerational educational mobility in post-reform India. https://ssrn.com/abstract=2050278 (accessed on January 3, 2019).

Estudillo, J., A.R. Quisumbing, and K. Otsuka. 2001. Gender differences in land inheritance, schooling, and lifetime income: Evidence from the Rural Philippines. *Journal of Development Studies* 37(4):23–48.

Francesconi, M. and J. Heckman. 2016. Symposium on child development and parental investment: Introduction. IZA Discussion Paper No. 9977. Bonn, Germany: Institute of Labor Economics.

Galiani, S. 2013. Social mobility: What is it and why does it matter? *Economica* 59:167–229.

Greene, W.H. 2003. *Econometric analysis* (5th edition). Upper Saddle River, New Jersey: Prentice-Hall.

Heckman, J. and S. Mosso. 2014. The economics of human development and social mobility. NBER Working Paper Series No. 19925. Cambridge, MA: National Bureau of Economic Research.

International Labour Organization (ILO). 2017. *Decent work country diagnostics: Philippines 2017*. Philippines: ILO.

Lanzona, L. 1998. Intergenerational educational mobility in rural Philippines: Test of liquidity constraints and gender differences. History of the People (vol. 5): Proceedings of the 1998 Centennial Regional Seminar-Workshop Series on Oral and Local History. National Historical Institute and Philippine National Historical Society, Manila, Philippines.

Lauby, J. and O. Stark. 1998. Individual migration as a family strategy: Young women in the Philippines. *Population Studies* 42(3):473–486.

Leone, T. 2017. The gender gap in intergenerational mobility: Evidence of educational persistence in Brazil. Freie University School of Business and Economics Discussion Papers 2017/27. Berlin, Germany: Freie Universitat Berlin, School of Business and Economics. https://refubium.fu-berlin.de/bitstream/handle/fub188/22079/discpaper2017_27.pdf?sequence=1&isAllowed=y (accessed on January 3, 2019).

Narayan, A, R. Van der Weide, A. Cojocaru, C. Lakner, S. Redaelli, D. Mahler, R.G.N. Ramasubbaiah, and S. Thewissen. 2018. Fair progress? Economic mobility across generations around the world. In *Equity and Development.* Washington, D.C.: World Bank.

Paqueo, V. and A. Orbeta. 2019. Gender equity in education: Helping the boys catch up. PIDS Discussion Paper 2019-01. Quezon City, Philippines: Philippine Institute for Development Studies. https://www.pids.gov.ph/publications/6807 (accessed on April 2, 2019).

Philippine Statistics Authority (PSA). 2010. 2010 Census of Population and Housing: Quezon City, Philippines: PSA.

———. 2011. Gross Regional Domestic Product-2011 Growth Rates of GRDP. Quezon City, Philippines: PSA. http://nap.psa.gov.ph/grdp/2011/2011congr.asp (accessed on October 6, 2018).

Quisumbing, A.R. 1994. Intergenerational transfers in Philippine rice villages: Gender differences in traditional inheritance customs. *Journal of Development Economics* 43(2):167–195.

Quisumbing, A.R. and S. McNiven. 2010. Moving forward, looking back: The impact of migration and remittances on assets, consumption, and credit constraints in the rural Philippines. *Journal of Development Studies* 46(1):91–113.

Ruhm, C. 2000. Parental employment and child cognitive development. NBER Working Paper 7666. Cambridge, MA: National Bureau of Economic Research.

Stafford, F. 1987. Women's work, sibling competition, and children's school performance. *American Economic Review* 77(5):972–980.

West, C. and D. Zimmerman. 1987. Doing gender. *Gender and Society* 1:125–151.

Yamauchi, F. and M. Tiongco. 2013. Why women are progressive in educuation? Gender disparities in human capital, labor markets, and family arrangement in the Philippines. *Economics of Education Review* 32:196–206.

## Appendix

Appendix 1. Test of means, difference between male and female schooling years, by cohorts: Philippines

| | 1960–1964 | 1965–1969 | 1970–1974 | 1975–1979 | 1980–1984 |
|---|---|---|---|---|---|
| Ilocos Region | -1.243*** | -1.39*** | -1.51*** | -1.658*** | -1.692*** |
| | 0.066 | 0.047 | 0.035 | 0.027 | 0.018 |
| Cagayan Valley | -1.718*** | -1.946*** | -2.018*** | -2.248*** | -2.201*** |
| | 0.112 | 0.081 | 0.058 | 0.042 | 0.028 |
| Central Luzon | -1.053*** | -1.337*** | -1.408*** | -1.571*** | -1.552*** |
| | 0.051 | 0.035 | 0.026 | 0.019 | 0.013 |
| CALABARZON | -1.302*** | -1.426*** | -1.38*** | -1.477*** | -1.368*** |
| | 0.047 | 0.033 | 0.025 | 0.018 | 0.012 |
| MIMAROPA | -1.389*** | -1.744*** | -2.017*** | -2.261*** | -2.173*** |
| | 0.145 | 0.033 | 0.076 | 0.056 | 0.037 |
| Bicol | -1.402*** | -1.652*** | -1.73*** | -1.961*** | -1.944*** |
| | 0.081 | 0.033 | 0.044 | 0.033 | 0.022 |
| Western Visayas | -1.918*** | -2.045*** | -2.065*** | -2.176*** | -2.126*** |
| | 0.061 | 0.033 | 0.034 | 0.025 | 0.017 |
| Central Visayas | -1.18*** | -1.316*** | -1.425*** | -1.579*** | -1.62*** |
| | 0.07 | 0.033 | 0.039 | 0.029 | 0.019 |
| Eastern Visayas | -1.885*** | -2.063*** | -2.024*** | -2.108*** | -2.111*** |
| | 0.095 | 0.033 | 0.054 | 0.041 | 0.028 |
| Zamboanga Peninsula | -1.564*** | -1.582*** | -1.908*** | -1.94*** | -1.801*** |
| | 0.141 | 0.033 | 0.069 | 0.05 | 0.033 |
| Northern Mindanao | -1.977*** | -1.83*** | -1.944*** | -1.966*** | -1.866*** |
| | 0.102 | 0.033 | 0.054 | 0.039 | 0.026 |
| Davao | -1.863*** | -2.162*** | -2.076*** | -2.165*** | -2.023*** |
| | 0.103 | 0.033 | 0.053 | 0.038 | 0.025 |
| SOCCSKSARGEN | -1.491*** | -1.736*** | -1.793*** | -1.971*** | -1.82*** |
| | 0.137 | 0.033 | 0.064 | 0.045 | 0.029 |
| National Capital Region | -0.964*** | -1.056*** | -1.022*** | -0.971*** | -0.922*** |
| | 0.041 | 0.033 | 0.022 | 0.016 | 0.01 |

## Appendix 1 (continued)

|        | 1960–1964 | 1965–1969 | 1970–1974 | 1975–1979 | 1980–1984 |
|--------|-----------|-----------|-----------|-----------|-----------|
| CAR    | -2.384*** | -2.75***  | -2.733*** | -2.908*** | -2.54***  |
|        | 0.152     | 0.033     | 0.081     | 0.056     | 0.035     |
| ARMM   | -0.1***   | -0.402*** | -0.538*** | -0.727*** | -0.713*** |
|        | 0.299     | 0.033     | 0.105     | 0.071     | 0.04      |
| Caraga | -1.849*** | -1.953*** | -1.922*** | -1.973*** | -1.893*** |
|        | 0.135     | 0.033     | 0.071     | 0.052     | 0.034     |

CAR = Cordillera Administrative Region; CALABARZON = Cavite, Laguna, Batangas, Rizal, and Quezon; MIMAROPA = Mindoro, Marinduque, Romblon, and Palawan; SOCCSKSARGEN = South Cotabato, Cotabato, Sultan Kudarat, Sarangani, General Santos City; ARMM = Autonomous Region in Muslim Mindanao
Note: For testing differences in means, Stata's test command is used. For each region, the difference between male and female offspring's educational attainment (in years) is calculated. Directly below these estimates are the standard errors.  *** denotes significance at 95 percent and confirms the rejection of the hypothesis that both are equal. Rejection confirms the acceptance that the mean difference is negatively significant.
Source: Authors' computation

# Counting Women's Work in the Philippines

Michael R.M. Abrigo and Kris A. Francisco-Abrigo

*"Stuck in the same place I've always been.
And I'll keep wonderin' and wonderin'
and wonderin' and wonderin',
When will my life begin?"*

- Rapunzel (Rapunzel, Disney)

## Introduction

Gender disparities in access to opportunities such as in education, employment, and even politics have important ramifications to individual men and women, their families, and the society as a whole. One estimate, for instance, suggests that having women's economic participation at par with men could potentially increase the global gross domestic product (GDP) by as much as USD 28 trillion by 2025 (Woetzel et al. 2015). In this light, it is therefore understandable why many public policies in recent decades 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 (Grant and Behrman 2010; Barro and Lee 2013), 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, only half of all working-age women are in the labor force. This is despite the fact that the country is considered as one of the most gender-equal countries in 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 the female wage penalty (Yamauchi and Tiongco 2013). Meanwhile, another strand of the literature suggests that women, particularly mothers, may deliberately forego participation in the labor market to enrich their home environment (Ruhm 2008). Indeed, the wages of working women may ease household budget constraints as additional and available household resources. However, employment also effectively limits time allocation that may be a crucial input to household quality including the development of children (Popkin 1980; Miller and Urdinola 2010; Abrigo 2016).

Although evidence points to different mechanisms that mediate the low participation of women in the labor market, all those underscore the importance of work regardless of whether unpaid for home activities or paid in market wages. But the value of time spent on unpaid housework is seldom documented, much less in official national statistics (Collas-Monsod 2010). In the Philippines, early attempts to incorporate the disaggregated contributions 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.

This research builds on earlier works by providing new estimates of the contribution of men and women in the Philippine economy. However, unlike in Virola and de Perio (1998) and Virola et al. (2007), this paper focused only on disaggregating the value of work and excluded returns from capital. Further, this relied on new sets 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 to the economy. The NTA and NTTA are widely used national frameworks that measure how much resources are generated, used, and shared among different generations in an economy. The authors supplemented these estimates by documenting the contribution of parental time on child schooling outcomes, the value of which is not readily captured in either NTA or NTTA. This allows the authors to provide indications of the contribution of unpaid home production on household quality as measured by the "quality" of children.

Overall, the results presented 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 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 house production were combined, the contributions of men and women are found more equal. Further, results show that women work more hours on average, although the attributed market value to the activities they perform may be lower. Finally, we also document a strong association between parental time, particularly mothers, and child schooling outcomes that are distinct from the influence of parental educational background and household income.

The results of this study highlight the important roles that men and women play in the economy. Should women be delegated to stay at home? Not necessarily. However, the results suggest that there is an important and quantifiable economic value to unpaid housework, which 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 receptive to take up productive activities outside the home if the quality of their household, particularly their children, is assured through other compensatory means.

## Work over the economic lifecycle

Important advances over the last 50 years helped shape and organize households 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 in her lifetime. This has since been reduced to around three births per woman in recent years. Moreover, time-saving devices such as washing machines and refrigerators became more common features among households. This is partly a result of rising incomes augmented by cheaper production costs. Together, these advances allowed men and especially women more time away from home management and production, particularly child care, to pursue other productive and leisure activities.

Despite these developments, female participation in Philippine labor force remained low, especially when compared to those in East Asian countries. Between 1990 and 2015, women's participation rate in the labor force increased only by less than 3-percentage points, while reaching a high of 49.6 percent in 2015. Comparatively,

more than 3 in 5 women are in the labor force among countries in the Association of Southeast Asian Nations such as Singapore (60.8%), Thailand (61.0%), Viet Nam (73.4%), Lao PDR (76.8%), and Cambodia (80.8%). That said, the female labor force participation rate in the Philippines is considerably similar to its Austronesian neighbors Indonesia (48.9%) and Malaysia (50.3%) and its richer East Asian 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 important differences across years, there are also distinct features that persist. Among men and women, average hours worked starts low when young, increases and peaks at adulthood, and eventually tapers off as they retire from the labor force. Women's average hours worked plateaus—or even slightly dips—between ages 20–30 coinciding with peak reproductive ages before topping at around ages 45–55. On the other hand, men's time on paid productive activities does not show a similar dip, instead peaks about 10 years earlier at ages 35–45.

Notwithstanding these regularities, the time spent by men and women on paid market work evolved over the last 25 years. For instance, the time spent by young boys and girls on paid work decreased significantly. In 1990, a 15-year-old boy is

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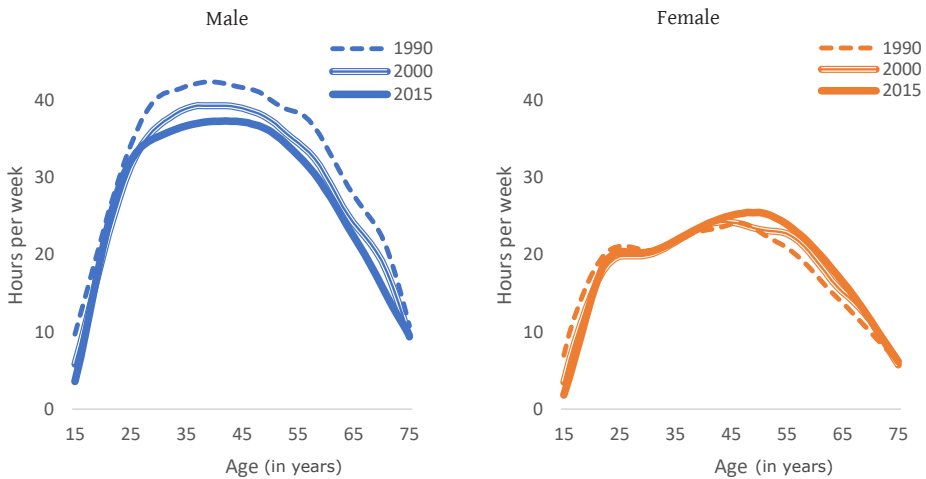


Source: Authors' calculations based on the October rounds of the 1990, 2000, and 2015 Labor Force Survey by the Philippine Statistics Authority (PSA, formerly National Statistics Office[NSO])

expected to spend around 10 hours per week on market-based activities. In contrast, girls of the same age spend 7 hours on average per week on market work activities. In 2015, these figures had been considerably reduced to 4 and 2 hours per week among boys and girls, respectively. This trend overlaps with greater school participation among the young, including the rise in secondary level gross enrollment rate from 69.7 percent in 1990 to 88.5 percent in 2015.

Over the same period, the time spent by adult women on work outside the home increased. The shift in women's time on paid work starts at around age 35 and peaks at around 60 with 3 hours per week added in 2015 relative to 1990, before winding down into retirement to the 1990 level. Meanwhile, men's time on paid productive activities decreased across all age groups in the last 25 years. At its peak, men spend an average of 42 hours per week on paid work in 1990 and shrank 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, although it may be as important as the time allotted to paid market work, is not similarly well documented.

Figure 2 plots the average time spent on unpaid home production activities in 2000 by men and women across different age groups. Home production activities are categorized under three broad classes, namely, child care, elder care, and housework. The first two categories represent activities targeted toward specific age groups, while the last category represents general activities that may benefit any household

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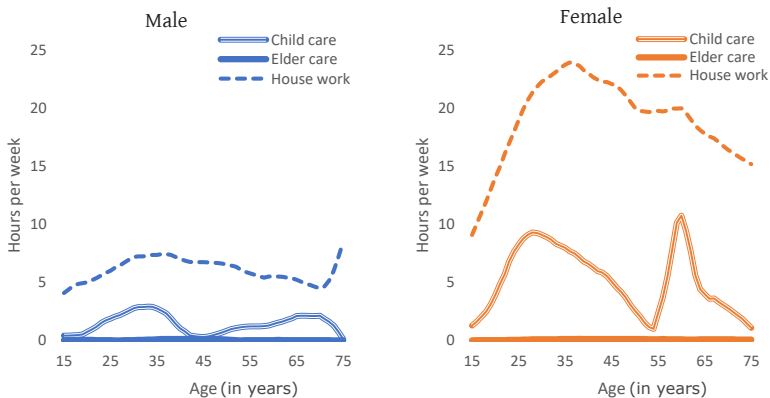


Source: Authors' calculations based on NSO (2000) data

member. 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 is 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 in terms of the market-versus-home production dichotomy persists across the lifecycle (Houng et al. 2017; Vargha et al. 2017) and may be observed in other economies as well (Antonopoulos and Hirway 2010).

Much of unpaid home production is spent on housework. Women in their mid-30s spend one whole day of their week on average for housework alone while men devote only about 7–8 hours per week on similar activities. This trend starts at a young age. At age 15, girls spend 9 hours every week on housework compared to boys' 4 hours.

Between child care and elderly care, households spend more time on the former. Again, women spend more time on both activities. As shown in Figure 2, time allotted for child care in the Philippines is double-humped representing two generations of child carers within households, i.e., the parents' and grandparents' generations for both men and women. This is not uncommon among multigeneration households and may be seen as a coping practice to allow parents to work and provide economic support for the family (Asis 2006). This double-humped profile is observed elsewhere in Asia such as in Viet Nam (Huong et al. 2017), but not in many European countries where provision of child care is largely borne only by the parents' generation (Vargha et al. 2017).

When time allotted for work in paid market and unpaid home production activities are combined (Table 1), it shows that women spend more hours working relative to men. Among those aged 15–19, for instance, young women devote around 30 percent more time working compared to men of the same age. The gap in work hours between men and women decreases around age 20–39 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 compared to men's 24 hours.

Table 1 also highlights other important and worth noting features. First, the young and the elderly are not only receivers of resources. 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

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

| Activity | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|
| | Age Group in Years | | | | Age Group in Years | | | |
| | 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 |
|    Housework | 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 |

... = less than 0.05 hours per week
Source: Authors' calculations based on NSO (2000, 2002) data. Values are in hours per week

cannot be discounted. Between ages 30 and 49, for example, women spend an average of 32.8 hours per 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 child care, conventional estimates of child consumption in general, and human capital investments in particular, may be direly undervalued.

## Counting men's and women's work

The Philippine Statistical System (PSS) adopted various mechanisms to regularly and systematically track and measure different gender and development indicators, including those related to (1) access to resources, (2) education, (3) health and related services, (4) public life and decisionmaking, and (5) human rights (PSA 2016). However, while women spend more time working than men, its value, particularly time for unpaid home production, is not often reflected in PSS. As a consequence, the value of women's work is frequently undervalued if not entirely invisible (Collas-Monsod 2010). Early attempts to incorporate gender into the Philippine System of National Accounts include Virola and de Perio (1998) and Virola et al. (2007) by disaggregating the country's GDP by sex while introducing the value of unpaid home production.

This paper builds on these earlier attempts to put value on men's and women's work in the country by providing sex-disaggregated estimates of NTA and NTTA for the Philippines. The NTA is a national accounting framework 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 60 NTA country research teams (Mason et al. 2017), including the Philippines (Racelis and Salas 2011; Abrigo et al. 2016). On the other hand, NTTA is a complementary account that introduces time inputs not incorporated in the national accounts-based NTA (Donehower 2019).[1,2]

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.[3] Further, Virola and de Perio (1998), and Virola et al. (2007) value unpaid home production using both opportunity cost and replacement cost of time.[4] In the NTTA, however, using replacement costs is the preferred methodology.[5] The replacement costs applied to home production activities are provided in Appendix 1.

Figure 3 shows NTA (Panel A) and NTTA[6] (Panel B) estimates of the age profiles of per capita labor income and per capita consumption in the Philippines for 2015.

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[1] Refer to UN (2013) and Donehower (2019) for an extensive description of the methodologies applied in the estimation of the Philippine NTA and NTTA.

[2] In addition to NTTA, several attempts had been made around the world to integrate the value of unpaid work into macroeconomic accounts, although an international consensus on specific methodologies is 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.

[3] 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.

[4] 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.

[5] Because of limitations in the availability of more recent data, this paper used 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.

[6] The NTTA estimates are based on the age profiles of home production activities in time units from the 2000 Pilot Philippine Time-Use Survey, 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
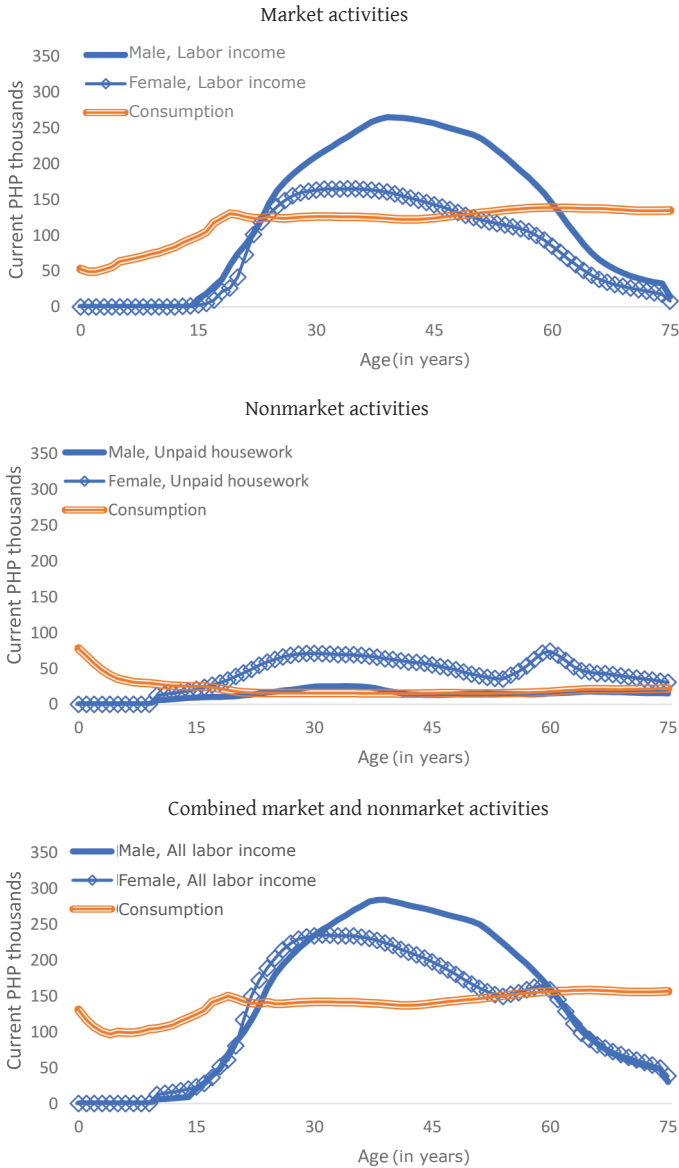


PHP = Philippine peso
Source: Authors' estimates following United Nations (2013) and Donehower (2019)

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, and prevailing market wages. Estimates are disaggregated by sex. The age profiles of per capita consumption, which include both private and public consumptions, 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's at every age group, while women dominate over men in unpaid home production when these activities are valued at market wages. Although the time spent by women on market and home production activities is 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, is barely half of those obtained from market activities. This highlights the wide discrepancy between the market value of activities that comprise home production, which is largely performed by women, and the activities that constitute market production.

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 25 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 to 60 that could reach as much as twice 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 at either end 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 PHP 2.5 trillion (Table 2). About three-fourths of this is by women. Meanwhile, the conventional national accounts-based estimate of aggregate labor income is estimated at PHP 9.3 trillion, in which men contribute more than 60 percent of the value. When combined, the country's aggregate labor income from paid market and unpaid home production activities is estimated at PHP 11.8 trillion, in which 47 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 | | | |
|---|---|---|---|---|---|---|---|---|
| | Age Group in Years | | | | Age Group in Years | | | |
| | 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 |
| Housework | 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 |
| Housework | 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 |

NTA = National Transfer Accounts; NTTA = National Time Transfer Accounts; PHP = Philippine peso
... = less than PHP 0.05 billion
Source: Authors' calculations following United Nations (2013) and Donehower (2019)

Adjusting the official 2015 Philippine GDP estimate by adding the imputed value of unpaid home production leads to an upward revision of 18.6 percent. This translates to an adjusted GDP of PHP 15.8 trillion from only PHP 13.3 trillion. This estimated rate is comparable to recent NTTA estimates of the value of unpaid work in Viet Nam, Latvia, and South Africa (Figure 4), but considerably modest relative to

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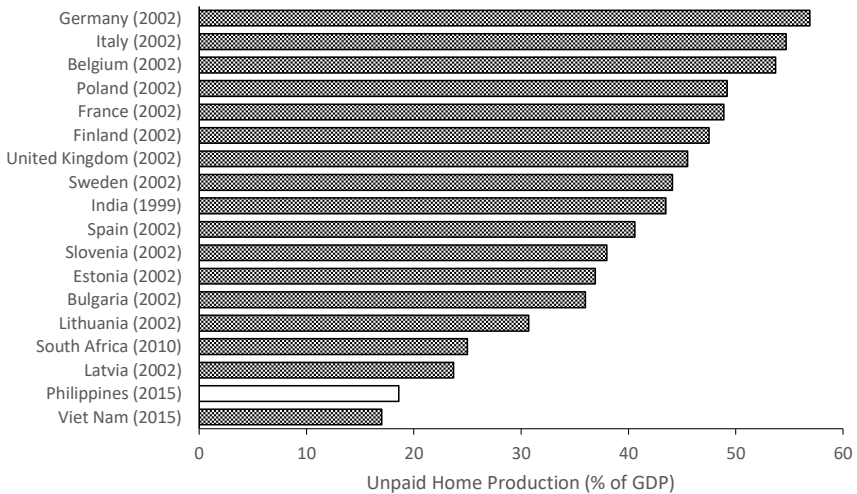


GDP = gross domestic product
Source: Estimates for Viet Nam, India, and South Africa are from the Counting Women's Work Project (http://www.cww-dpru.uct.ac.za/), and are available from Nguyen et al. (2017), Ladusingh (2016), and Oosthuizen (2016), respectively. Estimates for European countries are from the AGENTA (Ageing Europe –An Application of National Transfer Accounts for Explaining and Projecting Trends in Public Finances) 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 National Time Transfer Accounts methodology.

the earlier estimates for the Philippines using a different methodology by Virola and de Perio (1998) and Virola et al. (2007).[7] It is interesting to note that the values of unpaid home production presented in Figure 4 are rather dated even in many industrialized countries.

## Beyond monetary valuation

Estimates in the previous section provide valuation of the direct contribution of men's and women's work in the economy. While it improves upon using just market-based work to value men's and women's time, the picture it paints may very well still

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[7] Virola and de Perio (1998) estimated the value of unpaid home production in the Philippines at 36.5 percent 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.

be incomplete as many other important factors may be at play but not taken into account. Several of these potential factors are outlined below.

First, the value of unpaid home production is imputed using prevailing replacement wages. However, it may be possible that the time of those who stay at home to perform nonmarket productive activities are more valuable than the replacement wages employed in this study, 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 2–3 percent.

Second, potential differences are not considered in work quality between unpaid household member-producer and 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 the estimate of the value of men's and women's work, especially unpaid home production, is actually downward biased.

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

This study assesses this issue by looking at two schooling indicators, namely, school attendance propensity and standardized age-for-grade score. Both measures provide indications of the quality of children taken as proxies for the quality of a household. 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 not. Meanwhile, the second indicator, standardized age-for-grade score, indirectly gauges 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 $sd(\bar{a}_l)$ 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.

Data used in this analysis are from the matched 2015 Family Income and Expenditure Survey (FIES) and the January 2016 Labor Force Survey (LFS) by PSA (2016b, 2016c). The triennial FIES provides detailed information on household incomes and expenditures and is a rider to the quarterly LFS designed to capture individual-level labor force outcomes. This study restricts the sample to children aged 5–14 living with both parents in nuclear households. In addition, only children with mothers aged 25–49 at the time of the survey were included. This leaves a sample of 10,823 children from 5,468 households. These restrictions ensure that the children in the sample are exposed to more or less homogeneous household settings and limit the potential influence of unobserved confounders from having very young or elderly parents, especially on parental labor force participation.

Two measures of parental labor force participation are used in this study. First, the authors 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, they use each parent's hours worked in a week that captures the intensity of participation by each parent in the labor market. Moreover, the authors control for potential confounders in econometric models by including household income, family size, and parents' educational attainment in the specifications. These variables had been previously documented to significantly influence child schooling outcomes, while at the same time may be correlated with this study's measures of parental labor force participation, thereby potentially causing bias in the results. Summary statistics of these key indicators are presented in Appendix 2.

Although the authors limited their 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 that could introduce bias into the estimates. For instance, a mother's decision to reenter 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. However, these characteristics may also influence children's schooling success, thus potentially confounding the results.

The authors attempt to correct this potential endogeneity bias by instrumenting mother's labor force participation with the age of her youngest child. The children's age distribution 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 low substitutability of mother's care, which eases as children mature (Mincer 1962). The authors only instrument for mothers' labor market decisions since the issue of selection to work outside the home are of limited importance among fathers. In the sample, 97 percent of fathers reported to be in the labor force compared to only 61 percent of 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) show 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 and 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.

Overall, the authors' 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 attend 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). On the other hand, fathers' labor force participation appears more important in explaining schooling quality relative to children's school attendance. In both child schooling indicators, the estimated association relative to mothers' labor force nonparticipation is significantly higher compared to those of fathers.

Looking at the parents' intensity of labor force participation (Table 4), children of working mothers are more likely to not attend school as mothers spend more time at work. Every additional hour of work by mothers is associated with an increase of 0.8-percentage points in the probability that a child is not attending school. Moreover, the authors' estimates also suggest that as mothers spend more time working, their children lag further behind in school. In comparison, fathers' time at market work appears to be of limited importance to children's schooling outcomes. These

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] |
| Kliebergen-Paap LM statistic, $X^2$ | 9.056 | 7.484 | 7.109 | 12.695 | 10.823 | 10.193 |
| Kliebergen-Paap rk Wald statistic, F | 9.037 | 7.453 | 7.078 | 12.661 | 10.754 | 10.127 |

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
Source: Authors' calculations based on PSA (2016b, 2016c) data

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, X² | 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 |

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

Source: Authors' calculations based on PSA (2016b, 2016c) data

associations are robust even after controlling for household income and parents' educational attainment.

It is important to note that this study purposely limited its analysis to single-family households to ensure that the children in the study sample are more or less exposed to similar household settings. In the limited sample, however, child care 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 multigeneration households wherein other members of the extended family, such as grandparents, can substitute for parents' time for child care.

Nevertheless, the above results underscore the contribution of men's and women's participation in market and nonmarket work on the quality of children, which may not be readily monetized. On the one hand, working for pay outside the home 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 considerably depends also on time inputs of parents. A possible compromise to satisfy both requirements may be some form of specialization between men's and women's participation in paid market production and unpaid home production observed in many households.

## Conclusion

Men and women play important roles in the economy. However, the contribution of men and women is not often accounted similarly. This study highlights some of these unaccounted contributions by providing new estimates of the value of men's 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's and women's work in the economy are found to be more equal than when considering only the value of paid market work.

That said, the value of men's and women's work may go beyond monetary, and direct valuation of their contributions to the economy may not be fully possible. The authors 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 allow greater investments on children, time inputs may also be necessary in their

development. This may have important implications in designing policies to promote female participation in the labor force. Indeed, it may be counterproductive 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 the gains from their paid employment.[8] 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 among young people may be done early through mass media and 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 the authors' estimates barely scratched the surface of valuing men's and women's contribution to the economy. Indeed, this study only looked at the value of men's 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 was 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 on 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 in understanding future household dynamics.

But understanding the dynamics between men and women requires a careful appreciation of the evidence, which necessarily requires data. This study demonstrates the importance of both men's and women's work in the economy using established NTA and NTTA methodologies. However, the time-use survey that the study 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

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[8] This does not preclude gender issues in the workplace that this research did not touch.

other household-based surveys, is important in demystifying issues and advocating policies surrounding the care economy. As the authors 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.

# References

Abrigo, M.R.M. 2016. Who weans with commodity price shocks? Rice prices and breastfeeding in the Philippines. In *Health over the lifecycle: Essays on health and family*. PhD dissertation. Honolulu, HI: University of Hawai`i.

Abrigo, M.R.M., R.H. Racelis, J.M.I. Salas, and A.N. Herrin. 2016. Decomposing economic gains from population age structure transition in the Philippines. *The Journal of the Economics of Ageing* 8(C):19–27.

Agosin, M.R., D.E. Bloom, and E. Gitli. 2000. Globalization, liberalization, and sustainable human development: Analytical perspectives. Occasional Paper. UNCTAD/UNDP Global Program on Globalization, Liberalization and Sustainable Human Development. New York, NY: United Nations Conference on Trade and Development and United Nations Development Programme.

Antonopoulos, R. and I. Hirway. 2010. Unpaid work and the economy. In *Unpaid work and the economy: Gender, time use and poverty in developing countries*, edited by R. Antonopoulos and I. Hirway. New York, NY: Palgrave MacMillan.

Asis, M.M.B. 2006. Living with migration: Experience of left-behind children in the Philippines. *Asian Population Studies* 2(1):45-67.

Barro, R.J. and J.W. Lee. 2013. A new data set of educational attainment in the world, 1950–2010. *Journal of Development Economics* 104:184–198.

Bernal, R. 2008. The effect of maternal employment and childcare on children's cognitive development. *International Economic Review* 49(4):1173–1209.

Collas-Monsod, S. 2010. Removing the cloak of invisibility: Integrating unpaid household services in national economic accounts: The Philippine experience. In *Unpaid work and the economy: Gender, time use and poverty in developing countries*, edited by R. Antonopoulos and I. Hirway. New York, NY: Palgrave MacMillan.

Donehower, G. 2019. Methodology of the National Time Transfer Accounts. In *Time use and transfers in the Americas: Producing, consuming, and sharing time across generations and genders,* edited by B.P. Urdinola and J.A. Tovar. Basel, Switzerland: Springer.

Grant, M.J. and J.R. Berhman. 2010. Gender gaps in educational attainment in less developed countries. *Population and Development Review* 36(1):71–89.

Heckman, J.J. 1977. Sample selection bias as a specification error (with an application to the estimation of labor supply functions). NBER Working Paper No. 172. Cambridge, MA: National Bureau of Economic Research.

Hirway, I. 2015. Unpaid work and the economy: Linkages and their implications. *Indian Journal of Labor Economics* 58(1):1–21.

Killingsworth, M.R. and J.J. Heckman. 1986. Female labor supply: A survey. *Handbook of Labor Economics* 1:103–204.

Ladusingh, L. 2016. Counting women's work in India: The market and the household in India. Counting Women's Work Country Report No. 2. Capetown, South Africa: The Development Policy Research Unit, University of Cape Town.

Lee, R. and A. Mason. 2011. Population aging and the generational economy: A global perspective. Northampton, MA, and Ottawa, Canada: Edward Elgar and the International Development Research Centre.

Mason, A., R. Lee, A.C. Tung, M.S. Lim, and T. Miller. 2006. Population aging and intergenerational transfers: Introducing age into national accounts. NBER Working Paper No. 12770. Cambridge, MA: National Bureau of Economic Research.

Mason, A., R. Lee, M.R.M. Abrigo, and S.H. Lee. 2017. Support ratios and demographic dividends: Estimates for the world. Population Division Technical Paper No. 2017/1. New York, NY: United Nations Department of Economic and Social Affairs, Population Division.

Miller, G. and B.P. Urdinola. 2010. Cyclicality, mortality, and the value of time: The case of coffee price fluctuations and child survival in Colombia. *Review of Economic Studies* 80(4):1384–1421.

Mincer, J. 1962. Labor force participation of married women: A study of labor supply. Aspects of labor economics: A conference of the Universities-National Bureau Committee for Economic Research. Princeton, NJ: Princeton University Press.

National Statistics Office. 2002. Philippine Pilot Time-Use Survey 2000. Manila, Philippines: NSO.

Nguyen, T.L.H., M.T. Pham, and N.T. Pham. 2017. Counting women's work in Vietnam: New time use survey reveals gender in the market and the household in Vietnam. Counting Women's Work Country Report No. 3. Capetown, South Africa: The Development Policy Research Unit, University of Cape Town.

Oosthuizen, M. 2016. Counting women's work in South Africa: The market and the household in South Africa. Counting Women's Work Country Report, No. 1. Capetown, South Africa: The Development Policy Research Unit, University of Cape Town.

Philippine Statistics Authority (PSA). 2013. National Demographic and Health Survey 2013. Quezon City, Philippines: PSA.

———. 2014. Annual Poverty Indicators Survey 2014. Quezon City, Philippines: PSA.

———. 2016a. Women and men in the Philippines. Quezon City, Philippines: PSA.

———. 2016b. Family Income and Expenditure Survey 2015. Quezon City, Philippines: PSA.

———. Various years. Labor Force Survey 1990, 2000, 2015, 2016. Quezon City, Philippines: PSA.

Popkin, B. 1980. Time allocation of mother and child nutrition. *Ecology of Food and Nutrition* 9(1):1–13.

Racelis, R.H. and J.M.I. Salas. 2011. Changes in patterns of Philippine lifecycle consumption and labor income between 1994 and 2002. In *Population aging and the generational economy: A global perspective*, edited by R. Lee and A. Mason. Northampton, MA, and Ottawa, Canada: Edward Elgar and the International Development Research Centre.

Ruhm, C.J. 2008. Maternal employment and adolescent development. *Labour Economics* 15(5):958–983.

Sambt, J., G. Donehower, and M. Verbic. 2016. Incorporating household production into the National Transfer Accounts for Slovenia. *Post-Communist Economies* 28(2):249–267.

United Nations. 2013. National Transfers Account manual: Measuring and analyzing the generational economy. New York, NY: United Nations.

Vargha, L., R.I. Gal, and M.O. Crosby-Nagy. 2017. Household production and consumption over the lifecycle: National Time Transfer Accounts in 14 European countries. *Demographic Research* 36:905–944.

Virola, R.A. and S.M. de Perio. 1998. Measuring the contribution of women to the Philippine economy. Paper presented at the 7th National Convention on Statistics, December 2–4, Mandaluyong City, Philippines.

Virola, R.A., J.O. Encarnacion, A.G. Zaguirre, and R.S. Perez. 2007. Do women contribute less than men to nation building? Paper presented at the 10th National Convention on Statistics, October 1–2, Mandaluyong City, Philippines.

Woetzel, J., A. Madgavkar, K. Elingrud, E. Labaye, S. Devillard, E. Kutcher, R. Dobbs, and M. Krishnan. 2015. The power of parity: How advancing women's equality can add $12 trillion to global growth. New York, NY: McKinsey Global Institute.

Yamauchi, F. and M. Tiongco. 2013. Why women are progressive in education? Gender disparities in human capital, labor markets, and family arrangements in the Philippines. *Economics of Education Review* 32:196–206.

# Appendixes

Appendix 1. 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 | 29.6 |
| | Housekeeping and restaurant services workers | |
| 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 | 110.8 |
| | Business professionals | |
| | Finance and sales associate professionals | |
| | Administrative associate professionals | |
| Child care; elder care and care outside the home (including volunteering); and pet care (not veterinary care) | Personal care and related workers | 75.2 |
| | Social work associate professionals | |
| Travel (related to care activities and purchasing of goods and services) | Motor vehicle drivers | 45.8 |

PHP = Philippine peso
Source: Hourly wage rates are calculated from the pooled 2015 Quarterly Labor Force Surveys by the Philippine Statistics Authority

## Appendix 2. 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 | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| **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 | - | 15.614 | 23.786 | 25.672 | 39.571 | 25.050 | 22.457 | 25.454 |
| Father's hours worked (past week) | 40.400 | 19.104 | 44.713 | - | 42.047 | 17.973 | - | - | 43.403 | 16.541 |

SD = standard deviation
Source: Authors' calculations based on PSA (2016a, 2016b) data

# Examining Women's Low Labor Market Participation Rate in the Philippines: Is Housework the Missing Link?

Connie G. Bayudan-Dacuycuy

*"How I pray that a time will come,
I can free myself from their expectations.
On that day, I'll discover some way to be myself
and to make my family proud."*

- Mulan (Mulan, Disney)

## Introduction

Women in the Philippines comprise 50 percent of the country's population. As such, they have an equal role to play in steering the country toward sustainable and inclusive growth and in achieving development outcomes. For example, studies show that women's high educational attainment positively affects food security (Smith and Haddad 2000), children's health, nutrition status, and educational outcomes (Duflo 2012). Given these, women can help the country to achieve the goals in the *Philippine Development Plan (PDP) 2017-2022* and the 25-year vision and aspirations of the Philippines to become a middle-income society as outlined in the *AmBisyon Natin 2040* (Executive Order 5 Series of 2016).

The contributions of women to Philippine society have not gone unnoticed, and the country has achieved significant advancements in certain areas that could pave the way to fully harness women's potentials. In the education front, the Millennium Development Goals target ratios of girls to boys in primary, secondary, and tertiary education had been achieved. With respect to tertiary education, Commission on Higher Education data (CHED n.d.) indicates that female enrolments in Academic Year 2016–2017 stood at 57 percent, 62 percent, 47 percent, and 53 percent of total enrollees in state universities and colleges, local universities and colleges, other government schools, and private schools, respectively. There were also more females who enrolled in masters (66%) and doctorate programs (60%). In addition, the 2013 Functional Literacy, Education and Mass Media Survey indicates that male and female basic literacy rates, or the ability of a person to read, write, and understand a simple message in any language/dialect, are similar (PSA 2011). However, the female functional literacy rate, or the higher form of literacy that includes not only reading and writing skills but also numerical skills, is higher across various age groups (PSA 2011).

Notwithstanding the advancements in education, much remains to be done along the labor market participation front. Based on the *2018 Global Gender Gap Report* (GGGR) of the World Economic Forum (2018), the Philippines ranked 8th in the global ranking of gender parity, two ranks higher than in 2017. The country is the only Asian economy at the top ranks, with the rest of the Asian economies ranking between 26th (Lao PDR) and 148th (Pakistan). Despite this rosy trend, the 2018 GGGR indicates that the Philippines needs to do more work to achieve gender parity in economic participation/opportunity and political empowerment subindices.

In addition, the 1990 male labor force participation rate (LFPR) in Asian countries was between 79 percent and 85 percent (Figure 1). By 2016, the male LFPR in Thailand, Philippines, and Malaysia decreased by 10- , 7- , and 5-percentage points, respectively. Despite a downtrend in the male LFPR, the female LFPR remains substantially lower. In 1990, the female LFPR in Indonesia, Malaysia, Philippines, and Singapore was between 45 percent and 48 percent. Almost three decades after, the female LFPR in these economies has improved, with Singapore posting the biggest increase at 13-percentage points while the Philippines recorded the smallest increase at 3-percentage points.

The Philippine government has acknowledged the lackluster improvement in the female LFPR. The latest PDP 2017–2022 outlines several strategies to promote the labor force participation of women, some of which had already been translated into policies. Executive Order 12 signed in early 2017 aims to achieve zero unmet needs for modern family planning by 2018. The Responsible Parenthood and Reproductive Health Act of 2012, commonly known as the RH Law, provides for the comprehensive

Figure 1. Labor force participation rate in selected ASEAN countries, share (%) of respective sex population aged 15+, national estimates: 1990 and 2016
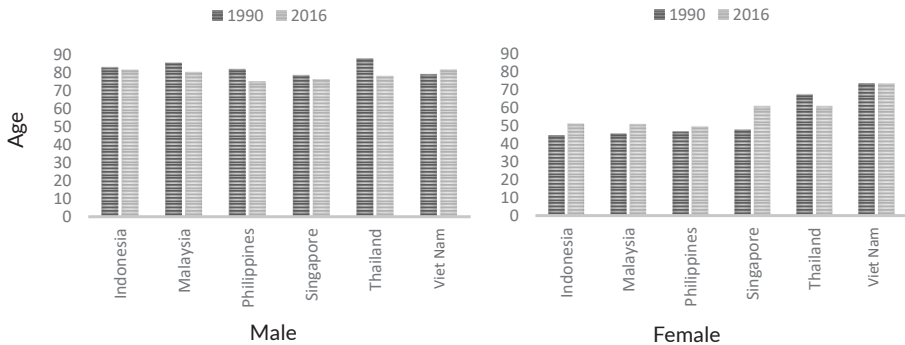


ASEAN = Association of South East Asian Nations

Note: Labor force participation rate is the proportion of the population ages 15 and older that is economically active; all people who supply labor for the production of goods and services during the specified period (https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS). The 2016 male LFPR for Thailand pertains to the latest available data (2015) while the 1990 male LFPR for Viet Nam pertains to the earliest available data (1996). Source: World Bank (n.d.)

delivery of reproductive and health services. The RH Law is deemed important in harnessing the demographic dividend, or the shift of the population structure to higher working-age population relative to young dependents and older population (65 years and above). Moreover, it has the potential to promote economic growth.[1]

Despite these efforts, there are other fundamentally important factors that researchers and policymakers can focus on to understand why women in the Philippines do not fully participate in the labor market. One of these factors pertains to the amount of time women spent on housework that tends to be dictated by gender identity,[2] which is defined by Akerlof and Kranton (2000) as one's sense of

[1] This follows from the idea that "children are net consumers while the working-age population are net producers and without large numbers of children to support, economies could divert more resources to capital investment, which can stimulate the productive employment for the working-age population" (United Nations Fund for Population Activities 2018). Indeed, this is echoed by the National Economic and Development Authority, "which recognizes the potential of the government to better allocate its resources for economic development and social services given a low dependency ratio" (http://www.neda.gov.ph/2018/12/19/neda-explainer-reaping-demographic-dividend/). The RH Law not only has the potential to lower teenage pregnancy but can also lead to better health outcomes for women and mothers and better education outcomes for girls.

[2] Identity economics is similar to the 'doing gender' theory of West and Zimmerman (1987). In this theory, males and females are providers and homemakers, respectively, and they under- or overperform household chores to compensate for the nonconformity to these roles.

belongingness in a social category that prescribes behavioral norms. For example, men and women, as social categories, are presumed to specialize in market work and housework, respectively.

Housework goes by many names. It is referred to as home production or nonmarket work (Becker 1965; Gronau 1977) and unpaid care work (Elson 2000). Different terminologies notwithstanding, housework is performed across countries and societies to enhance the welfare of individuals in households. However, unlike outcomes concerning market work, housework rarely enters the policy space. This is possibly because the valuation of housework is not easy and time-use data are rarely collected.

This paper, which aims to analyze the effects of housework on women's labor force participation (LFP), is relevant in several ways. First, time is a limited resource and its allocation, whether to market work or housework, has fundamental implications on labor market outcomes. Women and girls do disproportionately bear the burden of the care economy, which can result in time poverty. In turn, this leads to low development outcomes that prevent them from realizing their full potential. Hence, the analysis of housework role can provide better directions in crafting policies that can enhance female participation in the labor market. Since females comprise half of the country's population, putting into good use their skills, talents, and ideas can help in achieving sustainable and inclusive growth.

Second, the country has one of the highest fertility rates in the region at around 2.7 children born per woman (PSA 2018). This has significant implications on women whose responsibilities include taking care of children and the elderly. Housework may give rise to market work intermittency and to a relatively disadvantageous position in the formal labor market. This can partly explain why more women entrepreneurs are in the informal sector where work arrangements are relatively more flexible.

Third, housework and other services performed for household's own consumption are not included in the System of National Accounts (Bayudan-Dacuycuy and Dacuycuy 2018). To the extent that housework is largely confined in the women's sphere of responsibilities, their contribution to society remains undervalued, if not invisible. In some settings where relative resources affect household bargaining outcomes, a correct valuation of home-based production might shape more favorable environments for women (Bayudan-Dacuycuy and Dacuycuy 2018).

In the Philippines, few studies have analyzed housework and women's labor market outcomes until recently when advocates managed to attract the attention of national and international bodies to care economy and unpaid work. Today, the Sustainable Development Goals include in its Goal 5 (Gender equality and

empowerment of girls/women) a target to recognize and value unpaid care and domestic work. Partly due to such initiatives, several studies on housework in the Philippines have been undertaken. These include Bayudan (2006), Chen et al. (2018), and Bayudan-Dacuycuy and Dacuycuy (2018), who unlocked several important findings to better understand the consumption of time and how it is affected by various factors such as intrahousehold power, wages, and attitudes. Central to the focus of these studies are working women. However, around 49 percent of women in the Philippines are not economically active. A research on the potential factors affecting women's participation in the labor market is also important so that policies, on top of existing ones, can be crafted to fully harness the maximum potential contributions of the country's human resources.

It must be emphasized that though the main focus of the paper revolves around women's labor force participation and housework, it is also important to discuss the effects of housework on men's LFP. Doing so provides a holistic perspective, and hence, a better narrative to ensure that both men and women equally benefit from development. In addition, the market and nonmarket work of both men and women are necessarily interrelated. First, the Philippine society is egalitarian (Medina 1995) and typical of egalitarian households, wives and husbands are both key decisionmakers on household issues such as labor market participation, use of family planning methods, and hiring of household help (Bayudan 2006).

Second, there are gains from complementarity of spousal housework in the Philippines since doing housework together enhances marital relations through shared experiences and avenues that provide information necessary for a repeated game such as marriage (Bayudan-Dacuycuy and Dacuycuy 2018). Given the egalitarian mindset and possible gains from doing housework together, it is not surprising that men in the Philippines are more open to devote time to nonmarket production, which is likely to affect their participation in market work as well.

## Women in the Philippines: Background on policies and history

From a broader policy perspective, the Philippines has made significant gains toward gender equality. A major achievement is the signing of the Magna Carta of Women (MCW) in 2009 that implements the Convention on the Elimination of Discrimination Against Women (CEDAW). CEDAW seeks to eliminate all forms of discrimination by dismantling social structures such as laws and institutions that treat women unequally and prevent them from attaining full human development. The MCW reiterates the duties of the State to protect women against discrimination and violation of their rights.

In addition, the *Philippine Plan for Gender-Responsive Development 1995–2025* (PPGD) mandates every government administration to develop time-bound framework plans for women (NCRFW 1998). In line with the PPGD, then President Benigno C. Aquino's Social Contract included the promotion of equal gender opportunity in all spheres of public policies and programs. The PDP 2011–2016 and the PDP 2017–2022 include gender-related targets and strategies as well. The latest Framework Plan under PPGD was the *Women's Empowerment, Development and Gender Equality (WEDGE) Plan 2013-2016*. The WEDGE Plan was spearheaded by the Philippine Commission on Women and it aimed to operationalize the MCW and the Social Contract of the Aquino government. In particular, WEDGE was the gender equality guiding plan of the PDP 2011–2016 (PCW 2014).

In recent years, several laws have been put in place to protect and enhance the welfare of women and girls, and to some extent, the welfare of men and boys such as those provided by the Anti-Trafficking in Persons Act, Solo Parent's Welfare Act, and Responsible Parenthood and Reproductive Health Act (Table 1). Among these, the RH Law is the most relevant for harnessing the demographic dividend. However, its full implementation has been met with several discriminatory and legal barriers, such as the fragmented support of local government units to the RH law (Commission on Human Rights 2016) and the Supreme Court's (SC) voiding of the law's eight key provisions. In addition, the implementation of the law was stalled by the SC's temporary restraining order in 2014 on Implanon and Implanon NXT on the ground that these are abortifacient. However, Food and Drug Administration resolutions, issued on November 10, 2017, declared Implanon and Implanon NXT as nonabortifacient. This means that these contraceptives will be publicly provided once again, which is a welcome development for women belonging to the urban and rural poor sector whose household budgets cannot accommodate these contraceptives. Most women find the use of these contraceptives convenient (CHR 2016).

The role of women in Philippine society has been shaped by a combination of various factors that can be partly traced prior to the Spanish colonization when customary laws promoted gender equality and gave women the right to own and inherit property and engage in trade (Medina 2001). In addition, the 1987 Family Code stipulates that properties acquired during the course of marriage are jointly owned by husband and wife.

Owing to Spanish colonization for more than 300 years, various aspects of the family in the Philippines have shades of Spanish influences, the most pervasive of which is rooted in religion. Divorce remains a passionately disputed social issue. Possibly influenced by the Church teachings that men are the pillar and women are

Table 1. Recent significant laws for the protection of the welfare of women and girls

| Law | Significane in the Protection of Women |
| --- | --- |
| Domestic Workers' Act (2012) | Also known as *Batas Kasambahay*, the law seeks to protect the rights of domestic workers against abuse, to provide them decent working conditions and income, and to reduce the incidence of child labor and trafficking in persons for the purpose of domestic work. |
| Responsible Parenthood and Reproductive Health Act (2012) | Specifically stating gender equality goals in its declaration of policy, the RH Law provides a national policy for family planning, maternal and child health, and age-appropriate reproductive health education. |
| Magna Carta of Women (2009) | Operationalizes the Philippine commitment to CEDAW, the Magna Carta is a comprehensive act, which aims to eliminate all forms of discrimination against women. |
| Anti-Violence Against Women and Their Children Act (2004) | Through the criminalization of physical, sexual, psychological, and economic abuse of women and children by their intimate partners, the Anti-VAWC Law seeks to protect victims and prevent all forms of abuse against women and children. |
| Anti-Trafficking in Persons Act (2003) | Institutes policies to eliminate trafficking in persons, most of whom are women and girls. |
| Solo Parent's Welfare Act (2000) | Provides for benefits and privileges to solo parents and their children |

CEDAW = Convention on the Elimination of all Forms of Discrimination Against Women; VAWC = violence against women and their children; RH = reproductive health
Source: David et al. (2017)

the light, age-old norms and traditions ascribe roles to men and women: women nurture and their comparative advantages are in nonmarket work while men provide and their place is in the labor market. Over the years and potentially confounded by a host of factors, these social prescriptions have persisted.

Although earlier studies claim that Philippine women or Filipinas are still accorded lower social status (Williams and Domingo 1993), recent evidence points to Filipinas becoming more active in majority of household decisionmaking domains (Hindin and Adair 2002; Upadhyay and Hindin 2007). This is validated by Bayudan (2006) who shows that in Southern Philippines, consultation is a common practice between husbands and wives especially on the purchase of big-ticket items such as television or land, wives' labor market participation, hiring of household help, and the use of family planning method. Majority of wives do not consult their husbands on the purchase of small-ticket items such as shoes and clothes. In addition, there are

domains (such as the wife's labor market participation and travels) in which either the wife or husband prevails as the decisionmaker.

Meanwhile, housework in the Philippines appears to follow a male-female dichotomy, majority of which remains in the sphere of women's responsibilities. Bayudan (2006) shows that food shopping, food preparation, house cleaning, buying and washing clothes, and child care are tasks done mostly by wives while repair jobs are undertaken by husbands. A relatively similar proportion of wives and husbands gather firewood (6%), fetch water (15%), and tend to animals (20%).

In terms of market production, 41 percent of women in 2015 are in vulnerable employment,[3] although there are existing bills that aim to provide social security to the informal sector. In addition, there are 30 percent more women entrepreneurs according to the Global Entrepreneurship Monitor. The government is currently focused on the development of micro, small, and medium enterprises (MSMEs) since these have important roles in output and export growth, poverty alleviation, and economic empowerment. Moreover, MSMEs are touted to usher a resilient, people-oriented, and people-centered Association of Southeast Asian Nations community.

## Market and nonmarket work: Review of related literature

Due to Becker's (1991) theory of the family, the effect of housework on wages is well documented. Central to this theory, the division of housework is dictated by comparative advantage. Therefore, the spouse that commands a higher price in the market work will specialize in market work, and the other spouse will specialize in nonmarket work. In this setting, efficiency is central to the division of time devoted to nonmarket production. The implications of Becker's theory, including the male wage premium, had been tested and validated, although the question remains whether this premium has declined or not (Korenman and Neumark 1991; Hersch and Stratton 2000; Bardasi and Taylor 2008).

Focusing on women's market participation, factors such as costs (Fosu 1999), uncertainties (Blau and Grossberg 1991), and family-related concerns like husband's health status (O'Hara 2004) and parental care (Ettner 1995) had been illustrated to affect women's LFP. A recent strand of research highlights how attitudes on gender

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[3] Vulnerable employment is contributing family workers and own-account workers as a percentage of total employment. They are the least likely to have formal work arrangements, are the least likely to have social protection and safety nets to guard against economic shocks, and often are incapable of generating sufficient savings to offset these shocks (https://data.worldbank.org/indicator/SL.EMP.VULN.ZS accessed January 21, 2019).

roles at home and in the labor market affect the participation in market work (Fortin and Lacroix 1997; Akerlof and Kranton 2000; Greenstein 2000; Bertrand et al. 2013).

In the Philippines, an earlier study on women's labor market participation is that of Bayudan (2006) who analyzed women's time allocation in the context of a collective bargaining framework. This improves on earlier frameworks that assume that the family acts as a single unit with the same preferences and maximizes a single utility function. In the collective bargaining framework, the role of intrahousehold power to determine intrahousehold outcomes is recognized and the consumption of time, such as those spent in recreation, child care, household chore, backyard production, working at home, and working outside of home, is given by $T^i=f(W_w, \varphi_w(a_h, a_w);d)$, where $W$ is woman's wage and $d$ is a vector of other socioeconomic determinants.

Unlike the typical unitary framework that yields the consumption of time, $T^i=f(W_w, W_h, Y; d)$, the collective bargaining framework emphasizes the role of intrahousehold power of husband and wife, $\varphi_w(a_h, a_w)$. While the main objective of Bayudan (2006) is to establish the pareto efficiency in women's time allocation, results of the paper also emphasize that power is an important determinant of women's time use. For example, when there is a high probability of husbands' control over the wives' money, wives spend less time working outside and spend more time working at home where the flow of income can be easily monitored or controlled (Bayudan 2006).

Following Akerlof and Kranton (2000) on identity economics that emphasizes the importance of attitudes in various labor market outcomes, Bayudan-Dacuycuy and Dacuycuy (2018) analyze how wage and attitudes to work and family life affect the time devoted to housework. In this particular research, the consumption of time is given by $T=f(W_w, attitudes; d)$ where $T$ is the total hours spent on housework. This paper attempts to control for two sources of bias, namely, the sample selection bias arising from the fact that wages are observed only for working women and the endogeneity of wage. An important takeaway from the paper is the potential gains from the complementarity of spousal housework in the Philippines.

Another strand of research on housework focuses on the issue of double burden or second shift (Hochschild and Machung 2012) in which work at home and in the labor market can potentially lead to women's time poverty. In this context, Chen et al. (2016) characterize how this double burden evolves over the women's life course using latent class analysis in the data set collected in Southern Philippines. The authors find that most women in their mid-life are engaged in high-intensity market work and substantial amount of nonmarket chores, with some women becoming high-intensity caregivers and the rest dealing with double burden.

## Empirical strategy and data sources

This research uses the International Social Survey Program (ISSP)[4] data set, which is a collaboration among the ISSP member-countries (mostly from Europe and Asian countries like Japan, Philippines, and Taiwan) that aim to conduct annual surveys on social science topics. Typically, the ISSP data collection focuses on a given topic each year, including the role of government, social networks, social inequality, family and changing gender roles, work orientations, religion, environment, national identity, citizenship, leisure time and sports, and health and health care. The 2012 ISSP collected data on family and changing gender roles and is the main data set used in this research. The information collected in this survey includes attitudes toward gender roles at home and in the labor market, housework, market work history, and labor market outcomes of respondents and their partners. Data for the Philippines are collected using a stratified multistage clustered random sampling by the Social Weather Stations in Quezon City through face-to-face interviews on voting-age adults (18 years old and above) in four study areas, namely, National Capital Region, Luzon, Visayas, and Mindanao.

The theoretical framework that establishes the relationship between market and nonmarket work is well-documented. The earliest versions are household production models that include market work, housework, and leisure in an individual's utility function (Becker 1965; Gronau 1977). These had been extended by Pollak and Wachter (1975) to account for the joint production of market work and housework, which essentially improves on the assumption of the perfect substitutability of market and home-based commodities. Housework, on the other hand, can be affected by attitudes to family and the labor market. In the Philippines, some studies have underscored the importance of attitudes in explaining housework (Bayudan-Dacuycuy and Dacuycuy 2018).

To model labor market participation, the authors assume that the agents' utility to work is represented by $LFP = g(LFP^*) = \begin{cases} 1, & LFP^* > 0 \\ 0, & LFP^* \leq 0 \end{cases}$

where $g(LFP^*)$ is the link function that allows the linear model to be related to the response variable. $LFP_i^*$ is specified as $\beta_i x_i + \varepsilon_i$, where $x_i$ is a vector of observable characteristics and $\varepsilon_i$ denotes unobservable attributes.

For the purpose of the study and given the available information from the 2012 ISSP, the observed variable LFP is defined as

$$LFP = \begin{cases} 1, & \text{if both market work hours and wages are reported} \\ 0, & \text{if both market work hours and wages are not reported} \end{cases}$$

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[4] For further details, see http://www.issp.org.

Assuming that $\varepsilon_i$ is an independent and identically distributed error term, the appropriate estimator is a probit regression.

Housework, or the total hours spent per week on household work and on family members, is given by $HW_i = g(HW_i^*) = HW(a_i z_i + e_i)$, where $z_i$ is a vector of observable characteristics. Assuming that $e_i$ is an independent and identically distributed error term, the appropriate estimator is an ordinary least squares regression. The final models include the following specifications:

$$LFP = f(personal_{respondent}, HH\ chars, Y\ work\ history, HW_{respondent}, HW_{spouse}) \quad (1)$$

$$HW_{respondent} = f(personal_{respondent}, HH\ chars, Y, attitudes, personal_{spouse}) \quad (2)$$

$$HW_{spouse} = f(personal_{spouse}, HH\ chars, Y, attitudes, personal_{respondent}) \quad (3)$$

Given the assumptions on the error terms in equations (1)–(3), LFP and HW can be combined into a multiequation system in which the error terms share a multivariate normal distribution (Roodman 2011). Because the distribution of the errors is known, the parameters of the models in the system are estimated using the conditional mixed process estimator. In equations (2) and (3), personal pertains to the respondent's attributes such as age, educational attainment, marital status, and spouse's educational attainment; HH characteristics pertain to households' attributes such as location and household size; and $Y$ is family income.

Work history refers to the market work history of the mother of the respondent, the inclusion of which follows from two strands of literature that established the effect of maternal employment on children's future labor market outcomes. First, in the context of time inputs and home production, maternal employment affects children's cognitive skills (Stafford 1987; Ruhm 2004), which in turn affect labor market outcomes (Green and Riddell 2003). Second, in the context of gender identity, behavior is transmitted to children through demonstration, and maternal employment may elicit positive behavioral responses from children that may be valuable in the labor market (Bayudan-Dacuycuy and Dacuycuy 2018). There also appears to be a role model effect on children's subsequent labor market choices (Olivetti et al. 2013). Work history is used to identify the market work equation (1) from the nonmarket work equations (2 and 3).

Following Bayudan-Dacuycuy and Dacuycuy (2018), attitudes to family and labor market are also included as explanatory variables of housework in equations (2) and (3). Attitudes variables are culled out from the responses to the following statements: (1) When mother works, preschool child is likely to suffer; (2) When women work,

family life suffers; and (3) Men's job is to earn money while women's job is to look after home. Responses include 1 for strongly agree; 2 for agree; 3 for neither agree/disagree; 4 for disagree; and 5 for strongly disagree. The responses are recoded to create binary variables equal to 1 when the response is 4 or 5 (positive attitude) and equal to 0 when the response is 1 or 2 (negative or indifferent attitude). Attitudes are used to further identify the market work equation (1) from the nonmarket work equations (2 and 3).

## Discussion of results

### Results from the simultaneous estimations

The estimation results are presented in Appendix 1. Looking at the estimates for female respondents, those who are married are more likely to participate in market work (also referred to as working in the succeeding discussion). They are also more likely to work given that their mothers participated in market work and given higher family income and higher household size. They are less likely to work when they spend more time on housework, but are more likely to work when their spouses spend more time on nonmarket production.

The time spent on housework by female respondents is negatively correlated with household size and positively correlated with the presence of toddlers. None of the variables pertaining to the respondents' attitudes significantly affect the respondents' time allocated to nonmarket work. However, the attitudes of female respondents positively correlate with the time spent by their partners in nonmarket work.

Looking at the estimates for male respondents, those who are older, belong to bigger households, and reside in the urban areas are less likely to work. Men from households with high family income are more likely to work. While the probability of male respondents to join the labor market is not significantly affected by the time they devote to housework, it is positively correlated with the time devoted by their spouses to nonmarket production.

The time spent on housework by male respondents is positively correlated with the household size and having a college degree. Their partners' housework, on the other hand, is negatively correlated with male respondents' positive attitudes toward gender roles at home and in the labor market.

### Marginal effects of housework on the probability of working

Given these estimates, the probabilities of working are predicted for a set of attributes related to the respondents and their households. These include the following: the

respondent is a 40-year old college graduate and married to a partner who is a college graduate as well. In addition, the respondent's mother had worked when the respondent was young, and the respondent has positive attitudes toward gender roles at home and in the labor market. This means that the respondent disagrees with the notion that preschool children and family life suffer when women work, and with the dichotomy of men as earners and women as homemakers. In addition, the monthly family income of the respondent is around PHP 20,000 and the household resides in urban Luzon.

To assess the contribution of nonmarket work, the probabilities of working are predicted by assuming different amounts of time allocated by the respondents and their spouses to housework given benchmark characteristics above. We consider three combinations in terms of the respondent's and spouse's input to housework: (1) Each spends 10 hours (benchmark); (2) The respondent devotes 20 hours while the spouse devotes none; and (3) The respondent devotes 0 hours while the spouse devotes 20 hours.

The results of the prediction exercise are presented in Figure 2. Given the benchmark, the probability of market participation by males is around 60 percent while the probability of market participation by females is around 53 percent. Relative to the benchmarks, the respective probabilities associated with male and female market participation are higher when both are completely disengaged from housework. While this is the case, it can be noted that the increase in the female's probability of working relative to the benchmark is bigger compared to that of the male. In particular, the former increases by around 42-percentage points while the latter increases by around 25-percentage points.

While the probabilities of working for both male and female respondents are lower given that they devote 20 hours to housework and their spouses devote none, the decrease in the female's probability of working is noticeably bigger. In particular, relative to the respective benchmarks, the female's probability of working decreases by around 43-percentage points while the male's probability of working decreases by around 34-percentage points.

These results point to two key observations. First, housework affects both men's and women's participation in market work in the Philippines. Compared to men in other Asian countries, men in the Philippines have a more highly evolved response in performing household tasks. For example, based on the Counting Women's Work project of the International Development Research Centre, women in India spend an average of 40 hours per week on unpaid work and care economy while men spend only 3.5 hours (de Haan 2018). In the Philippines, men spend more time on unpaid work and care economy. From the 2012 ISSP data, the weekly average time

Figure 2. Predicted probability of working, male and female: Philippines
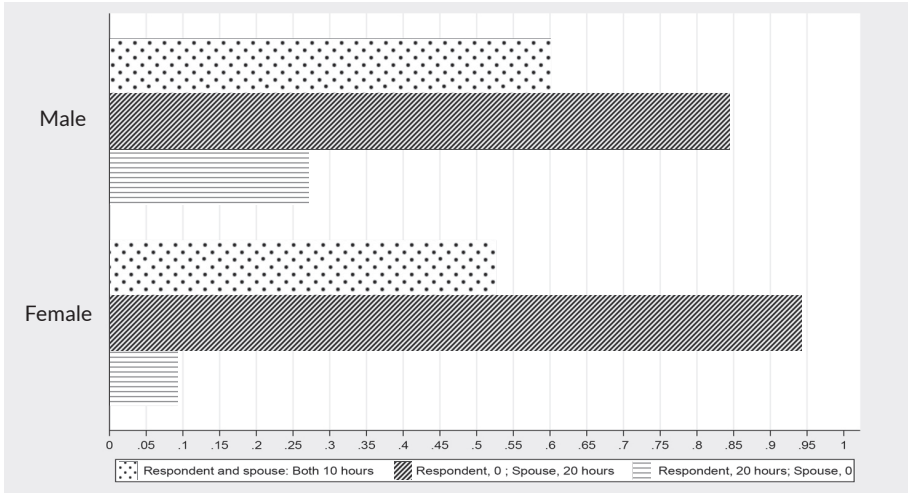


Source: Author's calculation

spent on care work, or housework related to child and elderly care is 18 hours for men and 30 hours for women. The weekly average time spent on noncare work, or housework related to preparation/cooking of dishes, washing clothes, and cleaning the house, is 16 hours for men and 25 hours for women. From these, it is also evident that there are discernible disparities in terms of inputs, with women spending more time in care work. Noncare work can be scheduled after office hours while care work demands more attention and often does not have the flexibility in terms of timing. This plausibly explains why female's involvement in market work varies more with nonmarket work.

Second, even though the labor market participation of both men and women is affected, that of the women is more so. This is shown in the bigger increase in women's market work participation when they do not engage in nonmarket work, and in the bigger decrease when their spouses do not share in household production. This provides evidence that housework acts as a major constraint in the realization of the full economic contribution of men and women in the country. These also highlight the importance of crafting policies that will help families in home production and care economy. Legislations related to child care economy are not wanting and had been in place since the 1970s. Of these legislations, one of the most prominent is the Early Childhood Care and Development (ECCD) Act of 2000, which provides for the

establishment of the National ECCD system that is comprehensive,[5] integrative,[6] and sustainable[7] (Manuel and Gregorio 2011). Despite government's efforts to step in and shoulder a portion of the care economy, there is a need for the state to ensure the quality of services provided in child development centers in the country.

While child care is well legislated, elderly care is less so. The elderly population is still low, which is around 6 percent in 2000 and 7.5 percent in 2015. However, the proportion of the elderly to the total population is expected to reach the double-digit mark by 2020, assuming a moderate fertility and mortality decline (NEDA 2017).  The government needs to anticipate this eventuality and should look into designing systems for elderly care, which typically falls within the women's sphere of responsibility.  The potential increase in caregiving demand due to aging or health deterioration should be included in the policy space since this could affect labor market outcomes such as absenteeism and tardiness that will adversely affect labor productivity.

At this point, it should be recognized that because social norms play an important role in housework, legislation may not be considered as an appropriate instrument to initiate change. After all, how can legislations veto age-old gender roles and attitudes? However, legislation can provide a "nudge" to steer mindsets to the suitable direction. For example, good and reliable child-care services that coincide with the 8-hour office schedule can encourage mothers to go back to work after childbirth. Legislations that promote good work-family life balance, such as flexi-time and four-day work week, can also push active participation in market work among women.

## Summary and conclusions

The Philippines has achieved several milestones in advancing gender equality in the country, although some areas can still benefit from further government interventions. One such area is the extent of female participation in the labor market, which barely improved in the last 25 years. The lackluster participation of women in the labor force is a continuing concern. This reflects in the space devoted to it in successive PDPs and in legislations designed to support working women. However, other important factors remain to be addressed. One such factor is the nonmarket production, which goes into the heart of issues related to the perpetuation of women's time poverty and lack of social mobility.

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[5] includes physical, social, emotional, mental, and spiritual aspect of child development
[6] delivery of complementary health, nutrition, early childhood education, social protection, and other social services to children aged 0–6 and their families
[7] supported by local government unit

While the main interest of the paper is to understand the role of nonmarket work in women's market work, its role in men's market work is also analyzed. This is consistent with the Gender and Development framework that seeks to recognize the importance of both genders in economic development. This is also to recognize the interrelatedness of men's and women's housework in the country, considering the evidence that points to the marital benefits of doing housework together. The paper models the probability of working and the time spent on housework as simultaneously determined. It uses the mother's work history to identify the equation related to working. It also uses attitudes toward gender roles at home and in the labor market to identify the equations related to housework.

Several salient results are noted. First, housework affects both men's and women's participation in market work. Second, while the labor market participation of both men and women is affected, the impact is higher for women than men. This is shown in the bigger increase in the women's market work participation when they do not engage in nonmarket work and bigger decrease when their spouses do not share in the household production. It is, therefore, important to craft policies that will help families in home production and care economy. These include

1.  providing child-care services that coincide with the 8-hour workload;
2.  ensuring the good quality of services provided in child-development centers;
3.  promoting work-life balance through a 4-day work week; and
4.  designing systems for elderly care to accommodate the eventual rise of the elderly population in the country.

It is important to emphasize that this study is an ongoing effort to understand housework/unpaid work/care economy and their potential effects on various socioeconomic outcomes. As such, there are some issues that the current research is not able to empirically address but needs to highlight as future research directions.

First, women's contribution to society does not necessarily have to be in the labor market. Mothers are vital in instilling the value of learnings and are considered vital partners of education institutions in realizing and reinforcing learning outcomes. It is already well established that mothers have a big role in fostering good learning environment especially during the children's early years when all types of development (physical, emotional, social, language, and cognitive) take place. Hence, women's contribution can also be in rearing and nurturing the next generation of potential leaders and healthy and productive citizens.

While it is hard to dispute these contributions, the next question that needs to be confronted is what happens after the children have grown up and started to go to

school? For women in households facing financial constraints, market work becomes inevitable, although finding a new job or easing into it may become a challenge. A clear understanding of the effects of care economy and unpaid work on the start-stop-start of market work can help in strengthening programs for labor market reentrants and in strengthening policies for work-family life balance.

Second, unpaid work and care economy are life's choices for some. For others, these are life's roles that they need to assume. Hence, it is important to have an in-depth understanding of the motivations and preferences of men and women to do (or not do) market and nonmarket work. A clear understanding of these elements can help in determining what can be done to support men and women who seek to engage in the market work after (or during) the pursuit of their life's roles.

Third, partly due to gender roles, men, as household providers, are expected to participate in market work. However, emerging narratives show that fathers have equally (if not more) important roles in child-rearing. Evidence shows that paternal presence and involvement in child-rearing and nurturing can result in increased academic test scores (Yeung 2004), reduced aggression (Chang et al. 2003), and reduced criminality and substance abuse and misuse (Sarkadi et al. 2008) of children. In the Philippines, researches on men's roles in children's outcomes are yet to flourish. Future research in the country should also investigate this issue so that policies can be designed to enhance the household presence of working men and strengthen their involvement in child-rearing.

Fourth, this paper provides an initial assessment of the effects of housework on men's and women's labor force participation using a cross-section data set. Further analysis will benefit from the use of panel data to establish the evolution of housework over the course of men's and women's lives. Given that more evidence is needed to develop convincing narratives for policies that address housework/unpaid work/care economy, the Philippine Statistics Authority should seriously consider including time-use questions as riders in its recurrent surveys such as the Labor Force Survey.

## References

Akerlof, G. and G. Kranton. 2000. Economics and identity. *The Quarterly Journal of Economics* 115(3):715–753.

Bardasi, E. and M. Taylor. 2008. Marriage and wages: A test of the specialization hypothesis. *Economica* 75(299):569–591.

Bayudan, C. 2006. Wives' time allocation and intrahousehold power: Evidence from the Philippines. *Applied Economics* 38(7):789–804.

Bayudan-Dacuycuy, C. and L. Dacuycuy. 2018. Wages, housework and attitudes in the Philippines. *Journal of Asian and African Studies* 53(3):366–383.

Becker, G. 1965. A theory of the allocation of time. *The Economic Journal* 75(299):493–517.

———. 1991. *A treatise on the family*. Cambridge, Massachusetts: Harvard University Press.

Bertrand, M., J. Pan, and E. Kamenica. 2013. Gender identity and relative income within households. NBER Working Paper 19023. Cambridge, Massachusetts: National Bureau of Economic Research.

Blau, F. and A. Grossberg. 1991. Real wage and employment uncertainty and labor force participation decisions of married women. *Economic Inquiry* 29(4):678–695.

Chang, L., D. Schwartz, K. Dodge, and C. McBride-Chang. 2003. Harsh parenting in relation to child emotion regulation and aggression. *Journal of Family Psychology* 17(4):598–606.

Chen, F., L. Bao, Z. Lin, Z. Zimmer and S. Gultiano. 2018. Double burden for women in mid and later life: Evidence from time use profiles in Cebu, Philippines. *Aging and Society* 38(11):2325-2355.

Commission on Higher Education (CHED). n.d. Higher education sex disaggregated data. http://ched.gov.ph/higher-education-sex-disaggregated-data/ (accessed on January 29, 2019).

Commission on Human Rights (CHR). 2016. Let our voices be heard: Report of the Commission on Human Rights Philippine national inquiry on reproductive health and rights. Diliman, Quezon City: Gender Equality and Women's Human Rights Center, CHR.

David, C., J. Albert, and J. Vizmanos. 2017. Sustainable Development Goal 5: How does the Philippines fare on gender equality? PIDS Discussion Paper Series No. 2017-45. Quezon City, Philippines: Philippine Institute for Development Studies.

De Haan, A. 2018. Can South Asia address barriers to women's paid work? https://www.idrc.ca/en/resources/perspectives/can-south-asia-address-barriers-womens-paid-work (accessed on January 9, 2019).

Duflo, E. 2012. Women empowerment and economic development. *Journal of Economic Literature* 50(4):1051–1079.

Elson, D. 2000. Progress of the world's women 2000: UNIFEM biennial report. New York: United Nations Development Fund for Women.

Ettner, S. 1995. The impact of "parent care" on female labor supply decisions. *Demography* 32(1):63–80.

Executive Order No. 5. 2016. Approving and adopting the twenty-five-year long term vision entitled *Ambisyon Natin 2040* as guide for development planning. Manila Philippines: Office of the President.

Fortin, B. and G. Lacroix. 1997. A test of the unitary and collective models of household labour supply. *Economic Journal* 107(443):933–955.

Fosu, F. 1999. Cost of living and labor force participation: Married women in urban labor markets. *Journal of Labor Research* 20(2):219–232.

Green, D. and W. Riddell. 2003. Literacy and earnings: An investigation of the interaction of cognitive and unobserved skills in earnings generation. *Labour Economics* 10(2):165–184.

Greenstein, T. 2000. Economic dependence, gender, and the division of labor in the home: A replication and extension. *Journal of Marriage and the Family* 62(2):322–335.

Gronau, R. 1977. Leisure, home production, and work: The theory of the allocation of time revisited. *Journal of Political Economy* 85(6):1099–1124.

Hersch, J. and L. Stratton. 2000. Household specialization and the male marriage wage premium. *Industrial and Labor Relations Review* 54(1):78–94.

Hindin, M. and L. Adair. 2002. Who's at risk? Factors associated with intimate partner violence in the Philippines. *Social Science and Medicine* 55(8):1385–1399.

Hochschild, A. and A. Machung. 2012. *The second shift: Working families and the revolution at home*. Revised ed. London, United Kingdom: Penguin Books.

International Development Research Centre (IDRC). n.d. Can South Asia address barriers to women's paid work? https://www.idrc.ca/en/resources/perspectives/can-south-asia-address-barriers-womens-paid-work (accessed on January 29, 2019).

International Social Survey Program (ISSP). 2012. International Social Survey Program. http://www.issp.org (accessed on February 27, 2018).

Korenman, S. and D. Neumark. 1991. Does marriage really make men more productive? *Journal of Human Resources* 26(2):282–307.

Manuel, M. and E. Gregorio. 2011. Legal frameworks for early childhood governance in the Philippines. *International Journal of Child Care and Education Policy* 5(1):65–76.

Medina, B. 1995. *The Filipino family: A text with selected readings*. Quezon City, Philippines: The University of the Philippines Press.

———. 2001. *The Filipino family*. Quezon City, Philippines: The University of the Philippines Press.

National Commission on the Role of Filipino Women (NCRFW). 1998. *Philippine Plan for Gender-Responsive Development 1995–2025*. Manila, Philippines: NCRFW.

National Economic and Development Authority (NEDA). 2011. *Philippine Development Plan 2011–2016*. Pasig City, Philippines: NEDA.

———. 2017. *Philippine Development Plan* 2017–2022. Pasig City, Philippines: NEDA.

———. n.d. NEDA Explainer: Reaping demographic dividend. http://www.neda.gov.ph/2018/12/19/neda-explainer-reaping-demographic-dividend/) (accessed on January 21, 2019).

O'Hara, B. 2004. Do mothers work to support ailing husbands? *Journal of Family and Economic Issues* 25(2):179–198.

Olivetti, C., E. Patacchini, and Y. Zenou. 2013. Mothers, friends and gender identity. NBER Working Paper 19610. Cambridge, Massachusetts: National Bureau of Economic Research.

Philippine Commission on Women (PCW). 2014. *Women's Empowerment, Development and Gender Equality (WEDGE) Plan 2013-2016*. Manila, Philippines: PCW.

———. n.d. What is CEDAW? Manila, Philippines: PCW. https://www.pcw.gov.ph/international-commitments/cedaw (accessed on January 7, 2019).

Philippine Statistics Authority (PSA). 2011. Literacy of men and women in the Philippines (Results from the 2008 Functional Literacy, Education and Mass Media Survey). PSA website. https://psa.gov.ph/content/literacy-men-and-women-philippines-results-2008-functional-literacy-education-and-mass-media (accessed on January 21, 2019).

———. 2018. Philippines 2017 National demographic and health survey key indicators report. Quezon City, Philippines: PSA.

Pollak, R. and M. Wachter. 1975: The relevance of the household production function and its implications for the allocation of time. *Journal of Political Economy* 83(2):255–278.

Republic Act 9710. 2009. An act providing for the Magna Carta of Women. Manila, Philippines: Congress of the Philippines.

Republic Act 10354. 2012. An act providing for a national policy on responsible parenthood and reproductive health. Manila, Philippines: Congress of the Philippines.

Roodman, D. 2011. Fitting fully observed recursive mixed-process models with cmp. *The Stata Journal* 11(2):159–206.

Ruhm, C. 2004.  Parental employment and child cognitive development. *The Journal of Human Resources* 39(1):155–192.

Sarkadi, A., R. Kristiansson, F. Oberklaid, and S. Bremberg. 2008. Fathers' involvement and children's developmental outcomes: A systematic review of longitudinal studies. *Acta Paediatrica* 97(2):153–158.

Smith, L.  and L. Haddad. 2000. Explaining child malnutrition in developing countries: A cross-country analysis. FCND Discussion Paper No. 60. Washington, D.C.: International Food Policy Research Institute.

Stafford, F. 1987. Women's work, sibling competition, and children's school performance. *American Economic Review* 77(5):972–80.

United Nations Population Fund (UNFPA). 2018. *The power of choice: Reproductive rights and the demographic transition.* New York, NY: UNFPA.

Upadhyay, U. and M. Hindin. 2007. The influence of parent's marital relationship and women's status on children's age at first sex in Cebu, Philippines. *Studies in Family Planning* 38(3):173–186.

Williams, L. and J. Domingo. 1993. The social status of elderly women and men within the Filipino family. *Journal of Marriage and Family* 55(2):415–426.

World Bank (WB). n.d. World Development Indicators. Washington, D.C.: WB. https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS (accessed on January 7, 2019).

World Economic Forum (WEF). 2018. *The global gender gap report.* Geneva, Switzerland: WEF.

West, C. and D. Zimmerman. 1987. Doing gender. *Gender and Society* 1:125–151.

Yeung, W. 2004. Fathers: An overlooked resource for children's school success. In *After the bell: Solutions outside the school,* edited by D. Conley and K. Albright. London, United Kingdom: Routledge.

# Appendix

Appendix 1. Determinants of work and housework of respondent and spouse

| | Male Respondent | | | Female Respondent | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Working Respondent | Housework, Respondent | Housework, Spouse | Working Respondent | Housework, Respondent | Housework, Spouse |
| Personal attributes | | | | | | |
| Respondent: Age | -0.02*** | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| | [0.01] | [0.00] | [0.00] | [0.01] | [0.00] | [0.01] |
| Respondent: College | -0.24 | 0.30** | -0.03 | -0.1 | 0.10 | 0.21 |
| | [0.21] | [0.15] | [0.14] | [0.18] | [0.11] | [0.15] |
| Married | -0.27 | -0.11 | 0.13 | 0.41** | 0.20 | -0.14 |
| | [0.24] | [0.15] | [0.14] | [0.19] | [0.13] | [0.17] |
| Partner: College | -0.03 | -0.16 | -0.12 | -0.15 | -0.21 | -0.06 |
| | [0.24] | [0.19] | [0.17] | [0.21] | [0.14] | [0.19] |
| HH characteristics | | | | | | |
| Household size | -0.08** | 0.07*** | 0.02 | 0.02 | -0.06*** | 0.00 |
| | [0.04] | [0.03] | [0.02] | [0.04] | [0.03] | [0.03] |
| Number of toddler | 0.06 | -0.05 | 0.00 | -0.07 | 0.19*** | -0.11 |
| | [0.10] | [0.07] | [0.06] | [0.10] | [0.06] | [0.07] |
| Family income | 0.25*** | -0.02 | 0.07 | 0.20** | 0.06 | 0.1 |
| | [0.09] | [0.06] | [0.05] | [0.08] | [0.05] | [0.07] |
| Urban | -0.38* | 0.04 | -0.09 | 0.25 | -0.06 | -0.12 |
| | [0.22] | [0.14] | [0.13] | [0.19] | [0.14] | [0.18] |

Appendix 1 (continued)

| | Male Respondent | | | Female Respondent | | |
|---|---|---|---|---|---|---|
| | Working Respondent | Housework, Respondent | Housework, Spouse | Working Respondent | Housework, Respondent | Housework, Spouse |
| Luzon | 0.08 | -0.13 | 0.45*** | -0.16 | 0.21 | 0.1 |
| | [0.26] | [0.16] | [0.15] | [0.21] | [0.14] | [0.18] |
| **Housework** | | | | | | |
| Respondent | -0.23 | | | -0.51*** | | |
| | [0.18] | | | [0.18] | | |
| Spouse | 0.31* | | | 0.46*** | | |
| | [0.18] | | | [0.13] | | |
| **Work history** | | | | | | |
| Mother works | -0.03 | | | 0.22* | | |
| | [0.15] | | | [0.13] | | |
| **Attitudes** | | | | | | |
| When mother works: Preschool child suffer (=1 disagree, =0 agree) | | -0.02 | 0.12 | | -0.06 | -0.07 |
| | | [0.12] | [0.11] | | [0.11] | [0.14] |
| When mother works: Family life suffers (=1 disagree, =0 agree) | | -0.13 | -0.24** | | 0 | 0.23* |
| | | [0.11] | [0.10] | | [0.10] | [0.12] |
| Men work, women housework (=1 disagree, =0 agree) | | 0.11 | 0.19 | | -0.19 | 0.22 |
| | | [0.18] | [0.15] | | [0.12] | [0.16] |

## Appendix 1 (continued)

| | Male Respondent | | | Female Respondent | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Working Respondent | Housework, Respondent | Housework, Spouse | Working Respondent | Housework, Respondent | Housework, Spouse |
| $\rho$working, housework$_r$ | 0.01 | | | 0.07 | | |
| $\rho$working, housework$_s$ | -0.20 | | | -0.42** | | |
| $\rho$housework$_r$,housework$_s$ | 0.25*** | | | 0.34*** | | |
| Observations | 399 | | | 454 | | |
| LR chi2 | 83.35 | | | 97 | | |
| p-val | 0.00 | | | 0.00 | | |

$\rho$ = correlation coefficient; LR chi2 = Likelihood Ratio (LR) Chi-Square test ; p-val = p-values
*/**/*** Significant at 10/5/1% level. Values in brackets are standard errors.
Source: Author's calculation

# The Wage Gap between Male and Female Agricultural Workers

Roehlano M. Briones

*"Heal what has been hurt.*
*Change the Fates' design.*
*Save what has been lost.*
*Bring back what once was mine,*
*What once was mine."*

- Rapunzel (Rapunzel, Disney)

## Introduction

The gender gap is a key development concern worldwide. In developing countries, the issue of gender gap particularly in agriculture has been highlighted in a number of studies reviewed by the Food and Agriculture Organization (FAO 2011). Women comprise 43 percent, on average, of the agriculture labor force in developing countries. Their contribution varies widely depending on activity. However, women in agriculture and rural areas face higher barriers in gaining access to productive resources and opportunities compared to men, namely for land, livestock, labor, education, extension, finance, and technology. Closing the gender gap in agriculture could potentially raise farm yields by 20–30 percent, thereby raising developing

countries' agricultural output by up to 4 percent and reducing the number of hungry people in the world by up to 17 percent.

The Philippines has made considerable progress in addressing the gender gap compared to other developing countries. A Gender and Development (GAD) perspective and process was explicitly adopted as a state policy under the Republic Act (RA) 9710 or the Magna Carta of Women, a landmark law enacted in 2008. GAD seeks to achieve gender equality as a fundamental value that should be reflected in development choices.

This policy appears to have produced gains so far. Out of 144 countries, the Philippines ranks 10th in the Global Gender Gap score (WEF 2017), with high rankings in educational attainment (1st) and political empowerment (13th). The country also ranks high in economic participation and opportunity (25th), although this score has hardly changed since 2006 (when the index was first estimated), despite rapid development in political empowerment. David et al. (2017) looked at the gender wage gap by occupation and found that women in the Philippines (contrary to the pattern in other ASEAN countries) seem to earn more than men on average. But in the case of agriculture, men's wages are 6 percent higher on average than women's. Data on average daily basic wage show an even greater disparity of 15-percent difference in 2015, or almost similar disparity in 2008 (16%).

Wage data are typically imputed by sector or occupation, which aggregates over different tasks or activities, each of which may correspond to a different wage rate. Heterogeneity across different sets of activities is especially common in agriculture. Hence, any difference in wages reported in the aggregate between men and women may arise from two sources—differences in activity composition and differences in wage for the same activity. Policy implications differ depending on the relative importance of these sources. If the wage gap is primarily due to activity composition, then the policy response may be to promote, to the extent possible, equal access to higher-paying activities for women. On the other hand, if the wage gap is primarily due to differences in pay for the same activity, then the policy response may be to promote equal pay for equal work.

This study analyzes the gender wage gap in Philippine agriculture using available secondary data. Specifically, the study undertakes to

1.  review the literature on gender gaps and related policies in Philippine agriculture with focus on recent studies in the Philippines;
2.  characterize the wage gaps in Philippine agriculture using official data, supplemented by data from other sources;
3.  decompose the sources of wage disparity between male and female agriculture workers; and

4.  draw implications from the decomposition analysis and wage gap characterization for GAD policies in Philippine agriculture.

The wage gap in agriculture will serve as a lens to examine other gender gaps in Philippine agriculture, a relatively less studied area within GAD. The findings of this study will inform policies and programs related to addressing gender disparities in economic opportunity within Philippine agriculture.

## Method of the study

### Data sources
The main source of data is the Agricultural Labor Survey (ALS) that started in 1974 under the Bureau of Agricultural Statistics. It covers four major crops, such as *palay*, corn, coconut, and sugarcane. For palay and corn, the ALS is conducted every January and July with the past six months as reference period. For coconut and sugarcane, the ALS is conducted every January with the past year as reference period. The survey sampled 81 provinces for palay, 53 provinces for corn, 48 provinces for coconut, and 19 provinces for sugarcane. A maximum of 4,020 samples were drawn for each survey round.

The methodology for ALS data collection has evolved over time. In 1994, disaggregation of wages between male and female workers became available. Average wage is computed at the regional level, based on the ratio of amount paid to labors in all provinces to the number of person-days of work in all provinces. The totals are obtained by a weighted average using number of farms by type as weights based on the 2002 Census of Agriculture (NSO 2002). Wages can be disaggregated by crop and sex of worker.

Regular release of the publication, *Trends in Agricultural Wage Rates* (TAWR), which is largely based on ALS, began in 2010 (which covered 2007–2009). The printed publication has since been available annually up to 2017 (covering 2014–2016). It is available online in PDF format. A spreadsheet version used in this study is available for 2016 (spreadsheet data for 2014 and 2015 are available but incomplete).

Another data source is the Labor Force Survey (LFS), a quarterly survey of households that provides data on household members' employment and wages. The reference period is prior to interview, disaggregated by basic sector.

Neither of these data sources disaggregate wage by activity and by sex of worker. In the case of ALS, the data disaggregated by activity and mode of payment make no distinction between male and female workers. This may be remedied by the Survey of Agricultural Workers conducted by the Philippine Institute for Development

Studies (PIDS). This survey focuses on households with at least one member who is an agricultural worker. It delves in detail about tasks and compensation of each worker in the household. Because of the depth of labor supply characterization, the data set is able to compare wage-equivalents paid to workers, disaggregated by task and by gender. The data from this survey will be used to check whether payments by activity and mode of payment are the same regardless of sex of worker. The survey is conducted once every quarter of 2018 beginning May. The information from the first round is available for this study.

It should be noted that in-depth data collection could not be done nationwide due to budget constraint. To ensure the greatest degree of representativeness given the constraint, the two provinces with the largest agricultural area from the regions with the largest number of agricultural workers in the country were selected. The survey covered a sample of at least 400 households spread across two provinces, namely, Nueva Ecija and Negros Occidental. Nueva Ecija is a landlocked province with the largest rice production area in the country. Meanwhile, Negros Occidental is the largest sugarcane producer. It also has extensive coastline as part of Negros Island.

**Decomposition analysis**

The decomposition analysis attempts to break down the gender wage gap into two sources, namely, differences in activity composition and differences in wage for the same activity. The decomposition begins with the following definition:

$$w^j = \sum_{i=1}^{n} \frac{w_i^j x_i^j}{XT^j} = \sum_{i=1}^{n} w_i^j s_i^j \,,$$

where:

$j = m, f$, denotes sex of worker, i.e., male and female, respectively;

$i = 1, 2, ..., n$ denotes a vector of activities;

$w_i^j$ denotes wage per activity;

$x_i^j$ denotes person-days per cropping per ha;

$XT^j = \sum_{i=1}^{n} x_i^j$ denotes total person-days by sex of worker;

$XT_i = \sum_{j=m,n} x_i^j$ denotes total person-days per activity per ha; and

$s_i^j = x_i^j / XT^j$ denotes the share in total person-days per cropping per ha, by sex.

Furthermore, let $\beta_i = w_i^f / w_i^m$; $\beta_i = 1$ implies the same wage per activity regardless of worker's sex; abstracting from other worker characteristics, then $\beta_i < 1$ implies a bias against women; and $\beta_i > 1$ implies a bias favoring women.

The gender wage gap is therefore:

$$w^m - w^f = \sum_{i=1}^{n} w_i^m s_i^m + \sum_{i=1}^{n} w_i^m \beta_i s_i^f$$

In percentage terms:

$$\frac{w^m - w^f}{w^m} = \frac{1}{w^m} \sum_{i=1}^{n} w_i^m \left( s_i^m - \beta_i s_i^f \right)$$

Adding and subtracting 1 to the bracketed term yields the following:

$$\frac{w^m - w^f}{w^m} = \frac{1}{w^m} \sum_{i=1}^{n} w_i^m \left( s_i^m - s_i^f \right) + \frac{1}{w^m} \sum_{i=1}^{n} w_i^m s_i^f \left( 1 - \beta_i \right) \quad (1)$$

If $\beta_i = 1$, then the percentage wage gap is composed entirely of differences in allocation of time across activities. If $\beta_i < 1$ then Equation (1) decomposes the percentage wage gap into two parts, one due to differences in allocation of time across activities and the remainder due to differences in wage rates for the same activity.

**Incorporating wage bias**

The TAWR publishes wage by activity, implicitly assuming $\beta_i = 1$. Instead, suppose reported figures corresponding to average wage $\bar{w}_i$ aggregates over possible sex-related differences. Hence Equation (1) requires a preparatory step to calculate $w_i^j$ from $\bar{w}_i$ as described below.

Denote $\theta_i^j = x_i^j / XT_i$; this is the share in total person-days per ha per cropping for an activity. To estimate male wages, given $\beta_i$, consider the expanded version of $\bar{w}_i$ as follows:

$$\bar{w}_i = \frac{w_i^m XT_i^m + w_i^f XT_i^f}{XT_i} = \theta_i^m w_i^m + \beta_i \theta_i^f w_i^m$$

Solving for $w_i^m$:

$$w_i^m = \overline{w}_i \frac{1}{\theta_i^m + \beta \theta_i^f} \quad (2)$$

Clearly, $\beta=1$ implies $\overline{w}_i = w_i^m = w_i^f$; $\beta_i <1$ implies $w_i^m > w_i^f$; and $\beta >1$ implies $w_i^m < w_i^f$. From (2), one may compute $w_i^f$ using the definition of $\beta_i$.

## Gender issues in Philippine agriculture

### Gender patterns of agricultural employment in the Philippines

In 2012, the Census of Agriculture and Fisheries (PSA 2017) recorded 5.6 million holders/operators of farm parcels, of whom only 16 percent were females. The census typically found that in most households, the male was identified as the household head. A female becomes a household head only in the absence of the male head (i.e., if male head has migrated or is deceased).

In terms of employment, the share of females in agricultural employment remained fairly constant at about 25 percent (Figure 1). In 2012, the share of workers primarily employed in agriculture was 32 percent. The share of female workers though was only 26 percent. By 2016, the disparity further widened that the share of agriculture in total employment was down to 27 percent, whereas the share of agriculture among female workers was only 17 percent.

Figure 1. Shares of females in agricultural employment: Philippines (%)
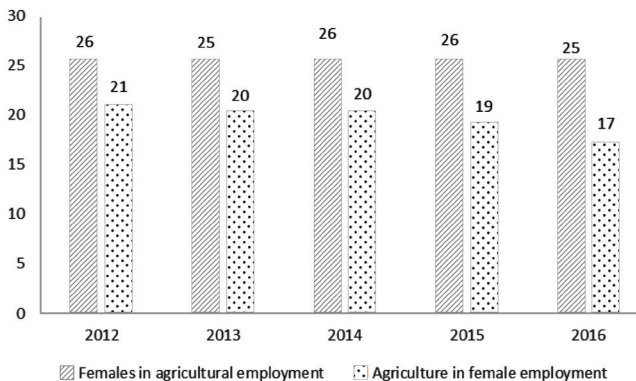


Source: PSA (2017)

Significantly, wages of male farmworkers are higher than that of their female counterparts (Figure 2). Wages for both male and female farmworkers increased in 2012–2016 when growth was sustained at over 6 percent, though the relative disparity between these workers remains virtually unchanged.

Figure 2. Wages of farmworkers in PHP per day: Philippines, 2012–2016 (2006 prices)
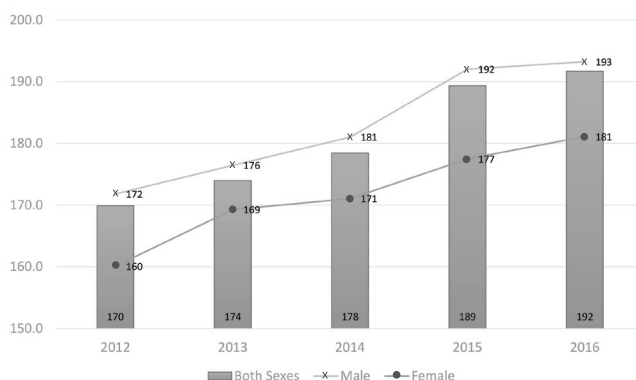


PHP = Philippine peso
Source: PSA (various years)

The disparity is displayed more clearly in Table 1. The relative wage of females is 6–8 percent lower across all farms. However, there are significant differences in relative wage gap trends across the major crops. In the case of coconut, the relative wage is highly erratic; in 2013–2014, the relative wage of females actually exceeded that of males before falling back to 92 percent. The lowest relative wages are consistently found in sugarcane, though the disparity narrowed in 2016.

Table 1. Female/male wage of farmworkers by crop: Philippines, 2012–2016 (%)

| Crop | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| All farms | 93 | 96 | 94 | 92 | 94 |
| Palay | 91 | 89 | 91 | 92 | 95 |
| Corn | 95 | 93 | 93 | 90 | 95 |
| Coconut | 93 | 106 | 102 | 98 | 92 |
| Sugarcane | 87 | 83 | 89 | 83 | 93 |

Source: PSA (various years)

Person-day requirements per ha vary considerably across crops (Table 2). Corn has the largest labor requirements, followed by sugarcane while coconut has the least. But the lopsided allocation for male employment is common between crops: the share is just over 80 percent for palay and corn, then rising to 89 percent for sugarcane, and 94 percent for coconut.

Table 2. Employment per hectare per cropping season, in person-days: Philippines, 2016

| Crop | Person-days per Hectare | | | Shares in Total (%) | | |
|------|------|--------|-------|------|--------|-------|
| | Male | Female | Total | Male | Female | Total |
| Palay | 51 | 11 | 62 | 82 | 18 | 100 |
| Corn | 180 | 41 | 221 | 81 | 19 | 100 |
| Coconut | 21 | 1 | 22 | 94 | 6 | 100 |
| Sugarcane | 70 | 8 | 79 | 89 | 11 | 100 |

Source: PSA (2016)

Valientes (2015) measured and decomposed gender wage gaps in agriculture employment based on LFS data. The author applied Oaxaca-Blinder decomposition, which identifies three components of the gap, namely, human capital (which reflects underlying productivity differences), a coefficient effect corresponding to unequal pay for the same occupation and worker characteristics, and an interaction term. In 2006–2009, the average wage for male workers in agriculture was 13–18 percent higher than their female counterparts. The gap shows that only 12 percent is due to human capital difference and 74 percent is due to a "coefficient effect", corresponding to unequal pay for the same work and worker characteristics. The remainder of 14 percent is due to an interaction term. The study concludes that wage discrimination is a pervasive and persistent feature in the agriculture labor market.

Specialized gender roles in agriculture are prominent in the Philippines, indeed in Southeast Asia (Akter et al. 2017). In rice farming, men primarily do land preparation, seedbed preparation, fertilizer spraying, and pesticide application. Meanwhile, men and women share activities such as transplanting, weeding, manual harvest, and postharvest activities. On the other hand, women primarily do the preparation of food for workers (said to be very time-intensive). In the Philippines, women tend to dominate the task to clear and maintain paddy dikes/bunds. Given the differences in payment by activity, then activity composition is a plausible explanation for the gender wage gap.

For palay farms, Table 3 shows activity shares by sex of workers. Female labor is focused on planting stage (including pulling and bundling of seedlings) followed by harvesting. Care of crops consumes 10 percent of their time. As for men, the time allocation across tasks is more evenly spread compared to women. But men's prime concentration is in harvesting, followed by planting/transplanting, and almost identical share for care of crops. Only men have any time allocation for land preparation.

Table 3. Shares in total person-days of labor per hectare, palay farms: Philippines, 2016 (%)

| Activity | Male | Female | Daily Wage (PHP/day) |
|---|---|---|---|
| Land preparation | 0.20 | 0.00 | 1,246.5 |
| Plowing | 3.91 | 0.00 | 509.3 |
| Harrowing | 5.24 | 0.26 | 530.2 |
| Levelling | 0.35 | 0.00 | 454.6 |
| Pulling and bundling of seedlings | 5.38 | 21.25 | 271.3 |
| Planting/ Transplanting | 15.57 | 26.82 | 283.8 |
| Irrigation/Watering | 7.95 | 0.80 | 272.2 |
| Care of crops | 15.38 | 10.52 | 283.9 |
| Picking of snails | 0.04 | 0.12 | 289.5 |
| Harvesting | 21.33 | 31.20 | 278.2 |
| Threshing | 8.90 | 3.02 | 336.0 |
| Hauling | 5.38 | 0.22 | 353.0 |
| Drying | 10.33 | 5.75 | 280.4 |
| Winnowing/Blowing | 0.02 | 0.04 | |
| Total (computed) | 100.00 | 100.00 | |

PHP = Philippine peso
Note: Published data on totals replaced by computed data
Source: PSA (2017)

The breakdown of activities for corn farm shows an identical set of activities for palay farms (Table 4). However, time allocation by sex of workers varies considerably from that of palay farms. The largest time concentration of female labor is for harvesting, followed by planting (including care of seedlings). Women devote some (but minimal) amount of time to land preparation. For men, the largest concentration of time is for care of crops, followed by harvesting.

Table 4. Shares in total person-days of labor per hectare, corn farms:
Philippines, 2016 (%)

| Activity | Male | Female | Daily Wage (PHP/day) |
|---|---|---|---|
| Land preparation | 0.02 | 0.07 | 302.72 |
| Plowing | 2.86 | 0.07 | 480.61 |
| Harrowing | 3.24 | 0.09 | 476.03 |
| Furrowing | 5.01 | 0.08 | 494.81 |
| Mending/Care of seedlings | 0.17 | 0.06 | 216.14 |
| Planting/Replanting | 13.33 | 26.73 | 233.41 |
| Irrigation/Watering | 1.41 | 0.06 | 251.08 |
| Care of crops | 21.45 | 14.63 | 242.15 |
| Off-barring | 2.20 | 0.49 | 472.81 |
| Hilling-up | 2.67 | 0.34 | 490.50 |
| Harvesting | 20.19 | 39.60 | 251.58 |
| Shelling | 8.87 | 11.18 | 291.83 |
| Hauling | 5.60 | 0.44 | 363.18 |
| Husking/detasseling of corn | 1.33 | 0.22 | 270.99 |
| Drying | 11.66 | 5.93 | 240.25 |
| Total (computed) | 100.00 | 100.00 | |

PHP = Philippine peso
Source: PSA (2017)

The types of activities for coconut and sugarcane differ from those in cereals and from one another. Management of cover crops, gathering and splitting of nuts, and removal of meat are unique to coconut. Off-barring and hilling up are unique to sugarcane.

In the case of coconut, women's time is concentrated mostly on postharvest activities such as the removal of coconut meat, gathering of nuts, and splitting of nuts. For men, the largest time allocation is on harvesting, while the rest of their time is evenly allocated to other activities (Table 5).

Lastly, for sugarcane farms, women's time allocation is greatest for care of crops, harvesting, and planting activities. Meanwhile, men allocate their time mostly to harvesting and hauling activities, followed by planting/replanting (Table 6).

Table 5. Shares in total person-days of labor per hectare, coconut farms: Philippines, 2016 (%)

| Activity | Male | Female | Daily Wage (PHP/day) |
|---|---|---|---|
| Land preparation | 1.21 | 2.64 | 279.92 |
| Planting/Replanting | 1.12 | 3.90 | 246.93 |
| Care of crops | 5.81 | 7.37 | 1,173.61 |
| Clearing of underbush | 1.18 | 0.41 | 266.24 |
| Rolling over of cover crops | 0.32 | 0.00 | 279.74 |
| Harvesting | 22.32 | 1.58 | 314.51 |
| Gathering/Piling of nuts | 14.33 | 22.75 | 241.38 |
| Hauling | 13.38 | 8.44 | 284.31 |
| Husking | 6.18 | 0.36 | 228.21 |
| Splitting of nuts | 10.79 | 10.52 | 240.53 |
| Removal of coconut meat | 11.35 | 25.01 | 242.95 |
| Drying | 12.03 | 17.02 | 247.66 |
| Total (computed) | 100.00 | 100.00 | |

PHP = Philippine peso
Note: Published data on totals replaced by computed data
Source: PSA (2017)

Table 6. Shares in total person-days of labor per hectare, sugarcane farms: Philippines, 2016 (%)

| Activity | Male | Female | Daily Wage (PHP/day) |
|---|---|---|---|
| Land preparation | 0.31 | 0.22 | 272.20 |
| Plowing | 1.43 | 0.36 | 422.77 |
| Harrowing | 0.89 | 0.02 | 494.50 |
| Furrowing | 1.09 | 0.03 | 581.42 |
| Care of seedlings | 0.81 | 0.35 | 188.84 |
| Planting/Replanting | 8.41 | 28.21 | 262.28 |
| Care of crops | 16.31 | 38.53 | 239.69 |
| Off-barring | 2.65 | 0.03 | 446.34 |
| Hilling-up | 2.83 | 0.00 | 509.26 |
| Harvesting | 45.12 | 30.92 | 318.09 |
| Hauling | 20.14 | 1.35 | 340.34 |
| Total (computed) | 100.00 | 100.00 | |

PHP = Philippine peso
Note: Published data on totals replaced by computed data
Source: PSA (2017)

### Related literature

The "gender gap" in wages has long been observed in labor markets. Discrimination in the workplace itself is the straightforward explanation. Women appear less welcome in the workplace. If they opt to work, they may be paid lower wages than men for equal marginal product. Becker (1971) attributed such inefficiency to employers' "taste" for discrimination. If sufficiently widespread, then this becomes a market-level feature (as women are unable to find enough alternative employers that will pay them their marginal product).

Alternatively, workers themselves may practice workplace segregation, i.e., one group (males) may prefer to work with other males. The persistence of a gender wage gap was shown to be inconsistent with the discrimination model. Becker shows that under constant returns to scale or free entry, if at least some employers are gender neutral, then the gender wage gap wanes in the long run. Likewise, workplace segregation should lead to nondiverse workplaces in the long run, but not necessarily unequal pay.

Mincer and Polachek (1974) presented an alternative explanation that focuses on the supply conditions of female labor. Differences in wages between men and women are related to lower participation of women in the labor force, and greater intermittency of employment among working women. This is ultimately traceable to differences in gender roles at home. Women are more apt to take part-time work or cease work altogether to devote more time and effort for home chores, especially child-rearing. This may be consistent with findings reported in Dacuycuy and Dacuycuy (2017) from a 2002 survey that showed husbands devote less time for housework compared to wives, although wives roughly allocate the same amount of time for market work as their husbands even as they earn lower wages.

Theoretical and empirical developments since then explored both aspects of the labor market to account for the gender wage gap. Introducing costly search allows employers who practice discrimination to simultaneously wield monopsony power, thereby perpetuating gender wage gap (Black 1995). Discrimination may be amplified by disparities in access to workplace authority, hiring and promotion, and gender representation. However, owing to the scarcity of studies, the empirical relevance of these disparities remains indeterminate (Bishu and Alkadry 2017).

An alternative to taste-based discrimination is statistical discrimination, owing to real or perceived differentials in productivity by gender or stability of employment, particularly in the face of uncertainty (Phelps 1972). Statistical discrimination may lead to persistent wage gaps owing to feedback and reinforcement effects. The uncertainty may be about inherently unobservable traits such as the private cost of

labor force participation, which may be an empirically significant factor behind the wage gap (Gayle and Golan 2012).

More recently, differences in psychological attributes correlated with wage (e.g., negotiating skill, risk aversion, etc.) had been subjected to experimental analysis. In laboratory setting, such differences were found to be potentially significant. However, statistical analysis of actual labor markets suggests such psychological differences may have little to moderate explanatory power for the wage gap (Blau and Kahn 2017).

Straddling the labor demand/labor supply explanations are social norms. Such norms may induce employers to set lower prices for female workers, which are accepted by both males and females themselves, leading to persistent wage gaps. An experimental factorial survey found that both men and women respondents reproduce a gender wage gap in their estimates of fair compensation, with the mean male-female wage difference of about 8 percent (Ausperg et al. 2017).

An alternative set of explanations relate to female labor supply. An obvious source of wage difference is biology. Some manual occupations demand greater physical strength, e.g., land preparation in agriculture. Also attributed to biology (though confounded by social expectations) is the need for temporal flexibility on the part of childbearers and caregivers, which turned out to be a disadvantage for some occupations or firms that place a premium on working long hours and/or specific hours of the day (Goldin 2014). In China, a 2008 survey indicates that up to 28 percent of gender wage gap is attributed to differences in time spent on unpaid care work (Qi and Dong 2015).

Time allocation of household members has been traditionally modeled in terms of unitary decisionmaking and utility maximization at the household level. However, the empirical literature subsequently began to note significant empirical failings of the unitary household model. For instance, development literature typically rejected the pooling model of household resources, i.e., specific types of resources under control of different household members will lead to different decisions.

Rubalcava et al. (2009) found that household beneficiaries of the cash transfer scheme in Mexico, where transfers are directly received by women, investments are higher in livestock and children's education (both directly controlled by women). Hence, theoretical explanations of time allocation expanded to include collective models.

One approach is to examine intrahousehold bargaining among members, especially between spouses. Supposing human capital and asset ownership at the time of marriage correlate with bargaining power, Quisumbing and Maluccio (2003) found that in Bangladesh and South Africa, households with greater share of women's assets are associated with higher share of household expenditure for education. Moreover,

Antman (2014) found that when both spouses are employed, the likelihood of joint decisionmaking in the household is greater compared to households where only the male head is employed.

### Gender and development policy and Philippine agriculture

Since the early twentieth century, gender has been evolving as a public policy priority agenda. One of the earliest feminist organizations was the Asociacion Feminista Filipina established by Concepcion Felix and other "prominent ladies" who sought social reforms (schools, prisons, factories, and other workplaces of women). In 1906, the Asociacion Feminista Ilonga was founded and quickly became politically active with women's suffrage as its key advocacy (Aquino 1994). The newly organized Women's Club of Manila also took up the cause sparked by the visits of prominent suffragettes Aletta Jacobs of Holland and Carrie Chapman Catt of the US (Casambre and Rood 2012).

In 1919, leading feminists held a rally in Malacañang before Governor-General Francis B. Harrison. Following the political action, several bills on women's suffrage were introduced in the Senate, though the House of Representatives remained opposed. In 1921, the women's crusade for suffrage widened into a grassroots and nationwide movement that led to the formation of the National Federation of Women's Clubs, and extensive activities of the League of Women Suffragettes.

The anachronistic-sounding provision on suffrage of the 1935 Constitution (Art. V Sec. 1) provides for the right to vote for adult male citizens. Suffrage for women was conditional on approval by a plebiscite to draw at least 300,000 qualified women voters. This was deemed an impossible requirement by the male-dominated Constitutional Convention Committee. In an extraordinary mobilization effort, women's organizations mustered 500,000 women voters, of whom 447,725 voted in the affirmative (Aquino 1994).

The right to vote led to other reforms in law and policy. In 1981, the Philippines ratified the United Nations Convention on the Eradication of All Forms of Discrimination Against Women (CEDAW). Gender equality as a principle in law and policy was enacted by the Magna Carta of Women in 2008 (RA 9710). The Magna Carta prohibits all forms of discrimination in both public and private spheres, thereby affirming in domestic law the country's existing international obligations under CEDAW. For instance, the law prohibits expelling female students from schools owing to teenage pregnancy. The Magna Carta provides for equal treatment before the law, and for amendment or repeal of existing laws discriminatory to women. But a striking omission is the absence of an explicit repealing clause for past discriminatory laws.

The Magna Carta defines GAD as a development perspective and process that is participatory and empowering, equitable, sustainable, free from violence, respectful of human rights, and supportive of self-determination and actualization of human potentials. Part of the implementation of the Magna Carta is gender mainstreaming, which is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring, and evaluation of policies and programs in all political, economic, and societal spheres so that women and men benefit equally and inequality is not perpetuated. The law mandates all government agencies to adopt gender mainstreaming. To this end, at least five percent of each agency's or local government unit's (LGU) budget shall be utilized for GAD programs.

In the area of agriculture development, the policy framework is shaped by several key laws, all of which reveal the influence of the gender equality movement. Agrarian tenure is largely governed by RA 6657 enacted in 1987, which forms the legal basis of the Comprehensive Agrarian Reform Program (CARP). Chapter X of the CARP law contains a section on rural women, which provides for equal rights to ownership of land, equal shares of farm's produce, and representation in advisory or decisionmaking bodies for qualified women members of the agricultural labor force.

Another "Magna Carta" enacted in 1992 for small farmers (RA 7607) requires the state to ensure that women and youth be provided ample opportunity to develop their skills, acquire productive employment, and contribute to their communities to the fullest of their capabilities. Lastly, the overarching legislative framework for agriculture development, the Agriculture and Fisheries Modernization Act (AFMA) of 1998 (RA 8435) also contains special provisions for women. The mandated Agriculture and Fisheries Modernization Plan (AFMP) is required to include women together with rural youth, senior citizens, indigenous peoples, etc., as areas of special concern. AFMA also explicitly provides for a focus on women in terms of access to credit, information and marketing support, and special training projects.

The Magna Carta of Women itself singles out agriculture. It widens the tenure provision of the CARP law, providing for equal treatment of women and men, whether married or not, in the titling of land and issuance of stewardship contracts and patents over public land, customary tenure in ancestral domains, and in the sharing of the produce of farms and aquatic resources, together with other asset entitlements.

## Decomposition analysis of gender wage gap

### Differences in activity share by sex of worker

The first step of the decomposition based on Equation (1) is to arrive at a difference in activity share by sex of workers. The data reported earlier is adjusted further to apply the decomposition formula, though the resulting data (Tables 7 to 10) remain close to the original. Adjustments are as follows: First, wages are based on daily wage figures, omitting other bases of compensation (i.e., per unit quantity, per hectare, by contract, by sharing), unless daily wage is unavailable. Second, wages are limited only to the estimates for "man-labor", i.e., excluding "man and animal" and "man and machine". Third, activities with below 0.01 person-days on average are set to zero (consistent with nonreporting of minuscule person-day figures in the TAWR).

Table 7. Person-days of labor per hectare per cropping, palay farms: Philippines, 2016

| Activity | Male | Female | Share in Male Labor (%) | Share in Female Labor (%) |
|---|---|---|---|---|
| Land preparation | 0.08 | 0.00 | 0.18 | 0.00 |
| Plowing | 0.73 | 0.00 | 1.68 | 0.00 |
| Harrowing | 0.63 | 0.00 | 1.45 | 0.00 |
| Levelling | 0.13 | 0.00 | 0.30 | 0.00 |
| Pulling & bundling of seedlings | 2.74 | 2.30 | 6.29 | 21.64 |
| Planting/Transplanting/ Replanting | 7.94 | 2.90 | 18.23 | 27.28 |
| Irrigation/Watering | 4.06 | 0.09 | 9.32 | 0.85 |
| Mechanical weeding | 0.11 | 0.00 | 0.25 | 0.00 |
| Manual weeding | 3.87 | 1.04 | 8.88 | 9.78 |
| Fertilizer application | 1.83 | 0.04 | 4.20 | 0.38 |
| Chemical application | 2.04 | 0.06 | 4.68 | 0.56 |
| Picking of snails | 0.02 | 0.01 | 0.05 | 0.09 |
| Harvesting | 10.88 | 3.38 | 24.98 | 31.80 |
| Threshing | 1.56 | 0.19 | 3.58 | 1.79 |
| Hauling | 1.73 | 0.00 | 3.97 | 0.00 |
| Drying | 5.21 | 0.62 | 11.96 | 5.83 |
| Total | 43.56 | 10.63 | 100.00 | 100.00 |

Source: PSA (2017)

Table 8. Person-days of labor per hectare per cropping, corn farms: Philippines, 2016

| Activity | Male | Female | Share in Male Labor (%) | Share in Female Labor (%) |
|---|---|---|---|---|
| Land preparation | 0.01 | 0.01 | 0.02 | 0.06 |
| Plowing | 0.46 | 0.01 | 1.87 | 0.06 |
| Harrowing | 0.19 | 0.00 | 0.77 | 0.00 |
| Furrowing | 0.36 | 0.00 | 1.46 | 0.00 |
| Mending/Care of seedlings | 0.05 | 0.00 | 0.20 | 0.00 |
| Planting/Replanting | 3.79 | 2.17 | 15.39 | 26.92 |
| Irrigation/Watering | 0.40 | 0.00 | 1.62 | 0.00 |
| Manual weeding | 2.27 | 0.45 | 9.22 | 5.58 |
| Fertilizer application | 2.29 | 0.72 | 9.30 | 8.93 |
| Chemical application | 1.52 | 0.01 | 6.17 | 0.12 |
| Off-barring | 0.62 | 0.04 | 2.52 | 0.50 |
| Hilling-up | 0.76 | 0.03 | 3.09 | 0.37 |
| Harvesting | 5.74 | 3.22 | 23.31 | 39.95 |
| Shelling | 1.81 | 0.89 | 7.35 | 11.04 |
| Hauling | 0.76 | 0.02 | 3.09 | 0.25 |
| Husking/Detasseling of corn | 0.38 | 0.02 | 1.54 | 0.25 |
| Drying | 3.22 | 0.48 | 13.08 | 5.96 |
| Total | 24.625 | 8.06 | 100.00 | 100.00 |

Source: PSA (2017)

Table 9. Person-days of labor per hectare per cropping, coconut farms: Philippines, 2016

| Activity | Male | Female | Share in Male Labor (%) | Share in Female Labor (%) |
|---|---|---|---|---|
| Land preparation | 0.25 | 0.04 | 1.31 | 3.10 |
| Planting/Transplanting/ Replanting | 0.23 | 0.05 | 1.21 | 3.88 |
| Mechanical weeding | 0.01 | 0.00 | 0.05 | 0.00 |
| Manual weeding | 0.83 | 0.08 | 4.36 | 6.20 |
| Fertilizer application | 0.37 | 0.02 | 1.94 | 1.55 |
| Chemical application | 0.01 | 0.00 | 0.05 | 0.00 |

Table 9 (continued)

| Activity | Male | Female | Share in Male Labor (%) | Share in Female Labor (%) |
|---|---|---|---|---|
| Clearing of underbush | 0.25 | 0.01 | 1.31 | 0.78 |
| Rolling over of cover crops | 0.07 | 0.00 | 0.37 | 0.00 |
| Harvesting | 4.67 | 0.02 | 24.51 | 1.55 |
| Gathering/Piling of nuts | 3.00 | 0.30 | 15.75 | 23.26 |
| Related nut-gathering | 0.76 | 0.02 | 3.99 | 1.55 |
| Husking | 1.46 | 0.05 | 7.66 | 3.88 |
| Splitting of nuts | 2.26 | 0.14 | 11.86 | 10.85 |
| Removal of coconut meat | 2.37 | 0.33 | 12.44 | 25.58 |
| Drying | 2.51 | 0.23 | 13.18 | 17.83 |
| Total | 19.05 | 1.29 | 100.00 | 100.00 |

Source: PSA (2017)

Table 10. Person-days of labor per hectare per cropping, sugarcane farms: Philippines, 2016

| Activity | Male | Female | Share in male labor (%) | Share in female labor (%) |
|---|---|---|---|---|
| Land preparation | 0.21 | 0.01 | 0.33 | 0.12 |
| Plowing | 0.18 | 0.03 | 0.28 | 0.36 |
| Harrowing | 0.08 | 0.00 | 0.13 | 0.00 |
| Furrowing | 0.22 | 0.00 | 0.35 | 0.00 |
| Mending/Care of seedlings | 0.57 | 0.03 | 0.89 | 0.36 |
| Planting/Transplanting/Replanting | 5.91 | 2.38 | 9.28 | 28.30 |
| Manual weeding | 7.46 | 2.51 | 11.71 | 29.85 |
| Fertilizer application | 2.95 | 0.74 | 4.63 | 8.80 |
| Chemical application | 1.05 | 0.00 | 1.65 | 0.00 |
| Off-barring | 1.86 | 0.01 | 2.92 | 0.12 |
| Hilling up | 1.99 | 0.00 | 3.12 | 0.00 |
| Harvesting | 31.71 | 2.61 | 49.77 | 31.03 |
| Hauling | 9.52 | 0.09 | 14.94 | 1.07 |
| Total | 63.71 | 8.41 | 100.00 | 100.00 |

Source: PSA (2017)

**Estimate of wage bias**

Data from the PIDS Agricultural Workers Survey of daily wages in agriculture are summarized in Table 11. The total number of workers, disaggregated by sex of workers, is shown on the top part of the table. The rows of the table refer to various activities as classified in the questionnaire. For most workers, the basis of payment is by day, making it a conventional agricultural wage. When the basis of payment is by units of quantity, area of land, or otherwise, daily wage is calculated assuming an eight-hour day and a normal level of effort, i.e., in wage-equivalent.

In only three activities are there 10 or more observations encountered among female workers. These activities will serve as basis for comparison of male and female worker wages referred to as "matching activities" such as fertilizer/pesticide application, weeding, and planting and related activities.

For the matching activities, a breakdown of worker attributes is provided, i.e., age and years of schooling, as well as daily wage (Table 12). The wage summaries

Table 11. Average daily wage by agricultural activity and sex of workers: Philippines, April 2018 (PHP/day)

| Activity | Male (n=416) | | Female (n=151) | |
| --- | --- | --- | --- | --- |
| | Obs | Mean | Obs | Mean |
| Fishing | 22 | 212.32 | 0 | |
| Other preharvest activities | 46 | 146.74 | 7 | 123.49 |
| Fertilizer/ pesticide application | 35 | 134.64 | 35 | 100.63 |
| Weeding | 65 | 146.57 | 60 | 123.37 |
| Planting and related activities | 42 | 155.23 | 39 | 119.86 |
| Land preparation | 24 | 193.75 | 0 | n |
| Vegetable raising | 13 | 207.15 | 2 | 80.00 |
| Drying | 51 | 136.27 | 1 | 150.00 |
| Hauling | 63 | 113.10 | 3 | 108.33 |
| Threshing of palay | 15 | 127.33 | 1 | 50.00 |
| Harvesting of palay | 40 | 72.00 | 3 | 43.33 |

Obs = observations
Source: Author's data

Table 12. Age, years of schooling, and daily wage of workers, by matched activity, and sex of worker: Philippines, 2018

| | Chemical Application | | Weeding | | Planting | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| Age (in years) | 44.6 | 45.8 | 44.2 | 46.1 | 44.9 | 47.9 |
| Years of schooling | 5.8 | 5.9 | 5.8 | 5.8 | 5.4 | 6.6 |
| Daily pay (pesos per day) | 134.64 | 100.63 | 146.57 | 123.37 | 155.23 | 119.86 |

Source: Author's data

show a marked difference in wages by sex of workers, heavily favoring males. For the three activities (chemical application, weeding, and planting), the differences are 13, 20, and 13 percent, respectively. The matched activities are not demanding in terms of skill or physical strength, rendering productivity difference as an implausible explanation for any wage gap for the same activity. Pesticide spraying may be cited as an exception because of the use of a heavy sprayer. However, some packs are smaller and pesticide spraying by women is not exactly unheard of.[1]

Nor do the wage differences seem related to worker characteristics. Ages of males and females in the sample differ by 1.2 to 2.0 years only. Differences in years of schooling are much narrower at 0.1 to 1.2 years. Regression analysis to find correlations between worker characteristics and wages paid find no significant coefficients and only very low goodness-of-fit. The male and female workers differ little in terms of age and schooling.

This finding is a substantial advance over official data that assume outright the equality of male and female worker wages paid at the activity level. On the contrary, the survey provides evidence of a wage bias (earlier referred to as $\beta_i$) against women in agriculture.

Unfortunately, the activity list in the survey of agriculture workers does not match the TAWR activity list. To continue the analysis, we assume $\beta_i = \beta$, i.e., posit only one wage bias parameter common across activities. A natural estimator for $\beta$ is the ratio of weighted average women's wage to weighted average men's wage for the three activities, where the weights equal the number of observations divided by total

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[1] See, for example, the photos in https://vietnamnews.vn/environment/276348/pesticide-overuse-a-top-food-safety-concern.html#wZx4PrcmYfvSqDV1.97 and https://www.tollebild.com/bilden/farmers-spraying-pesticide-8f.html (both accessed on April 15, 2019).

observations. The resulting estimate for the wage bias is 0.78949 or about 79 percent. In the following, we apply this estimate to the entire set of tasks as itemized in the TAWR. This is done as an exploratory analysis to develop the implications of finding a gender wage gap in agriculture.

**Full decomposition (with estimated male and female wages)**
Using the estimated wage bias, activity wages can now be computed based on TAWR average wages (by activity) presented in the first two columns of Table 13 in the case of palay farms.

Table 13. Estimated male and female wages (PHP/day) by activity, palay farms: Philippines, 2016

| Activity | $\beta = 1$ | | $\beta = 0.78949$ | |
| --- | --- | --- | --- | --- |
| | Male | Female | Male | Female |
| Land preparation | 571.85 | 571.85 | 571.85 | 451.47 |
| Plowing | 297.74 | 297.74 | 297.74 | 235.06 |
| Harrowing | 306.33 | 306.33 | 306.33 | 241.84 |
| Levelling | 299.78 | 299.78 | 299.78 | 236.67 |
| Pulling and bundling of seedlings | 271.33 | 271.33 | 300.17 | 236.98 |
| Planting/Transplanting/Replanting | 293.78 | 293.78 | 311.31 | 245.78 |
| Irrigation/Watering | 272.18 | 272.18 | 273.43 | 215.87 |
| Mechanical weeding | 316.28 | 316.28 | 316.28 | 249.70 |
| Manual weeding | 265.67 | 265.67 | 278.07 | 219.53 |
| Fertilizer application | 316.81 | 316.81 | 318.24 | 251.25 |
| Chemical application | 313.97 | 313.97 | 315.87 | 249.38 |
| Picking of snails | 289.52 | 289.52 | 311.37 | 245.82 |
| Harvesting | 278.15 | 278.15 | 292.76 | 231.13 |
| Threshing | 261.08 | 261.08 | 267.19 | 210.94 |
| Hauling | 296.33 | 296.33 | 296.33 | 233.95 |
| Drying | 280.62 | 280.62 | 287.05 | 226.62 |
| Average on computed data | 284.05 | 279.86 | 295.08 | 234.70 |
| Wage gap relative to male (%) | 0.00 | 1.47 | 0.00 | 20.46 |
| Published data | 307.40 | 290.65 | | |
| Wage gap relative to male (%) | 0.00 | 5.45 | | |

PHP = Philippine peso
Source: Author's data

Note that when $\beta = 1$, average wage, male wage, and female wage are identical. A distinction is created when $\beta < 1$, which corresponds to the last two columns of Table 14. Even with no wage bias, average wages differ between male and female workers as shown in the fourth-to-the-last row of Table 13. The gap though is minimal (only 1.5%). The gap as computed from published official data is also small at 5.45 percent, though it is larger than the computed wage gap. Allowing for wage bias leads to a much larger figure for the gender wage gap at about 20 percent.

Similar calculations are shown for corn, sugarcane, and coconut farms in Tables 14, 15, and 16, respectively. For corn farms without wage bias, computed wages and

Table 14. Estimated male and female wages (PHP/day) by activity, corn farms: Philippines, 2016

| Activity | $\beta = 1$ | | $\beta = 0.78949$ | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Land preparation | 190.77 | 190.77 | 213.21 | 168.33 |
| Plowing | 285.80 | 285.80 | 286.45 | 226.15 |
| Harrowing | 292.78 | 292.78 | 292.78 | 231.15 |
| Furrowing | 289.61 | 289.61 | 289.61 | 228.64 |
| Mending/Care of seedlings | 216.14 | 216.14 | 216.14 | 170.64 |
| Planting/Replanting | 233.41 | 233.41 | 252.79 | 199.57 |
| Irrigation/Watering | 251.08 | 251.08 | 251.08 | 198.22 |
| Manual weeding | 223.53 | 223.53 | 231.60 | 182.84 |
| Fertilizer application | 243.47 | 243.47 | 256.38 | 202.41 |
| Chemical application | 262.56 | 262.56 | 262.92 | 207.57 |
| Off-barring | 472.81 | 472.81 | 478.92 | 378.10 |
| Hilling-up | 490.50 | 490.50 | 494.45 | 390.36 |
| Harvesting | 251.58 | 251.58 | 272.17 | 214.88 |
| Shelling | 235.88 | 235.88 | 253.47 | 200.11 |
| Hauling | 268.19 | 268.19 | 269.65 | 212.88 |
| Husking/Detasseling of corn | 270.99 | 270.99 | 273.87 | 216.22 |
| Drying | 240.25 | 240.25 | 247.00 | 195.00 |
| Average on computed data | 258.66 | 244.06 | 270.97 | 206.47 |
| Wage gap relative to male (%) | 0.00 | 5.64 | 0.00 | 23.80 |
| Published data | 253.41 | 239.72 | | |
| Wage gap relative to male (%) | | 5.40 | | |

Source: Author's data

published wages are fairly close, hence the wage gap is quite narrow at 5–6 percent. However, with wage bias, the gender wage gap is quite large at 24 percent, even larger than that among palay farms. Similar patterns are found for sugarcane farms, though the ranges are wider. With no wage bias, the computed wage gap is about 6 percent versus 8 percent for published data. However, with wage bias, the computed wage gap balloons to as much as 29 percent, the largest among the crops.

The computed wage gaps in the case of a wage bias are disaggregated into differences in activity shares and differences in wages per activity (Table 17), based on Equation (1). In the case of palay, activity difference reduces the wage gap (time allocation of female workers is skewed toward higher-paying activities) by about

Table 15. Estimated male and female wages (PHP/day) by activity, coconut farms: Philippines, 2016

| Activity | $\beta = 1$ | | $\beta = 0.78949$ | |
| --- | --- | --- | --- | --- |
| | Male | Female | Male | Female |
| Land preparation | 276.38 | 276.38 | 284.65 | 224.72 |
| Planting/Transplanting/Replanting | 246.93 | 246.93 | 256.58 | 202.56 |
| Mechanical weeding | 246.93 | 246.93 | 246.93 | 194.95 |
| Manual weeding | 218.49 | 218.49 | 222.61 | 175.75 |
| Fertilizer application | 245.16 | 245.16 | 247.84 | 195.66 |
| Chemical application | 300.87 | 300.87 | 300.87 | 237.53 |
| Clearing of underbush | 266.24 | 266.24 | 268.41 | 211.91 |
| Rolling over of cover crops | 279.74 | 279.74 | 279.74 | 220.85 |
| Harvesting | 314.51 | 314.51 | 314.79 | 248.52 |
| Gathering/Piling of nuts | 241.38 | 241.38 | 246.09 | 194.28 |
| Related nut-gathering | 252.88 | 252.88 | 254.25 | 200.73 |
| Husking | 228.21 | 228.21 | 229.81 | 181.43 |
| Splitting of nuts | 240.53 | 240.53 | 243.52 | 192.26 |
| Removal of coconut meat | 242.95 | 242.95 | 249.37 | 196.87 |
| Drying | 247.66 | 247.66 | 252.12 | 199.04 |
| Average on computed data | 259.78 | 246.74 | 263.00 | 196.29 |
| Wage gap relative to male (%) | 0.00 | 6.17 | 0.00 | 25.36 |
| Published data | 257.33 | 236.53 | | |
| Wage gap relative to male (%) | 0.00 | 8.08 | | |

Source: Author's data

Table 16. Estimated male and female wages (PHP/day) by activity, sugarcane farms: Philippines, 2016

| Activity | $\beta = 1$ | | $\beta = 0.78949$ | |
| --- | --- | --- | --- | --- |
| | Male | Female | Male | Female |
| Land preparation | 272.20 | 272.20 | 274.83 | 216.97 |
| Plowing | 287.15 | 287.15 | 296.05 | 233.73 |
| Harrowing | 319.23 | 319.23 | 319.23 | 252.03 |
| Furrowing | 350.48 | 350.48 | 350.48 | 276.70 |
| Mending/Care of seedlings | 188.84 | 188.84 | 190.85 | 150.67 |
| Planting/Transplanting/ Replanting | 262.28 | 262.28 | 279.15 | 220.39 |
| Manual weeding | 231.96 | 231.96 | 244.94 | 193.38 |
| Fertilizer application | 252.06 | 252.06 | 263.17 | 207.77 |
| Chemical application | 266.72 | 266.72 | 266.72 | 210.57 |
| Off-barring | 446.34 | 446.34 | 446.84 | 352.78 |
| Hilling-up | 509.26 | 509.26 | 509.26 | 402.05 |
| Harvesting | 318.09 | 318.09 | 323.27 | 255.21 |
| Hauling | 301.29 | 301.29 | 301.89 | 238.33 |
| Average on computed data | 304.85 | 270.13 | 311.18 | 222.17 |
| Wage gap relative to male (%) | 0.00 | 11.39 | 0.00 | 28.60 |
| Published data | 270.26 | 252.34 | | |
| Wage gap relative to male (%) | 0.00 | 6.6 | | |

Source: Author's data

Table 17. Decomposition of gender wage gap, by crop: Philippines, 2016, case of $\beta = 0.78949(\%)$

| Crop | Components | | | Shares in total (%) | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Activity Difference | Wage Difference | Total | Activity Difference | Wage difference | Total |
| Palay | -0.75 | 21.21 | 20.46 | -3.6 | 103.6 | 100.0 |
| Corn | 3.49 | 20.32 | 23.80 | 14.6 | 85.4 | 100.0 |
| Coconut | 5.46 | 19.90 | 25.36 | 21.5 | 78.5 | 100.0 |
| Sugarcane | 9.57 | 19.04 | 28.60 | 33.4 | 68.6 | 100.0 |

Source: Author's data

0.75-percentage points. However, the wage bias contributes 21.21-percent wage gap, accounting for the total wage gap of 20.46 percent. Hence, over 100 percent of the computed gender wage gap is due to the wage bias.

For the other crops, the bulk of the gender wage gap is likewise contributed by the wage bias, but far less than 100 percent. The lowest contribution is for sugarcane (69%) followed by coconut (79%), and corn (85%).

## Conclusion

**Summary**

This paper began by citing a stylized fact of a gender wage gap in agriculture. Given the heterogeneity of wage activities in agriculture, the policy implications of the gender wage gap remained dim. It was unknown whether wage gap indeed exists in terms of unequal pay for the same activity, or simply due to aggregation over different sets of activities depending on the sex of workers. The implicit assumption made in the official data on agriculture wages further compounded the gap, essentially equating wages paid by activity irrespective of sex of worker.

This study attempts to address this data gap by, first, decomposing sources of wage variation to two sources, namely, differences in activity shares, and differences in wages for the same activity. Second, the latter is calibrated based on primary data from a survey of farmworkers covering two large agricultural provinces of the Philippines. The latter confirms the occurrence of wage differences for the same activity, i.e., a wage bias against women at 21 percent.

Third, actual decomposition is performed, breaking the gender wage gap down to its components. The study finds that the main source of the gender wage gap in Philippine agriculture is the difference in wages for the same activity. For corn, coconut, and sugar, the activity share accounts for one-eighth and one-third of the wage gap in percent. The remainder is due to wage bias by activity. In the case of palay workers, the wage gap is more than 100 percent.

An important caveat behind this finding is the admittedly sparse evidence brought to bear on the wage bias. Additional survey must be done to focus specifically on farmworkers as well as gender differences in equivalent daily compensation for each activity (rather than averaged over activities). This is necessary to establish a stronger policy conclusion from the gender wage gap. Similarly, it is proposed that ALS data on wages at the activity level be disaggregated by gender, and the breakdown be reported in the TAWR.

**Policy implications**

Supposing that the decomposition findings are strong to an expanded data-gathering effort, two sets of policy options can be considered. The first set of options may be denoted as compulsory approaches such as to compel farm operators to pay identical wages for the same activity and compel equal hiring of men and women for each activity. The second set of options may be denoted as empowerment approaches, eschewing coercion and ensuring rather that women are able to bargain for and win fair treatment in the rural labor market.

Compulsory approaches are probably doomed to fail in setting up informal labor markets in remote rural areas. Enforcement will remain a perennial problem, placing unreasonable demands on an already stressed government monitoring and policing system. Moreover, there are many ways that compulsory approaches may turn out counterproductive by erroneously forcing equality in essentially different types of workers and work.

This leaves empowerment approaches, which are consistent and strongly endorsed by existing state policy frameworks. The following are more specific measures suggested:

- *Prioritization of women as recipients of government services and transfers.* Explicit focus on women is lacking in many programs of agricultural grants, subsidies, training, and sundry services. Instead, in many of these programs, the identity of recipient can be explicitly specified as the female spouse or head of the household. This increases women's control over household, resources, and indirectly, their bargaining power.

- *Establishment of women's groups active in rural labor market information and advocacy.* Government labor programs tend to concentrate on urban labor markets for services and industry. Community organization efforts along with information and advocacy campaigns with strong gender dimension must be rolled out in rural areas. For instance, in women-dominated rural improvement clubs, experiences and data on wages paid by activity can be publicized and disseminated.

- *Support for gender mainstreaming and protection of women's rights at the grassroots.* Grassroot campaigns must be conducted to inform stakeholders, including male farm operators, about women's rights and gender equality, and perhaps, to stigmatize discriminatory treatment of women. It goes almost without saying that the full state apparatus down to the barangay level must be marshaled to protect women's rights against violence and violations at the domestic, community, and national levels.

# References

Akter, S., P. Rutsaert, J. Luis, N. Htwe, S. San, B. Rahorjo, and A. Pustika. 2017. Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. *Food Policy* 69(2):270–279.

Antman, F. 2014. Spousal employment and intra-household bargaining power. *Applied Economics Letter*s 21:8(560-563).

Aquino, B. 1994. Filipino women and political engagement. *Review of Women's Studies* 4(1):32–53.

Ausperg, K., T. Hinz, and C. Sauerc. 2017. Why should women get less? Evidence on the gender pay gap from multifactorial survey experiments. *American Sociological Review* 82(1):179-210.

Becker, G. 1971. *The economics of discrimination.* Chicago, IL: The University of Chicago Press.

Bishu, S. and M. Alkadry. 2017. A systematic review of the gender pay gap and factors that predict it. *Administration and Society* 49(1):65–104.

Black, D. 1995. Discrimination in an equilibrium search model. *Journal of Labor Economics* 13(2):309–334.

Blau, F. and L. Kahn. 2017. The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature* 55(3):789–865.

Casambre, A. and S. Rood. 2012. In Asia: Early feminism in the Philippines. The Asia Foundation. https://asiafoundation.org/2012/03/07/early-feminism-in-the-philippines/(accessed on August 7, 2018).

Dacuycuy, C. and L. Dacuycuy. 2017. Analyzing housework through family and gender perspectives. PIDS Policy Notes No. 2017-13. Quezon City, Philippines: Philippine Institute for Development Studies.

David, C., J. Albert, and J. Vizmanos. 2017. Sustainable Development Goal 5: How does the Philippines fare on gender equality? PIDS Discussion Paper Series No. 2017-45. Quezon, City, Philippines: Philippine Institute for Development Studies. https://www.pids.gov.ph/publications/5885 (accessed on August 8, 2019).

Food and Agriculture Organization (FAO). 2011. Women in agriculture: Closing the gender gap for development. In *The State of food and agriculture 2010-11.* Rome, Italy: FAO.

Gayle, G.L. and L. Golan. 2012. Estimating a dynamic adverse-selection model: Labour-force experience and the changing gender earnings gap 1968–1997. *Review of Economic Studies* 79(1):227–67.

Goldin, C. 2014. A grand gender convergence: Its last chapter. *American Economic Review* 104(4):1091–1119.

Mincer, J. and S. Polachek. 1974. Family investment in human capital: Earnings of women. Journal of Political Economy 82(2):S76–S108.

National Statistics Office (NSO). 2002. Census of Agriculture. Manila, Philippines: NSO.

Phelps, E. 1972. The statistical theory of racism and sexism. *American Economic Review* 62(4):659–61.

Philippine Statistics Authority (PSA). 2017. Trends in agricultural wage rates 2016. Quezon City, Philippines: PSA.

———. Various years. CountrySTAT. Quezon City, Philippines: PSA. https://psa.gov.ph/content/countrystat. (accessed on August 30, 2018).

Qi, L. and X.Y. Dong. 2015. Unpaid care work's interference with paid work and the gender earnings gap in China. *Feminist Economics* 22(2):143–67.

Quisumbing, A. and J. Miluccio. 2003. Resources at marriage and intrahousehold allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa. *Oxford Bulletin of Economics and Statistic*s 65(3):283–327.

Republic Act 9710. 2009. An act providing for the Magna Carta of women. Manila, Philippines: Congress of the Philippines.

Rubalcava, L., T. Graciela, and D. Thomas. 2009. Investments, time preferences and public transfers paid to women. *Economic Development and Cultural Change* 57(3):507–538.

Valientes, R. 2015. Male-female wage-gap decomposition in agriculture-based employment in the Philippines. *Journal of Economics, Management and Agricultural Development* 1(1):45–62.

World Economic Forum (WEF). 2017. *The Global Gender Gap Report 2017.* Geneva, Switzerland: WEF.

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From a distance, there is not much to improve in the Philippines' gender landscape. The country is 8th in the global ranking of gender parity and the only one in Asia to be included in the top 10. But the picture on the ground reveals persistent gender gaps in education, employment, and wages. They can undermine our hard-won advances, long-term development aspirations, and international commitments if we continue to turn a blind eye on them.

This very first book on gender and development of the Philippine Institute for Development Studies articulates the salient challenges confronting men and women today. It features research studies on the apparent lag in the education of boys, the gender differences in educational mobility, the important roles of housework in the economy, the effects of nonmarket work such as housework on labor market participation, and the gender pay gap in agriculture. This volume will hopefully widen the public's understanding of these gender issues and stimulate our policymakers to reflect on the evidence and recommendations.