Gender Analysis of the Cambodian Labor Market

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Introduction

The rapid growth of the Cambodian economy over the past two decades has been accompanied by significant steps towards gender equality in the labor market. The expansion in manufacturing and services jobs, fuelled by the garment and hospitality sectors, has led to a threefold increase in female wage employment in less than a decade.[1] In 2016, 42 percent of working women held paid occupations, almost half of which were in the garment sector. ILO estimates show that the country has retained the highest female labor force participation (LFP) rate (80 percent) and the lowest LFP gender gap (10 percent) in the East Asia and Pacific region (EAP).

Using data from the Cambodian Socio-Economic Survey (CSES)[2] and the ILO, previous analysis has indicated that even if the country's economy is becoming more feminized, a significant gender gap in earnings has persisted and remains unexplained by observable characteristics. In addition, despite the expansion of wage work, large numbers of men and women still rely on non-wage (vulnerable) occupations.

Using the 2011-2016 waves of the CSES, this paper provides an updated picture of the changing gender dynamics on the Cambodian labor market. Due to the drastic expansion in wage employment, any policy relevant study of these dynamics needs an in-depth analysis of women's opportunities for wage work and obstacles to better pay. We address this need in several ways.

This paper has six sections. We begin with an overview of the gender-specific trends in labor force participation, industry employment shares, overall shifts in wage employment, and gender gaps in wages and educational attainment in Cambodia. We continue with an industry-specific look at wage employment trends, which confirms that, while there are a few emerging higher-skilled sectors such as financial services, the manufacturing sector (and the garment sector in particular) still dominates and continues to grow in importance for women's wage work. We then shed light on the vertical occupational segregation patterns within industry and show that even if women are not underrepresented in manager positions in the dominant manufacturing (garment) sector, this type of positions represent less than one percent of all manufacturing jobs. In fact, at present the only sector providing prospects for career growth beyond low-skilled work is the services industry, where women are underrepresented as managers, but overrepresented as professionals and clerical workers. Moving on to wages, we test whether the gender wage gap and the factors contributing to it differ by industry. Occupational levels and education seem to play a role in explaining only a fraction of the wage gaps in construction and agriculture respectively, while the gender gap in trade remains completely unexplained by observable characteristics. What is of even greater interest is the fact that there is no

[1] Source: ILO & World Bank 2016

[2] A nationally representative household survey.

gender wage gap in manufacturing, while the gap in services appears only after controlling for education and occupational level. Importantly, in all sectors other than manufacturing, women with identical characteristics and similar occupations still earn significantly less than men.

We also explore the extent to which motherhood explains women's labor force experiences. The presence of young children in the household do not seem to explain the gap in wages. Nevertheless, we show that they significantly increase the probability that a woman would transition to non-wage employment, likely due to the need to combine household duties, childcare and work. Inspired by literature in similar country contexts, we then demonstrate that the sizeable expansion of job opportunities for women in the garment sector has likely had a disproportionately negative influence on Cambodian girls' retention beyond primary schooling (compared to boys), thus limiting their employment and wage opportunities.

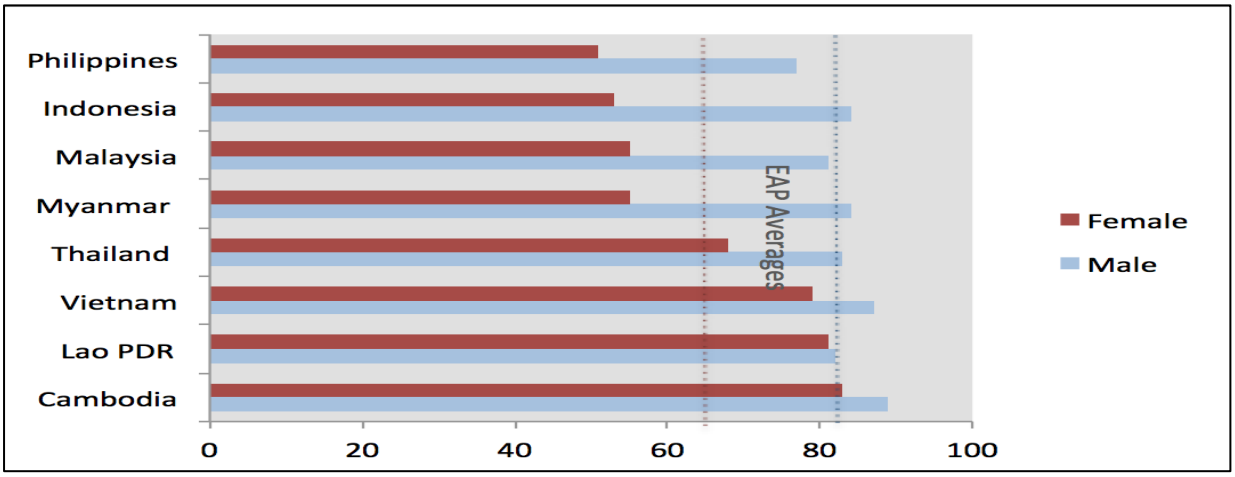
Because of the continued role that non-wage employment plays in women's occupational paths, we finish the paper with an overview of the trends in the sector, with a particular focus on non-farm enterprises, which appear to be slowly taking over agriculture.

Labor market overview

Labor force participation and unemployment

The Cambodian labor force participation (LFP) rate for both the male and female population aged 15 to 64 is high compared to the remaining countries in the EAP region (Figure 1). An estimated 80 percent of Cambodian women age 15-64 and 90 percent of Cambodian men in this age range worked for at least an hour in the previous week, as compared to an average of 66 of EAP women and 83 percent of EAP men. Cambodian LFP rates are similar to those of Vietnam, perhaps Cambodia's closest regional peer in terms of structure of their economies.

Figure 1: Labor Force Participation Rates in the EAP Region, by gender (2016)



Source: World Bank Indicators, ILO Modeled Estimates 2016

While unemployment rates are low in EAP compared to global standards, they are particularly low in Cambodia (Table 1). The Cambodian unemployment rate – measured as the share of people who are not working but who searched for a job in the week prior to the survey - is below 0.2 percent for both men and women. In comparison, 3.5 percent of women in developing EAP are unsuccessfully searching for a job.

Table 1: Unemployment rate in Cambodia and EAP, %

	Cambodia	EAP (without high income)
Female (% of female LF)	0.2	3.6
Male (% of male LF)	0.1	4.5

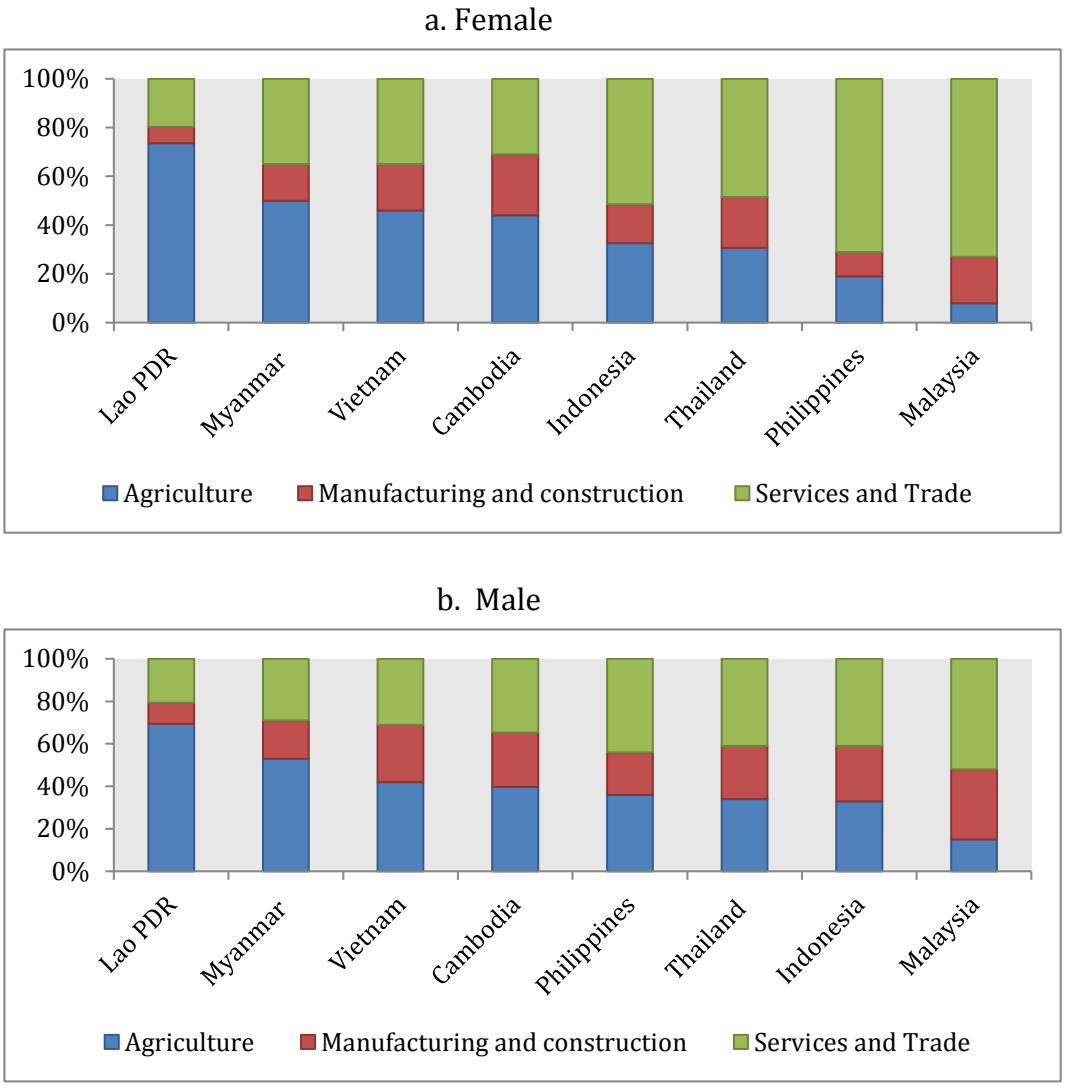
Source CSES 2016 and ILO Modeled estimates.

Total employment trends by sector

Agriculture plays an important role in Cambodia's employment landscape: about 40 percent of all employed men and women work in the sector. This is on par with agricultural employment in Vietnam and Myanmar, though higher than Indonesia and Thailand, for example (Figure 2).

However, what makes Cambodia stand out among its neighbors is women's higher rates of employment in the manufacturing sector. According to CSES data, nearly 23 percent of Cambodian women worked in the manufacturing sector in 2015, as compared to 21 percent in Thailand and 19 percent in Vietnam (Figure 2). In contrast, 25 percent of Cambodian men work in manufacturing, as compared to 25 percent in Thailand and 27 percent in Vietnam. Women's higher share in manufacturing is mostly due to the prominence of the foreign-owned garment and apparel sector, where women make up the majority of workers.

Figure 2: Total employment by sector and gender in EAP countries

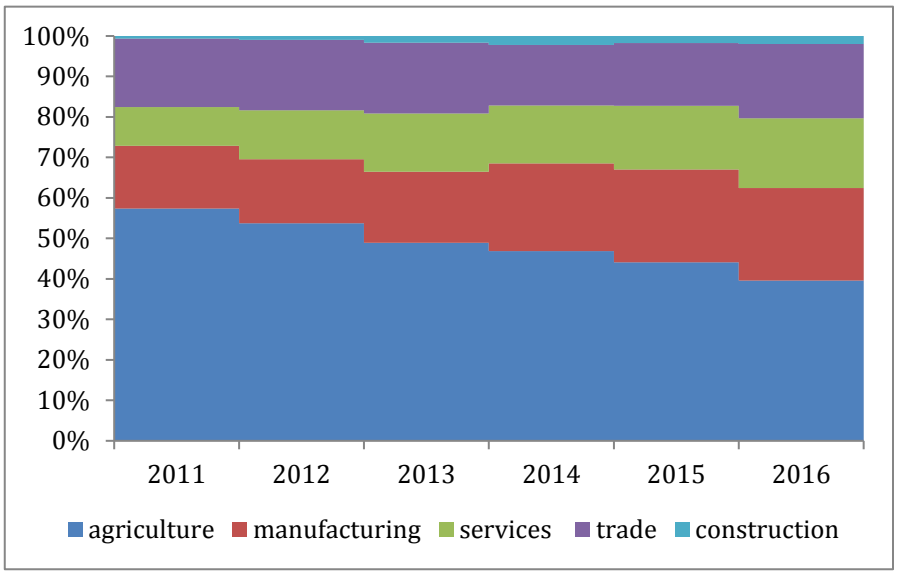


Source: Author's calculations based on the CSES and the latest available ILO estimates

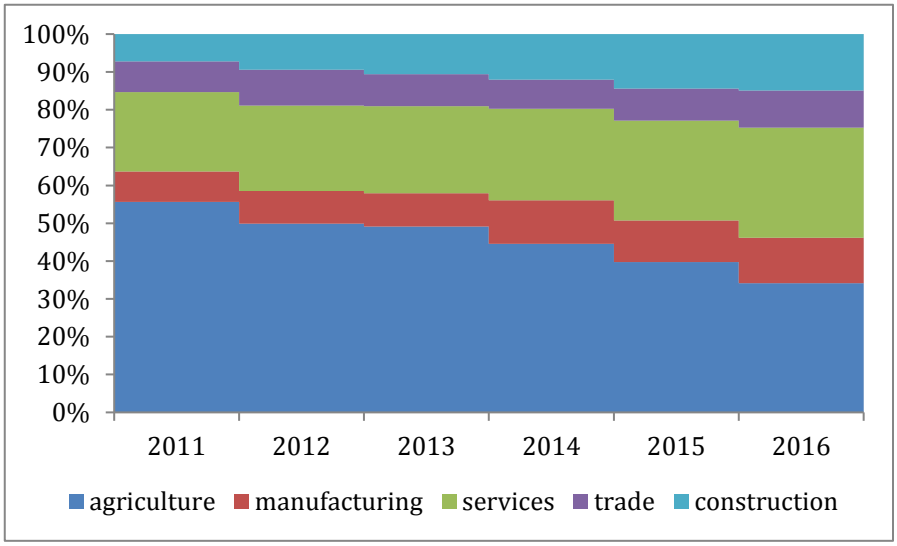
Over the period 2011-2016, there was a rapid shift out of agriculture, with women flowing into manufacturing while men moved into construction (both moved into services at a similar rate). During the five-year period between 2011 and 2016 the share of women employed in manufacturing increased from 15.3 to 22.8 percent and in services from 9.4 to 15.7 percent. Men's shift out of agriculture show similar patterns, though they moved out of agriculture at a faster rate – 17.2 percent as compared to 11.5 percent of women – and moving into construction (from 7 percent to 14 percent) and services (from 20.7 to 26.2 percent). Men's participation in manufacturing only increased by 3 percentage points – reaching 11.8 percent by 2016. The rapid transition out of agriculture was partly due to the fall in agricultural prices, just as the foreign-owned manufacturing sector expanded (post 2008 crisis) and domestic investment took off.

Figure 3: Growth in total employment by sector

a. Female



b. Male

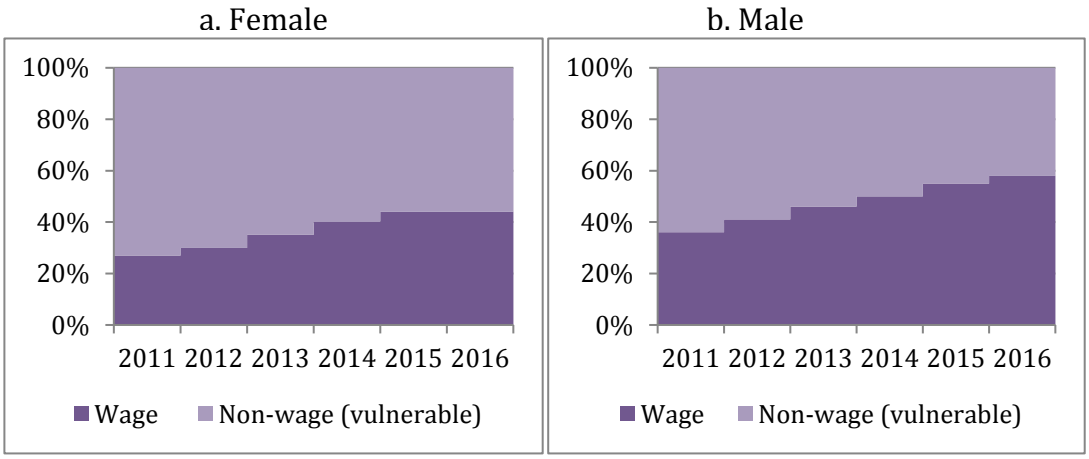


Source: Author's calculations based on the CSES 2011-2016

According to CSES data, in 2016 the garment sector accounted for 87 percent of all female manufacturing jobs and 42 percent of male manufacturing jobs. Despite the fact that labor is rapidly shifting out of agriculture and towards manufacturing and construction, the agricultural sector still accounts for 44 percent of female and 39 percent of male employment in Cambodia.

The industry shifts in employment have drastically affected the share of wage work for both men and women. Close to half of working women and about 60 percent of men were employed in wage work in 2016 (Figure 4).

Figure 4: Growth in wage employment in Cambodia

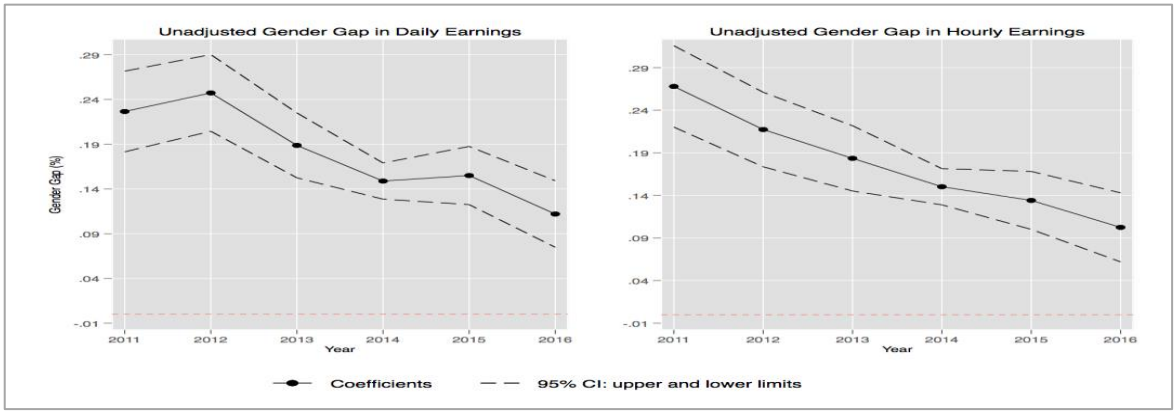


Source: Author's calculations based on CSES 2011-2016

The gender gap in wages

The gap in earnings between men and women is a significant obstacle to achieving gender equality. The 11 percent unadjusted gender wage gap[3] in Cambodia in 2016 is slightly above the 9 percent average for the EAP region.[4] The unadjusted gender wage gap in earnings (both hourly and daily) in Cambodia has been falling rapidly since 2011. In 2011, women earned, on average, 27 percent less per hour than men (Figure 5).

Figure 5: The unadjusted wage gap in hourly and daily earnings, by year



Source: CSES 2011-2016. Earnings estimated on the sample of people in the labor force, who were in paid employment and reported having worked at least 20 hours over the past week.

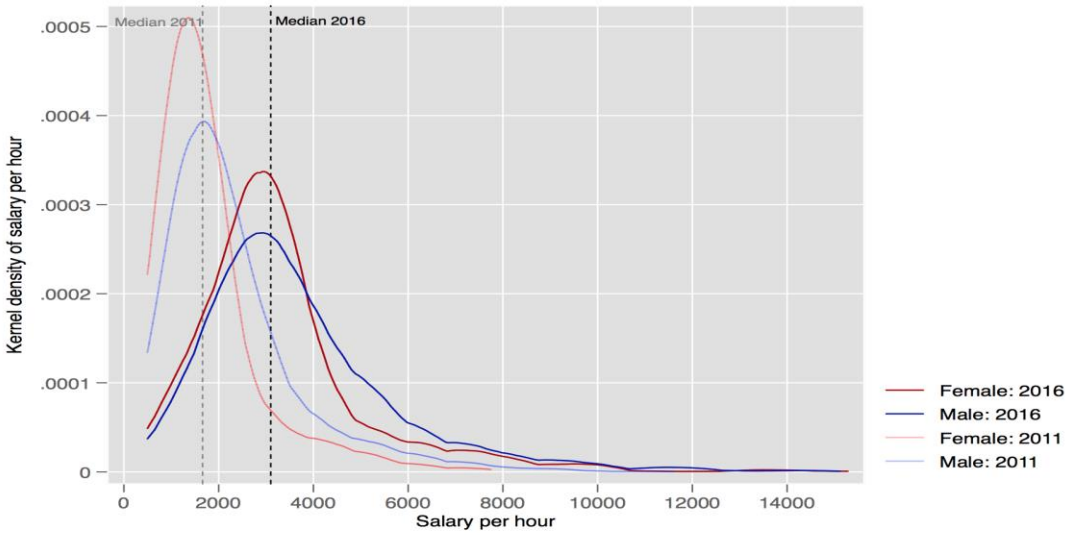
The distribution of hourly earnings in the period 2011 to 2016 has improved for men and women, though women continue to earn lower wage than men. There has been a striking increase in the median wage, along with a drop the fraction of both men and women

[3] The unadjusted gender wage gap is defined as the difference between average male and female wages when not taking into consideration differences between men and women in education, experience, or other productivity-related factors that may determine wages

[4] Although rigorous findings on the pay gap between men and women are scattered across sources and years, we use the latest comparable ILO estimates for the unadjusted wage gap (in percent) for available countries in the EAP region, along with 2016 estimate for Cambodia derived from the CSES dataset.

earning salaries below the median. Nevertheless, women are still more likely to earn wages around and below the median, while men are more likely to earn the wages in the upper end of the distribution (Figure 6). This points to a pattern of structural gender wage inequality, which has persisted in the period 2011-2016.

Figure 6: Changes in the distribution of wages (KHR per hour)

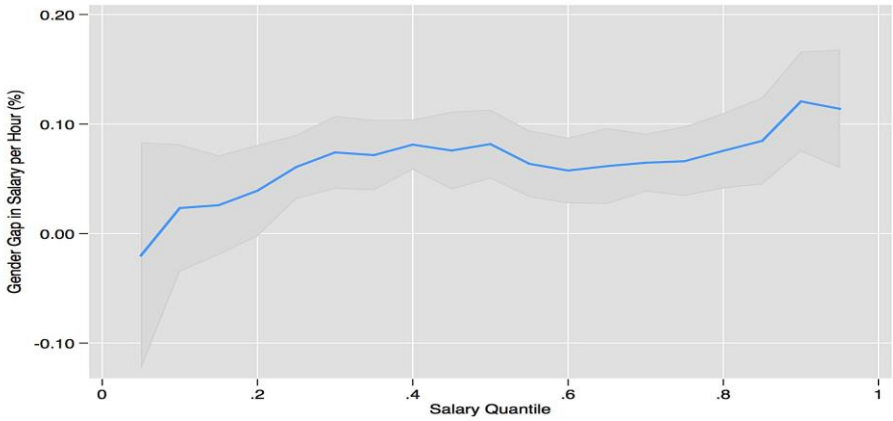


Source: CSES 2011-2016. Earnings estimated on the sample of people in the labor force who were in paid employment and reported having worked at least 20 hours in the past week.

The adjusted gender wage gap is nearly non-existent for low-wage jobs and increases as wages increase. The adjusted wage gap is the difference in wages for men and women who have the same demographic, industry and occupational profiles. Just like Figure 6 showed that the (unadjusted) gap in earnings is higher for wages above the median, Figure 7 shows that the adjusted gender wage gap increases along the wage distribution. When comparing men and women with the same levels of skills, same occupations and industries, same locations and demographics, the gender wage gap is virtually zero for the lowest-paid jobs. However, as we compare men's and women's adjusted wages at higher salaries, the gender wage gap between otherwise identical male and female workers also increases. At the highest part of the conditional wage distribution (quantile), women earn 12 percent less per hour than men with identical characteristics.[5]

[5] The estimates in Figure 7 are derived using quantile regression estimates. Strictly speaking, the "quantile" is the distribution of error terms, not the distribution of wages. However, if we assume a positive correlation between wages and the error term, the x-axis can be roughly interpreted as the wage distribution.

Figure 7: The unexplained portion of the wage gap across wage quantiles

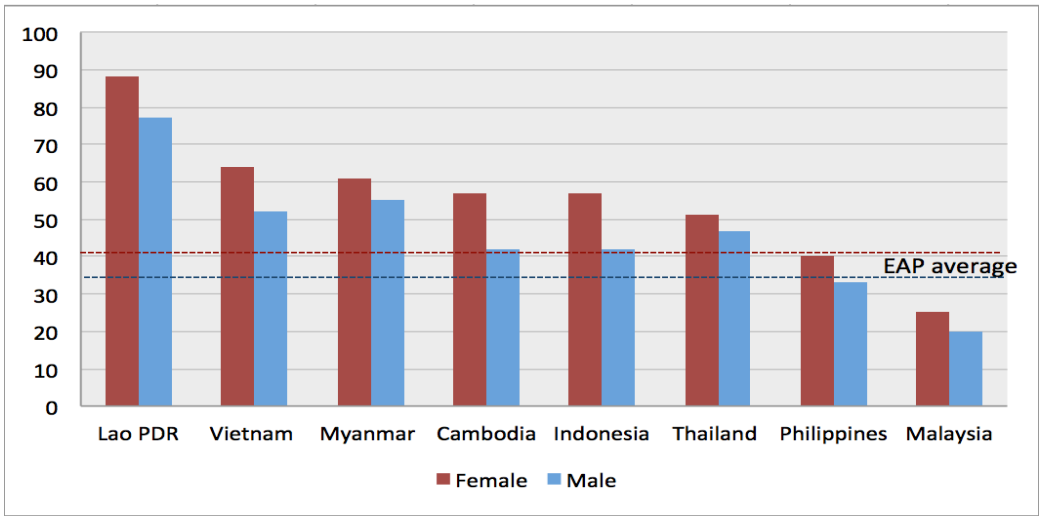


Data from CSES 2016; Dependent variable: logarithm of wages per hour; controlling for age, marital status, number of children, household composition, ethnicity, industry, occupation, region x rural/urban; sample consists of individuals in wage employment who worked more than 20 hours over the past seven days. 95% confidence intervals displayed together with point estimates.

The gender gap in non-wage employment

Women have higher participation in non-wage employment than men do in the EAP region, including in Cambodia. On average, more than 40 percent of working women and 35 percent of working men in EAP are working on family farms, engage in unpaid labor, or run household enterprises. Cambodia exceeds these numbers, with 58 percent of women and 41 percent of men in non-wage employment. But perhaps more importantly, Cambodia has among the largest gender gap in the region; in both Cambodia and Vietnam, there is a 17 percentage point gap between female and male engagement in non-wage employment. In spite of the expansion of manufacturing, services and construction sectors, which have shrunk the fractions of both men and women in non-wage

Figure 8: Non-wage (vulnerable employment) in EAP



Source: CSES and ILO modeled estimates 2016

employment, the non-wage (vulnerable) employment gap between man and women in Cambodia has remained stable (Figure 8).

Gender-specific trends in education

With manufacturing in Cambodia projected to slowly climb the value chain and the increasing demand for high-skilled work in the services sector, working towards equal access, quality and retention in education is synonymous with working towards long-run gender equality on the labor market. A recent report by the National Employment Agency (National Employment Agency 2018) shows that sectors such as finance and insurance, education and hospitality are already experiencing shortages of skilled job candidates.

At present Cambodia's labor force has a low level of education, with women at a disadvantage. The 2016 wave of the CSES shows that 46.1 percent of Cambodian women and 63.5 percent of men aged 25 and above have obtained at least a primary education. Cross-country comparisons show that in this respect, Cambodia lags behind other countries in the region.

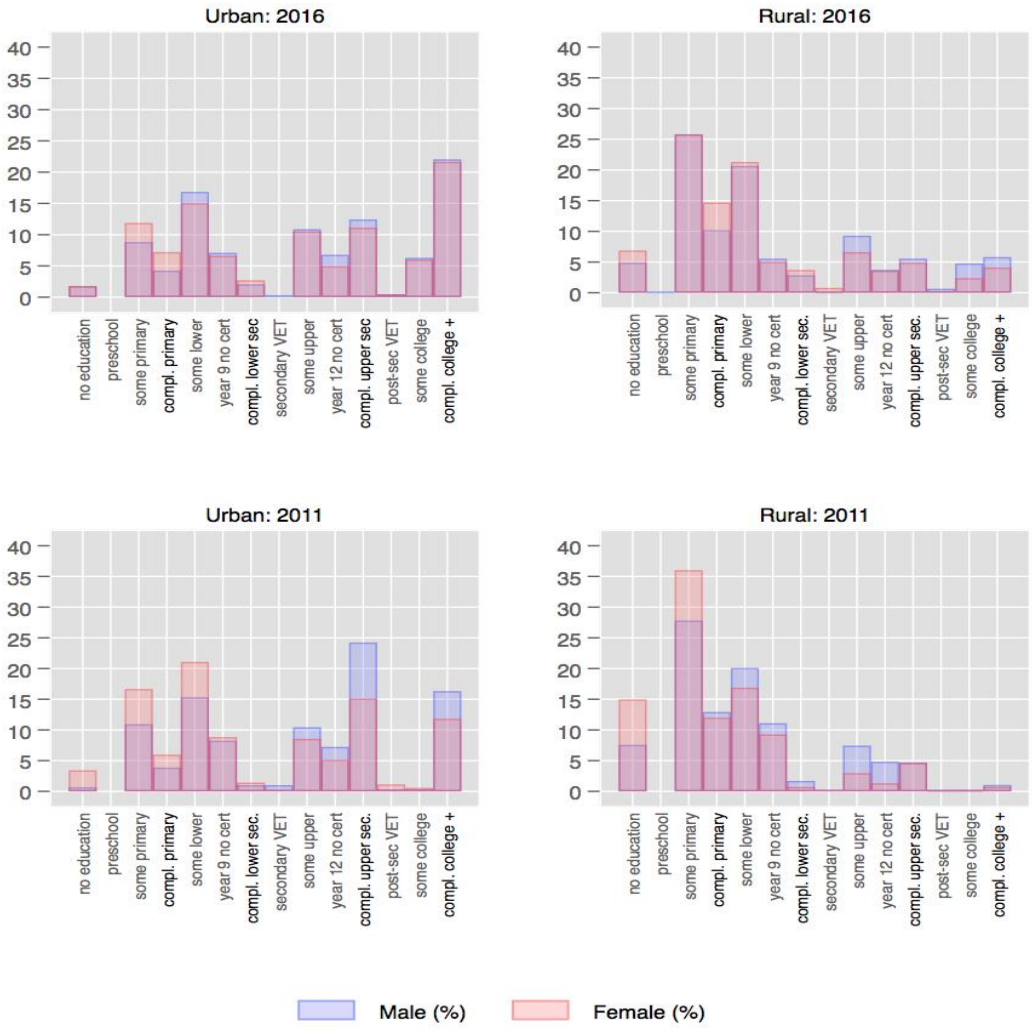
Table 2: Percent of population 25+ with at least primary education, %

	Female	Male
Cambodia	46.1	63.5
Thailand	62.1	69.7
Malaysia	88.0	94.3
Indonesia	73.6	81.7
Philippines	85.8	82.5

Source: Last available country estimates, World Bank Databank & CSES 2016

But more recent generations display a significant improvement in both educational attainment by male and female students and the gender gaps. When considering only the population of recent graduates aged 20-30, 75.7 percent of women and 76.6 percent of men had completed at least primary schooling. During the five-year period between 2011 and 2016, there was a significant increase in the fraction of urban women completing a university degree, nearly 22 percent in 2016, up from 11 percent in 2011 (Figure 9). By 2016, there was near gender parity in educational attainment in upper secondary and above in urban zones. The gap increased in rural areas but, at the same time, the total percentage of those completing some upper secondary or above also increased.

Figure 9. Educational attainment of the labor force aged between 20 and 30



Source: CSES 2016

In spite of a higher average level of schooling of today's youth as compared to the (older) labor force, school dropout is still significant. According to the CSES 2016 dataset, in 2016 fewer boys than girls aged 13 to 15 had completed (at least) primary education (Table 3). It also confirms the persisting low retention rates to lower and upper secondary education: more than half of female students do not pursue or drop out before completing lower secondary schooling, with only 18.1 percent of male students and 25.8 percent of female students aged 19-21 completing upper secondary education.

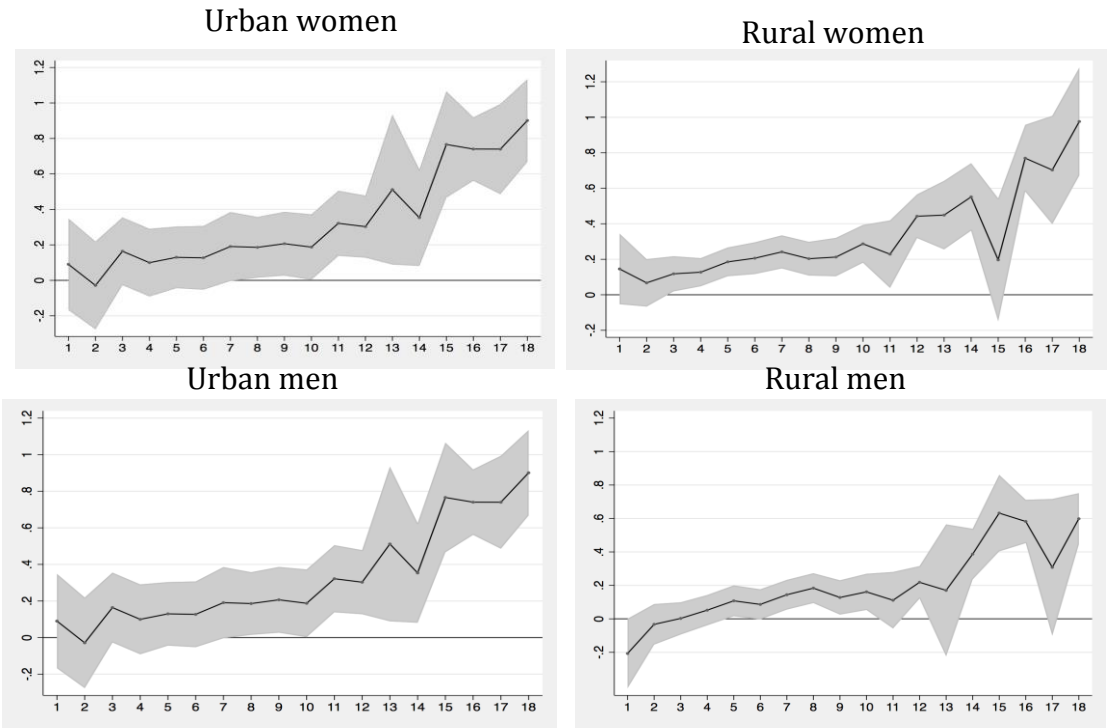
Table 3: 2016 Completion rates (as a percentage of reference age group)

	Primary (13-15)	Lower Secondary (16-18)	Upper Secondary (19-21)	College (24-26)
Male	71.0	43.4	18.1	13.6
Female	83.8	39.4	25.8	11.1

Source: CSES 2016. Percentage calculated as fraction of individuals in the age category with completed corresponding level of education. Insufficient sample size for urban/rural disaggregation.

The labor market only rewards secondary education or above. In 2016, rural men who have acquired 6 years of education (complete primary) or more and urban men and women who have nine or ten years (complete lower secondary) or more see their education reflected in their wages. The returns to schooling for rural women are already positive at merely three years of education, which may be due to the scarcity of rural women with any schooling (Figure 10).

Figure 10 The wage returns to years of education



Data from CSES 2016; Dependent variable: logarithm of wages per hour; controlling for age, marital status, number of children, household composition, ethnicity, region x rural/urban; sample consists of wage employees who worked more than 20 hours over the past seven days. 95% confidence intervals displayed together with point estimates.

Figure 10 shows that returns to schooling for both Cambodian women and men are convex (U-shaped), which could be driven by both supply and demand factors. As the supply of primary completers increases, their wage returns are likely to fall relative to

those with higher levels of schooling. On the demand side, the emergence/expansion of high-skilled jobs may be a reason why returns to higher levels of schooling have grown.

Wage employment: industry-specific developments

Growth in industry employment shares

The growth of the relative share of manufacturing in female wage employment is due to a continued increase in the importance of the garment sector and to a smaller extent, an increase in the food manufacturing and the consumer electronics sectors. Women's participation in the garment sector increased by 2 percentage points during 2011-2016 (Table 5). On the other hand, the relative growth of the services sector is driven by increases in the employment shares of the hospitality, private sector administration, and the financial sectors. [6] Women's participation in the financial sector doubled to 3.4 percent while participation in hospitality increased by two percentage points over the five-year period.

Table 4: Wage Employment: sector growth by gender

	Female			Male		
	2011	2016	Avg. yearly growth	2011	2016	Avg. yearly growth
Agriculture	0.245	0.140	- 0.022***	0.200	0.133	- 0.012***
Manufacturing	0.435	0.472	+0.011*	0.149	0.164	+0.004
Trade	0.042	0.031	- 0.001	0.024	0.040	+0.003***
Services	0.254	0.305	+0.006*	0.430	0.394	- 0.007*
Construction	0.021	0.050	+0.004**	0.183	0.251	+0.011***

The average yearly growth is calculated by regressions of yearly shares on year dummies, controlling for province x urban fixed effects.
***, **, and * denote statistical significance at 10%, 5 % and 1%.

Table 5. Decomposing the growth of the relative shares of manufacturing and services in female wage employment

Female wage employment			
	2011	2016	Avg. yearly growth
Manufacturing			
Garments and Footwear	0.419	0.444	+0.009**
Consumer Electronics	0.000	0.005	+0.001***
Food Manufacturing	0.007	0.014	+0.001
Other Manufacturing	0.009	0.008	- 0.001
Total	*0.435*	*0.472*	*+0.011**
Services			
Financial sector	0.017	0.034	+0.004***
Hospitality	0.037	0.057	+0.003*
Private Administration	0.034	0.044	+0.002**
Public Administration	0.016	0.019	-0.000

[6] We do not disaggregate construction into further sub-sectors (railroad, building, etc.).

Education	0.045	0.049	0.000
Cleaning and Landscaping	0.032	0.029	-0.000
Transport	0.007	0.005	0.000
Other Services	0.068	0.067	-0.002
Total	*0.254*	*0.305*	*+0.007**

The average yearly growth is calculated by regressions of yearly shares on year dummies, controlling for province x urban fixed effects.
***, **, and * denote statistical significance at 10%, 5 % and 1%.

These data show that the garment sector not only still dominates female wage employment, but also that it has continued to grow at close to a percentage point per year. Nevertheless, new occupations may be on the rise. On the one hand, the emerging export-based electronics-manufacturing sector in Cambodia may have the potential to further expand predominantly low-skilled wage work opportunities. On the other hand, the financial and private administration sectors have outpaced hospitality and show potential for high-skilled employment growth in the services industry. Men are faring less well in the service sectors, with an overall decline in service jobs, and gains only in the financial sector and hospitality (Table 6).

Table 6. Decomposing the growth of the relative shares of trade and services in male wage employment

Male wage employment			
	2011	2016	Avg. yearly growth
Trade			
Retail trade in shops	0.009	0.016	+0.002***
Retail trade in markets	0.003	0.004	+0.000
Wholesale trade	0.001	0.004	+0.001
Other	0.011	0.015	0.000
Total	*0.024*	*0.040*	*+0.003****
Services			
Financial sector	0.020	0.027	+0.002***
Hospitality	0.024	0.033	+0.002**
Private Administration	0.036	0.037	+0.000
Public Administration	0.044	0.044	-0.000
Education	0.043	0.031	-0.003**
Cleaning and Landscaping	0.007	0.005	-0.000
Transport	0.089	0.096	0.001
Other Services	0.167	0.120	-0.008***
Total	*0.430*	*0.394*	*-0.007*

The average yearly growth is calculated by regressions of yearly shares on year dummies, controlling for province x urban fixed effects.
***, **, and * denote statistical significance at 10%, 5 % and 1%.

Gender concentration within occupations by industry

Analyzing the patterns of gender sorting within occupations and the potential for climbing the occupational ladder within industry is highly relevant from a gender perspective.

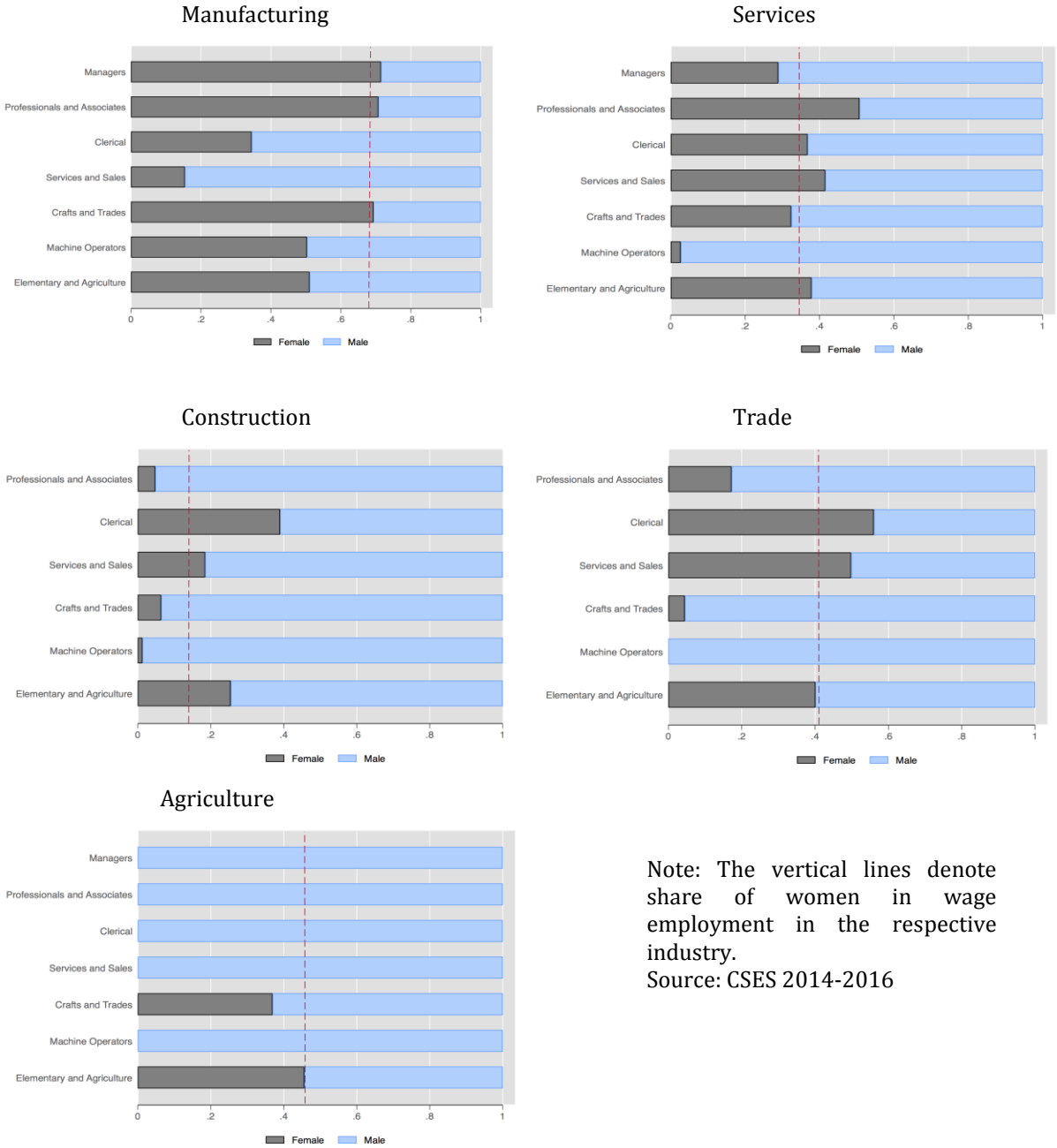
Women form the minority in all sectors, except manufacturing. While more than 60 percent of paid employees in the manufacturing sector are women, less than 40 percent of employees in services or trades are women.

The two "feminized" sectors – manufacturing and services – not only crowd in higher shares of women, they seem to offer women opportunities higher up the job-quality ladder. In manufacturing and services, women do not seem to be clustered in low-level occupations. For instance, the fraction of female managers in services is almost equal to the fraction of women in the services industry and the share of managers and professionals in manufacturing is greater than the share of women, with more than 65 percent of workers holding these positions being women (Figure 11). In contrast, women are over-represented among very low-skilled (and paying) occupations in construction, trades, and agriculture.

Even if women appear to be over-represented in managing positions in the manufacturing sector in 2016, these positions comprise an almost negligible fraction of the total number of jobs in the sector (Figure 12). This shows that the current low-skill work structure of the manufacturing sector does not provide many opportunities for career growth[7]. Services, on the other hand, appear to be the sector that provides the most opportunities for higher-level work. While this sector was still male-dominated in 2016, as we previously saw in Table 4, women's wage employment has been growing in higher-skilled services occupations, where career opportunities seem to be present. The remaining sectors consist of few occupations above the sales (trade), crafts (construction) and elementary (agriculture) level.

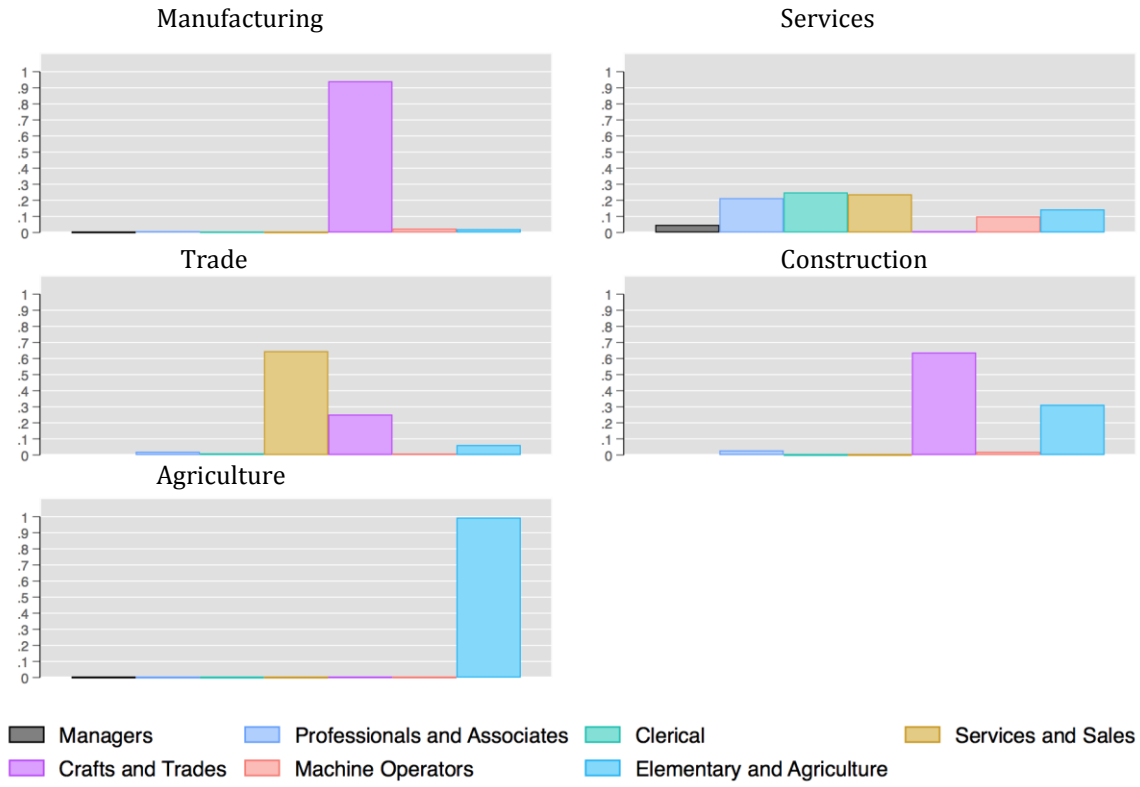
[7] The current distribution of occupations could be seen as a proxy for occupational opportunities within sectors; it does not take into account a number of relevant factors such as current or projected vacancies.

Figure 11: Vertical gender segregation within industries



Note: The vertical lines denote share of women in wage employment in the respective industry.
Source: CSES 2014-2016

Figure 12: Distribution of occupations within industry



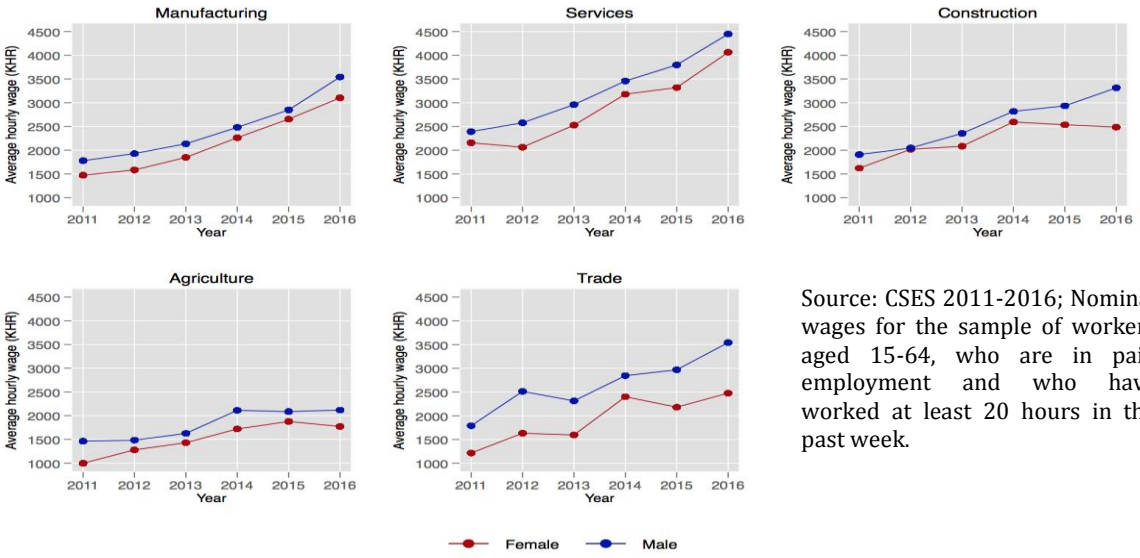
Source: CSES 2014-2016

Wage growth and the gender wage gap within industries

The sectors with highest increases in employment shares for both men and women are also the ones with highest wage growth. Manufacturing, services, and trade sectors saw average wages increase for both men and women. Notably, men's wages increased I construction while women's wages decline toward the end of the period (Figure 13).[8]

[8] The WB indicators database indicates that the inflation rate for the period averaged at 3.2%

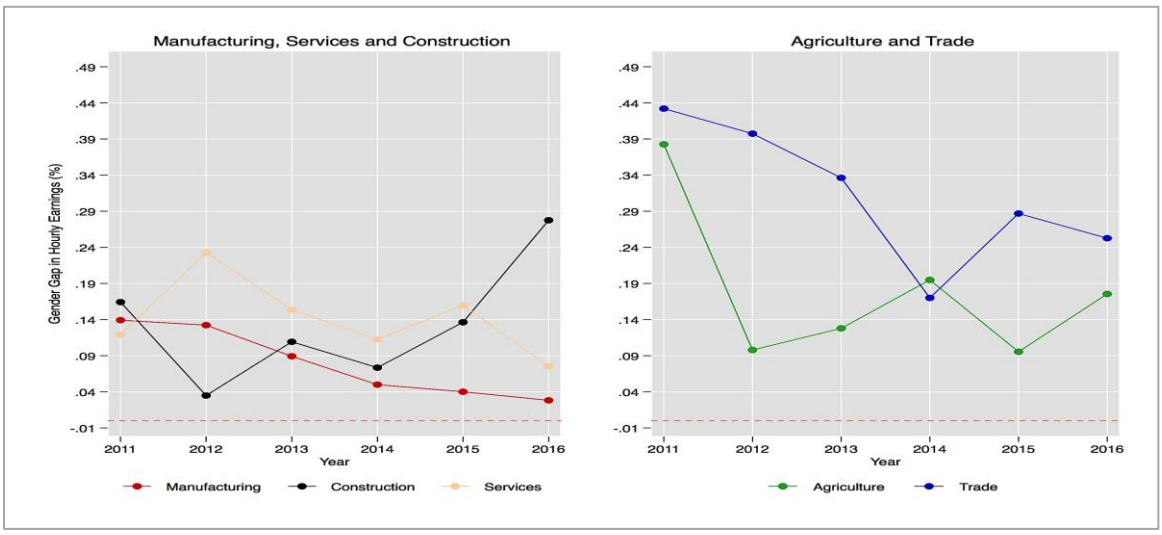
Figure 13: (Unadjusted) Wage growth across industries by gender



Source: CSES 2011-2016; Nominal wages for the sample of workers aged 15-64, who are in paid employment and who have worked at least 20 hours in the past week.

Nevertheless, the gender wage gap is the highest in sectors that are not dominated by women (Figure 14). In 2016, the gap measured 29 percent in construction and 25 percent in trade. In agriculture, which represents a slightly higher (but rapidly diminishing) share of female wage employment, the hourly earnings gap was 18 percent in 2016. In manufacturing and services, the sectors with highest share and growth of female wage employment, the unadjusted gap had basically disappeared by 2016 (in statistical terms, it was no longer significantly different from zero).

Figure 14: The unadjusted hourly wage gap by industry



Source: CSES 2011-2016. Earnings estimated on the sample of people in the labor force, who were in paid employment and reported having worked at least 20 hours over the past week.

Explaining the gender gap within industry

A common set of factors contribute to the overall gender wage gap and the existing gaps across industries. Some are observable characteristics – occupation, industry, and education – while others are external factors, including gender norms that constrain women's available work time (due to the expectation that women carry the bulk of unpaid household work) or work type (certain occupations or industries are viewed as "not appropriate for women) and the location of the jobs (for instance, working away from home). Examples of such occupations, perceived traditionally as typically male, are higher-level jobs in public administration and government, where women represented only 15 percent of all employees in 2013. [9]

Looking within industry, these variables explain a third of the gender wage gap in construction and agriculture (Table 7). Occupational level and location explain about a third of the gap in construction, which corresponds to Figure 11 above, that shows that women primarily work in low-skilled occupations in construction. Education and demographics explain a similar fraction of the earnings gap in agriculture. A possible reason for the important role of education is an increasing need for more productive skilled labor, given the decreasing number of workers in agriculture. As for demographics, age may be of significance, since the agricultural sector employs a non-negligible number of rural teenaged workers[10] who would likely earn less than those with more experience in the field. Notably, none of our observable variables explain the gender wage gap in trade; the gap persists even when holding each control category constant.

Table 7: Raw and adjusted wage gap within industries

	Manufacturing	Services	Construction	Trade	Agriculture
Unadjusted gap	0.0282	0.063	0.278***	0.253**	0.175***
	(0.031)	(0.038)	(0.059)	(0.129)	(0.054)
+ Education variables	0.013	0.076**	0.262***	0.251**	0.148***
	(0.030)	(0.030)	(0.058)	(0.108)	(0.052)
+ Demographic variables	0.059	0.045	0.263***	0.253**	0.115*
	(0.043)	(0. 030)	(0.058)	(0.106)	(0.067)
+ Location	0.046	0.065**	0.227***	0.233**	0.082
	(0.041)	(0.027)	(0.059)	(0.115)	(0. 062)
+ Occupational level	0.046	0.079***	0.163***	0.243**	0.111*
	(0.041)	(0.027)	(0. 062)	(0. 121)	(0.061)
N	1313	1870	725	183	491

Data: CSES 2016. Education variables include years of education and completed level dummies. Demographic variables include marital status, ethnicity, number of children, age and age squared. Location variables include Province x Urban dummies. Occupational level dummies correspond to a nine-tier ranking of occupations from Managers (highest) to Elementary Occupations (lowest).

[9] Asian Development Bank. 2015. "*Promoting women's economic empowerment in Cambodia*".
[10] About 10 percent of agricultural wage workers were below 16 years old in 2016 according to CSES.

Although the gender gap in services basically disappeared by 2016, when we compare women and men with the same skill level, occupations, and locations, we find a wage gap open in favor of men again. The gap in services becomes significant once we control for education, location and occupational level. A possible explanation could be, for instance, that in 2016 a higher fraction of women in services worked as professionals and clerks, which would be positively associated with earnings and would bias the coefficient of the gap downwards if omitted from the model.

The results from this section show that, while there has been a significant improvement in the gender gap over time, which has resulted in eliminating it in the manufacturing sector, significant gender gaps remain that cannot be explained by the data in the CSES.

The tradeoff between childcare and wage employment

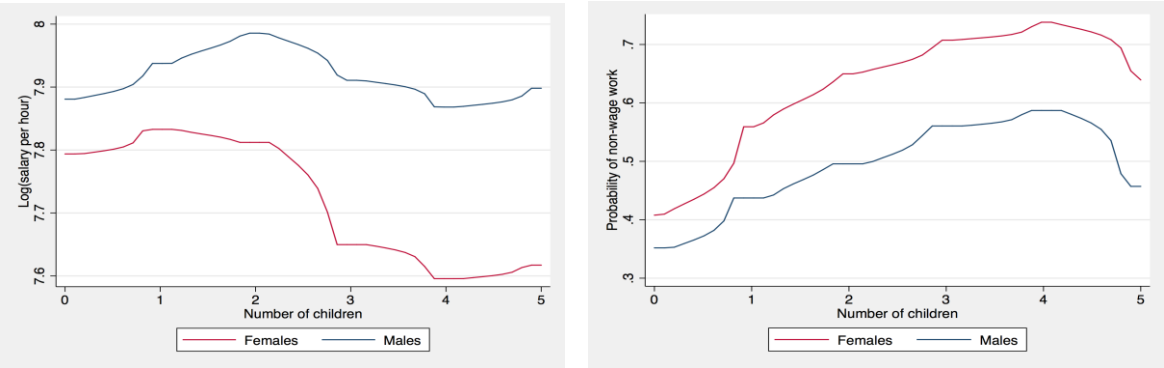
There is broad agreement in the labor economics literature that family formation is an important factor affecting women's career choices (Goldin 2014; Cortes and Pan 2016). Our analysis above showed that motherhood explains some of the gap in wages in some industries. In 2014,[11] women that do not have children earn about 12 percent less than men without children (Figure 15a). However, women's wages flatten after the birth of their first child, while men's earnings increase. The gap between men's and women's wages widens further around two children, and drastically expands to more than 30 percent after the birth of a third child, when women's wages rapidly fall.

What is equally remarkable in the Cambodian context is that the nature of the job is also sensitive to being a parent. Men and women without children have a similar tendency to work in a non-wage work. But after the birth of their first child, women's probability of working in a non-wage occupation increases dramatically and remains 10 percent higher than that of men. This is consistent with preferences expressed by Vietnamese household enterprise workers. Eighty percent of the sample said that they preferred working in a household enterprise rather than holding a wage-job. When asked why they preferred this type of work, 25 percent of women said that it allowed them to better attend to their household duties while only 5 percent of men gave this response (Pasquier et al 2017). Similarly, an assessment of household enterprise owners in Mexico found a cluster of young mothers who valued the time and location flexibility of owning their own informal business while no cluster of young fathers was identified (Cunningham et al 1998).

[11] We use 2014 data, since the sample size in 2014 was significantly larger allowing for better estimates of the local polynomial regressions.

Figure 15: Childcare and the gap in wages and vulnerable employment

a. Earnings b. Vulnerable employment



Local polynomial smooth using CSES 2014-2016. Sample includes women and men in the labor force, whose oldest child is 15 or younger (to increase the likelihood that the child would not have left the household)

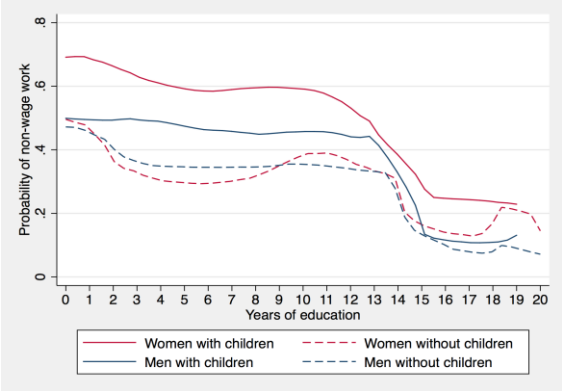
Mothers, especially those with less education, have a higher incidence of non-wage work than do non-mothers, men, and more educated. Figures 16a and 16b show a "difference-in-differences" type of picture, where we compare the probability of non-wage work for men and women, with and without children and at different levels of education. Figure 16a is drawn from a subsample of the younger cohort aged 15-30, while figure 16b reflects the older cohort between 30 and 64.

A number of striking discoveries emerge from these figures. First, young men and women without children have a similar propensity for non-wage work; this diverges once they have children. Second, it appears that the disproportionate effect of childcare on women is almost entirely driven by women in the younger cohorts with less than upper secondary education (equivalent to 12 years of education). This effect is also present, but less prominent for women in the younger cohort with the equivalent of university education (15-17 years of schooling). Interestingly, there is no gap in non-wage employment between men and women without children at any level of schooling.

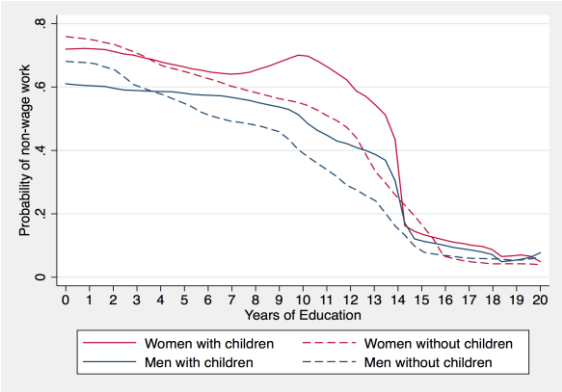
Third, as for the older labor force cohort, having any children does not seem to have such a pronounced effect on non-wage employment, except for men and women with education between lower and upper secondary. Even then, the effect for women is not much more pronounced than the effect for men. A likely explanation for this difference between the younger and older cohorts is the fact that the former is more likely to have younger children. Notably, unlike the younger cohort, women aged 30-64 without any children are about 10 percentage points more likely to be in non-wage employment compared to men at any level of schooling lower than some university (14 years of education and higher).

Figure 16: Childcare, non-wage employment, education and age

a. Ages 15-30



b. Ages 30-64



CSES 2014-2016: Sample includes women and men in the labor force, whose oldest child is 15 or younger (to increase the likelihood that the child would not have left the household)

After controlling for location and demographic characteristics, it appears that men without children are less likely to be in non-wage employment than women, and this effect has grown over time. Table 8 below presents a statistical relationship between having children and the probability of non-wage employment, this time controlling for differences in observable characteristics between men and women with and without children. Indeed, women drive the correlation, where being female and having children significantly increases the chances of being in non-wage employment; this tendency has increased since 2011. In contrast, men without children are increasingly unlikely to be in non-wage jobs. Tables A1 and A2 in the Appendix further show that these links are stronger for parents that have children below age 5.

Table 8: The effect of children on men and women's probability of non-wage employment over time

Year	2011	2012	2013	2014	2015	2016
	Dep. Var: P[Non-wage employment]					
Has Children	-0.0810***	-0.0453	-0.0222	-0.0483**	-0.115***	-0.105***
	(0.0266)	(0.0299)	(0.0339)	(0.0191)	(0.0328)	(0.0287)
Has Children x Female	0.143***	0.0989***	0.0735***	0.132***	0.123***	0.172***
	(0.0234)	(0.0246)	(0.0229)	(0.0131)	(0.0258)	(0.0232)
Dem. Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Province x Urban FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.165	0.143	0.151	0.167	0.154	0.175
N	6568	6833	6528	21021	6709	6767

Clustered standard errors in parentheses. Demographic covariates include years and levels of education, age, household size, marital status, ethnicity and number of children. The sample consists of men and women without children and with children aged 15 or younger. * p<0.1, ** p<0.05, *** p<0.01

Has the expansion of garment work affected girls' schooling?

In this section, we examine the impact of the increased availability of garment wage employment on schooling choices. Anecdotal accounts, backed by a growing body of literature, point to a potentially strong link between the two. Some, but not a lot of years of education are perceived as sufficient for garment work, which may lead to a positive effect at lower levels of schooling (Heath and Mobarak 2015; Le Brun, Harper and Levine 2009) and a negative effect at higher ones, due to both low perceived financial returns and a work-school tradeoff (Le Brun et al. 2009). Furthermore, as women dominated the sectors analyzed in these studies, the effects on schooling were stronger for female students.

Employing a difference-in-differences type framework similar to Acemoglu and Autor (2004), we use data on the growth in garment employment[12] per 1000 population[13] between 2011 and 2016 in Cambodian provinces and show that the expansion of the female dominated garment sector may be a reason why more women do not go further than primary schooling (Table 7) compared to men. The period 2011-2016 saw a significant diversification of the provinces in which garment factories were located. By the beginning of 2011, 67 out of the 87 garment factories registered with GMAC were located in Phnom Penh, with the remaining in the neighboring provinces of Kandal and Kampong Chhnang. By the beginning of 2016, the number of factories more than tripled to 296, with new garment work becoming available in 11 additional provinces, spreading as far as Battambang.

In what follows, we estimate how the change in number of garment jobs per province and this effect interacted with gender affect various education varaibles. The interacted coefficient is of particular interest for a number of reasons. To begin with, there are valid concerns about reverse causality linking overall education trends with manufacturing expansion.[14] Nevertheless, there is no plausible reason to expect that factory location choice would be linked to differential educational trends by gender, so the interaction term coefficient could be interpreted as the difference in the effect that the expansion of garment work had on women compared to men. In addition, since, similarly to other contexts examined by the literature, more than 80 percent of workers Cambodian garment factories are women the expected effect on schooling would be stronger for them.

The results reported in Table 9 are based on the regression equation:

[12] The data on garment employment is available on the website of the Garment Manufacturers Association in Cambodia (GMAC); the province population data come from the 2008 Cambodian Population Census

[13] We also run an alternative specification with the change in number of factories per province, and the results are robust. As an additional robustness check, we also estimate the model excluding Phnom Penh from the sample; the results remain similar.

[14] To alleviate this we control for the changes in agricultural jobs as share of total employment in provinces. It can be argued that the same reverse causality concerns do not hold in the case of the gender interaction term.

$$Y_{ipt} = \delta_p + \gamma D_{2016} + X_{ipt}'\beta + \lambda D_{2016}F_p + \mu D_{2016}F_p Female_{ipt} + \theta D_{2016}A_p + \epsilon_{ipt}$$

where Y_{ipt} stands for the educational outcome of interest of individual *i*, in province *p*, at time *t;* δ_p are province fixed effects; D_{2016} is a dummy, equal to 1 in 2016 and 0 in 2011; X_{ipt} is a vector of demographic characteristics; $D_{2016}A_p$ is the year dummy interacted with the change in the share of agricultural employment per province; $D_{2016}F_p$ is the year dummy interacted with the number of new garment jobs per 1000 opened between 2011 and 2016 per province; and $D_{2016}J_p Female_{ipt}$ is the latter interacted with gender. The main coefficient of interest is therefore μ.

While educational attainment has been growing for both males and females, the expansion of the garment sector may be slowing that growth more for girls than for boys. The results in Table 9 show that the availability of garment work contributes to girls not starting school (Panel I), dropping out of primary schooling (Panels II and III), and never continuing to secondary schooling (Panel IV) at higher rates than boys. For instance, an additional garment job per 1000 people in a province is associated with a 0.3 percentage point lower chance that a female aged 13-20 has completed primary schooling, compared to a male. Table A3 in the appendix uses the change in number of factories per province as the main independent variable and confirms the robustness of the results in Panels II through IV.

Table 9: Garment jobs and schooling

	I. Some schooling		II. Incomplete primary		III. Complete primary		IV. Started any secondary+	
	Entire Sample	*Ages 5-12*	*Entire Sample*	*Ages 13-20*	*Entire Sample*	*Ages 13-20*	*Entire Sample*	*Ages 16-23*
D_{2016} x Jobs	0.35***	-0.04	-0.08*	-0.31***	0.43***	0.62***	0.33***	0.72***
	(0. 03)	(0.06)	(0.04)	(0.05)	(0.07)	(0.06)	(0.07)	(0.09)
D_{2016} x Jobs x Female	**-0.08*** (0.03)**	**-0.21*** (0.07)**	**0.08* (0.04)**	**0.27*** (0.08)**	**-0.15*** (0.04)**	**-0.33*** (0.10)**	**-0.09* (0.05)**	**-0.22* (0.12)**
D_{2016} x Share Ag. Jobs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demo-graphic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	15,494	2,519	15,494	2,465	15,494	2,465	15,494	2,599
R^2	0.08	0.43	0.02	0.08	0.07	0.11	0.08	0.10

Coefficients transformed into percentage points.
Clustered standard errors in parentheses. Demographic variables include age, marital status, household size and ethnicity. Source: CSES 2011-2015, GMAC 2018, Cambodian Population Census 2008.

Non-wage (vulnerable) employment[15]

Growth in industry employment shares

While the importance of non-wage work has slowly been shrinking, it still plays an important role in Cambodians' (and especially Cambodian women's) lives. Therefore, in this section we examine the trends in industry shares in vulnerable employment. Non-wage agriculture has shrunk by more than 10 percentage points for both men and women, while non-wage jobs in trade and services have been growing in importance (Table 10).

Table 10: Non-wage (vulnerable) employment: sector growth by gender

	Female			Male		
	2011	2016	Avg. yearly growth	Male 2011	2016	Avg. yearly growth
Agriculture	0.684	0.582	- 0.011***	0.745	0.611	- 0.016***
Manufacturing	0.047	0.045	0.000	0.041	0.057	+0.002
Trade	0.214	0.297	+0.009***	0.113	0.173	+0.006***
Services	0.034	0.073	+0.006***	0.081	0.144	+0.010***
Construction	0.001	.0002	0.000	0.007	0.005	0.000

The average yearly growth is calculated by regressions of yearly shares on year dummies, controlling for province x urban fixed effects.
***, **, and * denote statistical significance at 10%, 5 % and 1%.

Types of non-wage occupations by gender

The employment shifts towards trade and services are clearly reflected in the increase in non-farm household enterprises, that have grown in importance, especially for women (Figure 17).

[15] We use the terms non-wage and vulnerable employment interchangeably throughout. The term encompasses own-account farm and non-farm workers, and unpaid family workers.

Figure 17: Non-wage occupations in rural and urban areas

Source: CSES 2016

Gender comparison of non-farm enterprises

The CSES data confirm that the majority (56 percent) of non-farm enterprises were led by females in 2016. Table 11 below summarizes some key characteristics of the men and women in the CSES 2016 sample, who reported running a non-farm enterprise as their main occupation. These characteristics are useful for understanding the way women and men start and operate their enterprises. The overwhelming majority of these businesses are micro-enterprises and do not employ any workers. More than half of the women running their own business, however, report having worked with a household member over the past year; this number is significantly lower for men. It is important to note that only about 56 percent of female entrepreneurs in 2016 report having completed at least primary schooling.

There is a clear gender division in the industries occupied by these own-account enterprises. 62 percent of female-led enterprises are in retail trade, while the distribution among male-led enterprises is more balanced: 33.4 percent in transport, 20.8 percent in retail and 15.5 percent in repair services, among others.

Table 11: Characteristics of male and female entrepreneurs (2016)

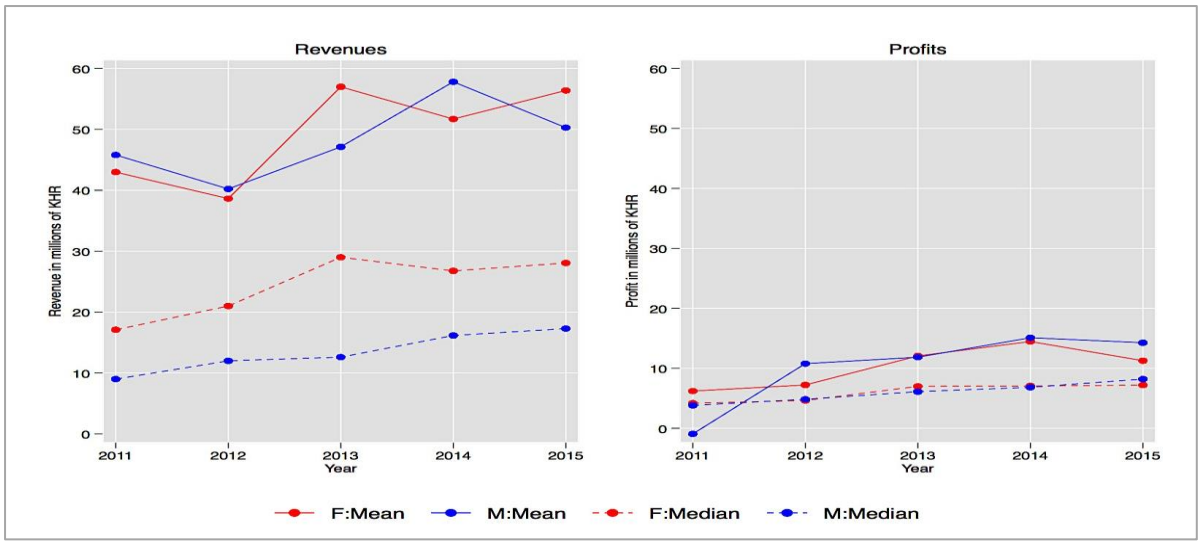
	Female	Male
Worked with another family member	56.3%	37.7%
Paid salary to another worker (on a temporary basis)	4.6%	10.1%
Main area of business:	• Retail trade in shops and markets: 62% • Hospitality: 10.2% • Handicrafts and garments: 6.2%	• Transport (mainly tuktuk drivers): 33.4% • Retail sale in shops and markets: 20.8% • Repair of vehicles and other services: 15.5% • Wholesale trade: 8%
Average profit(16):	KHR 11.3 million (2825 USD)	KHR 14.3 million (3567 USD)
Urban (%)	39.1%	36.4%
Average age (years)	40.6	39.3
Has at least one child (%)	82%	81%
Completed at least primary schooling (%)	55.6%	68.6%

Source: CSES 2016

Men and women earn similar average profits and revenues, with some exceptions. While average revenues were higher in 2011, 2012 and 2014 for females than males, median revenues for female-led enterprises were actually consistently higher than for male-led ones throughout the entire period 2011-2015 (Figure 18). [17] A likely reason for this trend is that a higher fraction of male businesses have remained clustered around the high end of the distribution. As for reported profits[18], women were more profitable on average only in 2011. Median profits, on the other hand, were largely similar across genders and years.

[17] Data for 2016 is not available.
[18] Calculated as sum of reported revenues minus sum of reported expenses.

Figure 17. Mean and Median revenues and profits of female- and male-led non-farm enterprises (2011-2015)



Source: CSES 2011-2015

These data show that, while profitability and revenues have been growing for both men and women, the situation of gender equality in non-farm household enterprises is not that clear. Our study shows that women entrepreneurs are less likely to hire an additional worker and to complete primary schooling; at the same time other studies have shown that female entrepreneurs have better access to loans from microfinance institutions (Asian Development Bank 2015). Improving overall schooling and literacy, providing access to training and better infrastructure are all steps that could benefit female and male entrepreneurs alike.

Conclusion and Policy Recommendations

Women have made significant advances in Cambodia, partly due to the rapid expansion of the textile sector. Cambodian men and women are hard workers: they have the highest labor force participation rates and among the lowest unemployment rates in the East Asia Region. With structural transformation, both men and women are moving out of agriculture and into services and manufacturing. Women are flocking to the textile sector while men move into construction.

However, women still lag men in various dimensions of the labor market. Gender wage gaps persist. Even when accounting for women's lower levels of education and crowding into certain sectors, they still earn an average of 11 percent less than men. Gender roles matter, as observed by a decline in women's wages with each child while men's wages increase with children. There is near gender parity in low-paying jobs, but the gap increases substantially in higher wage jobs.

Generally, women bump against a glass ceiling. In all occupations except manufacturing (textiles) and services, women are under-represented amongst the highest levels of management. They are particularly under-represented in more skilled jobs – and earn significantly less – in male-dominated sectors including construction and agriculture.

Women continue to be over-represented in non-wage jobs, including household agriculture and non-farm enterprises. The propensity to work in these sectors significantly increases with children, suggesting that these jobs may provide flexibility to balance work and home responsibilities. Women and men have similar revenues and earnings, though high earnings are concentrated among male non-wage earners.

While the feminization of the Cambodian economy – through the entrance of foreign-owned textile firms and the expansion of the service economy – have provided opportunities to women, the former may introduce a threat. Gender gaps in education have nearly closed for girls and boys living in urban zones and attainment is rapidly increasing. However, girls living in zones with more textile jobs (and firms) have a lower propensity than boys to start primary school, complete primary school, and attend secondary school, as compared to the gender gap in zones with fewer textile firms. If girls are looking toward a low-skilled textile job, and thus under-valuing education, it could put them at a disadvantage as Cambodia moves toward a more sophisticated and diversified economy.

These trends point to several policies and programs that could serve to level the playing field.

First, provide affordable and quality child care options for families with young children. This paper has shown that the increased availability of salary work is likely increasing the importance of wage-childcare tradeoff in Cambodia. A number of studies (Cascio 2009; Berlinski et al 2011) have documented positive effects of the availability of preschool facilities on women's labor supply. According to CSES 2016 data, only about 17 percent of all children aged 3-5 had attended pre-school. This number is similar to the gross enrollment rate in pre-primary education reported by the UNESCO Institute for Statistics (UIS).[19] The UIS data also reveal that Cambodia is lagging behind its neighbors in the region with Vietnam having a gross enrollment rate in pre-primary schooling of more than 80 percent, Thailand of 70 percent and Lao PDR of 40 percent. Pre-school has long been acknowledged as an important contributor to children's early wellbeing, especially in developing contexts (for instance Gertler et al 2014). Therefore, a continued effort to expand the availability and quality, and boost awareness, could have an additional beneficial effect through the lens of increased flexibility for working mothers.

[19] Source: http://data.uis.unesco.org/Index.aspx?queryid=120

Second, emphasize the importance of going to, and staying in, school, especially for girls. While Cambodia has made remarkable progress increasing educational attainment and in closing education gender gaps, the data show that these gains may be slowing for girls who are attracted to the textile manufacturing sector. Also, given that the labor market only begins to reward education after 6th grade, it is particularly important to keep young people in school into through secondary school. This points to the need for career counseling with girls to emphasize the range of employment options and the need to acquire a secondary education. Indeed, short interventions in the Dominican Republic and Mexico have found that basic information about the benefits of staying school serve to reduce dropouts of girls more than for boys (Jensen 2010).[20] There may also be a need to sensitize parents about the career options that their girls could strive for if they stayed in school. Recent analysis of qualitative data in Vietnam found that parents had a much bigger influence over their daughter's education and career choices than the girls had over their own futures and parents had over son's careers (Weimann-Sandig, 2019).

Third, provide career counseling for girls and young women to encourage them to enter non-traditional areas. The data showed that women only climbed the career ladder in female-dominated fields. Thus, there is room for them to move into semi- or professional level jobs across industries. And as Industrial Revolution 4.0 begins to reshape Cambodia's jobs markets, girls will need science, technology, engineering, and mathematics education to compete. Parental and teacher encouragement of girls has shown crucial to gender parity in the digital technology fields in India and the absence of it is thought to underpin the severe gender imbalance in, for example, the United States. Interventions to encourage girls to enter male-dominant fields has been found to triple women's earnings, for example, in Uganda (Campos et al. 2016).

Fourth, facilitate girl's secondary school completion, entry to STEM fields, and second-chance education for school dropouts. Girls who have the desire to stay in school and enter STEM fields need to overcome practical constraints to do so. Cambodia's secondary school equivalency (bridge) programs are well suited for girls, who may have left school early, to complete their secondary education. Across the world, cash transfer programs have successfully kept boys and girls enrolled in school. For example, a program in the city of Bogotá, Colombia gave a cash "reward" to vulnerable students upon completion of secondary school and enrolment in tertiary education. This program had a larger effect on secondary school completion than did a monthly payment for school attendance. (Barrera-Osorio, et al. 2011). To encourage higher education in the STEM fields, girls would need to overcome practical barriers, such as living away from their families. Programs that provide dormitory space or subsidies for safe transport, may provide peace of mind to these girls and their families.

[20] A similar intervention was carried out in Madagascar, with similar impacts (Nguyen 2008).

Fifth, leverage labor law and work-place norms for men to play a more active role in the household and to be more willing to accept women as their managers. Encouraging men to participate more in homecare and other related household responsibilities will be important in reducing the burden on the women and making advancements towards gender equality. While such social change is a long process, labor laws can provide incentives for them to play this role. In addition, promoting a work environment where women hold higher level and managerial positions will also force changing gender norms in the workplace and provide role models for young female professionals.

Sixth, foster gender-neutral industry. The Rectangular Strategy suggests that Cambodia will need to make a concerted effort in the near future to diversify its export sector into higher value-added goods and services. This could threaten women's jobs as textiles are replaced by other industry. But what you export matters for gender equality in labor markets. Thus, policymakers could put a gender lens on their strategies for negotiating foreign-investment or supporting export strategies so that women are swept up by these better jobs.

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Appendix

Sample

Throughout the analysis we take into account the multi-stage sampling design of the survey and adjust the estimates and standard errors accordingly. For comparability of nation-wide estimates we use datasets from 2011 to 2016, where person weights are computed by incorporating predictions for gender and age distributions across regions, so that individuals in households of the same size and in the same PSU can still get different sampling weights. This is not the case for data prior to 2011, where individual weights are computed simply by multiplying household weights by household size.

Wages

Wages per hour are computed by dividing total earnings by total hours in wage work per month. We consider only individuals whose primary activity is wage work and who report having worked more than 20 hours in the past week.

Table A1. Children aged below 5 and parents' probability of vulnerable employment

Year	2011	2012	2013	2014	2015	2016
Has Children	-0.104**	-0.0641	-0.00567	-0.0998***	-0.0806	-0.145***
	(0.0449)	(0.0525)	(0.0666)	(0.0309)	(0.0499)	(0.0506)
Has Children x *Female*	0.148***	0.104***	0.0347	0.166***	0.140***	0.204***
	(0.0297)	(0.0307)	(0.0332)	(0.0169)	(0.0341)	(0.0319)
Dem. Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Province x Urban FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.167	0.145	0.137	0.161	0.153	0.164
N	4863	4888	4718	15177	4869	4982

Clustered standard errors in parentheses. Demographic covariates include years and levels of education, household size, age, marital status, ethnicity and number of children.

* p<0.1, ** p<0.05, *** p<0.01

Table A2. Children aged 5-15 and parents' probability of vulnerable employment

Year	2011	2012	2013	2014	2015	2016
Has Children	-0.0582	0.0182	0.0371	-0.00881	-0.163***	-0.00246
	(0.0504)	(0.0522)	(0.0577)	(0.0310)	(0.0546)	(0.0503)
Has Children x *Female*	0.129***	0.0370	0.0415	0.0834***	0.0896**	0.117***
	(0.0340)	(0.0347)	(0.0309)	(0.0181)	(0.0360)	(0.0319)
Dem. Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Province x Urban FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.172	0.137	0.169	0.170	0.163	0.188
N	4464	4664	4529	14647	4770	4766

Clustered standard errors in parentheses. . Demographic covariates include years and levels of education, household size,age, marital status, ethnicity and number of children.

* p<0.1, ** p<0.05, *** p<0.01

Table A3: Garment factories and schooling

	I. Some schooling		II. Incomplete primary		III. Completed at least primary		IV. Started any secondary+	
	Entire Sample	*Ages 5-12*	*Entire Sample*	*Ages 13-20*	*Entire Sample*	*Ages 13-20*	*Entire Sample*	*Ages 16-23*
D_{2016} x Factories	0.25***	-0.11*	-0.12***	-0.35***	0.37***	0.38***	0.35***	0.68***
	(0.01)	(0.07)	(0.02)	(0.04)	(0.02)	(0.04)	(0.03)	(0.05)
D_{2016} x Factories x Female	**-0.03****	**0.001**	**0.07*****	**0.18*****	**-0.04***	**-0.16*****	**-0.05***	**-0.13*****
	(0.01)	**(0.004)**	**(0.03)**	**(0.04)**	**(0.026)**	**(0.05)**	**(0.03)**	**(0.06)**
D_{2016} x Share Ag. Jobs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demo-graphic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	15,494	2,519	15,494	2,465	15,494	2,465	15,494	2,599
R^2	0.08	0.38	0.02	0.08	0.07	0.11	0.08	0.10

Coefficients transformed into percentage points.
Clustered standard errors in parentheses. Demographic variables include age, marital status, household size and ethnicity.
Source: CSES 2011-2015, GMAC 2018, Cambodian Population Census 2008.