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## **Gaps in the (paid) work hours of male and female heads of households: Empirical evidence from Barbados**

To date, very little is known about the disparity in the paid work hours of male and female heads of households. This study attempts to fill this gap by investigating the magnitude and possible determinants of gaps in the (paid) working hours of male and female heads of households. The study utilises the Bauer and Sinning (2008) general decomposition method to examine the differences in work hours among male and female heads of households using data from the 2014 Barbados labour force survey. Our estimates suggest that the employment hours of female heads of households is 3.6 per cent less than that of their male equivalents, which translates to an annual hour differential of roughly 68 to 71 employment hours.

**Keywords:** hours of work; heads of household; female heads of households; gender; sex; Barbados

## Introduction

The employment hours gap between men and women is a long-standing feature of labour markets worldwide. In their analysis of 100 countries, the International Labour Organization (2016) reports that 34.2 per cent of employed women work less than 35 hours per week, compared with 23.4 per cent of employed men. Though significant gaps exist, the work-hour gap is an underutilised indicator of sex-based inequality (Landivar, 2015), at least compared to the burgeoning body of work on the gender-wage gaps (see for instance: Agrawal, 2020; Ñopo *et al.*, 2012; Pastore, 2010; Strawinski *et al.*, 2018). The lack of studies on the work-hour gap is surprising, given that discrepancies in paid work hours often reinforce other types of labour market inequalities, such as the gender gap in wages (Meara *et al.*, 2020; Blau and Kahn, 2017; Weeden *et al.*, 2016) and career advancement (Maume, 1999). This article focuses on evaluating the magnitude and possible causes of the gap in the paid labour hours of a special subset of men and women, namely, heads of households.

Generally, one would expect that any differences in the employment hours of male and female heads would largely be explained by differences in worker endowments, given both parties' role as the primary breadwinner of the household. Unfortunately, there are significant social and cultural constraints that may limit women's socio-economic mobility. Chief among these is the segregation and discrimination that often permeates labour markets, which severely constrains women's access to income-earning opportunities and full-time employment (Coverman and Kemp, 1987). Moreover, in every region of the world, women bear a disproportionate amount of time doing unpaid care work relative to men (International Labour Organization, 2018), which in turn reduces their ability to participate in the labour market fully. Mothers, especially, feel this burden. Gendered expectations may either cause mothers to select jobs with hours that can be integrated with their perceived familial responsibilities (Buttrose and Adams, 2005) or reduce the likelihood that employers will hire them for jobs that require extended work hours (Weeden *et al.*, 2016). To date, very little is known about the disparity in the paid work hours of male and female heads of households. This study attempts to fill the gap in the literature. The objectives of this study are to (1) determine if there is a gap in the employment of hours of male and female heads of households; and (2) if a discrepancy exists, establish the worker endowments that largely

explain the gap. The study is carried out using labour market data for Barbados, a small island developing Caribbean state.

Female headship of households<sup>1</sup> has long been a feature of Barbadian family life, dating back to days of slavery<sup>2</sup>. Massiah (1983) asserts that

“Under the slave regime the basic elements necessary to the sharing and maintenance of a common household by a legally married couple were unavailable to the slaves. Christian marriage was incompatible with the slave code: each partner was at the risk of being removed or sold at any time. The child of a slave woman derived status from its mother's legal status, thus automatically becoming the property of its mother's owner. Efforts at stimulating reproduction often took the form of special dispensations to the mother and to the plantation overseers or managers but never to the fathers.”

While the incidence of female-headed households was firmly established during slavery, other factors have contributed to the high prevalence of female household headship in Barbados. One such factor is the male-dominated international migration that occurred before the 1960s, leaving a significant number of women to manage their households on their own (Massiah 1983). Female household headship in Barbados has also been linked to female independence and empowerment as socio-economic conditions improve (Massiah, 1983). A common assertion in works on the feminisation of poverty is that female-headed households bear a disproportionate and growing burden of poverty (Thomas, 1994). Recent statistics point to a relationship between female household headship and poverty in Barbados: in 2016 the poverty rate of households headed by women was 21%, compared to 14% for male-headed households (Beuermann *et al.*, 2018). Notwithstanding this, the narrative of female headship in Barbados is one that also recognises the diversity in the experiences of female heads of households, not only in an economic sense but also in a practical and social sense. Female household headship in Barbados is presented as a legitimate alternative family arrangement, and not solely as a pathological form of existence or an indication of vulnerability (Safa, 1998).

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<sup>1</sup> In Barbados, heads of households are identified by the household's acknowledgement as the individual as the main breadwinner and decision-maker (Barbados Statistical Service, 2013).

<sup>2</sup> Barbados is a former British colony, only gaining independence in 1966.

Barbados's long history of female household headship makes it an ideal country to study the gap in paid work hours among heads of households. By focusing on Barbados, this paper adds to the sparse body of work on differences in labour market outcomes for men and women in developing countries, particularly those in the Caribbean. There are only a handful of quantitative studies on the sex differentials within Caribbean labour markets (Pastore et al., 2020) and to the best of our knowledge, there are no papers focusing on gaps in employment hours. The social, cultural and economic realities of the Caribbean are unique. The region thus represents fertile ground for leveraging theoretical findings and fresh empirical insights on sex-based inequality, which could be beneficial to the collective action to evaluate and reduce inequality at the global level.

The rest of this paper is organised as follows. The next section summarises the determinants of time spent in paid work, as suggested by the theoretical literature. We then provide a brief overview of women and men in the Barbadian labour market. The third section describes the data and the methods, and the fourth section presents the results. The last section discusses the implications of the results, the limitations of the study and possible areas for future research.

### **Determinants of hours worked**

The Becker-Gronau type model of time allocation (Becker, 1965; Gronau, 1977) serves as our the starting point for understanding time spent in paid work. Under this framework, members of the household obtain utility through its consumptions of leisure  $L$  and some quantity of commodity  $Z$ .  $Z$  is a combination of goods and services that could be purchased in the market ( $X_M$ ) and home goods ( $X_H$ ) which is a function of work at home ( $H$ ). The utility function could be summarised as

$$U = U(L, Z; \tau)$$

where  $\tau$  is a taste parameter. One can think of the taste variable as characteristics specific to household members that affect their preferences. The maximisation of  $U$  is bound by two constraints:

- (1) the budget constraint  $P_M X_M = WN + V$ , where  $P_M$  is the price of goods and services in the market,  $W$  is the wage rate,  $N$  denotes wage work and  $V$  represents other sources of income; and
- (2) the time constraint:  $T = L + H + N$

Solving for  $N$  gives us the general form of time spent in paid work, that is,

$$N = T - L - H = f(W, V, P_M, \tau)$$

The relationship between wages and time spent in paid work is a central focus in economic investigations of labour supply. The Becker-Gronau model predicts that an increase in the real wage rate will reduce work at home, while the wage rate's impact on leisure, and by extension work in the market, is indeterminate. Gronau (1977) notes that a change in the wage rate induces income and substitution effects that work in opposite directions. An increase in the wage rate raises the price of leisure and individuals respond by substituting leisure for market work. At the same time, a higher wage rate increases the demand for leisure hours, which is to say that less time will be spent in market work. Thus, the employment hours-wage rate relationship depends on the relative magnitude of the income and substitution effects. Work by Robins (1930) suggests that the relationship between the wage rate and employment hours may be non-linear, giving rise to a backward bending labour supply curve. Like previous works, the backward bending supply model suggests that impact of wages on time spent in market work depends on the magnitude of the income and substitution effects. In this framework, hours in market work increases with the wage rate up to a point, after which employment hours decline as the wage rate increases. Specifically, at low wages, the substitution effect dominates the income effect, and there is a positive relationship between the wage rate and time spent in market work. However, there exists some threshold wage rate  $W^*$ , where beyond  $W^*$  the worker can sustain their lifestyle without spending more time in market work. As such, if the wage rate increases beyond  $W^*$ , the income effect dominates the substitution effect and a negative relationship between the wage rate and employment hours emerges.

Human capital and job characteristics are also popular predictors of hours worked. Becker (1965) suggests that the opportunity cost of time spent outside of work increases with human capital accumulation, which in turn leads to a substitution of leisure for work. However, human capital does not just affect hours worked through its impacts productivity in market work, but also through its effect on home productivity (Ondoa, 2018). The empirical evidence to date has been mixed. Some studies find that labour supply increases with human capital accumulation (Aliaj *et al.*, 2016;

Bertila *et al.*, 2016), while others find evidence of a negative relationship between human capital and time spent in paid employment (Ondoa, 2018; Sánchez and Villarespe, 2017). Job characteristics matter due to the heterogeneity in normative hours across occupations and sectors (Landivar, 2015).

Another area of focus is how familial responsibilities impact time spent in market work, particularly, its asymmetric impact on men's and women's employment hours. There is empirical work to suggest that events like marriage and parenthood increase market work for men, but lower employment hours for women (Weinshenker, 2015; Weeden *et al.*, 2016). Gronau (1977) suggests that in partnered households, specialisation and trade within the family increase the welfare of the family. Gronau conjectures that since wives often receive lower wages than their husband, they are more likely to specialise in home production and husbands are more likely to specialise in market work. Other perspectives emphasise how social customs and conditioning affect the division of labour. Barriteau (2001) notes that societal expectations of gender identities help establish sex-differentiated behaviours. Indeed, the gender-identity thesis of Akerlof and Kranton (2000) predicts that cultural values and gender role belief systems affect the division of labour. Specifically, since men and women operate within societal constraints, social customs dictate the utility they derive from household work and market work. Akerlof and Kranton (2000)'s gender identity hypothesis predicts that beliefs about the appropriate behaviour of each sex mean that men and women may feel a loss of identity when they deviate from the established norm. Traditional gender role ideologies place women in the role of caretaker of the home and family and put men in the role of the breadwinner (Fulcher and Coyle, 2011). As such, partnered women living in societies that subscribe to traditional gender role ideologies may succumb to expectations to specialise in home production, while partnered men would specialise in market work.

Summing up, the theoretical literature suggests that a host of factors influence the amount of time spent on paid work. Guided by these concepts, we build an empirical model of hours worked by male and female heads, a special subset of men and women. On the one hand, the literature suggests that wage discrimination and gender relations could mean that female heads work fewer hours than male heads. On the other hand, female heads act outside of traditional gender roles and

serve as the primary provider for their families. Against this backdrop, it is not unreasonable to assume that in some respects, their hours worked function may resemble that of male heads.

### **Men and Women in the Barbadian Labour Market**

Over the last five decades, Barbados has made significant progress in reducing asymmetries in male and female labour outcomes. Statistics to date suggest that the gap in male and female labour participation in Barbados has declined significantly, moving from a gap of 23.6 percentage points in 1976 to 9.2 percentage points in 2018. The narrowing of the gap was driven by increases in the number of women entering the labour force, primarily facilitated by Barbados' shift from agricultural dependence to a services-oriented economy (Coppin, 1995), focusing on tourism and financial services (Mayers and Jackman, 2011). Not only did Barbados witness significant increases in female labour force participation, but women also gained access to positions of authority and leadership. In 1990, Barbados received its first female Governor General (Dame Nita Barrow), in 1999, its first female Central Bank Governor (Dr Marion Williams) and its first female leader of the opposition (The Honourable Mia Amor Motley) in 2008, who subsequently became the first female prime minister in 2018. Moreover, data from the Ministry of Labour in Barbados suggest in 2018, women made up 41.6 per cent of legislators, senior officials and managers.

While there is a trend towards equality in terms of labour force participation and career advancement, other inequalities remain persistently stubborn. Women are underrepresented in entrepreneurship. Nearly 60 per cent of firms included in the 2014 Compete Caribbean Productivity, Technology and Innovation survey were exclusively/mainly owned by men, while women mainly/exclusively owned 16.3 per cent of firms. Barriteau (2002) notes that existing gender relations marginalise women's economic activities in Barbados, which in turn limit female entrepreneurs' access to finance and by extension, their participation in entrepreneurship. The Barbadian labour market also features an income differential favouring men and sex-based segregation in the areas of work and care, all of which (according to the previous section) can result in sex-differentials in employment hours. At the industry level, men dominate administrative support, transport, electricity, gas and water supply and the goods-producing industries, most notably: natural resources, construction, mining and quarrying. In 2018, nearly 80 per cent of workers in the sectors mentioned above were men (Ministry of Labour, n.d.). Women, on the other



hand, dominate the service-providing industries, such as health, social work, education, financial, and the leisure and hospitality industries, representing 70 per cent of these workers in 2018. At the occupational level, women are more likely to be employed in jobs that require interpersonal skills or involve caregiving, such as professionals, clerks, and service workers in shops and markets. Together, these three categories of workers represented 64.5 per cent of women employed in the labour force in 2018, while only accounting for 28.0 per cent of the male labour force (Ministry of Labour, n.d.). Men are more likely to be employed in physically intensive jobs, such as craft and related workers; skilled agricultural and fisheries; and plant and machine operators and assemblers (Ministry of Labour, n.d.). Concerning wages, data from the InterAmerican Development Bank Labour Markets and Social Security Information System Database suggests that in 2016, women of working age earned BBD 2,527 per month from their main occupation, roughly 6.3 per cent less than men. Moreover, data from the 2016 Barbados Survey of Living Conditions suggests that for almost every occupation captured in that survey, women earned less than their male counterparts (see Figure 1). The most substantial gap occurred between men and women employed as plant and machine operators and craft and related trades workers, that is, jobs previously noted as male-dominated occupations. Interestingly, gender income parity is highest in the occupations previously noted to be dominated by women. Finally, data on the economically inactive shows that women are more likely to be homemakers<sup>3</sup>, pointing to gendered arrangements in the areas of household work and childcare where women bear greater responsibility for care and maintenance of the household than their male counterparts.

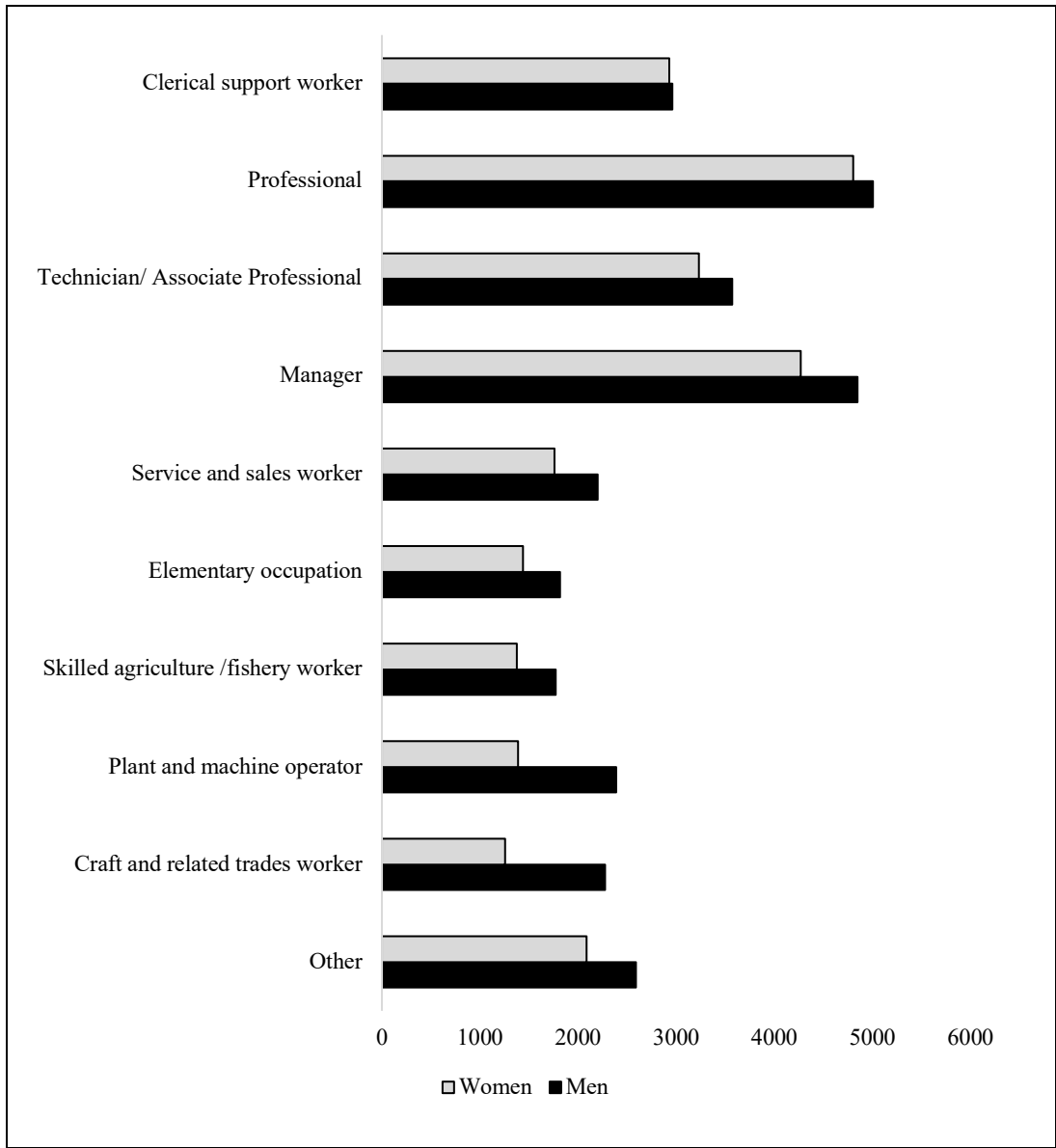
Barriteau (2001) suggests that inequalities continue to exist for women in Caribbean states partly due to the gendered nature of state institutions and the persistence of ideological relations of gender. Specifically, Barriteau (2001) contends that

“post-colonial Caribbean states continue to function with unjust gender systems...there are inequalities built into, and continuously reinforced in, their structures and practices. These inequalities occur in both the ideological and material dimensions of gender systems”.

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<sup>3</sup>According to data from the Ministry of Labour in Barbados, over 70% of homemakers were women in 2017.

Figure 1: Monthly income by sex and occupation of persons of working age (15 to 67) in 2016



Source: Barbados Living Conditions Survey, 2016

Barriteau also notes that with unjust gender systems, it is impossible to have gender-neutral policies. Specifically, if state policies fail to recognise the unevenness of gender relations, then these policies allow sex-based inequalities to persist. While there are laws and national policies that have helped to promote gender equality in Barbados, most laws and policies are indifferent to gender relations, and some even legitimise socially constructed boundaries for men and women.

For instance, the clause for discrimination in the Barbados Constitution currently makes no explicit mention of sex or gender (Allen et al., 2016). Barbados does not presently carry out gender budgeting or consider gender relations when implementing economic policies (Allen et al., 2016). As at 2020, Barbados has yet to make real progress in implementing a national gender policy, despite the Bureau of Gender Affairs drafting one in 2015 (Allen et al., 2016), suggesting that policies to promote gender equality are not urgent. As at 2020, there are no laws mandating equal remuneration for work of equal value or prohibiting non-discrimination based on gender in employment, hiring, promotions or dismissal (World Bank, 2020). Finally, laws currently mandate maternity leave (paid by the Government) but not paternity leave (paid or unpaid), which serves to legitimise and maintain societal notions of the woman's role as the primary caretaker. As alluded to earlier, ideological beliefs about the proper relationship between motherhood and paid work mean that the number of hours worked by women may not only be a function of personal preference but could also be affected by cultural factors.

## **Data and Methods**

### *Data and sample*

This paper uses data from the Barbados Continuous Labour Force Sample Survey (CLFSS). The survey is conducted quarterly by the Barbados Statistical Service and used to generate labour market statistics for the population aged 15 and over. The survey also contains questions eliciting information on household characteristics and socio-demographics. The data used in this study comes from the 2014 round of the CLFSS.

In the 2014 round, 11,580 persons responded to the survey, yielding a response rate of 85.5 per cent. The study focuses on employed heads of households of working age in Barbados (that is, aged 15 to 67), which led to an initial reduction in sample size to 2,884. Listwise deletion of missing observations across the dependent and independent variables led to a final sample consisting of 2,807 observations, which included 1,216 female heads and 1,591 male heads. We use the purged sample in all empirical analyses.

### *Variables*

The dependent variable captures responses to the CFLSS survey item that queries the normal hours worked per week. The Barbados Statistical Services uses intervals to code hours worked. The response options can be summarised as follows: less than 4 hours; 5 to 9 hours; 10 to 14 hours; 15 to 19 hours; 20 to 24 hours; 25 to 29 hours; 30 to 34 hours; 35 to 39 hours; 40 to 44 hours; 45 + hours. The purged dataset did not include any employed individuals who worked less than 10 hours per week. We express the dependent variable in log form.

Our empirical model was inspired by the theoretical literature summarised in section 2. However, we were constrained by the variables included in the CLFSS survey. Nonetheless, we were able to control for popular correlates of employment hours such as the wage rate<sup>4</sup> (and its square), age, human capital variables (education and experience), familial arrangements (the number of children in the household and marital status) and job characteristics (public sector employment, the industry of work and occupational segregation, which is measured using the Duncan index of dissimilarity by Duncan and Duncan (1955))<sup>5</sup>. Table 1 describes the independent variables used in this study.

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<sup>4</sup> As alluded to earlier, the Barbados Statistical Service captures work hours via intervals. As such, the wage rate was calculated based on rough estimates of hours worked. See Table 1 for details.

<sup>5</sup> The Duncan index captures the disparity of occupation distributions between men and women. Generally, it gives an estimate of the share of women (or men) who need to change occupations for there to be an equal distribution between men and women. See Table 1 for details.

Table 1: Description of independent variables

Independent Variable	Description
Age	Age of respondent in years
Children in household	This variable captures the number of children in the household and is presented as a 4-category variable: (1) no children; (2) 1 child; (3) 2 children; (4) 3 children; and (5) 4 children or more
Marital Status	Marital status is captured via a 3-category variable: (1) never married (reference category); (2) married; and (3) other
Education	Education represents the highest level of education completed and is captured by a 5-category variable: (1) primary/elementary (base category); (2) secondary; (3) post-secondary; (4) university; and (5) other
Experience	Experience is a 7-category variable. It is presented as follows: (1) under 1-year experience (base category); (2) 1 to 5 years of experience; (3) 6 to 10 years of experience; (4) 11 to 15 years of experience; (5) 16 to 20 years of experience; (6) Over 20 years of experience; (7) not stated
Wage rate	The CLFSS survey provides estimates of total earnings per week. However, as noted earlier, weekly employment hours variable is interval coded. The lowest extreme of each employment hours interval serves as a rough estimate of the hours worked. The wage rate is then calculated as total earnings per week divided by an estimate of hours worked that week.
Government employee	The government employee variable is a dichotomous variable, which takes on a value of 1 if the individual is employed in the public sector, 0 otherwise.
Industry	Industry is a 10-category variable presented as follows: (1) trade, transportation & utilities (base category); (2) information & communication; (3) professional and business services; (4) education & health ; (5) leisure & hospitality; (6) financial activities; (7) agriculture, forestry & fishing; (8) manufacturing; (9) construction, mining & quarrying; (10) other industries.
Occupational segregation	<p>The occupational segregation variable captures whether an individual works in a segregated household and is measured by the Duncan segregation index. An index <math>D</math> is calculated for each major occupation category <math>j</math> written as</p> $D_j = \frac{1}{2} \sum_{i=1}^N \left  \frac{m_{ij}}{M_j} - \frac{f_{ij}}{F_j} \right $ <p>where <math>m_{ij}</math> is the number of men in occupation <math>i</math> of major occupation category <math>j</math>, <math>f_{ij}</math> is the number of women in occupation <math>i</math> of major occupation category <math>j</math>, <math>M_j</math> is the total male population in occupational category <math>j</math> and <math>F_j</math> is the female population in occupational category <math>j</math>. The index can take on any value between 0 and 1. The greater the score, the greater the degree of segregation.</p>

### *Statistical Method*

The Blinder-Oaxaca decomposition method, first pioneered by Blinder (1973) and Oaxaca (1973), has emerged as the empirical workhorse to investigate group differentials in labour market outcomes. The popularity of this approach stems from its ability to decompose an outcome variable into an explained component (that is, a part explained by differences in observed characteristics or endowments) and an unexplained element (which is due differences in the average returns to the individual's characteristics). Researchers often use the unexplained component as an estimate of the degree of discrimination in the market. However, one must be cautious in using the unexplained component in this sense, as it also includes unobserved or unmeasured factors that influence labour market outcomes (World Bank, 2011).

For the most part, Blinder-Oaxaca decompositions are applied within the context of linear regression models. Nevertheless, as noted in the data subsection, the dependent variable (hours worked per week) is interval coded, and so the exact values are not observed. As such, we opt to use methods designed to handle interval data, that is the Bauer and Sinning (2008) general decomposition method, which is an extended version of the Blinder-Oaxaca decomposition that can be applied to models with discrete and limited dependent variables.

The steps are somewhat similar to that of the standard Blinder-Oaxaca approach. We begin estimating interval regressions of the (log) hours per week separately for male and female heads of households, summarised in matrix form below

$$Y^* = X'\beta + \varepsilon \quad (1)$$

where  $Y^*$  represents the unobserved logged employment hours,  $X$  is the matrix of observed characteristics that determine hours worked (previously described in Table 1),  $\beta$  is a vector of coefficient estimates and  $\varepsilon$  are residuals. Under the non-linear Blinder-Oaxaca method, the mean differences between the hours worked by male and female heads are decomposed using conditional expectations at different coefficient estimates. We opt for the Oaxaca and Ransom (1994)

approach<sup>6</sup>. The gap is decomposed into three portions: a portion attributable to differences in endowments ( $X$ ), a part attributable to the advantage of the "high" group and a part attributable to the disadvantage of the "low" group. This is summarised as:

$$\bar{Y}_M - \bar{Y}_F = [E_{\beta_P}(Y_{iM}|X_{iM}) - E_{\beta_P}(Y_{iF}|X_{iF})] + [E_{\beta_M}(Y_{iM}|X_{iM}) - E_{\beta_P}(Y_{iM}|X_{iM})] + [E_{\beta_P}(Y_{iF}|X_{iF}) - E_{\beta_F}(Y_{iF}|X_{iF})] \quad (2)$$

$\bar{Y}_M - \bar{Y}_F$  represents the gap between the average value of the log of employment hours for male and female heads;  $X_{iF}$  and  $X_{iM}$  represents the observed characteristics of male and female heads, respectively;  $\beta_M$  and  $\beta_F$  are the interval regression estimates of relevant parameter vectors; and,  $\beta_P$  is a non-discriminatory parameter obtained from a pooled regression of males and females. The first term on the right-hand side of the equation  $[E_{\beta_P}(Y_{iM}|X_{iM}) - E_{\beta_P}(Y_{iF}|X_{iF})]$  represents the portion of the hours gap that is attributable to characteristics or endowments ( $X$ ). The last two terms capture the portion of the gap that is not attributable to endowments. The term  $[E_{\beta_M}(Y_{iM}|X_{iM}) - E_{\beta_P}(Y_{iM}|X_{iM})]$  represents the part of the differential that is attributable to the advantage of the high group and  $[E_{\beta_P}(Y_{iF}|X_{iF}) - E_{\beta_F}(Y_{iF}|X_{iF})]$  displays the part of the differential that is due to the disadvantage of the low group.

## Results

### *Descriptive Statistics*

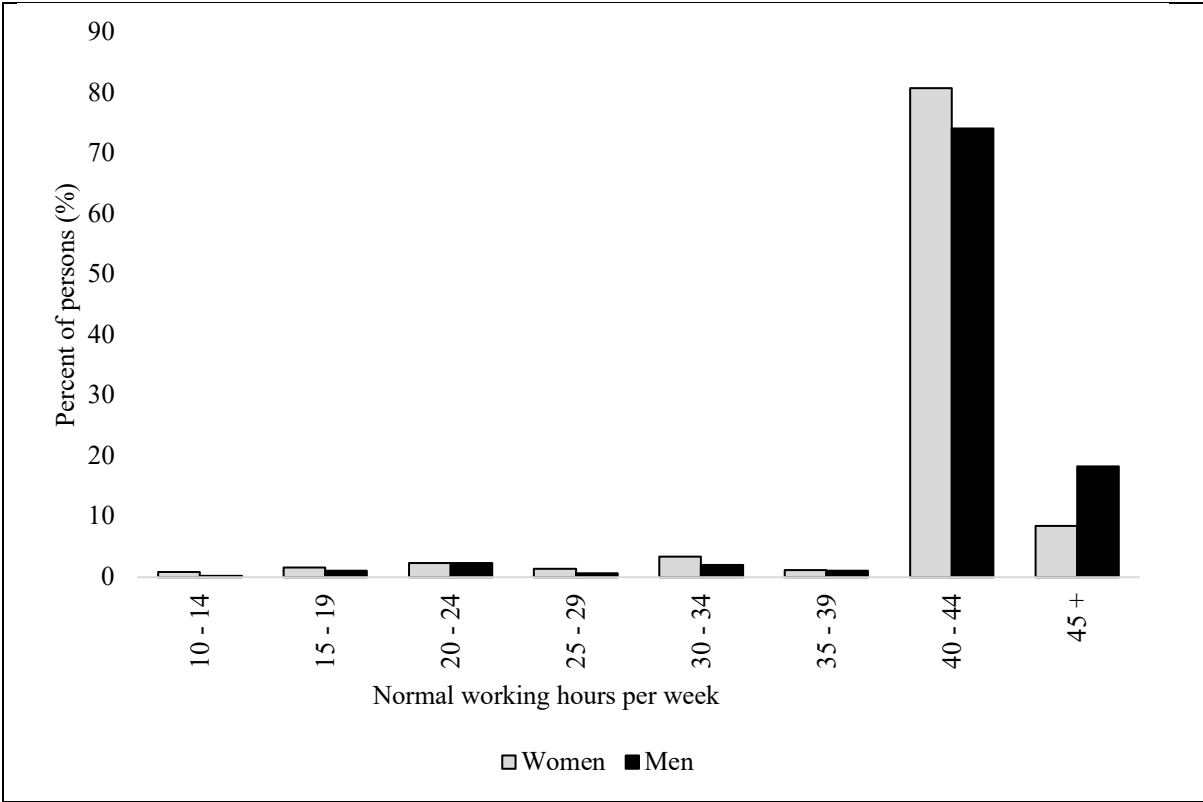
As a preliminary step to the inferential analysis, we describe the data. Figure 2 shows the distribution of male and female heads along the hours worked interval. The distribution of employment hours is skewed to the left for both men and women. There is some evidence of a gap in employment hours, with female heads being less likely to work excessive hours (that is, work more than 45 hours a week).

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<sup>6</sup>A brief summary of our approach is presented here. For greater details, see Oaxaca and Ransom (1994, 1988) and Bauer and Sinning (2008).

As noted in Section 2, differences in hours worked may be attributable to differences in the endowments of male and female heads of households. Table 2 provides descriptive statistics for the independent variables by sex. There is little evidence of a difference in the age or educational attainment of male and female households. More pronounced differences can be found in terms of work experience and wages, where male heads have greater work experience and also earn about \$2.80 more per hour than their female counterparts. Female heads are more likely to work in the public sector and work in industries such as education and health services, leisure and hospitality. Male heads were more likely to work in construction, mining & quarrying. Finally, as it relates to the family situations, female heads report a larger number of children (that is, greater dependents) and are 1.5 times more likely to be unmarried relative to male heads.

Figure 2: Distribution of employment hours of male and female heads



Source: Barbados Labour Force Survey, 2014



Table 2: Descriptive statistics for independent variables

	Women	Men	Statistical significance
<b>Categorical Variables (%)</b>			
Children in household			
No children	58.1	68.8	***
1 child	26.3	18.3	***
2 children	10.1	8.4	
3 children	3.6	2.8	
4 children or more	1.8	1.6	
Marital Status			
Never married	67.2	44.4	***
Married	16.0	45.8	***
Other	16.8	9.8	***
Education			
Primary	10.3	10.5	
Secondary	51.4	51.3	
Post-Secondary	22.2	23.0	
University	14.8	13.8	
Other	1.3	1.4	
Experience			
Under 1 year	5.1	3.8	+
1 to 5 years	21.6	16.2	***
6 to 10 years	23.0	18.8	***
11 to 15 years	16.4	14.4	
16 to 20 years	9.6	10.7	
Over 20 years	22.5	34.6	***
Not stated	1.9	1.8	
<i>Government Employee</i>	24.7	20.5	**
<i>Industry</i>			
Trade, Transport & Utility	20.9	25.4	**
Information & communication	1.0	2.4	**
Professional & business services	8.3	8.6	
Education & health services	17.4	6.8	***
Leisure & hospitality services	17.8	11.4	***
Financial activities	6.5	3.9	**
Agriculture, Forestry & Fishing	1.3	4.2	***
Manufacturing	5.8	7.5	+
Construction, mining & quarrying	2.1	17.4	***
Other industries	18.8	12.4	***
<b>Means of Continuous variables (standard deviations in parentheses)</b>			
<i>Age</i>	48.3 (9.9)	48.8 (10.1)	
<i>Wage rate</i>	14.7 (8.6)	17.5 (8.7)	***
<i>Occupational segregation</i>	0.4 (0.2)	0.3 (0.1)	***

Notes: +, \*, \*\* and \*\*\* indicate that differences between male and female heads are statistically significant at the 10, 5, 1, and 0.1 percent levels respectively.

### *Determinants of employment hours*

The results from the first stage of the non-linear Blinder-Oaxaca decomposition, that is, the estimation of the hours worked functions for male and female heads, are presented in Table 3. It

should be noted that even after expressing the dependent variable in natural logarithm form, the dependent variable is still highly skewed. This skewness could lead to non-normality in the standard errors and by extension, biased test statistics. As such, we employ bootstrapped standard errors to improve accuracy (Wright and Herrington, 2011).

The results presented in Table 3 highlight some key differences in the determinants of paid work hours of male and female heads. Familial arrangements affect the employment hours of heads of households. For men, we find that more children increase hours worked. Children appear to have a non-linear impact on female heads. When females head a household with three or fewer children, the effect children on their paid work hours resembles the effect found for men. However, beyond three children, the work hours of female heads and male heads begin to diverge. Living in a household with four children or more exerts a negative effect on the work hours of a female head, pointing to a trade-off between large families and female heads' work involvement. No such trade-off exists for male heads. Our results also indicate that the time spent in paid work by female heads is unaffected the presence of a spouse. Meanwhile, male heads experience a marital premium, whereby married male heads tend to work more than single male heads. There are also differences in the impact of working in the public sector, work experience and occupational segregation on the work hours of male and female heads of households. For female heads, being employed in the public sector and greater work experience increases their employment hours, while those employed in segregated occupations work fewer hours. The hours worked by male heads do not appear to be affected by their work experience, working in the public sector nor occupational segregation.

Amid these differences, there are some similarities in the hours worked functions concerning the impacts of age, education, industrial sector, and the wage rate. For both male and female heads, age does not affect employment hour and higher education is positively related to employment hours. The results suggest that the industry of work may dictate the time spent in paid work. The results indicate that on average, heads working in education and health services and miscellaneous industries spend the least time in paid employment. Finally, the wage rate has a non-linear (humped-shaped) effect on hours, lending credence that the theory of a backward bending supply curve holds for heads of households in Barbados.

Table 3: Interval regression of (log) Employment Hours of Heads of Households (with bootstrapping)

Variable	Women		Men	
	Coefficient	s.e.	Coefficient	s.e.
Intercept	3.724***	0.064	3.673***	0.046
Age	-0.001	0.001	0.000	0.001
Children in household (ref: none)				
1 child	0.020 <sup>+</sup>	0.011	0.025*	0.011
2 children	0.023 <sup>+</sup>	0.012	0.024*	0.012
3 children	0.027*	0.013	0.041*	0.019
4 children or more	-0.047*	0.023	0.045 <sup>+</sup>	0.024
Marital status (ref: never married)				
Married	0.001	0.016	0.018*	0.008
Other	0.022	0.021	0.003	0.020
Education (ref: primary)				
Secondary	0.021	0.028	0.006	0.019
Post-Secondary	0.040 <sup>+</sup>	0.022	0.046*	0.023
Tertiary	0.086*	0.033	0.075*	0.026
Other	0.049	0.033	0.021	0.058
Experience (ref: < 1 year)				
1 to 5 years	0.017	0.034	-0.020	0.022
6 to 10 years	0.028	0.035	-0.016	0.022
11 to 15 years	0.058 <sup>+</sup>	0.034	-0.002	0.020
16 to 20 years	0.088*	0.037	-0.009	0.024
Over 20 years	0.076*	0.038	0.008	0.019
Not stated	0.025	0.065	-0.044	0.063
Wage rate	0.006 <sup>+</sup>	0.003	0.012**	0.003
Wage rate squared $\times 10^{-3}$	0.245**	0.071	0.374***	0.061
Government Employee	0.046***	0.012	0.014	0.010
Industry (ref: Trade, Transport & Utility)				
Information & communication	0.043 <sup>+</sup>	0.025	0.038*	0.019
Professional & business services	0.011	0.022	-0.003	0.023
Education & health services	-0.044**	0.019	-0.027 <sup>+</sup>	0.016
Leisure & hospitality services	-0.023	0.018	-0.013	0.016
Financial activities	0.013	0.023	0.022	0.023
Agriculture, Forestry & Fishing	0.024	0.057	-0.011	0.026
Manufacturing	-0.031	0.031	-0.032	0.020
Construction, mining & quarrying	-0.018	0.032	-0.012	0.011
Other industries	-0.087***	0.023	-0.034 <sup>+</sup>	0.020
Occupational Segregation	-0.119***	0.034	-0.001	0.042
Sample size	1,216		1,591	

Notes: s.e. represents the bootstrapped standard errors. <sup>+</sup>, \*, \*\* and \*\*\* represent statistical significance at the 10, 5, 1, and 0.1 percent levels respectively.

### *Gaps in employment hours*

The results from the non-linear Blinder-Oaxaca decompositions are presented in Table 4.

The results are estimated using the “nldecompose” command in Stata by Sinning, Hann and Bauer (2008). Unfortunately, this form of the non-linear Blinder-Oaxaca does not allow for detailed decomposition, that is, information of the individual contributions of individual predictors to each component of the decomposition. However, one can trace the evolution of components of the gap by analysing stages. Four specifications are presented (labelled as Models 1 to 4). In each specification, we iteratively add a new subset of explanatory variables. Model 1 only contains demographic variables (that is, age, children and marital status) and serves as the baseline model. Model 2 adds the human capital variables (education and experience). Model 3 adds the wage rate (both linear and squared terms) and model 4 adds the job characteristics variables (that is, whether or not the individual is a Government employee, the industry they work in and occupational segregation). This approach allows us to monitor how the components of the gap change when new variables are added.

*Table 4: Decomposition of the gender-hours gap*

	Explained	Unexplained	
		Male advantage	Female disadvantage
Model (1): With demographics only Overall hours gap: 0.036 <sup>***</sup>	0.008 <sup>***</sup>	0.012 <sup>***</sup>	0.016 <sup>***</sup>
Model (2): Model (1) + human capital Overall hours gap: 0.036 <sup>***</sup>	0.010 <sup>***</sup>	0.011 <sup>***</sup>	0.015 <sup>***</sup>
Model (3): Model (2) + wages (per hour) Overall hours gap: 0.036 <sup>***</sup>	0.010 <sup>***</sup>	0.011 <sup>***</sup>	0.015 <sup>***</sup>
Model (4): Model (3) + Job Characteristics Overall hours gap: 0.035 <sup>***</sup>	0.017 <sup>***</sup>	0.007 <sup>**</sup>	0.011 <sup>**</sup>

Notes: +, \*, \*\* and \*\*\* represent statistical significance at the 10, 5, 1, and 0.1 percent levels respectively. Statistical significance based on bootstrapped standard errors.

The gap in employment hours between male and female heads is small. As shown in Table 4, the employment hours gap fluctuates between 0.035 and 0.036 log points, implying women heading households work about 3.6 per cent fewer hours than their male equivalents. Under a scenario where a typical full-time employee works about 40 hours a week and 47 to 49 weeks out of the

year<sup>7</sup>, then this gap easily translates to an annual hour differential of roughly 68 to 71 employment hours.

While the inclusion of various variables did not impact the size of the overall gap, it did result in differences in the size of the explained and unexplained components. In the first specification (Model 1), only 21.6 per cent of the gap could be explained by differences in age, children and marital status of heads of households. There is a sizeable female disadvantage (0.016 log points, approximately 45.4 per cent of the gap) when the model only includes age, children and marital status. Adding human capital variables to the mix (Model 2) led to a small increase in the explained component, and a slight fall in both the male advantage and female disadvantage components. Meanwhile, the addition of the wage rate (Model 3) did nothing to improve the explained component or quell the size of unexplained components. The inclusion of job characteristics (Model 4) led to a 28.3 per cent fall-off in the female disadvantage component, and a 31.0 per cent decline in the size of the male advantage, suggesting that job characteristics capture a significant portion of the heterogeneity in work hours of heads of households. Together, our independent variables explain 48.9 per cent of the gender-hour gap.

### **Concluding remarks**

The objectives of this study were to (1) determine if there is a gap in the employment of hours of male and female heads of households; and (2) if a gap exists, determine the worker endowments that largely explain the gap. Our estimates suggest that female heads of households work 3.6 per cent fewer hours than their male equivalents and that job characteristics, age, marriage and children explain the gap the most. The small gap observed is in contrast to global estimates that point to a large gap in the employment hours between men and women (International Labour Organization, 2016). A general view is that the number of hours women work outside of the home is affected by social customs and conditioning, where hegemonic cultural expectations for women to prioritise child-rearing often results in women working fewer hours than men (Webber and Williams, 2008). At the same time, heads of households provide the main (or sometimes sole) financial support for their families and their ability to provide for their household is a function of their income and by

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<sup>7</sup> According to the country's Holiday with Pay Bill, employees are typically granted 3 to 5 weeks of holiday a year.

extension, how many hours they work. The need to provide for their families could mitigate some of the gendered constraints of children. Our analysis of the individual work hour equation suggests that women heading households with three children or less work more than those heading household without children. Similar findings were found in the male work hours equation. However, economic factors are not capable of fully mitigating the constraints of children for women heading households with four children or more, pointing to a trade-off between large families and female heads' work involvement. Interestingly, we find no such trade off for male heads. The men with the greatest number of hours were those heading household with four children or more. Our descriptive analysis revealed that female heads are less likely to be married or cohabitating than male heads, and so female heads are less likely to have partners to share the day to day child-rearing. Thus, women heading large households may be forced to choose rearing children over working long hours, especially if the costs of full-time employment do not outweigh its benefits. As noted in Section 3, women in Barbados often earn less than men, even when working in similar occupations. If the pay for jobs available to female heads are low, then the monetary compensation from the job may not be sufficient to outweigh the social costs of full-time work or the child care costs they may incur, thus making child-rearing appear to be the more valid option.

Summing up, the study studies the employment hours of a relatively understudied group of men and women – heads of households. While this study sheds some quantitative light on the labour market decisions of heads of households, it is not without its shortcomings. The empirical analysis for the study utilised secondary data from the Barbados Labour Force Survey. While this is arguably the best data to use to study labour market issues in Barbados, it did place constraints on the determinants that could be included in the empirical analysis. Another concern was the measures used to record the number of hours worked in the survey. While the Barbados Statistical Service's choice to use intervals to code hours was primarily motivated by concerns about confidentiality and reporting bias, it does present a constraint concerning the type of empirical analysis we could carry out. As such, we employed the non-linear version of the Blinder-Oaxaca decomposition as this extension is designed explicitly to deal with limited dependent variables, such as our interval coded data. However, the Blinder-Oaxaca decomposition has several limitations, and so alternative methods have been proposed (see Fortin et al. (2011) for a review).

Chief among which are decomposition methods that can be applied to various distribution measures via recentered influence function regressions (Firpo *et al.*, 2018). While the aforementioned alternative technique is indeed appealing, to the best of our knowledge, this method does not currently extend to models with interval dependent variables. Computing that which is unobserved (that is, point estimates of hours worked) would mean incurring a large degree of imprecision. For this reason, we used the Bauer and Sinning (2008) general decomposition method.

An area unexplored in this study concerns the identification problem when estimating hours worked functions. It is widely accepted that the number of hours worked could be evaluated from either a supply or demand perspective. While we evaluated the impact of the wage rate from the labour supply perspective, conventional economic wisdom suggests that labour demand and wage rates are intimately related. As such, it is possible that the reaction of hours worked to the wage rate could also be related to labour demand. Second, we only focus on persons who work. As such, our sample only includes individuals with wages above their reservation wage; that is, the wage high enough to induce an individual to work. Our results could be affected by sample selection bias (Heckman, 1974). Unfortunately, data constraints prohibited us from adequately addressing identification problems. The extent to which the results presented here are affected by the identification problem could be an area of future research should data become readily available that would allow for such explorations. Finally, this study focuses on one country – Barbados. While this paper is a step towards narrowing the gap in the literature on gender inequality in the labour supply of heads of households, the findings here cannot be seen as representative. An important area for future research would be to analyse the gender gaps in the employment hours of heads of households in different types of countries and perhaps even conduct comparative analyses of developing and developed states. This will assist in confirming/reinforcing the findings of this study.

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