Assessing the role of women in tourism related sectors in the Caribbean

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Abstract.

We aim to contribute to the fast growing literature on women in tourism activities by focusing on a group of 13 Caribbean countries. We assess the impact of having a woman in apical positions (top manager or owner) for a firm (target group) on several indicators of firm' performance: productivity, profitability and share of female employment. We use several matching estimators to select appropriate control groups. With a few exceptions, the gender of the top manager or the owner makes little difference to profitability or productivity, while it positively affects the share of females employment, particularly in managerial positions.

JEL Classification: D22; J16; L26; L83; Z32;
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1. Introduction

This paper aims to contribute to the growing literature on the role of women in tourism related sectors by focusing on a group of 13 Caribbean countries, a region which has been under-researched in the gender and tourism literature. For most of these countries tourism represents an important, often vital contribution to employment and national income. Our analysis relies on a unique source of statistical information, namely the PROTEqIN enterprise survey conducted by Compete Caribbean in 2014. We consider firms in tourism related sectors - hotels, restaurants, transport and supporting activities.

We provide detailed information regarding the role of women in employment in tourist activities and, what is less common, in apical positions in the tourism industry, namely in management and ownership of tourist activities. We study both the determinants of the presence of women in apical positions and the impact on firms performance. We look at differences between firms owned and/or managed predominantly by women (our "treated" group) which we compare with closely comparable firms owned and/or managed predominantly by men, our control group.

In this way, we intersect different recent strands of the literature. First, we contribute to the study of the determinants of the segregation of women in some low value added industries and occupations within the service sector, where women tend to gather. Within the Caribbean women are more frequently employed in tourism related activities than in, say, manufacturing industries. Within tourism women tend to gather in those occupations which are generally at low productivity, such as cooking, cleaning and hospitality. This is not unusual. Similar findings are still quite common in the literature concerning gender and tourism in other regions. This is not to downplay the importance of tourism when, as in the Caribbean, there are few alternative sources of employment for women. This study confirms the potential that tourism has in empowering women in many countries, noted also in a number of recent publications isuch as Hall et al. (2018).

The second, perhaps more important innovation of our study regards the methodology adopted to assess the impact of female participation in the ownership and top management of tourism related firms. We consider the effects on performance indicators such as productivity and profitability and the impact on the share of females in employment. We use several matching estimators to select a suitable control group of similar firms that are predominantly male owned or male managed. The first of these is a propensity score (PS) matching estimator.

Since female participation in ownership and in the top management of tourism related firms are likely to interact with each other we use a second form of matching estimator. This is the Inverse Probability Weighted Regression Adjustment (IPWRA) estimator. As many firms with female owners are also managed by women, we use this methodology to assess the impact of both factors (ownership and management) separately and jointly. To our knowledge, these types of estimates have never been done earlier in the literature not only regarding the Caribbean countries covered but also for other countries.

As to the findings, our new methodology contributes to the existing literature by providing a new, more rigorous quantitative assessment of the previous findings, based on OLS or other similar estimators, by controlling for differences in observed characteristics. The study finds that, with some

exceptions, firms that are predominantly female owned or have predominantly female top managers (or both) perform neither better nor worse than others. This is not unique to tourism related firms but applies (again with some exceptions) to firms in other services and in manufacturing. In contrast having, in particular, female participation in top management does typically make a significant difference to the share of females in firm employment. An even stronger effect can be observed on the share of females employed in managerial positions.

The paper is structured as follows. Section two provides a survey of the several strands of literature that overlap with our study. Section three discusses the main characteristics of the data. We also provide an analysis of the main characteristics of our data of relevance to the study. Section four describes the methodology adopted – PS matching and IPWRA. Section five presents the main findings of the econometric analysis. First, we look at the impact of the gender of owners and managers on the two indicators of firm performance and on female employment. Then, we further analyse the absolute and relative impact of the female participation in ownership and top management using the IPWRA estimator. Section six presents the conclusions of the study.

2. Survey of the literature

This study focuses on the overlap between two different strands in the literature. Firstly, the role of women in senior positions within the firm and their impact on the firm's performance. Second, the employment of women in tourism related sectors in the Caribbean

2.1. Gender and managerial positions

The first theme in the literature that our paper develops is that on the role of women in "atypical" positions, including ownership and management of firms. Two types of questions have been asked: first question is whether and to what extent women are discriminated against in accessing these apical positions and, hence, also higher earnings. Secondly, the literature asks whether having a woman as owner or manager makes any difference in terms of firms' performance. For the first issue the literature is quite clear about the constraints that impede women from accessing apical positions in both ownership and management. For the second, the literature on the impact of women in senior positions on firms' performance is less unanimous. While some authors find a positive impact, others do not.

Regarding the first research question, several authors have shown that women tend to concentrate mainly among low skill, low productivity industries and occupations. This can be explained first of all in terms of the greater commitment of women in unpaid family work. In his seminal paper, Polachek (1981) constructs a theoretical model in which female earnings potential depreciates during temporary exits from the labour force at the same time that males remaining in the labour force see their earnings potential appreciate from continued skill development. This affects investment in skills and, hence, occupational choice. Maternity pushes women to self-segregate themselves into jobs which are less innovative and less skill driven, but are consequently paid less.

Polachek (1985) further extends this link between gender wages and a life-cycle view of occupational choice. Polachek (2014) finds the gender pay gap to be smaller between single men and women and larger between married men and women. This is attributable to his life-cycle model

of human capital and the resulting different occupational structure between the genders. In other words, due to their activity in unpaid work, women would experience a relative hardship in accumulating work experience and job tenure, which are important factors to reach apical positions.

Although declining from the 1970s, gender segregation in low productivity industries and occupations and in less senior positions is still important and explained about 40% of the gender gap in a number of developed countries in the 2000s (Blau and Kahn, 2017; Meara et al., 2019). More specifically, the negative impact of the occupational segregation of women and their tendency not to reach senior positions has effects on the wage distribution of men and women. Arulampalam et al. (2007) found that the gap was particularly sizeable at the lower (so-called "sticky floor effect") and upper (so-called "glass ceiling effect") ends of the wage distribution.

In addition to the traditional competitive advantage of men in paid work and division of roles, a further argument has been brought to the fore in the literature to explain the hardship of women in accessing managerial positions, especially the top ones, such as being a CEO, and in accessing many well paid professions. By their very nature, these jobs require a particularly large number of working hours and a high degree of temporal flexibility to be done properly (Goldin, 2014). As she notes, in these types of jobs it is not only a matter of education and human capital but of "trust" in the relationship with customers which makes the role of some individuals hard to substitute. This requires an extremely large number of hours and flexibility to work, conditions that are often not easy to meet for women. All these types of job require meeting deadlines (time pressure), adhering to pre-set schedules, impossibility, especially in some periods, to work shorter hours or undergoing interruptions. All conditions that conflict with the role of women in reproductive activities.

A number of personality traits or non-cognitive skills have been considered in a growing body of literature as factors able to explain the position of women in the labor market relative to men (Blau and Kahn, 2017, section 4). Experimental studies show that women are more risk averse than men on average, which would make them less fit for managerial positions (Croson and Gneezy, 2009), but other studies based on comparison of male and female managers find that there is no difference in the preference for risk, suggesting that the female attitude to risk may change over time because they may learn from their professional environment. In other words, preference for risk would be shaped by environment, rather than being innate.

On the other hand, a more recent strand of literature (see again Blau and Kahn, 2017) attempts to explain why women are slowly occupying a larger number of senior positions and several observers ask whether there is some competitive advantage that women have that might make them better managers and, therefore, have a positive impact on firms' performance. Some authors are considering social preferences by gender. Borghans, ter Weel, and Weinberg (2014) postulate and test whether women have better interpersonal or "people" skills than men. If this is true, then, it might give to women some advantage in some type of managerial positions. suited to perform monitoring, controlling and other tasks typical of independent directors. Team collaboration is greatly improved when the group includes female members; the presence of women directors increases the attendance rate of the board members, including among male directors.

Some authors, such as Schwartz-Ziv (2017) proposed the minimum of three women directors as a critical threshold. Some papers find a positive association between the presence of women directors, on the one hand, and board and company performance on the other hand (e.g. Carter et

al. 2003; Campbell and Minguez-Vera 2008; Francoeur et al. 2008; Garanina and Muravyev, 2019). Others report no statistically significant relationship (Carter et al. 2010; Miller and Triana 2009; Rose 2007, Marinova et al. 2015). Some even find a negative relationship between these factors (Adams and Ferreira 2009; Bøhren and Strøm 2010; Haslam et al. 2010; Ahern and Dittmar 2012). Finally, Gonzàlez et al. (2018) find a negative effect for family female directors and a positive one for outside female directors.

2.2. Gender and tourism

The focus of this paper is on the role of gender participation in tourist activities, either as workforce or as managers and owners of tourism related activities. This survey is therefore focused on this more recent, but fast growing body of literature[1].

Probably the first important contribution to this new strand of literature is constituted by a 1995 special issue of the Annals of Tourism Research edited by Margaret Byrne Swain. As she notes, tourism was originally a high class, male activity in the mid-1700s. Only more recently, It has become an activity for the entire population, including the middle class and women. Before the special issue by Swain, there were three main types of studies on gender and tourism: a) gender issues in tourism; b) feminist theories in leisure studies; c) interpretations of the meaning of the expression "gendered tourism".

The first strand focuses on tourism as a tool of economic development and how women start to play a role in this new sector (Hall et al. 2013). Our paper contributes to some new developments of this, more economic, stream of the literature. As Figueroa-Domecq et al. (2017) noted, after a decade of marginal ttention, these issues are generating a renewed interest which is witnessed by a large number of new papers. This literature mirrors the increasing importance that tourism is quickly gaining over the years worldwide: tourism represents an ever increasing share of GDP not only in some countries vocated to tourism, but also in more mature advanced economies with a complex economic structure. Moreover, due to the nature of service sector with specific characteristics – providing hospitality especially in some months of the years – tourism tends to be strongly related to gender and also with low pay, low productivity, often seasonal jobs, which attract the attention of researchers for the consequences, risks and opportunities that they generate for women.

In a United Nations World Tourism Organization (UNWTO) Global Report on women in tourism, published in 2010 it was found that 'women in tourism are still underpaid, under-utilized, under-educated and under-represented' (UNWTO, 2010: p. ii). Yet, in the same report, the UNWTO argued that tourism still represented one of the best means through which women could be empowered from an economic point of view, particularly in developing countries, where other sectors are lagging behind.

Boluk et al. (2019) highlight the importance of gender equality for the development of sustainable tourism, as also noted by the UNWTO in a declaration of 2017. This declaration positions tourism as a tool to advance the universal 2030 Agenda for Sustainable Development, including the 17

[1] For a recent more in-depth overview of the literature and the main issues under discussion, see Morgan and Pritchard (2019).

Sustainable Development Goals (2015–2030) (SDGs) and 169 targets. The latter has substituted the MDGs which, despite the emphasis, were not reached by 2015.

Recent studies have demonstrated the existence of gender inequality in leadership positions (see Munar et al, 2015; Pritchard and Morgan, 2017). Serious questions still remain about the complex and interlocking factors that result in the continued disempowerment of women in tourism and which have defied any sustainable transformation. Maliva et al. (2018) and Foley et al. (2018) in a special issue on gender and tourism have provided counter-narratives to hegemonic representations of the Third World woman in tourism as 'victim': in Zanzibar, Papua New Guinea and other similarly low income countries, tourism is contributing to empower women. Other similar previous studies (Movono and Dahles, 2017; and Tucker, 2007) had reinforced this concept in different country contexts, such as the Fiji highlands and Turkey respectively, showing that the possibility to work in tourism and earn a pay pushed many women in these countries to put under discussion traditional gender roles which tended to exclude or marginalize women from some jobs.

An important point to consider when looking at gender and tourism in developing countries is that female empowerment and, in turn, its opposite, namely female gap with respect to men is complicated by other gaps due to other factors which multiply the hardship of women. In particular these include ethnicity, living in rural areas and belonging to a poor household. Still, as Ferguson (2010) notes, tourism may represents an important source to empower women and reach the 3rd Millennium Development Goal. However, economic policy interventions aimed at fostering female employment, ownership and management are still underdeveloped, despite their high expected potential.

According to Rinaldi and Salerno (2019), women represent about 46% of employment in the sector worldwide, although still women experience sectoral and occupational segregation also within this industry. For instance, women tend to occupy positions in cooking, cleaning and hospitality, rather than in more qualified occupations and branches (on this, see also: Purcell, 1997; Campos-Soria et al., 2011). Santero-Sanchez et al. (2015) provide evidence of the lower quality level of jobs occupied by women using their job quality index.

The share of female employment is higher than in other sectors, but still below the average and wages are worldwide about 35-40% lower than for men employed in the sector according to World Bank data. Existing studies already document the existence of a gender pay gap in the tourism industry in several countries which is not explained only by different productivity characteristics, but is due to some form of discrimination, namely a different way the same characteristics are paid for men and women (for the case of Spain, see Campos-Soria et al., 2011b; for Braxil, Ferreira Freire Guimaraes and Silva, 2016).

Moreover, the existence of a glass ceiling effect, namely a larger gap at the highest end of the wage distribution, has been long identified in tourism economics and tourism management (Cotter et al., 2001).

Firms owned by women face constraints in their access to credit (International Finance Corporation 2011), while female social networks are less developed (Baines and Wheelock, 2000) which correlates with their businesses having less success. Carvalho et al (2019) uttered this point of view showing that women continue to be considered less fit for management also in the tourist sector,

although discrimination is not overt anymore, but invisible and therefore still pervasive. In turn, the prejudice that women are less competent and less fit for management reinforces in a more subtle way the well-known glass ceiling effect (see, also, Acker, 1998; Bruni, Gherardi, & Poggio, 2004; Patterson, Mavin, & Turner, 2012).

By bringing to the fore arguments similar to Goldin (2014), interestingly, Costa et al. (2017) define a sort of ideal type of tourism worker (and manager) showing that women may find themselves excluded from some apical positions because of their hardship in being as flexible as required in some types of jobs in terms of working hours. “Tourism is notorious for having very long work hours, at unsocial times and days (e.g. the weekend).Besides, shift work is very common, mainly because tourist services are available 24h a day, seven days a week” (p. 64). As a consequence, “flexibility”, or, more specifically, employer-friendly flexibility, meant as availability to work at any hour that the employer is requesting is considered an important asset in the sector. In other words, the ideal type of tourism worker and manager would follow more closely male, rather than female norms of behavior, therefore favoring men to women in managerial roles.

Nonetheless, Rinaldi and Salerno (2019) report evidence showing that female participation in ownership and management of tourist activities is dramatically increasing in many countries, especially the most advanced, such as countries of the EU, although differences are still remarkable and empirical evidence by country is useful to better assess the evolution of the phenomenon.

As noted above, policy interventions aimed at fostering female participation in employment, management and ownership of tourist activities are expected to have much success (see Ferguson, 2011) considering that women do have a comparative advantage in this type of sector related to services, hospitality, organization of events and other similar service sector activities. In fact, in more advanced economies, female entrepreneurship and management in the sector is now becoming even more frequent and successful than that of men.

2.3. The Caribbean experience

Like other previous studies, Johnson and Devonish (2008) look at the motivations of the demand for tourist services in the Barbados. They also look at gender differences in preferences and how they impact on the choice of the destination and pattern of tourist activities and services requested.

Much early research on gender and tourism in the Caribbean focused on sex tourism (see, for instance, Phillips, 2008 and the references therein). Recent research is exploring the case of romance tourism by female tourists (for the case of Jamaica, see Pruitt and LaFont, 1995). We are interested, instead, on the role of women in the economics and management of tourist activities in the Caribbean.

In their early study on gender and tourism in the Barbados, Levy and Lerch (1991) report their findings from qualitative interviews to a small sample of 53 men and 80 women. They found that women occupied low productivity and low earning job positions, due to their involvement in unpaid family work and their low qualification for jobs in the tourist sector. The authors concluded that for tourism to be a more important source of development and gender equality much should be done to

better train women, introduce more flexible hours arrangements and promote female entrepreneurship.

Gentry (2007), Vandergrift (2008), Duffy et al. (2015) reach similar conclusions for the work of women in tourism in Belize, Costa Rica and the Dominican Republic respectively. They also find a high degree of segregation in specific types of low productivity occupations iwthin the sector.

Interestingly, from our point of view, Gentry (2007) highlights how in Belize female ownership is also associated with small and very small businesses_ B&B, small restaurants and so on. The possibility to start these types of businesses also without a capital is attractive for women and represent for them a real tool to empower themselves and increase their status. Starting their own business helps women aquire some decision making power within the family and in the public sphere.

Regarding management positions, Gentry (2007) reports that in foreign owned companies operating in Belize, most top managers were from abroad because the owners felt that local workers were generally not qualified for those positions, but several intermediate positions were occupied by Belizians who were trained within the hotels. In the Belizean-owned companies, local workers were more frequent.

3. Data

3.1 The Dataset

The data for this study were taken from the PROTEqIN enterprise survey conducted by Compete Caribbean in 2014. Details of the survey, including questionnaire and data, can be found here: http://competecaribbean.org/proteqin/ . The survey yielded usable data for a total of 1890 firms, of which 407 were classified in "tourism related" activities. For the purposes of this study "tourism related" was defined as all firms within ISIC (rev.3.1) categories 5510 (hotels etc.) and 5520 (restaurants, bars etc.) plus firms within the categories 6010 to 6309 (transport and supporting activities) excluding all those firms engaged in the transportation, storage and handling of goods rather than people.

The study uses data for both "tourism related" and other firms. Data on firms from other sectors – manufacture and other services – were included to provide a degree of benchmarking. That is, to provide a sense of whether female participation in tourism related firms is greater than in other economic sectors. The data covers a total of 13 different Caribbean countries (listed in Table 2). Table 1 provides details of female labour force participation. It reports the mean share of females in total full-time employment by broad sector and type of job.

Table 1: Mean female share in firm level employment* by sector and type of job, 2013					
	All	Management	Skilled production	Unskilled production	Non-production
Manufacture	30.0%	23.6%	25.4%	25.6%	46.6%
Other services	34.1%	19.6%	28.2%	33.6%	48.1%
Tourism related	36.5%	21.9%	31.2%	37.4%	49.5%
of which:					
Travel	31.9%	27.6%	31.3%	32.2%	37.0%
Hospitality	37.5%	20.5%	31.1%	38.9%	51.0%
* Temporary workers counted as permanent equivalents (fractional)					
Source: PROTEqIN survey					

The data shows that in the Caribbean, as in other parts of the world, tourism related activities do employ a higher proportion of females than other sectors. This is more attributable to high female participation rates in the hospitality sector than in travel and supporting activities. That female participation in tourism related activities is more concentrated in lower skill, lower paid occupations is partly supported by female participation rates in management positions. Firms in the tourism related sector have lower female participation in management jobs than in manufacture but not in other services. Across all sectors females are least well represented in management of all the job categories.

Table 2 presents similar data but for each country in the sample. The data reveal considerable variation in mean female participation rates at firm level between one country and another. For tourism related activities these range from as low as 21% in Dominica to as high as 60% in Guyana. A similar degree of variation is also present in other economic sectors where mean female participation rates vary from 19% in the Bahamas to 45% in Jamaica. For most but not all countries in the sample female participation rates are higher in tourism related activities than in other sectors.

The degree of variation between countries is more extreme with respect to managerial positions. Mean firm level female participation rates in tourism related activities vary from 2.4% in Trinidad and Tobago to 61% in Guyana. Again a similar variation across countries can be observed for other economic sectors. The importance of variations between countries is such that later econometric analysis includes a number of country level variables to capture these differences.

One feature of Table 2 is that the data for three countries – Barbados, Belize and Jamaica – suggest that no “production” workers were employed in tourism related firms yet such workers were recorded in all other countries. It is impossible to know but it is possible that the same job has been differently recorded in different countries. In some senses services are not production and can have no “production” workers but, for example, chefs and waiters do “produce” a service and, arguably, could be counted as “production” workers. For these reasons this study treats the data on total and managerial employment as reliable but not those for other employment categories. Accordingly the econometric analysis focuses only on total and managerial employment.

Table 2: Mean Share of Female Employees in Firm Level Full-time Employment*, by Country, 2013						
		Mean share of females in full-time employment:				
Country	Sector	All	Managememt	Production		Non-production
				Skilled	Unskilled	
Antigua - Barbuda	tourism related	30.1%	26.7%	28.0%	42.1%	20.2%
	all other	21.8%	25.8%	11.1%	28.2%	24.3%
The Bahamas	tourism related	24.3%	23.1%	19.6%	34.6%	21.5%
	all other	18.9%	21.8%	15.3%	18.0%	19.4%
Barbados	tourism related	53.8%	35.8%			55.9%
	all other	39.8%	25.1%	24.7%	20.1%	47.6%
Belize	tourism related	53.7%	52.6%			54.0%
	all other	35.9%	28.2%	27.5%	20.5%	44.1%
Dominica	tourism related	20.6%	26.8%	15.4%	17.9%	18.2%
	all other	22.8%	30.2%	16.0%	19.6%	24.8%
Grenada	tourism related	28.4%	32.8%	5.7%	61.6%	20.2%
	all other	26.1%	31.9%	16.6%	28.9%	23.2%
Guyana	tourism related	62.0%	61.0%	77.9%	53.8%	58.3%
	all other	35.5%	39.0%	27.0%	56.9%	43.0%
Jamaica	tourism related	53.6%	29.3%			56.1%
	all other	45.4%	28.2%	33.2%	30.4%	55.7%
Saint Lucia	tourism related	30.8%	45.1%	9.1%	48.0%	20.0%
	all other	21.3%	31.2%	6.3%	24.2%	25.9%
St-Kitts and Nevis	tourism related	37.3%	34.6%	33.5%	42.9%	39.9%
	all other	23.1%	28.5%	14.8%	28.1%	22.3%
St-Vincent and the Grenadines	tourism related	24.9%	22.8%	16.1%	43.7%	17.7%
	all other	24.0%	32.6%	9.8%	23.9%	25.1%
Suriname	tourism related	47.6%	44.7%	26.0%	10.0%	57.3%
	all other	32.6%	36.0%	27.3%	19.2%	49.0%
Trinidad & Tobago	tourism related	35.5%	2.4%	52.3%	47.5%	92.6%
	all other	28.2%	3.7%	38.8%	36.1%	72.3%
* Temporary workers counted as permanent equivalents (fractional)						
Source: PROTEqIN survey						

The PROTEqIN survey asks firms to report the extent to which they are (a) owned and (b) managed by males or females. Response scores can vary from 1 (all men) to 5 (all women), with a score of 3 representing an approximate balance between males and females. Table 3 summarises the survey data. It reports the percentage of firms recording a score of 3 (approximate gender balance) or higher for both ownership and management.

The data show that the proportion of firms in tourism related activities in the Caribbean that are not predominantly male owned is comparable to other service sector firms but higher than in manufacture. In terms of management of firms the proportion that are not predominantly male managed is substantially higher in tourism related activities than other sectors.

Table 3: Female Ownership and Top Management of Firms, 2013.		
Sector	**% of firms not**	
	premoninantly male	
	owned	**managed**
tourism related	30.2%	39.8%
of which:		
travel	16.9%	31.2%
hospitality	33.3%	41.8%
manufacture	28.9%	33.1%
other services	30.7%	36.4%
Source: PROTEqIN survey		

Table 4 provides a similar summary on a country by country basis. Again there is considerable variation between one country and another. In terms of ownership as few as 9% of tourism related firms in Antigua and Barbuda and the Bahamas have other than predominantly male or wholly male owners. The comparable figure for Guyana is 60%. This variation between countries is greater for tourism related activities than for other sectors. In most but not all countries the proportion of firms not predominantly male owned is higher for tourism related firms than in other sectors.

In almost all countries the proportion of firms in which the top management is not wholly or predominantly male is substantially higher than in the case of ownership. With respect to top management firms not male dominated vary from 23.5% in Suriname to 90% in Guyana.

Table 4: Female Ownership and Top Management by Country, 2013			
Country	**Sector**	**% of firms not**	
		premoninantly male	
		owned	**managed**
Antigua - Barbuda	tourism related	9.1%	25.0%
	all other	16.1%	13.8%
The Bahamas	tourism related	9.4%	78.1%
	all other	22.1%	64.2%
Barbados	tourism related	47.1%	47.1%
	all other	40.8%	30.3%
Belize	tourism related	46.9%	46.9%
	all other	46.1%	50.0%
Dominica	tourism related	14.8%	31.5%
	all other	13.9%	25.0%
Grenada	tourism related	42.1%	39.5%
	all other	35.2%	39.6%
Guyana	tourism related	60.0%	90.0%
	all other	33.0%	42.0%
Jamaica	tourism related	55.6%	27.8%
	all other	43.1%	32.4%
Saint Lucia	tourism related	16.7%	33.3%
	all other	17.4%	25.0%
St-Kitts and Nevis	tourism related	36.4%	27.3%
	all other	37.4%	33.0%
St-Vincent and the Grenadines	tourism related	32.0%	48.0%
	all other	39.3%	44.9%
Suriname	tourism related	35.3%	23.5%
	all other	28.2%	35.3%
Trinidad & Tobago	tourism related	38.2%	35.3%
	all other	20.9%	30.1%
Source: PROTEqIN survey			

3.2 Variables

3.2.1 Country Level Control Variables

As has already been seen it is not possible to treat the Caribbean as a single homogeneous entity. This means that subsequent analysis needs to be capable of capturing differences between one country and another. To do this a number of country level variables were used in both strands of analysis. Data were taken from the World Bank's *World Development Indicators* database. The variables were:

- *regeff* - distance to frontier score (a measure of regulatory efficacy)
- *internet* - secure Internet servers (per 1 million people)
- *gdpcap* - GDP per capita (current US$)
- *rural* - rural population (% of total population)

All country variables were used as control variables.

3.2.2 Outcome Variables

For the analysis of the effects of female ownership and female top management on firm performance the following two outcome (dependent) variables were used:

- *lopw* - log of output per worker (productivity)
- *lppw* – log of profit per worker (profitablility)

For the analysis of the effects of female ownership and top management on female employment the following outcome variables were used:

- *fsall* – the share of females in the firm's total employment
- *fsmg* – the share of females in the firm's managerial employees

3.2.3 Treatment Variables

For both strands of analysis the same treatment variables were used. These were:

- *femown* - 0 if the firm was predominantly or wholly owned by males, 1 if otherwise
- *femboss* – 0 if the firm's top management was predominantly or wholly male, 1 if otherwise.

3.2.4 Firm Level Control Variables

The following control variables were used in both the analysis of firm performance and of female employment:

- *empall* - total full-time employees (used as a measure of firm size)
- *foreign* – percentage foreign ownership
- *age* – age of the firm
- *manexp* – number of years of experience of the firm's top manager
- *loan* – (0,1) whether or not the firm was in receipt of a loan or line of credit

For the analysis of firm performance two further control variables were included. Both of them were calculated as the mean of the firm's response to several different questions concerning obstacles, each scored from 0 (no obstacle) to 4 (very severe obstacle). These were:

- *infrastructure* – the mean response score for telecommunications, electricity and transport
- *bureaucracy* – the mean response score for customs, tax administration, business licensing and labour regulations.

For the analysis of female employment the following control variables were also used:

- *training* – (0,1) whether or not the firm had provided training to its full-time employees
- *seas* – the share of temporary or seasonal workers in full-time employment
- *workeduc* – the perceived extent to which inadequate education of the firm's employees was perceived as an obstacle (scored from 0 = no obstacles to 4 = very severe obstacle)

4. Methodology

4.1 Overview

The data used for this study is from a firm level survey covering 13 different countries. Initial analysis of the data has already revealed considerable heterogeneity between one country and another. Heterogeneity between one firm and another is commonplace with enterprise survey data. A common approach to deal with heterogeneity and the consequent risk of sample selection bias is to make use of one or more matching estimators. The approach of this study is to use two different matching estimators – propensity score (PS) and inverse probability weighted regression adjustment (IPWRA).

4.2 Propensity Score (PS) Matching

Propensity score matching seeks to estimate whether a (0,1) "treatment " variable has a statistically significant effect on an outcome variable. For example, it may seek to test whether the (0,1) variable of a female top manager has a statistically significant effect on the share of females in the firm's employment. A simplistic approach would be to divide the sample into *treated* (firms with a female top manager) and *untreated* (firms with a male top manager) and test for a difference in means between the two groups. The propensity score (PS) matching approach is not dissimilar but seeks to compare the treated group with a carefully selected control group drawn from within the untreated group.

At the heart of all matching approaches is an attempt to address a problem known as "missing data". We can observe that a particular firm had a female top manager at the time of the survey and the share of females in the firm's employment. But we cannot observe what the share of females in the same firm's employment would have been had the top manager been male. This is the "missing data" problem. Matching seeks to create these missing data from observations of untreated (male managed) firms which are identical in all relevant characteristics other than the gender of their top manager. In effect, it selects a control group to create a counter-factual for the missing data.

Propensity score matching uses a series of *control* variables to construct a "propensity score". This is a probability model (probit in this study) which estimates the probability of observing treatment (a firm with a female top manager) given the control variables. The control variables should be relevant to explaining the outcome (the share of females in employment) and not necessarily the treatment (female top manager). This propensity score is then used to select the control group.

There are three possible treatment effects that can be subsequently derived. These are: :

- ATE – the average treatment effect in the population (defined as all treated and untreated firms or individuals)
  $ATE = E(Y_{1i} - Y_{0i}) \equiv E(\beta_i)$ (1)
- ATT – the average treatment effect for treated firms
  $ATT = E(Y_{1i} - Y_{0i} \mid D_i = 1) \equiv E(\beta_i \mid D_i = 1)$ (2)
- ATNT – the average treatment effect for untreated firms
  $ATNT = E(Y_{1i} - Y_{0i} \mid D_i = 0) \equiv E(\beta_i \mid D_i = 0)$ (3)

where Y is the outcome (share of females in employment), with subscript 1 for those firms that are *treated* (female top manager) and subscript 0 for those that are not (male top manager). D is an indicator of the treatment received (by definition 1 for treated and 0 for untreated). The treatment effect was estimated using the *psmatch2* routine in *Stata* and the results reported in this study are for the average treatment effect on the treated group (ATT). There exist a number of different ways to select a control group from any given propensity score. This study used matching by kernel density.

Having produced an estimate of ATT it is necessary to assess how well the treated group and the selected control are matched: to check how well the control group matches the treated group in terms of all the covariates used for selection. This is known as checking for *bias on obeservables*. Such checks and tests are not included for conciseness but may be found online at:

A further potential problem with the PS matching is known as bias on unobservables. This is similar to omitted variable bias in regression models. This bias can arise if an important confounding variable has been excluded from the propensity score and, hence, from the selection of the control group. As with confounding variables more generally there is no certain method to avoid such bias. The strategy of this study has been to minimise the risk of an excluded variable by including as many firm level and country level control variables as possible.

4.3 Matching with Inverse Probability Weighted Regression Adjustment (IPWRA)

The IPWRA model has some common ground with the PS matching one. That is, like PS matching it estimates a (probability of) treatment model. In this study logit rather than probit is used for that purpose. For example this gives the probability of observing a female top manager given that the firm is, say, foreign owned or is small in size. This treatment model is used to assign a sampling probability for each observation. This provides a solution to the missing data problem. The inverse probabilities – the probability of the counter-factual that the firm had a male top manager – can be used to model the missing data.

The IPWRA model differs from PS matching in that it also includes an outcome model – for example, a model of the determination of the share of females in firm employment. In the outcome model the inverse probabilities are used to weight each observation. In effect, this weights all observations by their (counter-factual) inverse probability. The technique estimates multiple outcome models - one for each treatment level – each with a predicted outcome. Estimates of treatment effects (ATT) are based on the means of these predicted outcomes.

The explicit estimation of inverse probabilities and, hence, a clear counter-factual for the missing data problem is an attractive feature of the IPWRA. As Cattaneo (2010) and Cattaneo et al (2013) show the IPWRA technique also has the very useful property of “double robustness”. The technique comprises both a treatment and outcome model. If either one of these is mis-specified but the other is correctly specified then the IPWRA estimator is still consistent. A further problem with matching models is selecting a control group on irrelevant variables. King and Nielsen (2016) found IPWRA estimators to be less prone to bias from mis-matching on irrelevant observables. Doubly robust estimators such as IPWRA were found by Hirano et al (2003) to exhibit lower bias than other estimators.

For the purposes of this study a particularly useful feature of the IPWRA model is that, unlike PS matching, it allows for more than one treatment variables. In this study the main focus is on two treatment variables – female top management and female ownership. The IPWRA technique allows treatment effects to estimated not only for each individual "treatment" but also for the interaction between the two. The ability to differentiate firms with female participation in both ownership and top management from firms with female participation in just one clearly offers additional breadth to the analysis.

5. Firm Performance and the Gender of Owners and Top Managers

In Table 3 this study showed that, for the sample of tourism related firms, the share of firms with equal or greater than equal female ownership or top management was higher than for other economic sectors. Likewise the proportion of firm with equal or more than equal top management was higher than in other sectors. There are many possible explanations as to why tourism related activities might exhibit comparatively more female owned and run firms. The purpose of this analysis is to test whether firm performance has a role at all in any of these explanations.

Table 5 presents the results of the propensity score matching analysis. This tests whether (a) female ownership and (b) female top management have a statistically significant effect on, firstly, productivity and, secondly, profitability. Those results which are statistically significant at 90% confidence or higher are highlighted.

For tourism related firms female participation in top management is found to have a statistically significant (at 90% confidence) and negative effect on productivity. Careful interpretation is needed. This finding does not tell us whether or not females are only more likely to be given opportunities in poorer performing firms or whether other factors cause them perform worse. This finding is also atypical. There was no statistically significant effect of female top managers on profitability in tourism related firms. Nor did female ownership have any statistically significant effect on either productivity or profitability. It is also worth noting that the sample size for tests of the effect on profitability are smaller because unprofitable firms are necessarily excluded (logs of negative numbers do not exist). It is possible, even likely, that excluding loss making firms would have made the effect on productivity also statistically insignificant.

Tourism related firms in transport and supporting activities were not separately analysed because of the small sample size. For hospitality (hotels, bars, restaurants and the like) a separate analysis was completed. This reflects the findings of the analysis for all tourism related firms. Female top managers were associated with a statistically significant (at 90%) and negative effect on productivity but had no statistically significant effect on profitability. Female ownership again had no statistically significant effect on either productivity or profitability.

To assess the extent to which these findings are unique to tourism related firms or simply reflect characteristics which apply to Caribbean economies more widely the analysis was extended to, firstly, manufacture and, secondly, other services. For manufacture there was no statistically significant effect of female top managers on productivity and no statistically significant effect of female owners on either productivity or profitability. The only statistically significant effect (at 95% confidence) was a positive effect of female top managers on profitability.

The findings for other services are broadly similar. Female top managers had no statistically significant effect on either productivity or profitability. Female owners had a statistically

TABLE 5: PROPENSITY SCORE MATCHING (KERNEL DENSITY) RESULTS FOR FIRM PERFORMANCE

Tourism Related

A. Treatment: female top manager

Variable	Sample	Treated	Controls	Difference	S.E.	t stat	Observations	
A.1 Outcome = productivity (log output per worker)								
lspw	Unmatche	9.154518	9.25543	-0.10091	0.146817	-0.69	Untreated	244
	ATT	9.154518	9.505966	-0.35145	0.181991	-1.93	Treated	162
							Total	406
A.2 Outcome = profitability (log profit per worker)								
lppw	Unmatche	7.576891	7.736794	-0.1599	0.20384	-0.78	Untreated	216
	ATT	7.576891	7.935751	-0.35886	0.253134	-1.42	Treated	136
							Total	352

B. Treatment: female owner

B.1 Outcome = productivity (log output per worker)								
lspw	Unmatche	8.927922	9.345917	-0.41799	0.15376	-2.72	Untreated	279
	ATT	8.927922	9.154251	-0.22633	0.172879	-1.31	Treated	127
							Total	406
B.2 Outcome = profitability (log profit per worker)								
lppw	Unmatche	7.253629	7.895739	-0.64211	0.20632	-3.11	Untreated	231
	ATT	7.253629	7.608003	-0.35437	0.228865	-1.55	Treated	121
							Total	352

Of which: hospitality

A. Treatment: female top manager

Variable	Sample	Treated	Controls	Differenc	S.E.	t stat		
A.1 Outcome = productivity (log output per worker)								
lspw	Unmatche	9.108346	9.177201	-0.06885	0.167885	-0.41	Untreated	191
	ATT	9.108346	9.469651	-0.3613	0.21252	-1.7	Treated	138
							Total	329
A.2 Outcome = profitability (log profit per worker)								
lspw	Unmatche	8.87291	9.292399	-0.41949	0.172959	-2.43	Untreated	173
	ATT	8.871957	9.039867	-0.16791	0.195441	-0.86	Treated	117
							Total	290

B. Treatment: female owner

B.1 Outcome = productivity (log output per worker)								
lspw	Unmatche	8.959513	9.151096	-0.19158	0.266414	-0.72	Untreated	216
	ATT	8.916896	8.954081	-0.03718	0.302395	-0.12	Treated	113
							Total	329
B.2 Outcome = profitability (log profit per worker)								
lppw	Unmatche	7.213737	7.798609	-0.58487	0.230766	-2.53	Untreated	183
	ATT	7.225859	7.451242	-0.22538	0.256929	-0.88	Treated	107
							Total	290

Manufacture

A. Treatment: female top manager

Variable	Sample	Treated	Controls	Difference	S.E.	t stat	Observations	
A.1 Outcome = productivity (log output per worker)								
lspw	Unmatche	8.911206	8.588903	0.322303	0.166643	1.93	Untreated	411
	ATT	8.911206	8.712909	0.198297	0.171906	1.15	Treated	208
							Total	619
A.2 Outcome = profitability (log profit per worker)								
lppw	Unmatche	7.497916	6.997721	0.500195	0.216645	2.31	Untreated	341
	ATT	7.497916	7.048305	0.449611	0.2206	2.04	Treated	170
							Total	511

B. Treatment: female owner

B.1 Outcome = productivity (log output per worker)								
lspw	Unmatche	8.627105	8.7264	-0.09929	0.173245	-0.57	Untreated	437
	ATT	8.615192	8.740475	-0.12528	0.175049	-0.72	Treated	182
							Total	619
B.2 Outcome = profitability (log profit per worker)								
lppw	Unmatche	7.137391	7.174923	-0.03753	0.226668	-0.17	Untreated	364
	ATT	7.129035	7.156074	-0.02704	0.231056	-0.12	Treated	147
							Total	511

Other Services

A. Treatment: female top manager

Variable	Sample	Treated	Controls	Differenc	S.E.	t stat		
A.1 Outcome = productivity (log output per worker)								
lspw	Unmatche	8.749081	8.950133	-0.20105	0.143344	-1.4	Untreated	538
	ATT	8.749081	8.945469	-0.19639	0.155919	-1.26	Treated	311
							Total	849
A.2 Outcome = profitability (log profit per worker)								
lppw	Unmatche	7.334188	7.598597	-0.26441	0.176969	-1.49	Untreated	483
	ATT	7.334188	7.546915	-0.21273	0.191381	-1.11	Treated	251
							Total	734

B. Treatment: female owner

B.1 Outcome = productivity (log output per worker)								
lspw	Unmatche	8.539332	9.028636	-0.4893	0.148424	-3.3	Untreated	585
	ATT	8.539332	8.812945	-0.27361	0.161986	-1.69	Treated	264
							Total	849
B.2 Outcome = profitability (log profit per worker)								
lppw	Unmatche	7.225525	7.641292	-0.41577	0.179556	-2.32	Untreated	499
	ATT	7.225525	7.403176	-0.17765	0.190507	-0.93	Treated	235
							Total	734

significant (90% confidence) negative effect on productivity but no statistically significant effect on profitability.

Taken over all sectors there were sixteen tests for the effect of female ownership and top management on productivity and profitability. Of these twelve yielded no statistically significant results and three of the four others were statistically significant at 90% confidence but not at 95%. There are some qualifications but the general conclusion of the propensity score analysis is that in Caribbean the gender of firms' owners makes little difference to firm performance. In this respect tourism related firms are not different from other sectors.

Table 6 sets out the results of the IPWRA analysis of the effects of female ownership and top management on productivity for tourism related firms and for (the subset of) firms in hospitality. Other services and manufacture are again included to provide a sense of whether tourism related firms are somehow distinct from other sectors. Absolute effects provide a comparison between female owned or female run firms to the control group of firms which are both predominantly male owned and have predominantly male top management. Note that "Both" refers to firms which have at least equal female ownership and at least equal female top management. In terms of absolute effects there were no statistically significant results either for tourism related firms overall or for hospitality firms. That is, there are no statistically significant differences in productivity performance between firms that are male dominated (in ownership and top management) and firms that are not.

By way of comparison the absolute effects for other services suggest that there is no statistically significant difference in productivity between firms that male dominated in ownership only or in top management only and those that are male dominated in both. However, there is a negative and statistically significant difference between firms which are male dominated in neither and those that are male dominated in both. For manufacture the findings are different. Firms with female participation in top management have a statistically significantly (95% confidence) higher productivity than firms that are male dominated by both ownership and top management. Female ownership also has a positive effect but one that is only significant at 905 confidence.

For all tourism related and for hospitality firms there were no statistically significant relative effects. That is, for example, comparing firms with female participation in management with those with female participation in ownership (and those with both) suggests no statistically significant effects on productivity. In this respect the tourism related sector is different from both manufacture and other services. For manufacture firms with female participation in top management

Table 6 :IPWRA Analysis with Femboss and Femown as treatments, productivity as outcome				
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
TOURISM RELATED	**ATT**	-0.1864815	-0.2268238	-0.3520807
	Std Error	(0.1666294)	(0.1929964)	(0.2693676)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	0.1346049	-0.2243993	-0.3207084
	Std Error	(0.2613113)	(0.2565951)	(0.2578509)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
of which, HOSPITALITY	**ATT**	-0.152399	-0.1842175	-0.2557577
	Std Error	(0.1952075)	(0.2111294)	(0.2967787)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	0.3925207	-0.0623961	-0.3053884
	Std Error	(0.2894749)	(0.2942744)	(0.2863134)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
OTHER SERVICES	**ATT**	-0.0418197	-0.132663	-0.5298461**
	Std Error	(0.1345553)	(0.1580587)	(0.2075055)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	0.0303014	-0.4577422*	-0.4393735*
	Std Error	(0.2101816)	(0.2467965)	(0.2507471)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
MANUFACTURE	**ATT**	0.5302307***	0.3401304*	-0.1095023
	Std Error	(0.1709422)	(0.1881368)	(0.2234527)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.3234531	-0.718547***	-0.942322***
	Std Error	(0.2796946)	(0.2589773)	(0.2930926)
Absolute treatment effects are in relation to the control group of predominantly male owned and male managed firms				
***** statistically significant at 99%, ** at 95% and * at 90%.**				

Table 7 provides a similar IPWRA analysis but for the effects of female participation in ownership and top management on profitability. In this case firms in tourism related activities with female participation in top management show no statistically significant difference in profitability from firms dominated by males in both ownership and top management. However, both firms with female participation in ownership only or in both ownership and top management are shown to have a statistically significantly (at 95% and at 90% respectively) lower profitability. For hospitality firms it is only those firms with female participation in both ownership and top management that were found to have a statistically significantly (95% confidence) inferior profitability. For all tourism firms and for hospitality firms there were no statistically significant relative effects. That is, there are no differences in profitability performance between firms with female participation in top management only from firms with female ownership only and firms with female participation in both.

Comparison with the results for the "other services" sector again reveal s some differences from tourism related firms. For other services none of either the absolute or relative effects were statistically significant. That is, the evidence does not support any difference in profitability between firm with female participation and firms without female participation. For manufacture the findings are different. In particular female participation in top management was found to result in a statistically significantly (at 99% confidence) higher level of profitability compared to firms which are male dominated in both ownership and top management.

Table 7 :IPWRA Analysis with Femboss and Femown as treatments, profitability as outcome				
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
TOURISM RELATED	ATT	-0.3215511	-0.5288252**	-0.6315507*
	Std Error	(0.2362719)	(0.2730707)	(0.3402893)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.0333015	-0.4810192	-0.3363654
	Std Error	(0.3984753)	(0.3554473)	(0.3432985)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
of which, HOSPITALITY	ATT	-0.3109015	-0.3715556	-0.5193341***
	Std Error	(0.2748432)	(0.2879192)	(0.3735193)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	0.4938367	-0.1180406	-0.3550914
	Std Error	(0.4446021)	(0.4484758)	(0.3819405)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
OTHER SERVICES	ATT	0.1144671	-0.0247109	-0.3814642
	Std Error	(0.1907097)	(0.1880901)	(0.247625)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	0.0921171	-0.3811859	-0.4484699
	Std Error	(0.2298733)	(0.293898)	(0.3022881)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
MANUFACTURE	ATT	0.8149964***	0.4851212*	0.1352275
	Std Error	(0.2357128)	(0.2625655)	(0.2880799)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.1048389	-0.6064305	-1.146412***
	Std Error	(0.4332441)	(0.3839063)	(0.3838455)
Absolute treatment effects are in relation to the control group of predominantly male owned and male managed firms				
*** statistically significant at 99%, ** at 95% and * at 90%.				

The analysis of firm performance, in general, finds that female participation in both the top management and ownership of tourism related (and hospitality) firms makes little difference to the either productivity or profitability. This is not a universal result and there are some exceptions where female participation in top management or ownership does make a (negative) difference. Behaviourally there are some differences between tourism related firms and those in manufacture or other services. In consequence it makes some sense to think of tourism related firms as constituting a distinct sector from the perspective of firm performance.

6. Female Employment at the Firm Level and the Gender of Owners and Top Managers

The purpose of this section is to analyse whether or not firms in which females have at least an approximately equal role in the firm's ownership or in its top management are more likely to employ females. This is analysed for two categories – for all employees and for managerial employees.

Table 8 presents the propensity score matching (kernel density) analysis. Statistically significant results at 90% confidence or higher are highlighted. As with earlier analysis results are presented for both all tourism related firms and for hospitality firms. Results for both manufacture and for other services are also included to provide a basis for comparison.

For tourism related firms female participation in top management was found to have a statistically significant (at 90% confidence) and positive effect on the share of females on overall employment. For the share of females in management employees the effect of female participation in top management was even more positive and statistically significant at 99% confidence. With respect to female participation in ownership there was statistically significant (at 90%) positive effect on overall female employment but no statistically significant effect on the share of females in management employees. For hospitality firms there was no statistically significant effect of female participation in ownership on the share of females in either overall or management employment. Participation of females in the top management of hospitality firms had no statistically significant effect on the share of females in overall employment but a statistically significantly (at 95%) positive effect on their share in management employment.

By way of comparison female participation in the top management of manufacturing firms had a positive and statistically significant effect on the share of females in overall employment (at 95% confidence) and management employment (at 99% confidence). Female participation in the ownership of manufacturing firms likewise had a positive and statistically significant effect on the share of females in both overall and management employment. A similar picture emerges for firms in other services. Female participation in top management and in firm ownership was found to have statistically significant and positive effects on the share of females in both overall and management employment.

Based on the evidence of the firms in manufacturing and in other services one might expect a similar picture to emerge for tourism related firms. Indeed female participation in the top management of and ownership of tourism related firms also has similar positive effects on the share of females in employment but such effects are less evident for hospitality firms.

TABLE 8: PROPENSITY SCORE MATCHING (KERNEL DENSITY) RESULTS FOR FEMALE PARTICIPATION

Tourism Related									**Manufacture**								
A. Treatment: female top manager									**A. Treatment: female top manager**								
Variable	Sample	Treated	Controls	Difference	S.E.	t stat			Variable	Sample	Treated	Controls	Difference	S.E.	t stat		
A.1 Outcome = female employment (all, proportion of total)									**A.1 Outcome = female employment (all, proportion of total)**								
femp	Unmatche	0.382637	0.334235	0.048402	0.021797	2.22	Untreated	244	femp	Unmatche	0.295932	0.246195	0.049737	0.015526	3.2	Untreated	411
	ATT	0.382637	0.337165	0.045472	0.026428	1.72	Treated	162		ATT	0.295932	0.250573	0.045359	0.017026	2.66	Treated	208
							Total	406								Total	619
A.2 Outcome = female employment (management, proportion of total)									**A.2 Outcome = female employment (management, proportion of total)**								
femmg	Unmatche	0.409552	0.253492	0.15606	0.036312	4.3	Untreated	244	femmg	Unmatche	0.358219	0.152749	0.205471	0.025264	8.13	Untreated	409
	ATT	0.409552	0.272075	0.137477	0.044079	3.12	Treated	162		ATT	0.358219	0.165319	0.1929	0.030389	6.35	Treated	208
							Total	406								Total	617
B. Treatment: female owner									**B. Treatment: female owner**								
B.1 Outcome = female employment (all, proportion of total)									**B.1 Outcome = female employment (all, proportion of total)**								
femp	Unmatche	0.405817	0.329755	0.076062	0.022851	3.33	Untreated	279	femp	Unmatche	0.307275	0.24443	0.062844	0.016031	3.92	Untreated	437
	ATT	0.405817	0.359399	0.046419	0.02458	1.89	Treated	127		ATT	0.308183	0.245062	0.063121	0.017119	3.69	Treated	182
							Total	406								Total	619
B.2 Outcome = female employment (management, proportion of total)									**B.2 Outcome = female employment (management, proportion of total)**								
femmg	Unmatche	0.355121	0.297846	0.057275	0.039116	1.46	Untreated	279	femmg	Unmatche	0.286436	0.195063	0.091373	0.027314	3.35	Untreated	435
	ATT	0.355121	0.333452	0.021669	0.042207	0.51	Treated	127		ATT	0.288019	0.211264	0.076755	0.030959	2.48	Treated	182
							Total	406								Total	617
Of which: hospitality									**Other Services**								
A. Treatment: female top manager									**A. Treatment: female top manager**								
Variable	Sample	Treated	Controls	Difference	S.E.	t stat			Variable	Sample	Treated	Controls	Difference	S.E.	t stat		
A.1 Outcome = female employment (all, proportion of total)									**A.1 Outcome = female employment (all, proportion of total)**								
femp	Unmatche	0.39773	0.353746	0.043984	0.023705	1.86	Untreated	191	femp	Unmatche	0.37304	0.293588	0.079452	0.014526	5.47	Untreated	538
	ATT	0.39773	0.348261	0.04947	0.03221	1.54	Treated	138		ATT	0.37304	0.302157	0.070883	0.01541	4.6	Treated	311
							Total	329								Total	849
A.2 Outcome = female employment (management, proportion of total)									**A.2 Outcome = female employment (management, proportion of total)**								
femmg	Unmatche	0.430784	0.276456	0.154328	0.040948	3.77	Untreated	191	femmg	Unmatche	0.403203	0.178581	0.224622	0.023143	9.71	Untreated	538
	ATT	0.430784	0.286796	0.143988	0.055058	2.62	Treated	138		ATT	0.403203	0.191473	0.21173	0.025913	8.17	Treated	311
							Total	329								Total	849
B. Treatment: female owner									**B. Treatment: female owner**								
B.1 Outcome = female employment (all, proportion of total)									**B.1 Outcome = female employment (all, proportion of total)**								
femp	Unmatche	0.408718	0.353089	0.05563	0.024571	2.26	Untreated	216	femp	Unmatche	0.376235	0.29853	0.077705	0.01515	5.13	Untreated	585
	ATT	0.412368	0.389066	0.023302	0.026543	0.88	Treated	113		ATT	0.376235	0.322795	0.05344	0.01648	3.24	Treated	264
							Total	329								Total	849
B.2 Outcome = female employment (management, proportion of total)									**B.2 Outcome = female employment (management, proportion of total)**								
femmg	Unmatche	0.351503	0.335794	0.015709	0.043458	0.36	Untreated	216	femmg	Unmatche	0.368885	0.212114	0.156771	0.024815	6.32	Untreated	585
	ATT	0.354641	0.380279	-0.02564	0.047147	-0.54	Treated	113		ATT	0.368885	0.279777	0.089109	0.027615	3.23	Treated	264
							Total	329								Total	849

Table 9 presents the IPWRA analysis of the effects of female participation in the top management and ownership of firms on the share of females in overall employment by the firm. As before results are presented for tourism related and (separately) the subset of hospitality firms. Firms in other services and in manufacturing are included for comparison. Absolute effects are based on a comparison with firms whose top management and ownership are both male dominated.

Table 9 :IPWRA Analysis with Femboss and Femown as treatments, outome = female employment as proportion of total				
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
TOURISM RELATED	**ATT**	0.0384933	0.0466841	0.1225599***
	Std Error	(0.0270506)	(0.0330809)	(0.0337069)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.0166929	0.0573123*	0.0695958*
	Std Error	(0.0382944)	(0.0347842)	(0.0385864)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
of which, HOSPITALITY	**ATT**	0.0431905	0.0140646	0.0956462**
	Std Error	(0.0302363)	(0.0351095)	(0.0370739)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.0565334	0.0180903	0.0752024*
	Std Error	(0.0424573)	(0.0469968)	(0.0394864)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
OTHER SERVICES	**ATT**	0.0444863**	0.0367478*	0.1524655***
	Std Error	(0.01743)	(0.0196849)	(0.0236534)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.039317*	0.0721743***	0.1183903***
	Std Error	(0.0235125)	(0.0246292)	(0.0275805)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
MANUFACTURE	**ATT**	0.0346369*	0.0367736*	0.1215131***
	Std Error	(0.0190711)	(0.0192482)	(0.0271731)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.0310887	0.0526069	0.0986519***
	Std Error	(0.0376067)	(0.0432629)	(0.0309912)
Absolute treatment effects are in relation to the control group of predominantly male owned and male managed firms				
***** statistically significant at 99%, ** at 95% and * at 90%.**				

For tourism related firms the absolute effects suggest that firms where there is female participation in one out of top management or ownership but not the other do not exhibit a statistically significantly greater propensity to employ females. However, where females participate in both top management and in ownership there is a statistically significantly (at 99%) positive effect on the share of females in overall employment. A similar set of results apply to the absolute effects for hospitality firms – no statistically significant effect where female participation is either in just top

management or ownership but a statistically significant effect where females participate in both. The relative effects for both all tourism related and for hospitality firms confirm the insight that it is where female participation is in both top management and in ownership where firms are more likely to employ females.

For both manufacture and for other services the absolute effects on the share of females in overall employment are positive and statistically significant (at least at 90% confidence) for female participation in top management (but not ownership), ownership (but not top management) and participation in both. The relative effects for both sectors suggest female participation in both top management and ownership is, in general, more likely to have a positive effect on the share of females in overall employment.

Table 10 presents a similar IPWRA analysis but with the share of females in management employment as the outcome.

Table 10 :IPWRA Analysis with Femboss and Femown as treatments, outome = female management employment as proportion of total				
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
TOURISM RELATED	**ATT**	0.1651806***	0.0197182	0.2095154***
	Std Error	(0.0447368)	(0.0557739)	(0.0577613)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.1684317***	-0.0035217	0.1344321**
	Std Error	(0.0596813)	(0.0690178)	(0.0691705)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
of which, HOSPITALITY	**ATT**	0.1661924***	-0.0397837	0.1783557**
	Std Error	(0.0507157)	(0.0618889)	(0.0656203)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.1676852**	0.0435618	0.0435618**
	Std Error	(0.0719349)	(0.0834883)	(0.0704881)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
OTHER SERVICES	**ATT**	0.1662624***	0.0598644**	0.3488888***
	Std Error	(0.0276083)	(0.0281608)	(0.0421747)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.1781809***	0.0986207**	0.2936771***
	Std Error	(0.0376745)	(0.0437574)	(0.0468936)
Sample		**Absolute Effects**		
		Female Management	**Female Ownership**	**Both**
MANUFACTURE	**ATT**	0.1582826***	0.0293791	0.288766***
	Std Error	(0.0352138)	(0.0279361)	(0.0532246)
		Relative Effects		
		Female Ownership vs. Female Management	**Both vs. Female Management**	**Both vs. Female Ownership**
	ATT	-0.1701665***	0.0390635	0.2425249***
	Std Error	(0.0671993)	(0.0907459)	(0.0568416)
Absolute treatment effects are in relation to the control group of predominantly male owned and male managed firms				
***** statistically significant at 99%, ** at 95% and * at 90%.**				

For tourism related firms the absolute effects suggest that female participation in top management has a positive and statistically significant (at 99% confidence) effect on the share of females in management employment compared to firms where males dominate both top management and ownership. There was no similar statistically significant effect for female participation in the firm's ownership but firms with female participation in both top management and in ownership also had a statistically significant (99% confidence) effect on the share of females in top management. The relative effects also show female ownership to be of little consequence in relation to female participation in top management or female participation in both.

Hospitality firms reveal a similar set of results. The absolute effects (relative to male dominated firms) show female participation in (a) top management and (b) both top management and ownership to have a positive a statistically significant effect on the share of females in management employment. No statistically significant effect was found for participation in ownership only. Again the relative effects show the effect of female participation in ownership to be statistically insignificant in relation to female participation in top management or in both.

The results for manufacture are similar to those for tourism related firms. In relation to male dominated firms there was a positive and statistically significant effect on the share of females in management employment of female participation in (a) top management and (b) both top management and ownership. Female participation in just ownership had no statistically significant effect. The results for other services differed from both tourism related and manufacture in that female participation in ownership also had a statistically significantly positive effect on the share of females in management employment.

The analysis of the effects of female participation in top management and in ownership shows that in sectors of the economy not related to tourism both tend to increase the share of females in overall employment. This applies to both overall employment and employment in management positions. Female participation in top management tends to be strongly related to female employment than female participation in ownership. When it comes to tourism related firms the results are similar for the share of females in management employment. With respect to the share of females in overall employment tourism related firms are distinct from other sectors in that female participation in top management did not have a statistically significant effect on the share of females in overall employment.

Conclusions

This study has focused upon the role of women in tourism related firms in the Caribbean. It makes a significant contribution to this under researched area by focusing not just on female employment in these firms but also on female participation in the ownership and top management of them. By providing comparisons with other sectors it also highlights behavioural differences and similarities with firms engaged in other economic activities. For example, the sample shows tourism related firms to employ a higher proportion of females than either other services or manufacturing but not in management positions.

The strategy of the study was to analyse the impact of female participation in the ownership or in top management of firms upon, firstly, the economic performance (profitability and productivity) of these firms and, secondly, their propensity to employ women. With some exceptions, the findings

were that female participation in ownership or top management made little difference to the productivity or profitability of tourism related firms. Comparison with other sectors suggest that tourism related firms are not much different in that respect. In all sectors female participation at the top of firms does not typically impact on firm performance for better or worse.

An important finding of the study was that tourism related firms with, in particular, female participation in top management (and to a lesser extent in ownership) employed a statistically significantly higher proportion of females. Again similar observations could be made with respect to other sectors so tourism related firms are mainly distinguished not by different behavior but that they are more likely to employ women in the first place.

Females are under represented in management positions in tourism related firms compared to other sectors. The finding that a female top manager is associated with higher employment is even stronger for employment in managerial positions. This produces the main policy implication of the study. Female participation at the top of tourism related firms encourages not just greater employment of women but also their employment at a managerial level. Empowerment of women should, therefore, start at the top.

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