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DISCUSSION PAPER SERIES

IZA DP No. 13486

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ISSN: 2365-9793

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ABSTRACT

Assessing the Role of Women in Tourism Related Sectors in the Caribbean

This study contributes to the rapidly growing literature on women in tourism. It focuses on a group of 13 Caribbean countries. The study analyses the impact of women in apical positions within firms (top manager or owner) on firm performance – productivity, profitability and female employment. For this both a decomposition model and the Inverse Probability Weighted Regression Adjustment (IPWRA) estimator are used. The analysis finds that opportunities for women in these positions in the Caribbean are constrained to less productive and profitable firms, as elsewhere. However, those firms with females at the top employ more women, particularly in management roles.

JEL Classification: D22, J16, L26, L83, Z32

Keywords: gender differences, tourism, propensity score matching, IPWRA, Caribbean

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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 tourism related activities and, what is less common, in senior positions in the tourism industry, namely in management and ownership of tourist activities. We study both the determinants of the presence of women in senior positions and the impact on the performance of firms. We look at differences between firms owned and/or managed partly or wholly 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, the study overlaps with different recent strands of the literature. Firstly, 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 be concentrated. Within the Caribbean women are more frequently employed in tourism related activities than in, say, manufacturing industries. Within tourism women tend to be concentrated 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 also supports earlier research which finds that tourism has potential to empower women in many countries by providing a source of employment, as discussed by, for example, 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. Since the data used are at the level of the firm and such data are almost always beset by problems of heterogeneity both matching estimators offer an approach better

suited to heterogeneous samples. These are not used in place of existing methodology (and a de-composition approach in particular) but in addition to it. This enables each methodology to act as a robustness check on the other.

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 key aspects of the methodology adopted – matching and IPWRA. Section five presents the main findings of the econometric decomposition analysis. In this the impact of the gender of owners and managers on firm performance and then on female employment is examined. In section six the absolute and relative impact of the female participation in ownership and top management is analysed using the IPWRA estimator. Section seven 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 tourism and tourism related firms and their impact on the firm's performance is considered. Secondly, the employment of women in tourism related sectors in the Caribbean is examined.

2.1. Gender and managerial positions

The first theme in the literature that our paper develops is that on the role of women in "senior" positions, including ownership and management of firms. Two types of questions have been asked. Firstly the literature considers whether and to what extent women are discriminated against in accessing these apical (senior) positions and, hence, also apical earnings. Secondly, the literature examines 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 more divided. 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 potential earnings depreciate 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 disadvantage in accumulating work experience and job tenure, which are important factors to reach senior 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 (apical) positions has an impact on the wage distributions 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 are 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). More generally, a large literature argues that men possess characteristics that are associated with occupying senior positions. In this view men place a higher value on money, have higher self-esteem, are less risk averse, more competitive, self-confident and believe that they control better their fate than women (Blay and Kahn, 2017, p. 837). Other even more contentious advantages of men over women would consist of being more disposed to negotiate for better economic conditions. Moreover, women are seen as less likely to being competitive within the organization, which prevents them from advancement. These reasons are taken to explain why, as Blau and Kahn (2017, p. 828) report, based on Fortune 500 companies, although women are nearly half of managers, only 14.3% are executive officers, 3.8% are CEOs, and only 16.6% hold board seats.

Some 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). 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 (in this view) is shaped by environment rather than being innate.

A more recent strand of literature (see again Blau and Kahn, 2017) attempts to explain why women are slowly occupying an increasingly larger number of senior positions. 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 (see, among others, de Oliveira et al. 2014; and the surveys of the literature: Eagly and Johnson, 1990; Badura et al. 2018; and Offermann and Foley, 2020; and references therein). 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. Extending the analysis to 73 developing countries observed over the years 2007-2010, Islam and Amin (2016) find that the share of female managers is higher in the firms of countries where women outperform men in terms of enrollment rates in all levels of education (primary, secondary and tertiary).

Some authors, such as Schwartz-Ziv (2015) 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, 2017). 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, Boehren and Stroem 2010, Haslam et al. 2010, Ahern and Dittmar 2012).

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].

Much early research on gender and tourism in the Caribbean focused on sex tourism (see, for instance, Phillips, 2008 and the references therein). Our focus is, instead, 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.

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

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

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 interest, these issues are generating a renewed interest which is witnessed by a large number of new papers. This literature emphasises 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 which specialize in tourism but also in more mature advanced economies with a complex economic structure. Moreover, due to the seasonal nature of service sector employment – providing hospitality for part of the year – tourism tends to be strongly related to gender and also with low pay, low productivity and seasonal working. These aspects have attracted the attention of researchers for the adverse 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 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. They show 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 had 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 its opposite, the gap in opportunities between men and women, is complicated by other factors which increase the disadvantage of women. These include ethnicity, living in rural areas and belonging to a poor household. Nonetheless, as Ferguson (2010) notes, tourism may represent 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 in tourism 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 Brazil, Ferreira Freire Guimaraes and Silva, 2016).Moreover, the existence of a glass ceiling effect – 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) showed that women continue to be considered less fit for management in the tourist sector, although discrimination is not overt anymore, but invisible and 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 (senior) positions because of their difficulty 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 (availability to work at any hour that the employer requests) 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 that female participation in ownership and management of tourist activities is dramatically increasing in many countries, particularly advanced countries such as the EU. Despite this differences are still remarkable and empirical evidence by country is useful to better assess the evolution of this phenomenon.

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

As to the impact of women occupying senior positions on the performance of firms a large literature shows gender productivity (and profitability) gaps in certain sectors, and then tries to explain why these gaps exist. In many cases, women managers or owners may face discrimination in accessing financial assets and other resources which might indirectly affect also firms' performance. Typically, a decomposition analysis (usually of the Blinder and Oaxaca type) is used to explore these issues - see, amongst others, Bardasi et al., 2011; Klapper and Parker, 2010; Kilic et al., 2014; Martin-Ugedo et al., 2014; Islam et al., 2018.

This approach, however, assumes the gap to be there and to be attributable to the presence of women in senior (apical) positions and then searches for differences in characteristics or prices for those characteristics. The studies find in particular that female owned and female managed firms typically have characteristics which are associated with lower productivity and/or profitability. This implies that females tend to be given opportunities at the top of less well performing firms. At the same time when the same characteristics are possessed by male and female owned or managed firms, they often pay less in terms of productivity/profitability

Klapper et al. (2010) summarises the then existing literature and find that female owned firms tend to concentrate in the more labor-intensive sectors such as trade and services, rather than manufacturing. The differences in business survival rates and growth patterns derive from those different characteristics. Amin and Islam (2014) confirm with an empirical analysis relative to about 90 developing countries that women tend to manage firms in the service sector, particularly in the retail rather than the wholesale sector. Moreover, female-managed firms tend to be of small size and to locate in relatively small cities.

Bardasi et al. (2011) is one of the first studies to address the issue of gender gaps in productivity among firms owned by individuals of different genders in a sample of developing countries of different continents. They find that female owned companies tend to be much smaller than their male counterparts, but not less efficient. The smaller size is explained by segregation and the concentration of female owned firms in those sectors where firms are generally smaller in size. The authors find no evidence of gender discrimination in access to formal finance, although female entrepreneurs tend to receive smaller loans than men, despite the fact that the returns from each dollar they receive is no lower in terms of sales revenue.

In a study relative to agriculture in Malawi, Kilic et al. (2014) find that the productivity gap between female managed plots and those male managed is essentially due to the different observable characteristics of the two types of plots, and especially the high-value crop cultivation and household adult male labor inputs of male managed crops. From the point of view of this paper, this implies caution is needed to avoid comparing firms whose ownership (or management) is of different genders and then using decomposition analysis to explain gaps. The question remains whether the gap is itself due to gender or to the fact that we are comparing different types of firms.

More recently, Islam et al. (2018) find an unconditional productivity gap of female managed firms as compared to male owned firms of about 11% in a large sample of 128 mostly developing economies. When using decomposition analysis, the Authors find that fewer female- than male-managed firms protect themselves from crime and power outages, have their own websites, and are (co-) owned by foreigners. In addition, in the manufacturing sector, female-managed firms are less capitalized

and have lower labor cost than male-managed firms. Interestingly, restricting the analysis to the retail sector, where female managed firms are more frequent, does not allow reveal any gender gap. This suggests that the performance gap is usually found in the manufacturing sector between female and male managed firms.

From the point of view of the approach followed in this study, the last finding is important because suggests that a gender performance gap among firms with a management of different genders does not necessarily exist. In other words, this decomposition approach is not fully satisfactory in as much as it does not fully control for possible heterogeneity of firms with an ownership or management of different genders. In other words, it does not test whether the gap is there in the first place. Our paper aims to fill in this gap in the existing literature. We ask, firstly, whether firms with exactly the same characteristics except for the gender of the owner or manager have a different productivity and/or profitability. Rather surprisingly, we find that this is not necessarily the case in the Caribbean tourism related activities. This is an important contribution of our paper: estimating the "female" effect on firm performance in comparison to firms with the same characteristics, which we select by propensity score matching and other matching estimators.

This matching approach to assessing the extent of the gender gap in productivity and profitability of firms is complementary to that of the existing literature, which is mainly based on decomposition of the gender gap in performance. Decomposition analysis cannot control for differences in observable characteristics, even though it is able to address other questions. Analysis of the gender performance gap between firms with the same characteristics allows estimates on a more rigorous and sound basis than before. This complements the ability of decomposition analysis to disentangle quantity and price factors of the gap. In a sense decomposition analysis goes beyond the aims of our paper, in addition to being widely implemented in the existing literature already. In order to compare our findings with the previous findings and provide an explanation of the components of the gap we also run the decomposition analysis.

A related field of study has addressed the question of what determines the tendency of women to be more frequently owners and managers of firms with low productivity characteristics. For instance, the question is why women tend to own or manage small sized firms or low productivity /profitability firms? Aisedu et al. (2013) provide empirical evidence to support the view that female owned firms are financially constrained in Sub-Saharan Africa. Hansen and Rand (2014a) provide a more complex picture regarding the different access to financial assets of male and female owned firms in Sub-Saharian Africa as based on different data sources. When real data are used, then female owned firms often appear to be no more constrained than male owned firms, especially for firms of smaller size. Perception, though, is more in favour of the idea that female owned firms are financially constrained. Again with reference to Sub-Saharan Africa, Hansen and Rand (2014b) find that small sized female firms have easier access to credit as compared to their male counterparts. Medium sized firms instead show no gender differences in access to credit. The authors note that firms' performance by gender is not different and this lack of difference would not justify a different treatment of female owned firms by banks and other financial intermediaries.
In another interesting study, based on a sample of over 50 thousand firms belonging to about 100 economies, Islam et al. (2019) have found that the type of legislation and its ability to guarantee gender equality matters. Moreover, access to finance, property ownership, business registration,

and labour market constraints are pathways by which legal gender disparities disempower women in the private sector in the sample of countries considered.

2.3. The Caribbean experience

Like a number of earlier studies, Johnson and Devonish (2008) examined the determinants of the demand for tourist services in Barbados. They also analysed gender differences in preferences and how they impact on the choice of the destination and pattern of tourist activities and services demanded. Much early research on gender and tourism in the Caribbean focused on sex tourism (see, forinstance, Phillips, 2008 and the references therein). Recent research has explored the case romance tourism by female tourists (for the example of Jamaica, see Pruitt and LaFont, 1995).

The focus of this study is different - on the role of women in the economics and management of tourism related 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 regarding the employment of women in tourism in Belize, Costa Rica and the Dominican Republic. They also find a high degree of segregation in specific types of low productivity occupations within the sector. Interestingly, Gentry (2007) highlights how in Belize female ownership is also associated with small and very small businesses - often B&B's, small restaurants and so on. The opportunity to start these types of businesses with minimal capital is attractive to women and represents a real means to empower themselves and increase their status. Starting their own business helps women acquire 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 Belizeans, who were trained within the hotels. In the Belizean-owned companies, local workers were better represented.

3. Data

3.1 The Dataset

The data for this study were taken from the PROTEqIN enterprise survey conducted by Compete Caribbean in 2014. The survey covered firms from a total of 13 Caribbean territories (listed in Table 2), across all broad sectors. It was conducted by means of a standardised questionnaire, intended to

be completed in three short interviews with the firm.This questionnaire covered many aspects of firm behaviour including employment, skills, ownership, the business environment, finance, competition, government regulation and costs. The sample of firms was structured to, as far as possible, cover all sectors active in the region and all of the countries in the survey. A small proportion of firms in the survey were not formally registered (22 of the 1,968 usable returns). It is likely that informal firms are much more prevalent in tourism related activities in the Caribbean so the sample may not be representative in that respect. No wholly state owned firms from the tourism related sector were included but 3 (out of a total of 409) had some partial state ownership. Further 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 sample includes both informal and government owned firms. Further details of the sampling procedures and conduct of the survey are available from: https://publications.iadb.org/en/productivity-technology-innovation-caribbean

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. In the survey (which used the same questionnaire for service and manufacturing firms) "non production" workers were defined to comprise: management, professional, support, administrative, sale employees and others. This implies that the like of waiters, chefs, chambermaids and bar staff would be treated as directly "producing" the service. To avoid possible confusion 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:

- *fertil* – fertility rate (children per woman)
- *fempop* – females as a percentage of the of total population

- *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)

Further country level variables intended to capture the general favourability of the country's legal, social and business environment towards women were also included, taken fromthe *Women, Business and Law* database (all scored from 0 to 100). These were:

- wbljob – starting a job
- wblpay – getting paid
- wblbus – running a business
- wblfin – managing assets

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)

Profits were defined as gross (pre-tax) profits – total revenues less total costs.

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, covering the firm's experience with infrastructure and bureaucracy. The inclusion of infrastructure follows the finding in existing literature by, for example, Islam and Hyland (2019), Davis et al (2001) and Moyo (2011) that water outages in particular adversely affected firm performance. The variables were:

- *infrastructure* – total percentage of sales lost to outages of power, mobile phones, internet and water.
- *bureaucracy* – the typical percentage of management time spent on dealing with government and regulatory requirements each week.

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* – firm level average of difference between actual education of workers and minimum education needed.

4. Methodology

4.1 Overview

This study uses a decomposition approach to analyse differences in performance between male dominated firms and those with female participation at the top. Since this technique has been widely used in the literature no further exposition is offered here. The methodology focuses on techniques less widely used in previous studies.

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 Matching Estimators

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 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.

Matching uses a series of *control* variables to construct a "propensity score". This is a probability model (logit 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
  $ATT = E(Y_{1i} - Y_{0i} | D_i = 1) \equiv E(\beta_i | D_i = 1)$ (2)
- ATNT – the average treatment effect for untreated firms
  $ATNT = E(Y_{1i} - Y_{0i} | D_i = 0) \equiv E(\beta_i | D_i = 0)$ (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.

A potential problem with 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 , for example, propensity score (PS) matching.. 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 be 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. OLS regression and decomposition analysis

In this section, we provide OLS regressions and a decomposition analysis of the determinants of firms' productivity and profitability[2] by distinguishing those firms which are managed by women or owned (wholly or partly) by women. We run the same exercise for all the sectors considered above, namely tourism related services, manufacturing and other services.

The results of the OLS regressions are presented in Annex I. Note that for each sector we present two models, one without and the other with country fixed effects. Table I1 shows that in the tourism industry the coefficient for female managed and female owned firms is often negative, almost always not statistically significant. The only exception is the coefficient for female owned firms which is negative and also quite sizeable, but the coefficient becomes statistically insignificant once controlling for country fixed effects. We may sum up this first result saying that female owned or managed firms are not much different from the male ones in terms of productivity and profitability characteristics.

Not surprisingly, results regarding the determinants are quite similar across estimates without and with country fixed effects, although coefficients may vary also importantly from one estimate to the next. The question arises as to the different impact that such determinants may possibly have individually or as groups of variables on firms with a different gender of management or ownership.

Table I2 on the manufacturing industry brings a similar result for thegehnder dummy variables, which are again non statistically significant except in one case, namely the impact of being a female manager on firm's productivity, with a 5% significance level. The coefficient becomes statistically

[2] We thank a referee for suggesting us this development.

insignificant when one controls for fixed effects which suggests that the positive sign was associated to some heterogeneity across countries.

The coefficients of individual variables are again quite different according to whether one control or not for fixed effects. Again the doubt is that variables might affect in a different way firms according to the gender of managers and owbers. In other words, it may be that these firms have very different characteristics, which may be partly caught in Oazaca-Blinder decomposition analysis. A different approach will be followed in the rest of the paper, resorting to matching analyhsis.

Table I3 refers to the other services sector. The main findings are the same: there is no statistically significant gender gap, while estimated coefficients are very different according to whether one controls or not for country fixed effects.

The instability of coefficients might mirror the fact that they differ across firms of different management and ownership type. That is why the next step of the analysis consists of running a Blinder-Oxaca type of decomposition analysis (Blinder, 1973; Oaxaca, 1973). The results are presented in Tables 5 to 8. To provide a concise picture we report only overall price and quantity effects [3]. However, for completeness' sake, we report the full tables of results with the price and quantity effects of the individual variables in Annex II.

Table 5 reports results for the tourism related sector. Here we find, as expected, that firms which are managed predominantly by women have about 10% lower productivity and 16% lower profitability. However, this difference is not statistically significant (at 90% confidence or higher). Firms owned by women (partly or wholly) were found to be about 42% less productive and about 64% less profitable than male dominated ones. These differences were not only larger than for female managed firms, but also statistically significant at 95% confidence or higher. This finding - that the productivity and profitability of female owned firms is lower – is consistent with previous studies mentioned in the literature review (see, among others, Bardasi et al., 2011; Klapper and Parker, 2010; Talip et al., 2014; Martin-Ugedo et al., 2014; Islam et al., 2018). Indeed, the results suggest that female owned firms in the Caribbean may be more disadvantaged than in other less developed countries. These results for the female owned firms are, to some extent, supported by the IPWRA analysis which follows.

Within the Blinder-Oaxaca decomposition approach, the productivity and profitability gaps between firms with and without female participation at the top may be explained either by different characteristics of the predominantly female managed and owned firms or by the different way such characteristics are remunerated on the market. Table 5 includes the explained and unexplained components. Neither of them is statistically significant for either productivity or profitability. The decomposition suggests that it is the characteristics that determine female participation in different types of firm that matters. Again the differences are not statistically significant, which is consistent with our findings based on the IPWRA.

Table 5 – Oaxaca Blinder decomposition of product and profit per worker by predominantly female managed or owned firms in the tourism industry

Variable	opw_femboss	ppw_femboss	opw_femown	ppw_femown
Differential				

[3] The full results are available on request from the authors.

Men	9.2554***	7.7368***	9.3459***	7.8957***
Women	9.1545***	7.5769***	8.9279***	7.2536***
Difference	0.1009	0.1599	0.4180**	0.6421***
Decomposition				
Explained	-0.1238	-0.0648	0.1799**	0.2242**
Unexplained	0.2247	0.2247	0.2381	0.4179**
Statistics				
N	406	352	406	352

Note: p<.1; ** p<.05; *** p<.01.

Different conclusions apply to the manufacturing sector (See Table 6). That is, there are no statistically significant differences between firms according to the gender of owners but partly or wholly female managed firms tend to be more productive and less efficient than those with predominantly male ownership. This is apparent by the negative sign of the difference. The decomposition seems not to highlight any specific factor behind this gap. It is more a combination of factors that tend to make female owned firms less productive and profitable and female managed firms slightly more profitable.

Table 6 – Oaxaca Blinder decomposition of product and profit per worker by predominantly female managed or owned firms in the manufacturing sector

Variable	opw_femb~s	ppw_femb~s	opw_femown	ppw_femown
Differential				
Men	8.5889***	6.9977***	8.7264***	7.1749***
Women	8.9112***	7.4979***	8.6271***	7.1374***
Difference	-0.3223*	-0.5002**	0.0993	0.0375
Decomposition				
Explained	-0.1433	-0.1018	0.0136	-0.0019
Unexplained	-0.1790	-0.3984**	0.0857	0.0394
Statistics				
N	619	511	619	511

Table 7 provides similar decompositions for other services. The results remain essentially the same. Female managed firms do not seem to be different, at least not in a statistically significant way from male managed ones. The predominantly female owned firms, though, are less productive and profitable than their male counterparts. Differences in productivity are both explained and unexplained, whereas differences in profitability are mainly due to the explained component. Per capita GDP seems to be the single factor able to explain the gap in productivity and profitability. Other factors seem to be less important individually.

Table 7 – Oaxaca Blinder decomposition of product and profit per worker by predominantly female managed or owned firms in the other services

Variable	opw_ femboss	ppw_femboss	opw_femown	ppw_femown
Differential				
Prediction_1	8.9501***	7.5986***	9.0286***	7.6413***
Prediction_2	8.7491***	7.3342***	8.5393***	7.2255***
Difference	0.2011	0.2644	0.4893***	0.4158**

Decompiosition				
Explained	0.0228	0.1291	0.2271**	0.2466**
Unexplained	0.1782	0.1353	0.2622**	0.1692
Statistics				
N	849	734	849	734

Results for the remaining outcome variables used in our study – the share of female employment in total employment and the share of women in managerial employment– are presented in Tables 8 to Table 10. These tables show the results of decomposition analysis of the differences between female managed or owned firms versus the male managed or predominantly male owned ones with respect to employment of females. The results suggest, as do those of the following IPWRA analysis, that there is a positive gap in favour of female managed and firms with some female ownership. The existence of a female top manager generally seems to have a positive effect on female employment, both overall and in terms of managerial employees. However, predominantly female owned firms do not necessarily have a higher than average share of women in management positions.

Table 8 focuses on the tourism related sector and shows that the gap between male dominated firms and those with female participation at the top is unexplained for both types of firms. It is, therefore, due less to women occupying senior positions than other characteristics. It is the unexplained component that matters and specifically the weight that these other characteristics have on the outcome variables. There are several individual factors that are associated with a particularly strong and statistically significant correlation with the outcome variables. That is, it is a combination of factors rather than any individual one.

Table 8 – Oaxaca Blinder decomposition of female employment and female managers by predominantly female managed or owned firms in the tourism industry

Variable	femp_femboss	femp_ femboss	femp_femoned	femp_femoned
Differential				
Prediction_1	0.3342***	0.2535***	0.3298***	0.2978***
Prediction_2	0.3826***	0.4096***	0.4058***	0.3551***
Difference	-0.0484**	-0.1561***	-0.0761***	-0.0573
Decomposition				
Explained	0.0120	0.0196	-0.0201**	-0.0258
Unexplained	-0.0604***	-0.1756***	-0.0560**	-0.0315
_cons	0.6466	0.4012	-0.0707	0.1384
Statistics				
N	406	406	406	406

Table 9 focuses on manufacturing. In the manufacturing sector, even more than in tourism related activities, female managed and owned firms tend to employ more women both as a share of total employment and in managerial positions. The gaps range from about 5% to 20%. The price component of the gap explains most part of the overall gap. This suggests that it is not so much the structure of firms (female versus male managed or owned) that matters, but how the same characteristics are rewarded in the two types of firms. The efficiency variable in particular seems to be of consequence.

Table 9 – Oaxaca Blinder decomposition of female employment and female managers by predominantly female managed or owned firms in manufacturing

Variable	femp_fem~s	femmg_fe~s	femp_fem~n	femmg_fe~n

Differential				
Prediction_1	0.2462***	0.1527***	0.2444***	0.1951***
Prediction_2	0.2959***	0.3582***	0.3073***	0.2864***
Difference	-0.0497***	-0.2055***	-0.0628***	-0.0914***
Decomposition				
Explained	-0.0034	-0.0159	-0.0041	-0.0189
Unexplained	-0.0463***	-0.1896***	-0.0588***	-0.0724***
Statistics				
N	619	617	619	617

Table 10 focuses on other services. Again, female managed or female owned firms tend to hire more women in both overall employment and especially in management positions. The gap is particularly strong for the managerial positions in both types of firms. In this sector both the explained component and the unexplained one seem to matter in the case of female owned firms. Again no individual variable seems to be of particular importance.

Table 10 – Oaxaca Blinder decomposition of female employment and female managers by predominantly female managed or owned firms in other services

Variable	femp_fem~s	femmg_fe~s	femp_fem~n	femmg_fe~n
Differential				
Prediction_1	0.2936***	0.1786***	0.2985***	0.2121***
Prediction_2	0.3730***	0.4032***	0.3762***	0.3689***
Difference	-0.0795***	-0.2246***	-0.0777***	-0.1568***
Decomposition				
Explained	-0.0088	-0.0057	-0.0220***	-0.0660***
Unexplained	-0.0706***	-0.2189***	-0.0557***	-0.0907***
Statistics				
N	849	849	849	849

6. Inverse Probability Weighted Regression Adjustment (IPWRA)

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. 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, firstly, to test whether firm performance has a role at all in any of these explanations. That is, it seeks to test whether there is any evidence from tourism related firms and firms in other broad sectors (by way of comparison) that those with a female top manager or some female ownership perform better or worse than male dominated firms. Performance, as before, is measured by productivity, profitability and the share of women in employment (in total and in managerial positions).

IPWRA analysis varies both the treated and control group. To avoid possible confusion the treated and control groups in each case are summarised as follows. For "absolute" treatment effects the control group are those firms that are male dominated (that have neither a female top manager nor any female owners). The comparison is with three different "treated" groups:

- firms with a female top manager but no female owners
- firms with some female ownership but no female top manager, and
- firms which have both a female top manager and some female ownership.

The "relative" treatment effects are defined as:

- firms with some female ownership (but no female top manager) compared to the control group of firms with a female top manager (but no female ownership)
- firms with both female owners and a female top manager compared to those with a female top manager but no female ownership
- firms with both female owners and a female top manager compared to those with a female ownership but no female top manager.

Table 11 sets out the results of the IPWRA analysis of the effects of female ownership and top management on productivity for tourism related firms. Other services and manufacture are included to provide a sense of whether tourism related firms are somehow distinct from other sectors. 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 for tourism related firms. For tourism related firms there was no statistically significant absolute effect of female ownership on productivity but a negative and statistically significant effect of a female top manager (at 95% confidence) and for firms with both a female top manager and female ownership (at 90% confidence). Firms with both a female top manager and female ownership also exhibited statistically significant lower productivity but only at 90% confidence. These results, although in accord with a number of findings in the literature, are at variance with our decomposition findings. This is attributable to the difference in techniques. IPWRA does not utilise the full sample but compares a "treated" sub-sample with a matched "control" group – in this case a sample of male owned and male managed firms selected to share common characteristics of relevance.

By way of comparison the absolute effects for other services suggest that there is no statistically significant difference in productivity (at 90% confidence) between firms that are male dominated in both management and ownership and firms with either female top management or female ownership. As with tourism related firms, those with both a female top manager and female ownership had a statistically significantly lower productivity but, again, only at 90% confidence. For manufacture the findings are different. Firms with a female top manager (but not female owners) and those with female owners (but not a female top manager) have a statistically significantly, at 95% confidence, higher productivity than firms that are male dominated by both ownership and top management. Firms which have both female top management and female ownership revealed no statistically significant difference from male dominated firms.

Table 11: IPWRA Analysis of Productivity

Sample		Absolute Effects		
		Female Management	Female Ownership	Both
TOURISM RELATED	ATT	-0.3488729**	-0.2776307	-0.514286*
	Std Error	(0.1712492)	(0.1924114)	(0.3077358)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.13222	-0.3917115	-0.4522852
	Std Error	(0.1906952)	(0.2533314)	(0.3394977)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
OTHER SERVICES	ATT	0.0461782	-0.0722388	-0.3058096*
	Std Error	(0.1293075)	(0.1492284)	(0.1650006)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.0485483	-0.4425244**	-0.4840134**
	Std Error	(0.1671408)	(0.1832599)	(0.2275934)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
MANUFACTURE	ATT	0.3880039**	0.3181685**	0.0487317
	Std Error	(0.1525581)	(0.1603947)	(0.2039546)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	0.054326	-0.3209625	-0.5294192*
	Std Error	(0.2545655)	(0.3003421)	(0.3159794)
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 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 systematically different from other services but not from manufacturing.

Table 12 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 no significant difference in productivity between either and firms with female participation in both.

Comparison with the results for the “other services” sector again reveals 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 12: IPWRA Analysis of Profitability

Sample		Absolute Effects		
		Female Management	Female Ownership	Both
TOURISM RELATED	ATT	-0.5450245**	-0.553776**	-0.7440955*
	Std Error	(0.2693557)	(0.2820048)	(0.4213824)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.3363805	-0.5120229	-0.3732769
	Std Error	(0.3391278)	(0.4040905)	(0.4502057)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
OTHER SERVICES	ATT	0.2590029	0.0798591	-0.2084105
	Std Error	(0.2000493)	(0.1853634)	(0.2181458)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	0.1523797	-0.1968478	-0.5933237**
	Std Error	(0.2098344)	(0.254474)	(0.2861311)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
MANUFACTURE	ATT	0.5398939**	0.5137041**	0.2988918
	Std Error	(0.2880799)	(0.2200727)	(0.2527255)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	0.3993697	0.0560428	-0.4024534
	Std Error	(0.5113816)	(0.5746286)	(0.3440597)
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 there are, as with the analysis of productivity, no statistically significant relative effects. That is there exists no evidence of statistically significant differences in profitability between firms which are female owned (but not female managed) and firms which are female managed but not female owned, nor is there any significant difference between either type of firm and those that are both female owned and managed. These relative effects are in almost all cases also not statistically significant for either other services or manufacturing. In that respect, tourism related firms are behaviourally similar to those in other sectors in the Caribbean.

Table 13 summarises the IPWRA analysis of the effects of female participation at the top of firms on the employment of women. For tourism related firms the absolute effects on female employment are positive and statistically significant at 95% confidence or more. That is, firms with female management (but not ownership), firms with female ownership (but not management) and firms with both all exhibit statistically significantly higher shares of females in employment than do male dominated firms. For both manufacture and other services a similar set of results can be observed – statistically significant absolute effects on the share of females in employment. Whilst these positive effects are comparable in magnitude between tourism related firms and other services they are somewhat smaller for manufacturing.

Table 13: IPWRA Analysis of the Share of Females in Total Employment

Sample		Absolute Effects		
		Female Management	Female Ownership	Both
TOURISM RELATED	ATT	0.0623408**	0.0636255**	0.1544623***
	Std Error	(0.0310411)	(0.0326404)	(0.0372403)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.0326546	0.0891131**	0.0938938**
	Std Error	(0.0351248)	(0.0363182)	(0.0439572)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
OTHER SERVICES	ATT	0.0634613***	0.0370121**	0.1526433***
	Std Error	(0.0176201)	(0.0178443)	(0.023725)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.0520057**	0.0613349**	0.1141053***
	Std Error	(0.0214927)	(0.0241531)	(0.0268731)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
MANUFACTURE	ATT	0.0409581**	0.0386536**	0.1230089***
	Std Error	(0.0190531)	(0.0200556)	(0.030574)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.032367	0.0544152	0.0610077*
	Std Error	(0.0379137)	(0.042393)	(0.0348926)
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 relative effect between those firms which are female managed (but not owned) is not statistically significant but those firms which are both female owned and managed do exhibit a statistically significantly greater share of females in employment than either of them. For other services it is also the case that firms that are both owned and managed by females employ a greater share of women than firms that are either just female owned or just female managed. This is not the case for manufacturing where there were no statistically significant relative effects.

The IPRWA analysis was extended to treatment effects of female ownership and female management on the share of females in managerial positions. Table 14 presents the results. For tourism related firms the share of females in managerial positions is both statistically significantly and substantially higher (than for male dominated firms) for firms with female top management and for firms with both female management and ownership. There was no statistically significant effect of female ownership alone. A similar picture emerged for manufacturing firms – a statistically significant and substantial absolute effect for female managed only and both female managed and owned firms but not for female owned only. For other services the absolute effects (that is, in comparison to male dominated firms) were positive and statistically significant for all three types of female participation.

Table 14: IPWRA Analysis of the Share of Females in Managerial Employment

Sample		Absolute Effects		
		Female Management	Female Ownership	Both
TOURISM RELATED	ATT	0.1442937***	0.0473989	0.2208901***
	Std Error	(0.0476971)	(0.0523298)	(0.055632)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.1676907**	0.0601296	0.1035186
	Std Error	(0.0663999)	(0.0705596)	(0.0763075)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
OTHER SERVICES	ATT	0.1707145***	0.064224**	0.3504646***
	Std Error	(0.0278382)	(0.0276053)	(0.0417824)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.173093***	0.0872405**	0.2895909***
	Std Error	(0.0379091)	(0.0455838)	(0.0497975)
Sample		Absolute Effects		
		Female Management	Female Ownership	Both
MANUFACTURE	ATT	0.1679382***	0.0380182	0.3064425***
	Std Error	(0.0365656)	(0.026799)	(0.0533758)
		Relative Effects		
		Female Ownership vs. Female Management	Both vs. Female Management	Both vs. Female Ownership
	ATT	-0.145503**	0.0734225	0.2717444***
	Std Error	(0.0589865)	(0.0641257)	(0.059908)
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 only one of the relative effects was statistically significant. Female top management was found to have a statistically significantly stronger effect of female managerial employment than female ownership but neither was found to be statistically significantly different from firms with both female management and ownership. For both other services and manufacturing firms female top management alone also resulted in more female managerial employment than did female ownership alone. For firms in both sectors firms with both female managers and owners employed a significantly share of females in managerial employment than those with female ownership alone.

7. Conclusions

Much of the existing literature on the relationship between firm performance and female participation at the top of the firm (either as owners or as managers or both) suggests a negative relationship between the two – that female managed or owned firms perform less well in terms of productivity or profitability. This and a related literature sets out the many reasons why constraints on female opportunities create this situation. For consistency with the literature this study, firstly, ran a decomposition analysis on a sample of Caribbean firms. For manufacturing and other services the results were, as might be expected from the literature, that female management and female ownership were associated with lower productivity and lower profitability than male dominated firms. For tourism related firms this was also true for profitability but not for productivity.

The second strand of analysis used an IPWRA matching estimator. This also found statistically significant negative effects of both female top management and female ownership on productivity and profitability for tourism related firms in the Caribbean sample. The same was true for firms engaged in other services only when firms were both female owned and managed. In contrast, for manufacturing firms female ownership and female management had statistically significant and positive effects on both productivity and profitability. Thus, for tourism related firms (and for other service firms to a lesser extent) the IPWRA findings are again consistent with the view that female opportunities are constrained. The contrary results for manufacturing can be attributed either to specific features of the Caribbean or to the way in which the IPWRA estimator addresses heterogeneity in data. No conclusion supported by evidence can be offered but both explanations are plausible and are not mutually exclusive.

An important feature of our analyses was the effect of female top management and female ownership on female employment and, in particular, in tourism related firms. Given the importance of tourism to the Caribbean, outward migration from the region, unemployment within it and continued gender disparities this is of no small relevance. Our decomposition analysis found both female managed and female owned firms to employ a statistically significantly larger share of women in tourism related firms. In this they were similar to other firms in the Caribbean. Similar results were obtained for firms in manufacturing and other services. These findings were confirmed by the IPWRA analysis which found female participation at the top of firms (ownership and management) to have statistically significant positive effects on the share of women in overall employment for all three sectors.

Both strands of analysis were repeated for female employment in managerial positions. For tourism related firms the decomposition analysis found a statistically significant effect of female management (but not of female ownership) female employment in managerial positions. This was again supported by similar conclusions from the IPWRA analysis. Again, this was not unique to tourism related firms. Those in both manufacturing and other services exhibited comparable behaviour.

From a perspective of policy the common ground with the existing literature suggests that women in the Caribbean, as elsewhere, face constraints in becoming owners or managers of firms. Neither the Caribbean nor tourism related activities are unique in this respect but tourism, employment and gender disparities are of particular concern to the region. The finding that putting women in positions of power within firms, as either top managers or as owners (or both) results in a greater share of female employment is of considerable relevance. Of even more consequence is that these effects are even stronger for employment in a managerial capacity. Policies to support and encourage female ownership or management can be expected to affect not just the women directly concerned but to also extend opportunities to others too.

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Annex I. OLS regressions

Table I1. Determinants of productivity and profitability in the tourism industry

Variable	SPW_boss1	SPW_boss2	PPW_boss1	PPW_boss2	SPW_own1	SPW_own2	PPW_own1	PPW_own2
femboss	-0.1237	-0.1176	-0.1355	-0.1152				
femown					-0.2172	0.0170	-0.3476*	0.0729
fertil	-0.1293	-11.5763***	0.3837	-12.6491***	-0.1030	-11.5438***	0.3991	-10.3647***
fempop	0.1985**	-0.9288***	0.2862**	-1.1268***	0.1844**	-0.9175***	0.2581**	-0.9608***
gdpcap	0.0001***	-0.0001***	0.0001***	-0.0001***	0.0001***	-0.0001***	0.0001***	-0.0000
rural	-0.0036	-0.0794***	0.0036	-0.0783***	-0.0023	-0.0778***	0.0056	-0.0554***
wbljob	0.0041	-0.0342***	0.0058	-0.0319***	0.0036	-0.0342***	0.0053	-0.0137*
wblpay	-0.0017	0.1097***	-0.0122	0.1088***	-0.0017	0.1088***	-0.0124	0.0846***
wblbus	-0.0615***	0.0000	-0.0592***	0.0017	-0.0626***	-0.0024	-0.0598***	-0.0284*
wblfin	0.0017	-0.2078***	-0.0040	-0.2456***	0.0027	-0.2064***	-0.0018	-0.1892***
empall	-0.0011*	-0.0005	-0.0005	0.0003	-0.0012*	-0.0004	-0.0006	0.0016***
foreign	0.0019	0.0005	0.0020	0.0003	0.0019	0.0006	0.0021	0.0043*
age	-0.0003	0.0000	-0.0004*	-0.0001	-0.0003	0.0000	-0.0004	-0.0001
manexp	-0.0050	0.0089**	-0.0037	0.0115	-0.0042	0.0088**	-0.0017	0.0067
loan	0.2290*	0.1737**	0.2078	0.1597	0.2261*	0.1760**	0.1993	0.1853
training	0.0015	-0.0863	0.1255	-0.0462	-0.0016	-0.0795	0.1104	0.2906**
seas	-0.2096	-0.2307	-0.4606	-0.3988	-0.1903	-0.2302	-0.4026	0.1299***
workered	-0.1227	0.0452	-0.0797	0.1414	-0.1443	0.0439	-0.1063	0.0666
bureaucr	-0.0134*	-0.0108**	-0.0339**	-0.0299**	-0.0121	-0.0106**	-0.0317**	-0.0048
infra	-0.0496	-0.0316	-0.0557	-0.0384	-0.0530	-0.0350	-0.0581	0.0048
Fixed effects	NO	YES	NO	YES	NO	YES	NO	YES
_cons	32.018	99.2100***	-34.113	113.3926***	37.950	98.5057***	-22.319	95.1610***
N	406	406	352	352	406	406	352	511

Table I2. Determinants of productivity and profitability in manufacturing

Variable	SPW_boss1	SPW_boss2	PPW_boss1	PPW_boss2	SPW_own1	SPW_own2	PPW_own1	PPW_own2
femboss	0.1906	-0.0233	0.3293**	0.1157				
femown					0.0488	-0.0660	0.2325	0.0729
fertil	0.4992	-10.3656***	1.2828**	-10.3272***	0.5127	-10.3595***	1.3400***	-10.3647***
fempop	0.0881	-0.7253***	0.0557	-0.9461***	0.0710	-0.7262***	0.0366	-0.9608***
gdpcap	0.0002***	-0.0000***	0.0003***	-0.0000	0.0002***	-0.0000***	0.0003***	-0.0000
rural	0.0309***	-0.0718***	0.0491***	-0.0547***	0.0305***	-0.0716***	0.0491***	-0.0554***
wbljob	0.0237***	-0.0278***	0.0329***	-0.0137*	0.0241***	-0.0277***	0.0337***	-0.0137*
wblpay	-0.0155***	0.0982***	-0.0236***	0.0841***	-0.0157***	0.0979***	-0.0241***	0.0846***
wblbus	-0.1125***	-0.0104	-0.1328***	-0.0285*	-0.1131***	-0.0105	-0.1348***	-0.0284*
wblfin	-0.0021	-0.1764***	0.0020	-0.1877***	-0.0025	-0.1760***	0.0019	-0.1892***
empall	-0.0005	0.0014***	-0.0003	0.0016***	-0.0005	0.0013***	-0.0002	0.0016***
foreign	0.0052**	0.0046***	0.0050*	0.0043*	0.0053**	0.0046***	0.0051*	0.0043*
age	0.0003	-0.0002	0.0003	-0.0001	0.0003	-0.0002	0.0002	-0.0001
manexp	-0.0052	0.0024	-0.0012	0.0069	-0.0056	0.0024	-0.0017	0.0067
loan	0.1675	0.1387*	0.1745	0.1834	0.1720	0.1391*	0.1784	0.1853

training	0.6476***	0.1966**	0.7699***	0.2938**	0.6499***	0.1979**	0.7637***	0.2906**
seas	0.0562	0.0797*	0.0949**	0.1289***	0.0589	0.0798*	0.0970**	0.1299***
workered	0.0282	0.0905*	0.0158	0.0666	0.0278	0.0903*	0.0166	0.0666
bureaucr	-0.0218***	-0.0020	-0.0215*	-0.0049	-0.0217**	-0.0017	-0.0215*	-0.0048
infra	-0.0249**	0.0022	-0.0234**	0.0049	-0.0255**	0.0021	-0.0238**	0.0048
Country fixed effects	NO	YES	NO	YES	NO	YES	NO	YES
_cons	76.702	83.6525***	55.282	94.1843***	86.339	83.6618***	65.153	95.1610***
N	619	619	511	511	619	619	511	511

Table I3. Determinants of productivity and profitability in other services

Variable	SPW_boss1	SPW_boss2	PPW_boss1	PPW_boss2	SPW_own1	SPW_own2	PPW_own1	PPW_own2
femboss	-0.1001	-0.0863	-0.0913	-0.1144				
femown					-0.2089*	-0.1024	-0.1240	-0.0620
fertil	0.2753	-10.3738***	0.6706	-9.4938***	0.2985	-10.3443***	0.6832	-9.4738***
fempop	-0.1008	-0.7176***	-0.0837	-0.6773***	-0.1061	-0.7180***	-0.0854	-0.6730***
gdpcap	0.0002***	-0.0001***	0.0002***	-0.0000	0.0002***	-0.0001***	0.0002***	-0.0000
rural	0.0049	-0.0848***	0.0174**	-0.0648***	0.0055	-0.0846***	0.0179**	-0.0647***
wbljob	-0.0027	-0.0396***	0.0067	-0.0276***	-0.0025	-0.0397***	0.0067	-0.0280***
wblpay	0.0126***	0.1077***	-0.0039	0.0818***	0.0118***	0.1074***	-0.0044	0.0818***
wblbus	-0.0901***	0.0158**	-0.0956***	-0.0006	-0.0907***	0.0158**	-0.0958***	-0.0004
wblfin	-0.0225**	-0.2078***	-0.0314***	-0.1965***	-0.0231**	-0.2082***	-0.0318***	-0.1970***
empall	0.0002	0.0012***	0.0005	0.0014***	0.0002	0.0013***	0.0006	0.0014***
foreign	0.0063***	0.0029**	0.0089***	0.0062***	0.0064***	0.0030**	0.0090***	0.0064***
age	-0.0003*	0.0001	-0.0005**	-0.0001	-0.0003*	0.0000	-0.0005***	-0.0001
manexp	-0.0041	-0.0006	-0.0007	0.0016	-0.0040	-0.0006	-0.0007	0.0017
loan	0.3626***	0.2616***	0.3669***	0.2416**	0.3756***	0.2685***	0.3745***	0.2481**
training	0.4171***	0.2022***	0.3654***	0.2065*	0.4162***	0.2041***	0.3681***	0.2096*
seas	-0.1773**	-0.0936	-0.5436***	-0.3254**	-0.1730**	-0.0914	-0.5332***	-0.3197**
workered	-0.0197	0.1011*	0.0436	0.1670**	-0.0237	0.0989*	0.0432	0.1666**
bureaucr	-0.0126**	-0.0077	-0.0199**	-0.0131	-0.0124*	-0.0077	-0.0200**	-0.0133
infra	-0.0164**	0.0019	-0.0045	0.0131**	-0.0174**	0.0011	-0.0052	0.0124**
Fixed effects	NO	YES	NO	YES	NO	YES	NO	YES
_cons	19.2757***	85.5055***	17.0783***	79.8710***	19.6315***	85.5217***	17.1975***	79.6270***
N	849	849	734	734	849	849	734	734

Annex II: Full Blinder-Oaxaca decomposition

Table II.1 – Oaxaca Blinder decomposition of product and profit per worker by predominantly female managed or owned firms in the tourist industry

Variable	opw_femboss	ppw_femboss	opw_femown	ppw_femown
Differential				
Men	9.2554***	7.7368***	9.3459***	7.8957***
Women	9.1545***	7.5769***	8.9279***	7.2536***
Difference	0.1009	0.1599	0.4180**	0.6421***
Decomposition				
Explained	-0.1238	-0.0648	0.1799**	0.2242**
Unexplained	0.2247	0.2247	0.2381	0.4179**
Explained				
Regeff	-0.0269	-0.0463	0.0595*	0.0680
Internet	0.0383*	0.0808*	0.0241	0.0566
Gdpcap	-0.0808*	-0.0768	0.0482	0.0551
Rural	-0.0832**	-0.0874**	0.0518	0.0475
Empall	0.0120	0.0074	-0.0288	-0.0235
Foreign	0.0015	-0.0002	0.0078	0.0041
Age	0.0059	0.0105	0.0121	0.0150
Manexp	0.0080	0.0047	0.0174	0.0106
Infra	0.0037	0.0041	-0.0009	-0.0009
bureaucracy	0.0011	0.0070	-0.0010	-0.0113
Loan	-0.0013	0.0020	-0.0043	-0.0012
Training	-0.0123	-0.0026	-0.0134	-0.0115
Workeduc	-0.0039	-0.0050	-0.0097	-0.0096
Seas	0.0011	0.0057	0.0034	0.0076
Total	-0.1238	-0.0648	0.1799**	0.2242**
Femown	0.0130	0.0313		
Femboss			0.0137	0.0177
Unexplained				
Regeff	-32.019	20.500	28.674	6.3612**
Internet	-0.1298	-0.1767	-0.1257	-0.1057
Gdpcap	-0.5542*	-0.6752	-0.5602*	-0.7939*
Rural	0.5411*	0.3526	0.8723*	0.4674
Empall	0.0978	0.1255	0.1389	0.0095
Foreign	0.0699	0.0088	0.0343	0.0685
Age	-0.0558	-0.0564	-0.0432	-0.0541
Manexp	0.3832	0.8097**	0.4092	0.8293**
Infra	0.0399	0.0512	-0.0051	-0.0505
bureaucracy	0.0189	0.1951	-0.3796	-0.4832
Loan	-0.0939	-0.1436	-0.1557	-0.1217
Training	0.1670	0.3311	-0.0667	-0.3187
Workeduc	-0.0074	0.0751	0.2833	0.1333
Seas	-0.0367	0.0102	-0.1126**	-0.1349
Total	0.2247	0.2247	0.2381	0.4179**

Femown	0.0388	0.0495		
Femboss			0.1037	0.0899
_cons	29.480	-27.822	-30.222	-5.4784*
Statistics				
N	406	352	406	352

Note: p<.1; ** p<.05; *** p<.01.

Table II.2 – Oaxaca Blinder decomposition of product and profit per worker by predominantly female managed or owned firms in the manufacturing sector

Variable	opw_femb~s	ppw_femb~s	opw_femown	ppw_femown
Differential				
Men	8.5889***	6.9977***	8.7264***	7.1749***
Women	8.9112***	7.4979***	8.6271***	7.1374***
Difference	-0.3223*	-0.5002**	0.0993	0.0375
Decomposition				
Explained	-0.1433	-0.1018	0.0136	-0.0019
Unexplained	-0.1790	-0.3984**	0.0857	0.0394
Explained				
Regeff	0.0093	0.0145	0.0015	-0.0088
Internet	-0.0374	-0.0526	0.0163	0.0216
Gdpcap	0.0483	0.0214	0.1014	0.1040
Rural	-0.1348***	-0.0638*	-0.0467	-0.0222
Femown	0.0080	0.0035		
Empall	-0.0056	0.0033	-0.0177	-0.0113
Foreign	-0.0104	-0.0047	0.0094	0.0089
Age	0.0049	0.0035	-0.0060	-0.0093
Manexp	-0.0091	-0.0017	-0.0043	0.0022
Infra	-0.0165	-0.0221	-0.0201	-0.0238
bureaucracy	0.0078	0.0083	-0.0064	-0.0023
Loan	-0.0058	-0.0058	-0.0047	-0.0028
Training	0.0038	-0.0012	0.0095	-0.0145
Workeduc	-0.0060	-0.0045	-0.0007	-0.0052
Seas	0.0002	-0.0001	0.0001	-0.0001
Total	-0.1433	-0.1018	0.0136	-0.0019
Femboss			-0.0179	-0.0384
Unexplained				
Regeff	-0.3120	0.5395	17.551	5.8071**
Internet	0.0691	0.0883	-0.0271	0.0298
Gdpcap	0.1523	0.2817	-0.0447	-0.2956
Rural	-0.1053	-0.2804	-0.0591	-0.2024
Femown	0.3086***	0.3480***		
Empall	-0.0517	-0.0180	0.0316	0.0524
Foreign	0.0226	-0.0067	-0.0800	-0.1471**
Age	-0.0603***	-0.0665***	-0.0115	-0.0072
Manexp	0.4808*	0.5062	-0.5048*	-0.6453*

Infra	-0.0509	-0.1336	0.1218	0.0467
bureaucracy	-0.2902	-0.1096	-0.2505	-0.4482
Loan	0.0201	0.0074	0.0662	0.0315
Training	0.2374	0.1676	0.1775	0.1704
Workeduc	0.0780	0.0750	-0.0906	-0.2707
Seas	0.0116	0.0296	-0.0058	0.0284
Total	-0.1790	-0.3984**	0.0857	0.0394
Femboss			0.3724***	0.4782***
_cons	-0.6891	-18.268	-13.649	-4.5885**
N	619	511	619	511

Table II.3 – Oaxaca Blinder decomposition of product and profit per worker by predominantly female managed or owned firms in the other services

Variable	opw_ femboss	ppw_femboss	opw_femown	ppw_femown
Differential				
Men	8.9501***	7.5986***	9.0286***	7.6413***
Women	8.7491***	7.3342***	8.5393***	7.2255***
Difference	0.2011	0.2644	0.4893***	0.4158**
Decompiosition				
Explained	0.0228	0.1291	0.2271**	0.2466**
Unexplained	0.1782	0.1353	0.2622**	0.1692
Explained				
Regeff	-0.0015	-0.0007	0.0057	0.0060
Internet	0.0779**	0.0862**	-0.0217	-0.0204
Gdpcap	-0.0539	0.0165	0.2713***	0.2512***
Rural	-0.1012***	-0.0786**	-0.0718**	-0.0432
Empall	0.0010	0.0031	-0.0004	-0.0022
Foreign	0.0145	0.0215	-0.0022	-0.0085
Age	0.0144	0.0258	0.0072	0.0155
Manexp	0.0003	0.0002	-0.0000	0.0001
Infra	0.0242	0.0132	-0.0049	-0.0038
Bureaucracy	0.0118	0.0078	0.0096	0.0105
Loan	0.0167	0.0180	-0.0199	-0.0147
Training	0.0095	0.0108	0.0151	0.0041
Workeduc	-0.0142	-0.0051	0.0216	0.0213
Seas	-0.0009	-0.0057	-0.0003	0.0174
Total	0.0228	0.1291	0.2271**	0.2466**
Femown	0.0243*	0.0160		
Femboss			0.0179	0.0132
Unexplained				
Regeff	0.4657	0.6549	0.5919	0.8147
Internet	-0.0440	-0.0222	-0.0138	-0.0500
Gdpcap	-0.0331	-0.3562	-0.3252	-0.1167
Rural	0.1594	0.6792	0.0365	0.1223
Empall	0.0243	0.0246	-0.0748	-0.0976*
Foreign	0.0356	0.0725	-0.0617	-0.0449

Age	0.0361	0.0248	0.0224	-0.0081
Manexp	-0.3981**	-0.3608	-0.0967	-0.1027
Infra	-0.0491	-0.0460	-0.0194	-0.1209
Bureaucracy	-0.1334	-0.3090	-0.3162	-0.2209
Loan	0.0794	0.0507	-0.0696	-0.0839
Training	-0.0072	-0.0029	0.1523	0.2345
Workeduc	0.0812	0.0086	0.0270	-0.0194
Seas	0.0288	0.0167	0.0626**	-0.0091
Total	0.1782	0.1353	0.2622**	0.1692
Femown	0.1042	0.1027		
Femboss			0.1076	0.1502
_cons	-0.1716	-0.4021	0.2393	-0.2783
Statistics				
N	849	734	849	734