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Definitions Matter: Measuring Gender Gaps in Firms' Access to Credit*

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Abstract

Standards measures of female ownership and management of firms included in the World Bank Enterprise Survey do not support the existence of a gender gap in access to finance in the Latin American and Caribbean region. Nonetheless, more precise measures show that women-led businesses are more likely to be financially constrained than other comparable firms. The evidence presented herein suggests that this gender gap may be driven by taste-based discrimination. This paper exploits a rich dataset that provides detailed information about female ownership and management in firms, allowing for further understanding of gender gaps in access to finance.

JEL Codes: G21; J16; O54.
Keywords: Access to credit; Gender; Discrimination; Firm ownership.

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1 Introduction

Access to finance is a key factor for a firm's growth, as it strongly influences the performance of entrepreneurial initiatives (Klapper and Parker, 2011). Therefore, it is important to investigate the existence of a gender gap in access to finance, as it would prejudice the growth opportunities of women-led businesses (WLBs) (Sabarwal and Terrell, 2008). The reasons for such a gap may originate on both the supply and demand sides. On the one hand, banks may treat a loan application differently based on whether it comes from a male or a female – notwithstanding similar business and borrower characteristics – because of preferences or cultural beliefs about gender, causing a taste-based discrimination à la Becker (1957). On the other hand, there could be differences between male- and female-led enterprises in terms of size, age, sector of activity, human capital, entrepreneurial ability, and risk aversion, which could affect the demand for credit.

The focus on gender-based discrimination in credit markets in recent literature is growing. The results, however, are not yet definitive and have not been generally agreed upon. In fact, a key issue is how to define the gender of firms depending on the role played by the women in ownership and management. In most of the available empirical analyses, the definition adopted is indeed limited by data availability, with many studies focusing exclusively on microfirms (i.e., sole proprietorship firms), because the decision is straightforward in these cases (e.g., Alesina *et al.*, 2013).

This paper exploits the wealth of information about gender ownership and management available in a new dataset (FINGEN), which was built through a questionnaire survey by the Inter-American Development Bank (IDB) as a follow up to the World Bank Enterprise Survey (WBES) in Barbados, Jamaica, and Trinidad and Tobago. The abundance of data about the presence of females in the ownership and management of companies in these countries, and the introduction of different definitions of WLBs, make it possible to investigate the presence of a gender gap in the access to financial instruments. For instance, while there is no evidence of a gender gap according to the standard definitions of WLBs used in the WBES, the current study finds that the probability of being credit rationed is significantly more likely when using a more precise definition of WLBs, identified as those firms in which a woman is the major shareholder/owner and plays a key role in the strategic decisions. The main contribution of this paper is the empirical confirmation that a gender gap in access to finance strongly depends on the definition of the gender composition (ownership/management) of the firm. Specifically, the results point to a need to collect *ad hoc* information about the strategic role of women in business management in order to improve the empirical investigation of gender issues.

The paper is organized as follows. The next section provides a brief account of the literature on gender and credit access, with a focus on the empirical analyses undertaken in developing countries and the different definitions of gender within the firm. Section 3 illustrates the dataset and the variables used in the present analysis, with special attention to the definition of the gender variables. Section 4 presents a descriptive analysis about female ownership and management in the survey firms, as well as some statistics about their access to finance. Section 5 discusses the findings of the regression analysis and their implications. Section 6 concludes.

2 Does a Gender Gap in Access to Finance Exist?

2.1 The Literature

The effect that the gender of the owner and/or manager has on a firm's access to financial services has received increasing attention in economic literature. So far, much of the empirical work has been conducted on Europe and the United States, although recent studies have also been undertaken in less developed regions, such as Africa and the Latin American and Caribbean (LAC) region. Although the existence of differences in the degree of access to credit and financial services between male-led businesses and WLBs has been confirmed in existing literature (as documented later in this section), this literature does not provide clear and convincing evidence about the existence of a gender gap in access to finance. Two main problems make it difficult to draw conclusions in this area.

First, there is the possibility of an omitted variable bias. Gender differences in access to credit are often explained by a firm's heterogeneous characteristics, such as size, age, and sector of activity. Women-led businesses, for instance, are usually younger, less productive, and operate on a smaller scale and in less capital-intensive and efficient sectors than men-led ones (Sabarwal and Terrell, 2008; Bruhn, 2009; Cole and Mehran, 2009; Bardasi *et al.*, 2011; Aterido *et al.*, 2013). Therefore, banks often perceive WLBs as riskier and less creditworthy. However, it is generally very difficult to control for all the borrower's characteristics, which may affect creditworthiness and riskiness. Ideally, using a panel dataset (which is not common with survey data), it would be possible to control for a firm's fixed effects; but this would prevent the identification of the gender effect. Hence, researchers often use a very large set of control variables to check for all possible (observable) measures of risk.

Second, there is a selection bias, because the empirical analyses are not undertaken on random samples. In fact, some firms never apply for a bank loan, perhaps because they anticipate a rejection or prefer to invest small amounts of personal wealth. In other words, the observed differences in the use of credit across gender could not be the result of a supply-side effect, but they could reflect a lower demand for credit by WLBs when compared to male-led businesses, which would be the natural outcome of a higher risk aversion, lower investment in firm growth, and/or a bargaining inside the firm, according to which women may fear that the borrowed money would be diverted from its original purposes. Alternatively, WLBs may apply for bank loans less frequently, as they more often anticipate a rejection.

Given these biases, the following review of the literature on gender and access to finance considers how the use of financial services differs between male-led businesses and WLBs, with particular attention to the differences in developing countries.[1] A large number of empirical studies show the existence of (unconditional) gender differences in the composition of financial sources used by male-led businesses and WLBs. In developing countries, there is evidence of significant differences

[1]Microfinance has traditionally given great emphasis at the role of women. Hence, a related strand of literature looks at gender differences in creditworthiness and access to microfinance by individual entrepreneurs (see, among others, Fletschner, 2009; D'Espallier *et al.*, 2011; Agier and Szafarz, 2013). However, as this paper looks at small- and medium-sized business lending, it does not discuss this literature.

in credit needs and access to finance by gender (International Finance Corporation, 2011). Stefani and Vacca (2013) document a less intensive use of bank funding in the Euro area. They find that WLBs are less likely to apply for external finance and, in turn, are less likely to use a wide range of funding sources than male-led businesses. In another recent study on 17 European countries, Ongena and Popov (2013) show that WLBs rely less on bank credit and more on trade credit than male-led businesses to finance their working capital.

Taking gender ownership and other firm characteristics into account, the results of the empirical literature on credit availability and loan terms are quite mixed and vary across countries, possibly reflecting differences in institutional and cultural traits (Demirguc-Kunt *et al.*, 2013; Ongena and Popov, 2013). For example, Cavalluzzo and Cavalluzzo (1998) and Blanchflower *et al.* (2003) do not find any significant evidence of a gender based discrimination in the U.S. credit market, once several measures of riskiness are taken into account. On the other hand, in the case of European countries, using data from a European Central Bank survey on the access of small- and medium-sized enterprises (SMEs) to finance, Stefani and Vacca (2013) confirm that gender ownership largely explain differences in access to finance. Some interesting country-specific results emerge from this study. For example, German and Italian WLBs have a significantly higher probability to have their loan requests rejected than comparable male-led businesses.

In presence of a gender-based effect, it is difficult to disentangle statistical discrimination (i.e., gender provides a signal to the lender of some hidden characteristics of the borrower) and taste-based discrimination (i.e., WLBs are considered less desirable as loan clients, *per se*), given that it is not always possible to observe all individual characteristics that may affect the bank's evaluation of the borrower's creditworthiness. With a focus on Italy, Alesina *et al.* (2013) find that WLBs tend to pay higher interest rates than male-led businesses, and that this gender-based difference persists even controlling for a large number of firm characteristics. However, Bellucci *et al.* (2010) find a different result, showing that WLBs in Italy do not necessarily pay higher interest rates, but they face tighter credit constraints than male-led firms, since they are more likely to pledge collateral. These results hold even controlling for unobserved individual characteristics, suggesting the presence of a taste-based discrimination against women. A similar result is obtained in Ongena and Popov (2013), which, based on a sample of 17 European countries, finds that WLBs have more difficulties in obtaining bank loans than male-led businesses; but, once granted, the loan conditions are similar.[2]

In developing countries, once individual characteristics – such as income, educational attainment, and employment conditions – are taken into consideration, evidence on a gender based effect remains inconclusive. Aterido *et al.* (2013) and Bruhn (2009) show that gender has no significant effect on the likelihood of firms accessing credit in both Latin America and Sub-Saharan Africa. Similarly, Bardasi *et al.* (2011) analyze firms in Central Asia, Europe, Latin America, and Sub-Saharan Africa and find that the likelihood of obtaining bank loans and the interest rates on such

[2]Evidence on gender discrimination is also found in the analysis of peer-to-peer lending platforms. Barasinska and Schäfer (2010) find that, on average, WLBs in Germany pay higher interest rates for loans than male-led firms, even if they have similar credit risk, while Cesaroni *et al.* (2013) suggest that WLBs in Italy may suffer disproportionately during credit crises (i.e., they face greater credit contraction), as evidenced, for example, during the period 2007-09.

loans are not statistically different among male- and female-led firms, once loan and firm characteristics are controlled for.[3] The absence of gender-based discrimination is also confirmed by Storey (2004), who looks at the effect of gender on the probability of loan denial in Trinidad and Tobago. In contrast, the influential contribution by Muravyev *et al.* (2009) looks at 34 countries, mainly from Central Asia and Eastern Europe, and provides some evidence that WLBs are more likely than men-led businesses to have their loan application denied and to be charged higher interest rates.

Asiedu *et al.* (2013) stress the need to account for country-specific characteristics, since, they argue, the role of gender in access to credit varies across regions. In particular, they find that in Sub-Saharan Africa, female-owned businesses are more likely to perceive access to finance as an obstacle to business activity than male-owned firms; however, the effect of gender is the opposite in Latin America, and it is not significant in Asia or Central and Eastern Europe. The evidence on Sub-Saharan African countries is particularly heterogeneous. Hansen and Rand (2011) analyze survey data on eight African countries from the WBES and find that firms owned by females are less likely to be credit rationed than those owned by men. Using the same data, Bardasi *et al.* (2007, p. 74) partially reconcile the existing evidence, showing that no clear pattern emerges across Africa, since "access to finance appears to be as much a male problem as it is a female one. If women are more likely to indicate this constraint as 'major' or 'very severe' in Burundi, Eritrea, Kenya, Lesotho, and Madagascar, men identify this more as a constraint in Angola, Mauritania, and Tanzania."

The literature on financing constraints also investigates the discouraged borrowers, because the existence – if any – of a gender gap in access to finance could be the result of lower demand rather than actual credit rationing. For example, firms might not apply for a bank loan because they anticipate a denial, rather than because they do not need one. If the firm's expectations are correct, discouragement may signal an actual credit rationing. On the whole, the evidence suggests that female-owned firms are as likely to apply for loans as those owned by males, once individual characteristics are taken into account (Storey, 2004; Stefani and Vacca, 2013; Aterido *et al.*, 2013; Ongena and Popov, 2013). The results discussed by Bardasi *et al.* (2011) are, instead, more heterogeneous, since WLBs located in Central Asia and Europe are more discouraged from applying than male-led businesses, while the opposite is true for Sub-Saharan African firms, and no significant effect is detected in Latin America.

In sum, existing literature provides conflicting results and three different factors may contribute to explain this heterogeneity. First, small sample sizes, especially common in the investigation of WLBs, could affect the significance of the gender effect. Second, country-specific characteristics may also be a factor. If the gender gap is the result of a taste-based discrimination, one should expect that the level of financial development, and especially the increase of competition in credit markets, could mitigate the gender gap, consistently with the presence of a Becker-type discrimination (see, for example, Muravyev *et al.*, 2009). On a different ground, Demirguc-Kunt *et al.* (2013) find evidence of a gender gap in account ownership and saving and borrowing opportunities in countries

[3] In this study, the only result pointing to the presence of a gender discrimination is the higher collateral requirements for WLBs.

where women either face legal discrimination in the ability to work, head a household, choose where to live, and/or inherit property or are required by law to obey their husbands. In a similar vein, Ongena and Popov (2013) show that access to credit for female borrowers is more problematic in countries in which there is a more severe inherited cultural gender bias (e.g., the former Yugoslavian countries) than in other countries where the gender bias is weaker (e.g., Germany and Ireland). Third, the heterogeneity in the empirical results could be partially explained by the different ways in which WLBs are defined. The issue of how to define the gender presence in firms is the focus of the next section.

2.2 Defining the Gender Composition of the Firm

To empirically investigate the existence of a gender gap in access to finance, a crucial step is to define the gender composition of the firm. In existing literature, it is common to define the firm's gender as the gender of the owner. This choice is motivated by the fact that, in many cases (e.g., in the U.S. Survey of Small Business Finances (SSBF) (Cavalluzzo and Cavalluzzo, 1998; Blanchflower *et al.*, 2003; Blanchard *et al.*, 2008) and in the Italian Central Credit Register (*Centrale dei Rischi*), run by the Bank of Italy (Alesina *et al.*, 2013), the gender of the owner is the only information to go by. Therefore, one way to unambiguously define the gender of a firm is based on ownership, limiting the sample to sole proprietorship firms. This is what is done, for example, by Bellucci *et al.* (2010) and Alesina *et al.* (2013), using data from Italy; by Storey (2004), using data from Trinidad and Tobago; and by Muravyev *et al.* (2009) and Ongena and Popov (2013), using cross-country data from the Business Environment and Enterprise Performance Survey (BEEPS). Although limiting the analysis to sole proprietorship companies simplifies the task of defining the gender composition of the firm, it comes at the (nontrivial) cost of significantly reducing the sample size and variety.

In some studies, the gender ownership of the firm is defined by using a certain threshold level of ownership. In this case, there is a degree of arbitrariness in determining the threshold for classifying a firm as female-owned. For instance, Cesaroni *et al.* (2013) classify a private company as female-owned if over 60 percent of the owners are women, and they consider a public company as female-owned if women own at least 60 percent of the total shares. Other studies, such as Blanchard *et al.* (2008) and Asiedu *et al.* (2012), classify a company as female-owned if at least half of the owners are women.

Some other studies, with looser criteria, classify a firm as female-owned if there is at least one woman among the owners. This is, for instance, the case of the definition used in the WBES (Bardasi *et al.*, 2011; Hansen and Rand, 2011; Aterido *et al.*, 2013). In fact, as long as one considers sole proprietorship firms and very small businesses, ownership and management are closely aligned. However, in analyzing large firms with multiple owners, this definition of gender could involve a certain degree of arbitrariness and be rather imprecise. This is because, in larger firms, the internal organization becomes more complex, and thus the presence of at least one female among the owners does not necessarily imply that women in general have a significant impact in the decision-making process. Moreover, the composition of management by gender could be different from that of ownership, further weakening the correlation between the gender indicator and the actual female

influence in the company. In other words, to classify a firm as female-owned only on the basis of some female ownership may lead to lower bounded estimates on the extent to which gender actually matters (Aterido *et al.*, 2013).

While the majority of the existing studies focus on ownership to determine the gender of a firm, this variable may not be the most accurate one to measure the actual influence of women within a firm. Thus, some empirical surveys provide data about the management structure and its gender composition as well. For example, the WBES collects information about the gender of the managers, while the European Central Bank (ECB) survey on access to finance by European SMEs has an explicit question about the gender of the owner/director/chief executive officer of the firm.[4] In their study focused on business ownership and performance, Aterido and Hallward-Driemeier (2011) clearly point out the need to consider the women's level of control in the decision-making process, along with their participation in ownership. Analyzing a sample of Sub-Saharan African firms, these authors conclude that the traditional measure of ownership does not provide any significant evidence of a gender gap, while a large productivity gap often emerges once WLBs are defined as those in which the primary decision maker is a woman.

3 Data and Variables

The present study focuses on three Caribbean countries – Barbados, Jamaica, and Trinidad and Tobago – analyzing a dataset obtained through the merging of the WBES and the FINGEN survey. The IDB undertook the FINGEN survey in 2012, as a follow-up to the WBES already carried out in these three Caribbean countries, but with a specific focus on access to finance and the introduction of several detailed questions about the gender of the owners and the managers of the sampled enterprises. The full sample consists of 405 observations, which is a subsample of the 896 observations of the WBES.

The questionnaire is composed of five sections. Section A collects information about how a firm finances itself, and Section B asks about the firm's intention to request financial services in the future. Section C gathers data about insurance coverage, while Section D, the most important for the present analysis, requests information regarding the gender of the owners and the managers of the firm. Section E asks about the use of services provided by technical assistance programs.

The next subsections describe the different groups of variables introduced in the empirical analysis. Table 1 presents the definitions of the variables and the summary statistics.

3.1 Measuring Gender

As anticipated in Section 2.2, the WBES provides information on the composition of ownership and management by gender within a given firm. More precisely, there are two gender-related variables. The first variable identifies firms in which there is at least one woman among the owners (WOB_{WBES}), and the second identifies the firms with a top female manager (WMB_{WBES}). While certainly informative, these two variables do not make it possible to disentangle different levels of

[4] In this study, the indicator does not disentangle ownership and management.

female ownership in a firm; in particular, it is not possible to single out those firms in which women own the majority of the firm.[5] In determining the gender of management, the WBES only takes into consideration those firms with a female top manager, therefore discounting the different levels of female involvement in managerial responsibilities.

Thanks to its explicit focus on gender, the FINGEN survey overcomes some of the limitations of the WBES. The FINGEN survey collects a wealth of information, making it possible to measure different effects of the gender composition of the firm along multiple dimensions. In particular, it classifies gender composition of the ownership and the management of the firms surveyed according to five categories: (i) all men, (ii) predominantly men, (iii) equal share of men and women, (iv) predominantly women, and (v) all women. The survey collects information about the gender of the largest owner/shareholder, his or her involvement in the firm management, and his or her past work experience. In addition, it provides information about the gender of the manager(s) in the firm dealing with tax inspectors/authorities and banks and other financial institutions.[6]

Based on the information collected in Section D of the FINGEN survey, the present empirical analysis introduces different definitions of the gender composition of the firm with respect to the one traditionally proposed in the WBES, to take into account different forms of female involvement. We propose three measures of female participation in the managerial and ownership structure of the firm:

- WOB_{FINGEN} is a dummy for women-owned businesses (WOB), which is equal to 1 when all or the majority of the firm owners are women, and zero otherwise;[7]
- WMB_{FINGEN} is a dummy for women-managed businesses (WMB), which is equal to 1 when all or the majority of the firm managers are women, and zero otherwise;
- $WO\&MB_{FINGEN}$ is a dummy for women-owned and managed businesses (WO&MB), which is equal to 1 for firms in which owners and managers are all or predominantly women, and zero otherwise.

The definition of ownership based on the FINGEN survey is more restrictive than that of the WBES, which only requires the presence of a woman in the ownership of the firm. As for the management, both the information available in the FINGEN and the WBES imply an influential presence of women in the management of the firm. However, the two definitions do not overlap, since in some firms, even though a woman is the top manager, the majority the other managers are men, while in others, there may be a predominant share of women in the management team, but a

[5] This limitation is specific to the most recent waves of the WBES. In earlier waves, there was a different variable about the gender of the principal owner of the firm (see, for instance, Bruhn (2009) and Bardasi *et al.* (2011)).

[6] In particular, the data from the FINGEN survey make it possible to identify the gender of the finance manager. This variable measures an interesting aspect of gender within the firm, but it cannot be considered as an alternative measure for WLBs. Thus, given that the focus of the paper is on WLBs and access to finance, the analysis of the possible effects of having a woman as a finance manager is left for future studies.

[7] In this variable, as well as in the following ones, the control group consists in all other firms in the sample, including those fully owned or managed by men and those in which the presence of women in ownership or management is less than or equal to the presence of men. We have also built weak measures of female ownership and management to consider the cases of minoritarian women presence in firms. These measures, however, do not provide any significant result (possibly because the indicators are not able to really disentangle firms where there is an actual presence of women in decision making), and thus have been excluded from the empirical analysis.

man as the top manager.[8]

In order to introduce a more precise definition of WLBs, we also consider the firms in which the major owner or shareholder is a woman. Among these firms, we select those in which the owner is in charge of major strategic and financial decisions, exploiting some additional information available in the questionnaire (Question D1e).[9] This dummy variable (WLB_{FINGEN}) is our preferred measure of WLBs. It entails restrictive conditions about the female presence in the ownership and in the management of the firm, and thus we can be reasonably sure that the firm is actually led by a woman. Using data from the WBES, it is not possible to identify firms in which the main owner and decision maker is a woman, unless the analysis is limited to sole proprietorship firms, where ownership and management responsibilities coincide. Thus, with respect to most of the existing literature, our variable WLB_{FINGEN} makes it possible to identify those firms in which women have an actual involvement, both in ownership and in decision making, without limiting the sample size and excluding medium- and large-sized companies.

3.2 Measuring Access to Bank Credit

In Section A, the FINGEN survey provides detailed information about the different financial resources that firms currently use to operate, distinguishing between short-term credit lines or medium- to long-term loans, trade credit, equity financing, government grants, and leasing financing. For each of these funding sources, the survey asks detailed information regarding the level of satisfaction with several price and non-price factors, as well as regarding the firm's decision to request or not (and why) any specific type of financing in the previous quarter. The following analysis focuses on bank credit lines and loans. To assess any gender difference in the use of bank financing, we define the dummy variable $LOANS$ as equal to one if a firm has a short-term credit line or a medium- to long-term loan. Then, we use available data about the loan application process and bank loan rejections and approvals to build two measures of a firm's financing constraints (as done, for instance, in Muravyev *et al.*, 2009; Ongena and Popov, 2013). The first one ($DISCOURAGED$) identifies *discouraged borrowers*, which are firms that need a bank loan but have not applied for it in anticipation of adverse lending conditions. In particular, the main reasons indicated for not applying even when bank credit is needed are high costs and complicated procedures. The second

[8]Based on a comparison of the data from the FINGEN survey on ownership and management with that of the WBES, we have found some inconsistencies. Specifically, there are 17 firms (out of 405) classified in the FINGEN survey as owned only by men, while in the WBES, these firms appear to have a female among the owners. Moreover, the WBES classified 3 firms as not owned by females, while the FINGEN survey reported that the owners of these same 3 firms were all female. Considering the gender of management, inconsistencies are found, respectively, in data from 9 and 4 firms. One possible reason for these discrepancies is the timing of the two surveys. The WBES took place between April and August of 2011, and the FINGEN survey was carried out one year later (between April and June of 2012). While most structural characteristics of the interviewed firms has remained the same, the research team that conducted the FINGEN survey has encountered unexpected inconsistencies in 30 cases, which have all been carefully inspected. Moreover, control checks were run on all these cases at the time of the survey without detecting any systematic biases. In addition, these cases are indistinguishable spread throughout the three countries, and include firms of different size. For all these reasons, and given the specific focus of the FINGEN survey on gender, this study uses the data also to contrast information with data from the WBES. We test the robustness of our results dropping all the inconsistent observations.

[9]The alternative answers proposed by the questionnaire are: (i) makes decisions in consultation with other partners, and (ii) delegates decisions to other partners. They are not included in our variable.

measure ($RATIONED$) is a standard indicator of (quantity) *credit rationing* that identifies firms that have requested credit lines or loans, but their requests have been declined by the bank.[10]

3.3 Control Variables

As discussed in Section 2.1, to identify the presence of a gender bias in access to finance, we need to mitigate as much as possible the omitted variable bias controlling for a large set of characteristics, which may capture firms' risk and creditworthiness. The WBES dataset offers a sufficiently large and comprehensive set of standard control variables.[11]

Two standard measures of firm's riskiness and informational opacity are size and age, with smaller and younger firms being generally less capable of providing verifiable information on their business activities to banks, and thus being more likely to be credit rationed. Firm size ($SIZE$) is measured in terms of the (logarithm of the) number of full-time employees, ranging from a minimum of 5 to a maximum of 1800, with the average (median) firm having 85 (30) employees. Regarding the age of the firm, 95 percent of those surveyed had been in operation for at least five years. The average year the firms were established is 1982, and the age of the median firm is 21 years. We take advantage of the available information on the firm structure to identify sole proprietorship firms ($SOLE-PROP$) and those belonging to a business group ($GROUP$).

To further capture the degree of informational asymmetries between firms and financial institutions, we build two additional dummies, one for firms that have an internationally-recognized quality certification ($QUALITY$) and another for firms whose financial statements have been certified by an external auditor ($AUDIT$).

Another indicator of firm riskiness is related to the degree of internationalization. In our sample, only 28 percent of firms sell part of their production abroad. This share increases to 33 percent when considering indirect exporters (firms selling domestically to third parties that then export the goods). The dummy $EXPORT$ identifies indirect exporters. A second indicator of internationalization is a dummy identifying firms which have foreign owners ($FOREIGN$).

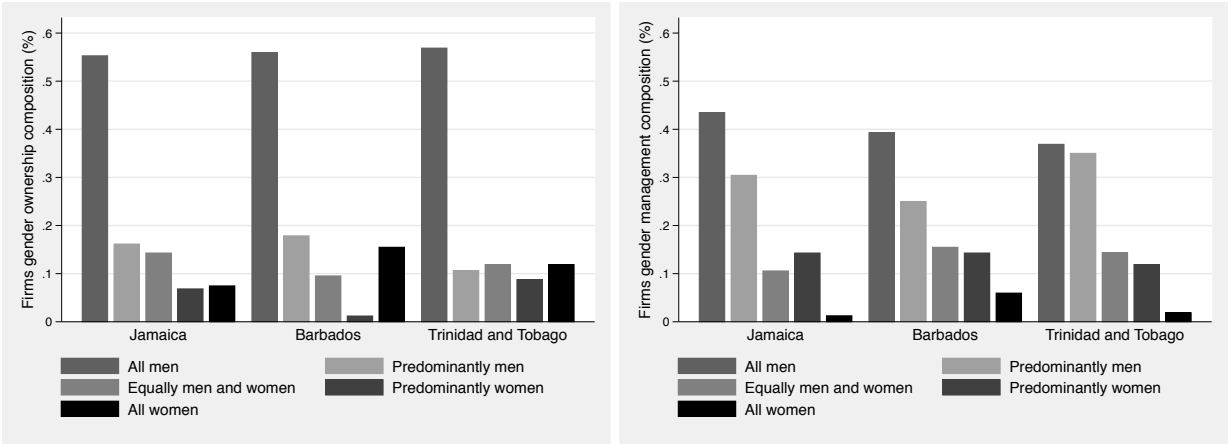
Finally, we can control for firms working in manufacturing or services, including the dummy $MANUFACTURE$,[12] and for their location, in terms of the size of the city and country in which they are headquartered. Table 1 provides the complete list of variables.

[10] Alternatively, one could merge discouraged and rationed borrowers, building a single dummy variable which is equal to 1 for rationed and discouraged firms, similarly to what is done in Muravyev *et al.* (2009). This would avoid the risk of underestimating the share of rationed firms because of self-selection of borrowers who refrain from applying to banks, but would lead to an overestimation of denial rates. The latter issue may generate biased estimates of gender discrimination if men and women differ in their degree of overconfidence, and thus have different attitudes when choosing to apply for a loan or not. Henceforth, we prefer to include both variables in the empirical analysis.

[11] Unfortunately, we share with the analyses that use the WBES the impossibility to control for other measures that may capture the riskiness of the firm (e.g., credit rating and financial structure), and the lack of individual-specific information (e.g., age and education) about the major owner/shareholder or the top manager. Other data are available (e.g., innovative capacity and labor force education), but their inclusion dramatically reduces the sample size.

[12] The limited sample size does not allow for a more granular distinction of the sectors in which the firms operate.

Figure 1: Gender Composition in Ownership and Management (by country)



(a) Firm ownership

(b) Firm management

Source: Calculations based on the FINGEN dataset.

4 Descriptive Analysis

This section presents a descriptive analysis of the gender composition of the firms included in the FINGEN survey and of their diversified access and use of financial products. The analysis is based on the data collected in all three countries under investigation. Unfortunately, the small sample size does not allow for meaningful country-specific analyses.

4.1 Female Ownership and Management

Figure 1 presents the distribution of firms in the three countries of study according to the five categories of ownership and management provided by the FINGEN survey. The following three key facts emerge: (i) men strongly dominate both as owners and managers in the sample firms; (ii) comparatively, the male presence is larger in ownership than in management; and (iii) the pattern in the three countries is indeed very similar, justifying the poolability of the data.

Based on an analysis of the intensity of the gender ownership and management in the sampled firms, there are no women at all among owners and managers in about 30 percent of businesses. Moreover, 178 firms have at least a female among the owners, and 243 (more than 50 percent) have at least one woman as a manager. An estimated 140 businesses (more than one-third of the sample) have at least one woman among each the owners and managers. Strong female presence – that is, the owners or managers are predominantly or all women – is found in 70 firms in the case of ownership and 64 in the case of management. Using the most stringent definition of female presence – that is, women are the majority among both owners and managers – we identify 31 companies (7.6 percent of the sample). These firms are almost equally distributed in the three countries. In relative terms, however, they represent 11.9 percent of the sample in Barbados, 7.5 percent in Jamaica, and 5.6 percent in Trinidad and Tobago.[13] Finally, if we consider our preferred

[13]In addition, these 31 firms are more likely to be active in the retail sector, and are younger and smaller than the

definition of WLBs, there are 45 cases, quite equally distributed across countries, in which a woman is the largest shareholder/owner and makes strategic and financial decisions. Hence, WLB_{FINGEN} is a conservative measure of WLBs, so that – if anything – it would underestimate the presence of a gender gap in access to finance.

When considering the WBES definitions, it is clear that there are significant differences between the two surveys. On one hand, since the ownership variable (WOB_{WBES}) in the WBES is much less restrictive than the one constructed on the basis of the FINGEN data, the share of sampled firms which can be defined as female-owned is 44 percent according to the WBES definition, compared to 17 percent according to the FINGEN data. On the other hand, the management variable (WMB_{WBES}) is quite restrictive. In fact, only 16 percent of firms can be considered as women-managed according to the WBES definition, which is almost identical to the findings using WMB_{FINGEN}. However, a closer look reveals that the overlapping between the two variables is limited to 26 firms, while 74 have a woman as top manager, but do not have predominantly women working as managers, or vice versa.

4.2 Gender and Access to Finance

The data collected by the FINGEN survey show that bank loans and trade credit are the two most widely used sources of external finance, while only a minority of firms use all the other instruments (leasing, equity, and government grants). The share of firms which finance their operations using bank loans or credit lines is, on average, more than 80 percent and it is quite constant across all the alternative definitions of gender. The difference still holds when considering firms in which women are the majority among both owners and managers and in the stringent definition of WLBs. The use of trade credit is rather heterogeneous across countries, since it is very common in Trinidad and Tobago (91 percent) and Jamaica (79 percent), and much less so in Barbados (56 percent). Other sources of external finance are much less widespread. For example, only about 13 percent of firms use leasing, while even less use equity and government grants (9 and 7 percent of firms, respectively).

The data reported in Table 2 show that WLBs do not have a significantly different probability of using bank credit than other firms, irrespective of the gender definition. The lack of a gender gap in using bank credit, even without controlling for firm's characteristics, is consistent with the evidence discussed by Bruhn (2009) on some Latin American countries.

Moving to actual access to finance, the results suggests that this is an important issue for Caribbean firms. On average, 16 percent of firms are discouraged and 9 percent are credit rationed. Gender plays a role with regard to financing constraints and the data clearly point out that the different definitions of the gender composition of the firm tell different stories. In fact, while we do not find any evidence that gender affects the probability of being a discouraged borrower, in firms where the majority of managers and owners are women ($WO\&MB_{FINGEN}$), we find that the probability of having a loan request denied is 19 percent, higher than the average of 8 percent for the other firms. The probability of being credit rationed is generally much higher for WLBs

average firm in the sample.

than for the others, except when the WBES gender variables are used, even if the difference is not statistically significant at the usual confidence levels. These findings confirm the need to carefully measure gender within the firm.

5 The Econometric Analysis

This section exploits the richness of the FINGEN dataset regarding gender presence in the ownership and management of firms, as well as their financial structure, to assess whether alternative measures of gender participation in ownership and management provide diverse results in terms of access to finance. The next section presents the statistical design used to test for the presence of a gender gap in the likelihood of being a discouraged borrower and in the probability of being credit rationed by the banking system. Sections 5.2 and 5.3 discuss the main results. Then, in subsection 5.4, we decompose the gender gap in a part explained by the differences in the observable control variables, as well as in an unexplained part, which could be interpreted as a measure of the extent of a gender-based discrimination.

5.1 The Estimated Models

This section tests for the presence of a gender gap in a firm's access to finance, primarily focusing on how alternative definitions of gender presence in the firm's management and ownership structure may affect financing constraints. We model the probabilities of being a discouraged borrower and the likelihood of being credit rationed by the bank.

Given that we have a cross-sectional dataset and cannot exploit the longitudinal dimension of the data, we try to control for as many firm characteristics as possible, in order to better determine the existence of a gender gap. However, since we cannot control for unobserved individual characteristics, our identification strategy could still suffer from an omitted variable bias. However, as our main goal is to assess to what extent alternative measures of gender affect a firm's access to finance, rather than to determine the presence of a gender gap *per se*, the omitted variable bias could be considered as a second-order problem.

We estimate three different probit models in which the dependent variable is a dummy variable capturing the firm's limited access to finance along three dimensions: discouragement, credit rationing, and obstacles to business activity. The baseline equation is the following:

$$Prob(Y_i = 1) = \Phi(GENDER_i; CONTROLS_i) \tag{1}$$

where Y is, alternatively, a dichotomous indicator equal to 1 if the i-*th* firm does not apply for a bank loan even if it needs it ($DISCOURAGED$) or is credit rationed ($RATIONED$). The probability that each of these dummy variables is equal to 1 is a function of the six alternative definitions of female participation in the ownership/management of the firm ($GENDER$) and of a standard set of control variables ($CONTROLS$). The set of controls include firm age (in logarithm), the (logarithm of the) number of employees, dummies for export status, foreign ownership, group membership, quality certification, external audit, and sector of activity (manufacturing vs. services), as well as

country and location dummies. Tables 3 and 4 present the average partial effects obtained from the estimation of equation 1 when the dependent variables are $DISCOURAGED$ and $RATIONED$, respectively.

To assess the accuracy of the different models, the bottom of the tables report some goodness-of-fit measures. Along with the standard Akaike and Bayesian information criteria (AIC and BIC, respectively), which combine–and try to balance–fit and complexity, we report the area under the receiver operating characteristic (ROC) curve (AUROC), which is a measure of the predictive ability of the model that is independent of the cutoff probability used to classify the predictions of the model.[14]

5.2 The Effect of Gender

The first finding from our regression results is that the different definitions of gender do not consistently tell the same story, so that gender is not robustly correlated with firms' financing constraints. This is a confirmation of the previous results obtained in the empirical analysis. The second finding is that when the female presence in the firm' ownership and decision making process is precisely measured, there is evidence that WLBs are less likely to be discouraged borrowers, but they are more likely to be credit rationed than comparable firms, once they apply for bank credit.

Starting from the model about discouraged borrowers, the estimates reported in Table 3 are only significant when the strong definition of WLBs is adopted and, in this case, the sign of the coefficient is negative and it implies that WLBs are less likely than the others of being discouraged borrowers, once individual characteristics are taken into account. The coefficients on the other gender variables are not statistically significant, indicating that the likelihood of being a discouraged borrowers is the same across all other definitions of the gender composition of the firm. This evidence is in line with the univariate analysis, and the lack of a robust gender gap is also consistent with results of previous studies in developing countries (Storey, 2004; Aterido *et al.*, 2013), especially in Latin America (Bardasi *et al.*, 2011).

Moving on to the model about credit rationing (Table 4), the results change. In this case, we generally observe that female involvement in firms is positively associated with the likelihood of being credit rationed. The coefficient is positive and statistically significant when considering the standard measure of ownership (Column 1), as well as the definition of female involvement both in ownership and management (Column 3) and our preferred definition of WLBs (Column 4). The predominant presence of women in the managerial structure does not have a statistically significant

[14]Under the standard classification rule, the probability cutoff is set at 0.5, implying that Type 1 and Type 2 errors are equally bad. However, varying the cutoff probability reduces the chances of making one type of error at the expense of increasing the other type of error. The ROC curve tells exactly how this trade-off works for all possible cutoffs, plotting the true positive rate of the model against its false positive rate. The y-axis captures the 'Sensitivity', which is the probability of correctly predicting when the outcome is equal to 1 (i.e., the firm is actually credit rationed). The x-axis is (1-Specificity), where 'Specificity' is the probability of correctly predicting the outcome variable equal to 0 (i.e., the firm is not credit rationed). It is easy to see that the further the ROC curve is from the 45 degree line, the better the model predicts both characteristics (i.e., rationed and nonrationed). The AUROC provides a simple test against the null value of 0.5 with an asymptotic normal distribution. When this area under the ROC curve is 1, the model is correctly predicting everything. This statistic decreases as the model becomes worse. For a recent example of the use of the AUROC in a finance context, see Bharath and Dittmar (2010).

effect on the probability of credit rationing, even if the coefficient on WMB_{FINGEN} is still positive (Column 2). Interestingly, the two measures constructed using the WBES do not show any evidence of a disadvantage of WLBs in accessing bank loans (Columns 5 and 6).[15]

As a whole, these findings can help rationalize the heterogeneity of the results discussed in the literature. The evidence of a higher likelihood of credit rationing for WLBs is consistent with the evidence provided by Muravyev *et al.* (2009) – using a restrictive definition of female ownership – on developing countries in Central Asia and Eastern Europe. Instead, the lack of support for the presence of a gender gap when using the WBES gender variables is in line with what Bardasi *et al.* (2011) found using a sample of Latin American countries and the same broad definition of female ownership (WOB_{WBES}).

The point estimate reported in Column 1 indicates that firms with a predominant presence of female owners are 2.1 percentage points more likely to be credit rationed by the banking system than other firms in the sample, even when controlling for a full range of firm observable characteristics (e.g., riskiness, informational opaqueness, and quality). This gender effect is economically meaningful, given that the average probability of being rationed in the sample is 9.4 percent (see Table 1). The gender gap is the same when considering our preferred measure of WLBs, identifying firms in which a woman is the major shareholder/owner and plays a key role in the strategic decisions (Column 4), and even stronger (and equal to 3.3 percentage points) in the case of firms in which women are the majority among both owners and managers (Column 3).

The goodness-of-fit measures reported at the bottom of each table do not point out significant and large differences across different specifications. The only pattern observed is that the information criteria and the AUROC in Table 3 are, respectively, smaller and larger when gender is measured by WLB_{FINGEN} than by the other variables. Finally, the AUROC values suggest that the model explaining the probability of credit rationing is better specified than the one about discouraged borrowers.

5.3 The Role of Control Variables

In regards to control variables, our results are generally consistent with what has been suggested in the literature. As Ongena and Popov (2013) find, the evidence herein shows that discouraged borrowers are more likely to be domestically oriented and informationally opaque (Table 3). In particular, the lack of a quality certification could be a signal of riskiness that, based on the anticipation of denial, may prevent companies from applying for bank loans. There is also evidence that discouraged borrowers are frequently located in smaller towns. If small town are not served by banks, and discouraged borrowers correctly anticipate a loan denial, the increase in the probability of being discouraged associated with a greater distance from banks would be consistent with a positive effect of bank-borrower distance on the likelihood of being credit rationed (Alessandrini *et al.*, 2009).

The probability of credit rationing is higher for sole proprietorship firms, while it is lower for

[15] Results are robust to a more stringent definition of WOB_{WBES} WMB_{WBES}, in which we drop all observations that originate discrepancies between the FINGEN and WBES definitions of female ownership and management of firms (see footnote 8).

firms that have their financial statements certified by an external auditor (Table 4), confirming the importance of informational frictions for access to finance. The coefficient of $SIZE$ is negative, consistent with the expectations, but it is never statistically significant. Moreover, the effect of firm's size on credit rationing is likely to be captured by the positive coefficient of $SOLE-PROP$. Finally, the probability of rationing is about 8 percentage points lower in Barbados than in Jamaica, consistent with the actual frequencies.

5.4 The Blinder-Oaxaca Decomposition

This last section focuses only on the significant results found in the previous estimations, pointing to the presence of a gender gap in access to finance, in order to assess to what extent these effects are driven by differences in observable characteristics across male- and female-led firms. The literature on discrimination often uses the counterfactual decomposition technique developed by Blinder (1973) and Oaxaca (1973) to disentangle the effect of observable and unobservable characteristics on racial and gender gaps in outcomes, especially in the labor market. In a linear model, the mean difference of the dependent variable can be decomposed in an explained part, due to differences in characteristics across groups, and in a residual *unexplained* part, which can be interpreted as a measure of discrimination. Fairlie (2005) extends the Blinder-Oaxaca decomposition to nonlinear models. We adopt this last approach to decompose the gender gap in firms' financing constraints into the explained and unexplained parts in order to have a rough, albeit informative approximation of what explains these constraints in female-owned and managed firms.

We start by considering the estimation of the rationing equation, which has more robust results. We then decompose the gender gap in the probability of being credit rationed, measuring gender with the indicators of female ownership and management, which have a significant coefficient in Table 4. The results, reported in the bottom panel of Table 5 indicate that differences in observable characteristics between male- and female-led firms explain a small fraction of the gender gap. This implies that there are unobservable factors – and discrimination might be one of them – which hinder access to finance for female-owned and managed firms.[16] In particular, starting from the credit rationing model (upper panel), the gender gap for female-owned businesses is 4.1 percentage points, and only 1.6 percentage points are explained by differences in firm characteristics across these firms and the rest of the sample. The gender gap is somewhat larger for firms with a predominant share of women among managers and owners (5.5 percentage points) and for WLBs (5.1 percentage points). However, the unexplained part is even larger, given that the observable characteristic would predict, respectively, a probability of credit rationing of 0.5 and 1.6 percentage points higher for WLBs. Finally, the results reported in the top panel suggest that the lower probability of WLBs being discouraged is almost entirely due to unobservable factors.

[16] This may also reflect the fact that our model specification is not controlling for certain factors (e.g., financial structure) that may affect differences in access to bank credit.

6 Conclusions and Policy Implications

This paper exploits the rich availability of data about gender included in the FINGEN survey in three Caribbean countries to test for the presence of a gender gap in access to finance. A clear advantage of this survey is the possibility to introduce various measures of the gender composition of the firm and, in particular, new indicators of WLBs, according to which a female business owner must be involved in decision making as well.

Standard measures of ownership and management, such as those available in the WBES, suggest the lack of a gender gap in firms' access to finance. However, our results indicate that it is crucial to also measure the extent of female involvement in firm ownership and management in order to understand whether WLBs are at a disadvantage when trying to access finance. Specifically, the main result of our analysis is that the presence of a gender gap in access to finance varies according to the different definitions of WLBs. For example, when adopting a precise measure of women involvement in the ownership and management of the firm, WLBs are significantly less likely than other comparable firms to be discouraged borrowers, but they are more likely to be credit rationed.

We also find that the existence of a gender gap – as in the case of the probability of being rationed – is consistent with the presence of a taste-based discrimination, rather than being due to observable differences between the two groups of firms. However, this finding should be carefully interpreted, given that the cross-sectional dimension of the dataset does not allow to perfectly control for firm's riskiness and creditworthiness.

On the whole, our findings highlight the need to deepen the analysis of the effect of gender in firms' decision-making processes, and also stresses the importance of undertaking an *ad hoc* survey, such as the FINGEN survey. This first set of results exploit only part of the FINGEN data, which could also be used to investigate other relevant questions, such as: (i) Does gender discrimination in access to finance affect firm performance? (ii) How much does the perception of being discriminated by gender reflect an actual gender discrimination? (iii) Is there a gender gap in access to and usage of insurance products?

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Table 1: Variables: definitions and summary statistics

VARIABLE	DEFINITION	Obs	Mean	St.Dev.	Min	Max
	Gender variables					
WOB_{FINGEN}	Dummy equal to 1 when a firm has all or predominantly women among owners, and 0 otherwise.	405	0.173	0.379	0	1
WMB_{FINGEN}	Dummy equal to 1 when a firm has all or predominantly women among managers, and 0 otherwise.	405	0.158	0.365	0	1
$WO\&MB_{FINGEN}$	Dummy equal to 1 when a firm has all or predominantly women among managers and owners, and 0 otherwise.	405	0.077	0.266	0	1
WLB_{FINGEN}	Dummy equal to 1 if the firm largest shareholder/owner is a woman and she makes major strategic and financial decisions, and 0 otherwise.	405	0.111	0.315	0	1
WOB_{WBES}	Dummy equal to 1 when a firm has at least a woman among owners, and 0 otherwise.	405	0.438	0.497	0	1
WMB_{WBES}	Dummy equal to 1 when a firm has a woman as a top manager, and 0 otherwise.	405	0.158	0.365	0	1
	Access to finance					
$LOANS$	Dummy equal to 1 when a firm has a line of credit or a medium/long-term loan, and 0 otherwise.	405	0.827	0.378	0	1
$DISCOURAGED$	Dummy equal to 1 when a firm did not apply for bank credit even if it needed this type of financing, and 0 otherwise.	405	0.160	0.368	0	1
$RATIONED$	Dummy equal to 1 when a firm has requested bank credit but had its application denied, and 0 otherwise.	405	0.094	0.292	0	1
	Control variables					
$SIZE$	Logarithm of the number of permanent full-time employees at the end of fiscal year.	405	3.562	1.290	1.609	7.496
$GROUP$	Dummy equal to 1 if the establishment is part of a large firm and 0 otherwise.	405	0.143	0.351	0	1
AGE	Logarithm of the number of years since the inception.	393	3.002	0.867	0.693	5.831
$EXPORT$	Dummy equal to 1 for exporting firms and 0 for firms selling the whole production in the domestic market.	405	0.326	0.469	0	1
$FOREIGN$	Dummy equal to 1 when a firms has a foreign ownership at least equal to 20 percent, and 0 otherwise.	394	0.150	0.357	0	1
$AUDIT$	Dummy equal to 1 when a firms has its financial statements checked and certified by an external auditor, and 0 otherwise.	393	0.791	0.407	0	1
$SOLE-PROP$	Dummy equal to 1 when a firm has a sole proprietor, and 0 otherwise.	405	0.296	0.457	0	1
$QUALITY$	Dummy equal to 1 when the firm has an internationally-recognized quality certification, and 0 otherwise.	393	0.224	0.417	0	1

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(continued)

VARIABLE	DEFINITION	Obs	Mean	St.Dev.	Min	Max
MANUFACTURE	Dummy equal to one when the firm operates in the manufacturing sector, and 0 otherwise.	405	0.474	0.500	0	1
Country dummies (the reference category is Jamaica)						
BARBADOS	Dummy for Barbados	84				
TTB	Dummy for Trinidad and Tobago	160				
Location dummies (the reference category is the capital city)						
LARGE CITY	Dummy equal to 1 when a firm is located in large-sized cities	25				
MEDIUM CITY	Dummy equal to 1 when a firm is located in medium-sized cities	141				
SMALL CITY	Dummy equal to 1 when a firm is located in small-sized cities	50				

Table 2: Differences in access to finance by gender

	WOB_{FINGEN}				WMB_{FINGEN}			
	No	Yes	p-value	Obs	No	Yes	p-value	Obs
LOANS	0.821	0.857	0.467	405	0.830	0.813	0.736	405
DISCOURAGED	0.167	0.129	0.425	405	0.155	0.188	0.522	405
RATIONED	0.084	0.143	0.123	405	0.085	0.141	0.163	405
	$WO\&MB_{FINGEN}$				WLB_{FINGEN}			
LOANS	0.829	0.806	0.752	405	0.828	0.822	0.926	405
DISCOURAGED	0.160	0.161	0.990	405	0.169	0.089	0.166	405
RATIONED	0.086	0.194	0.048	405	0.086	0.156	0.133	405
	WOB_{WBES}				WMB_{WBES}			
LOANS	0.836	0.810	0.610	398	0.836	0.825	0.773	390
DISCOURAGED	0.158	0.190	0.526	398	0.169	0.152	0.654	390
RATIONED	0.090	0.127	0.823	398	0.091	0.099	0.787	390

Notes: The table reports the p-values of the mean comparison test for each row variable between female-firms other firms, for the different gender definitions (see Table 1).

Table 3: Discouraged borrowers

Dep. Var.: *DISCOURAGED*	(1)	(2)	(3)	(4)	(5)	(6)
AUDIT	0.033	0.030	0.032	0.032	0.033	0.029
	(0.049)	(0.050)	(0.047)	(0.052)	(0.047)	(0.053)
GROUP	0.017	0.013	0.011	0.011	0.010	0.033
	(0.038)	(0.030)	(0.032)	(0.028)	(0.031)	(0.042)
FOREIGN	0.044	0.043	0.045	0.043	0.044	0.033
	(0.038)	(0.041)	(0.042)	(0.034)	(0.041)	(0.037)
AGE	0.023	0.024	0.022	0.019	0.023	0.023
	(0.029)	(0.029)	(0.028)	(0.030)	(0.030)	(0.031)
SIZE	-0.019	-0.017	-0.017	-0.019	-0.016	-0.015
	(0.020)	(0.022)	(0.021)	(0.022)	(0.023)	(0.027)
$SOLE-PROP$	0.007	0.001	0.003	0.013	0.004	0.004
	(0.049)	(0.048)	(0.053)	(0.047)	(0.049)	(0.053)
EXPORT	-0.046***	-0.048**	-0.047**	-0.044***	-0.047***	-0.055**
	(0.018)	(0.019)	(0.019)	(0.014)	(0.017)	(0.022)
QUALITY	-0.085***	-0.089***	-0.086***	-0.078***	-0.087***	-0.082**
	(0.027)	(0.031)	(0.031)	(0.025)	(0.028)	(0.041)
MANUFACTURE	0.049	0.051	0.046	0.042	0.044	0.051
	(0.036)	(0.042)	(0.039)	(0.037)	(0.037)	(0.039)
BARBADOS	0.014	0.009	0.011	0.015	0.010	0.014
	(0.041)	(0.040)	(0.042)	(0.040)	(0.041)	(0.037)
TTB	0.021	0.020	0.018	0.016	0.016	0.021
	(0.017)	(0.016)	(0.015)	(0.015)	(0.016)	(0.018)
LARGE CITY	-0.049	-0.048	-0.045	-0.050	-0.047	-0.036
	(0.080)	(0.076)	(0.074)	(0.072)	(0.079)	(0.067)
MEDIUM CITY	-0.022	-0.019	-0.020	-0.018	-0.021	-0.021
	(0.023)	(0.023)	(0.023)	(0.024)	(0.026)	(0.022)
SMALL CITY	0.016	0.015	0.015	0.019	0.015	0.022*
	(0.010)	(0.009)	(0.014)	(0.013)	(0.013)	(0.013)
WOB_{FINGEN}	-0.044					
	(0.053)					
WMB_{FINGEN}		0.044				
		(0.037)				
$WO\&MB_{FINGEN}$			-0.006			
			(0.087)			
WLB_{FINGEN}				-0.141*		
				(0.074)		
WOB_{WBES}					0.001	
					(0.038)	
WMB_{WBES}						-0.019
						(0.045)
Observations	361	361	361	361	358	348
Pseudo R^2	0.025	0.026	0.023	0.034	0.023	0.023
Log-Likelihood	-151.801	-151.763	-152.141	-150.478	-151.732	-146.704
AIC	307.602	307.526	308.282	304.957	307.464	297.408
BIC	315.380	315.304	316.059	312.735	315.225	305.112
AUROC	0.631	0.629	0.625	0.654	0.623	0.623
s.e.	0.042	0.041	0.041	0.040	0.041	0.043

Notes: The table reports the average partial effects and, in brackets, the associated clustered (at country level) standard errors. * significant at 10%; ** significant at 5%; *** significant at 1%. For the location and country variables, the missed categories are, respectively, *CAPITAL CITY* and *JAMAICA*.

Table 4: Rationed borrowers

Dep. Var.: *RATIONED*	(1)	(2)	(3)	(4)	(5)	(6)
AUDIT	-0.015***	-0.013**	-0.014***	-0.014***	-0.010***	-0.014***
	(0.004)	(0.006)	(0.005)	(0.005)	(0.002)	(0.005)
GROUP	0.025	0.031	0.026	0.029	0.022	0.034
	(0.064)	(0.065)	(0.063)	(0.067)	(0.067)	(0.072)
FOREIGN	-0.093	-0.095	-0.091	-0.094	-0.099	-0.087
	(0.091)	(0.092)	(0.091)	(0.091)	(0.093)	(0.088)
AGE	-0.018	-0.017	-0.017	-0.017	-0.019	-0.016
	(0.028)	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)
SIZE	-0.002	-0.002	-0.003	-0.002	0.000	0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.007)
$SOLE-PROP$	0.076***	0.077***	0.076***	0.075***	0.081***	0.090***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.013)	(0.015)
EXPORT	0.011	0.011	0.012	0.012	0.012	0.009
	(0.038)	(0.037)	(0.038)	(0.038)	(0.040)	(0.044)
QUALITY	0.024	0.021	0.024	0.023	0.024	0.003
	(0.019)	(0.021)	(0.019)	(0.019)	(0.020)	(0.038)
MANUFACTURE	0.003	0.006	0.005	0.005	0.003	0.005
	(0.021)	(0.023)	(0.021)	(0.021)	(0.020)	(0.020)
BARBADOS	-0.078***	-0.078***	-0.079***	-0.078***	-0.086***	-0.077***
	(0.022)	(0.021)	(0.021)	(0.021)	(0.020)	(0.023)
TTB	0.007	0.008*	0.009**	0.008*	0.008**	0.011
	(0.005)	(0.005)	(0.005)	(0.004)	(0.003)	(0.008)
LARGE CITY	-0.082***	-0.087***	-0.085***	-0.084***	-0.087***	-0.076**
	(0.031)	(0.029)	(0.030)	(0.031)	(0.031)	(0.037)
MEDIUM CITY	-0.003	-0.003	-0.003	-0.004	-0.001	-0.002
	(0.012)	(0.014)	(0.013)	(0.013)	(0.017)	(0.012)
SMALL CITY	-0.046	-0.045	-0.050	-0.045	-0.048	-0.041
	(0.046)	(0.047)	(0.048)	(0.045)	(0.040)	(0.049)
WOB_{FINGEN}	0.021**					
	(0.009)					
WMB_{FINGEN}		0.021				
		(0.019)				
$WO\&MB_{FINGEN}$			0.033***			
			(0.001)			
WLB_{FINGEN}				0.021***		
				(0.007)		
WOB_{WBES}					0.047	
					(0.047)	
WMB_{WBES}						0.027
						(0.033)
Observations	361	361	361	361	358	348
Pseudo R^2	0.085	0.085	0.086	0.085	0.090	0.087
Log-Likelihood	-105.125	-105.142	-105.087	-105.178	-104.272	-101.630
AIC	214.250	214.284	214.175	214.356	212.543	207.261
BIC	222.028	222.062	221.952	222.134	220.305	214.965
AUROC	0.732	0.731	0.732	0.726	0.725	0.722
s.e.	0.043	0.045	0.044	0.045	0.043	0.045

Notes: The table reports the average partial effects and, in brackets, the associated clustered (at country level) standard errors. * significant at 10%; ** significant at 5%; *** significant at 1%. For the location and country variables, the missed categories are, respectively, *CAPITAL CITY* and *JAMAICA*.

Table 5: Blinder-Oaxaca decomposition

Gender variable: FEMALE	Prob(Y=1 | GENDER = 0)	Prob(Y=1 | GENDER = 1)	Difference in means	Explained	Share (%)	Obs.
			Model: Prob(DISCOURAGED)			
WLB_{FINGEN}	0.166	0.057	0.109	-0.001	-0.7	361
			Model: Prob(RATIONED)			
WOB_{FINGEN}	0.090	0.131	-0.041	-0.016	39.0	361
$WO\&MB_{FINGEN}$	0.093	0.148	-0.055	-0.005	9.5	361
WLB_{FINGEN}	0.092	0.143	-0.051	-0.016	31.1	361

Notes: The table reports the Blinder-Oaxaca decomposition of the gender gap for alternative measures of gender (by row). The top panel refers to the estimation of Equation 1 when the dependent variable (Y) is $DISCOURAGED$ (it replicates regressions reported in Table 3, Column 4), while the bottom panel considers $RATIONED$ as dependent variable (it replicates regressions reported in Table 4, Columns 1, 3 and 4). Results are obtained using the Stata routine FAIRLIE (Jann, 2006). Column 5 ("Explained") reports the part of the difference in means (Column 4) that is due to group differences in the predictors (the "endowments effect"). See Fairlie (2005) for additional details.