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We Have Got Credit!

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Abstract

This paper investigates whether there is a gender bias in granting credit for businesses from Eastern Sub-Saharan Africa. It is first necessary to determine whether firms are credit-constrained. In order to identify the status of the firms with respect to credit, two recently introduced methods that can identify the credit-constrained status of firms are used. The paper uses World Bank's Enterprise Survey Program data set from 2013 to investigate this question. The empirical results obtained, after controlling for a large number of firm-level characteristics and using country-level dummies, reveal that female-owned firms appear to have more access to credit than their male counterparts. The paper also shows that the female-owned firms in the region finance their capital according to the Pecking Order Hypothesis.

Keywords: Female-owned Firms, Access to Finance, Banks, Pecking-Order Hypothesis, and Eastern Sub-Saharan Africa

JEL Classification: G32, O160, and M2

Introduction

Capital and access to the same are two significant aspects of businesses. They are not only essential for starting businesses, but are also necessary for their survival and growth (Myers and Majluf, 1984 present; Rajan and Zingales, 1996). Hence, a study of these aspects of businesses is helpful for firms and lending institutions, as well as policy makers. These aspects are especially critical in Eastern Sub-Saharan Africa, which is a region with the lowest rate for penetration of financial institutions, poor infrastructure, and red tape—factors that worsen business environment. Specifically, these aspects could become more serious for firms that are owned by females. It is important to study female-owned firms in the region, because more than a third of the firms in this region are owned by females, making them an important element of the economy. Hence, this paper studies two aspects of finances of businesses for female-owned firms.

First, it explores whether female-owned firms are more credit-constrained than their male counterparts. Second, it finds out whether these female-owned firms follow the Pecking-Order Hypothesis—an important element of the capital structure of firms. The hypothesis states that when a firm is in need of capital, it first seeks internal funds, thereafter it applies for loans, and finally it raises equity capital. This order of seeking capital is important because costs associated with internal funds are the least and with equity capital are the most.

In order to examine these two questions, the World Bank's Enterprise Surveys Program data set from the year 2013 was used. This set has firm-level surveys from Kenya, Tanzania, Uganda, and Zambia. It is a firm-level data set with more than 3000 firm-level observations and more than 500 firm-level characteristics of the firm. These characteristics represent various dimensions of firms, ranging from ownership and employment structure to capital access and its use to infrastructure and customers and suppliers. The data set not only represents all the sectors of the economy but also includes all firms of all sizes—making it an excellent representative of the economy.

The paper begins its investigation of female-owned firms by studying whether they follow the Pecking-Order Hypothesis. The Pecking-Order Hypothesis posits that when firms need capital

they follow a certain order. Firstly, they prefer internal funds; secondly, they go for debt financing; and finally, they pursue equity financing. An analysis of the capital structure of female-owned firms in the region, which is available in Section 4, indicates that these firms do indeed follow the Pecking-Order Hypothesis.

Thereafter, an important question that arises is as follows: If the firms need more capital after exhausting internal financing, do they experience any gender bias with respect to their debt financing? In order to answer this question, it is important to accurately identify the credit-constrained status of these firms. To address this issue, two recently introduced methods, which can identify the credit-constrained status of firms, are used.

The *first method* is based on the Allen, Carletti, Cull, Senbet, and Valenzuela (2014) definition of credit-constrained firms. Results from the model, which uses the credit-constrained status of firms as a dependent variable and female-owned firms as a key independent variable, indicate that female-owned firms have greater access to credit than their male counterparts. In the *second method*, this paper follows the Kuntchev, Ramalho, Rodríguez-Meza, and Yang (2012) style of credit-constrained measurement. This metric formulates two groups that measure the degree to which the firms are credit-rationed during the fiscal year.

Empirical results of probit-regression models based on both methods show that female-owned firms have more access to credit than their male counterparts. These interesting and encouraging results using the two different metrics indicate that female-owned firms in Eastern Sub-Saharan Africa are *not* credit-constrained compared to their male counterparts. The results are of importance because females constitute a big part of the labor force in the region, and more than a third of the firms in the data set are owned by females. Additionally, these female-owned firms follow the Pecking-Order Hypothesis. Thus, it appears that a firm-owner's gender has no impact on the order in which a firm chooses its sources of financing.

The rest of the paper is organized as follows. Section 2 provides a literature review on the Pecking-Order Hypothesis and various dimensions surrounding access to finance for female-owned

businesses. Section 3 discusses the data set, hypothesis development, and econometric methodology. This section also highlights contributions of the paper. Section 4 presents numerical results. The last section concludes the paper with key policy recommendations.

Literature Review

The literature review begins with a discussion on a theory in finance that focuses on the way businesses prioritize their sources of financing. This discussion is important for two reasons: 1. It explains the role played by external credit in financing business activities. 2. It offers an understanding of financing patterns of male- and female-owned firms. The way businesses finance their capital structure can be explained by the Pecking-Order Hypothesis in corporate finance theory[i]. Myers (1984) provides a characterization of observed corporate financing preferences. He posits that there are three forms of corporate financing behaviors:

1. Irrespective of volatility in profits, stock prices, or profitable investment avenues, managers favor stable dividends.
2. Managers prefer financing via retained earnings to financing via debt or equity.
3. If businesses have to raise funds externally, managers choose to raise funds that are least risky. Under these circumstances, securities that range from least risky to most risky are: straight debt, convertible debt, preferred stocks, and common stocks.

He further claims that this universally exhibited preferences for financing business activities are due to the costs associated with them. Myers and Majluf (1984) postulate that the cost associated with various financing avenues increases due to information asymmetry. They argue that capital markets are persistently uninformed about firms with respect to their various investment opportunities and profits from those opportunities. This problem of information asymmetry is more severe in small- and medium-sized firms. Therefore, capital markets tend to finance these profitable projects at higher costs. Thus, mangers of businesses, who always presume to act in the best interest of the firm and maximize its value, realize that the cost of external financing is more than it should be. Hence, they prefer to rely more on retained earnings than external

financing. This financing behavior is more prevalent in case of small- and medium-sized firms (Sánchez-Vidal & Martín-Ugedo, 2005; Watson & Wilson, 2002). These findings are of significant importance because of the large number of small-sized (60 percent) and medium-sized (30 percent) firms in the region under study from the data set.

If both male- and female-owned firms depend on internal funds to a large extent, then it is critical to examine whether there is any gender bias in extending credit when external funds are needed. It turns out that gender discrimination is a major factor related to financing. These factors range from the extent of dependence on external finance and trade finance to the frequency of applying for external finances to terms and conditions of approved loans. There may be some differences between female- and male-led firms in terms of risk-taking behavior, which is a key factor that many a time affects demand for loans. Another dimension to gender discrimination concerns access to credit for growth prospects of the female-owned firms and usually the prospects for women are lower than those for their male counterparts (World Bank, 2011b). Moreover, financial institutions treat loan applications of businesses differently depending upon their age, number of employees, sector of activity, legal status and export-oriented activities (Aterido, Beck, & Iacovone, 2011; Bardasi, Sabarwal, & Terrell, 2011; Sabarwal & Terrell, 2008).

The number of female-owned firms in the region is surprisingly large compared to the numbers in other nations. In the sample under study for this paper, more than 35 percent of women own businesses. That number was 25 percent in the U.S. in 2000 (Coleman & Robb, 2009) and was 28 percent in the Eastern Europe and Central Asia in 2005 (Sabarwal & Terrell, 2008). Because access to credit not only encourages business activities but also growth, it is critical to look at whether there exists a gender gap with respect to access to credit. It is often perceived that female-owned firms are more credit-constrained than male-owned firms (Alesina, Lotti, & Mistrulli, 2013; Aterido et al., 2011; Coleman, 2000; Presbitero, Rabellotti, & Piras, 2014) and access to credit is the greatest challenge for these firms (Orser, Riding, & Manley, 2006). Firms run by women are less likely to get loans than firms run by their male counterparts, although the credit gap becomes thin with firm size and the formal sector (World Bank, 2011a). This particular finding is interesting because it shows that the bigger the firm, the better the quality of the collateral

(assets) it has to pledge when it applies for a loan. In addition, when a firm belongs to the formal sector, usually, it has audited books of accounts and it is registered with the local commerce agencies. Thus, firms that are big and belong to the formal sector have footprint that can traced back by financing institutions.

Usually, women start businesses with lower investment than other comparable firms—an observation that holds even for developed countries. In an independent survey of 600 small proprietary firms in the UK owned in equal numbers by men and women, Sara and Peter (1998) document that while establishing a business, men deploy more capital than women do. They maintain that because of this lower investment at the "founding stage," female-owned firms remain underfunded even in the long run. Moreover they also note that these firms are less likely to use bank services in the form of over draft, loans, and informal credit from suppliers. A report prepared by the U.S. Department of Commerce (2010) also observes considerable differences between financing methods of male- and female-owned firms. In the U.S., females start their businesses with less capital than men do and are less likely to take loans for expansion (United States Department of Commerce, 2010).

Among female-owned firms, lack of access to finance can be determined by the level of education and income, and expertise in dealing with business environment. These factors can potentially affect women's ability to maintain financial records, which is key to obtaining loans from banks. Also, women may be more susceptible to default on loan repayments if their educational level is lower and business experience less intensive. Thus, these constraints make women less likely to get loans for their businesses. This practice is known as "statistical discrimination," which is a prevalent phenomenon in Sub-Saharan Africa (Aterido et al., 2011). Moreover, lack of asset ownership can also have an adverse effect on empowerment and self-employment opportunities for women (World Bank, 2014).

Productivity and profitability also play a role in obtaining credit. In Eastern Europe and Central Asia, female-led firms are not only less likely to be productive but also less likely to be profitable than their male counterparts (Sabarwal & Terrell, 2008). Using the enterprise Survey data for

Sub-Saharan Africa, (Aterido et al., 2011) document that firms in which women are key strategic decision-makers are less productive than other comparable firms. Therefore, these firms are less creditworthy and more risky, and it is harder for them to get credit.

Differentials in interest rates, collateral, and size of loans are also observed as factors driving gender discrimination. Alesina et al. (2013) note that in Italy, female-owned firms pay higher interest rates on their loans than their male counterparts. On the other hand, for the same country, Bellucci, Borisov, and Zazzaro (2010) document that female-owned firms do not pay higher interest rates; these authors do however claim that the female-owned firms face more rigid credit constraints than other comparable firms and that they "pledge collateral more often." Using a survey data set from 1990s for micro and small firms from Ecuador, Baydas, Meyer, and Aguilera-Alfred (1994) demonstrate that fewer female entrepreneurs apply for loans than their male counterparts and that a rejection rate for female entrepreneur's loan applications is not high; rather their loan sizes are smaller. They claim that the smaller size of loans is due to inbuilt information asymmetry with regards to female-owned firms. In the same vein, based on three rounds of surveys from 1987 to 1993 to 2001 of female-owned small businesses in the US, Treichel and Scott (2006) document that firms with women ownership apply less frequently for loans and borrow less than other comparable firms. However, they further note that loan applications of male-owned firms are not more likely to be approved than their female counterparts. Bellucci et al. (2010) find that female-owned firms are not discriminated based on interest rates; however the factors that work against them are tougher collateral requirements and credit availability. The authors further claim that gender-based discrimination in access to finance is partly induced by the loan-officer's taste, after controlling for duration of relationship with lending institutions and individual effects.

One major aspect of female-owned enterprises is the decision-making authority of their own firms. Usually, husbands or male partners or male siblings of these female entrepreneurs, who may not be fully involved in day-to-day business operations, make decisions that can have a long lasting impact on businesses operations. Firms in which women have a part ownership, men make decisions in 77 percent of the business affairs—a number making it imperative to focus on

decision-makers and not on ownership while appraising the performance of firms (Aterido & Hallward-Driemeier, 2011). Thus, this decision-making role played by men, although they are not a hundred percent owners of the firms, affects not only the performance of these firms but also the availability of credit avenues in the forms of lending institutions.

Usually, female-owned firms are more concentrated in retail and services sectors than in manufacturing and construction sectors (Treichel & Scott, 2006). Generally, a large number of women entrepreneurs set up their businesses in industries that require less capital. This is a potential sign that women face more barriers regarding access to finance than their male counterparts (Klapper & Parker, 2011). There is a high probability that firms with women ownership are not likely to get loans and even if they get loans, they have to pay a higher rate of interest than other comparable firms' (Muravyev, Talavera, & Schäfer, 2009). Therefore, women business owners rely more on internal or informal financing to start and run their businesses. In their study on Ethiopia, Tanzania and Zambia for micro and small firms' women entrepreneurs, Richardson, Howarth, and Finnegan (2004) maintain that because of the obstacle to finance, women depend upon retained earnings from business operations to finance their businesses operations.

Some country specific studies demonstrate that female-owned firms are more credit constrained than their male counterparts. Asiedu, Kalonda-Kanyama, Ndikumana, and Nti-Addae (2013) use World Bank's Enterprise Surveys Program data for 2006 for comparing access to credit by female-owned firms in Sub Saharan Africa, Latin America, East Asia and Pacific, and East and Central Europe. They find that access to finance is more tilted toward males than females in Sub Saharan Africa, suggesting that gender does play a role when the credit is given. This gap is larger in Sub Saharan Africa than the one observed in other remaining regions under study. In the same vein, Presbitero et al. (2014) maintain that female-owned firms in Barbados, Jamaica and Trinidad and Tobago are more credit constrained. They follow a broader definition of women-led businesses.

Some studies suggest that the small size of female-owned firms is the main reason for these firms to be credit constrained. In their study for the Sub-Saharan African region regarding gender gap

for firms and individuals, Aterido et al. (2011) claim that firms owned by women are small and belong to sectors that are symbolized by "limited use of external finance." Therefore, female-owned firms are at a disadvantage in access to finance. However, the authors claim that the onus lies not with the financial sector, but with the very nature of the businesses, they operate in. In the same vein, Hallward-Driemeier (2011) suggests that in the African region, because women own small firms, they face more financial constraints. Thus, both—the size and the sector of the firm—play a decisive role in obtaining credit.

However, for a specific study of the manufacturing sector in 16 Sub-Saharan countries, Hansen and Rand (2014) maintain that comparatively small-sized female-owned firms are not financially more constrained than small-sized male-owned firms, however, medium-sized female-owned firms are. Thus, it appears that, in general, for the manufacturing sector in the region, small-sized firms do not face a gender bias when granting loans. But, the situation reverses for the medium-sized firms.

Hypothesis Development and Econometric Methodology

A common narrative emerges from all the empirical evidence seen so far. Female-owned firms generally start with fewer funds, are still developing, and are less efficient and profitable. These characteristics of female-owned firms influence their candidacy as borrowers, and therefore, they are less likely to apply for loans. Even if they get loans, the size of those loans is small, while the interest rates are higher, and collateral requirements are more stringent. This paper contributes to the ongoing debate on gender discrimination in credit rationing with the help of two recently introduced credit-constrained variables in the literature to identify credit-constrained firms.

The *first method* is based on the Allen, Carletti, Cull, Senbet, and Valenzuela (2014) definition of credit-constrained firms. According to this definition, firms can be classified into three groups: those that have a bank loan or line of credit, those that have bank accounts, and those that do not have a bank account or line of credit. An ordered-regression model is used in this study. In this model, a value of "3" is assigned if the firm has a bank loan or line of credit, a value of "2" if the

firm has a bank account, and a value of "1" if the firm does not have a bank account or a bank loan or line of credit. Results from the model, which uses the credit-constrained status of firms as a dependent variable and female-owned firms as a key independent variable, indicate that female-owned firms have greater access to credit than their male counterparts.

In the *second method*, this paper follows the Kuntchev, Ramalho, Rodríguez-Meza, and Yang (2012) style of credit-constrained measurement. This metric formulates two groups that measure the degree to which the firms are credit-rationed during the fiscal year. The first group consists of credit-constrained firms. In order to be called credit-constrained, this group must fulfill all of the following conditions.

1. Applied for loans or line of credit but their applications got rejected.
2. Did not apply for credit because the terms and conditions of loans were not favorable.

The above-mentioned credit-constrained status of the firms is derived from the answers in the data set to specific questions about loan applications. The firms were asked whether they applied for loans and answer choices were a "yes" and a "no." If the answer was "yes," then the next question was whether the application got accepted. A firm that answered a "no" to this question was treated as credit constrained. On the other hand, if the firms did not apply for the loan, the next question was about the reasons for not doing so. the reasons for not applying for loans are the five reasons that are mentioned in the previous paragraph. In the above, the terms and conditions of loans could be in the form of a complex application process, unfavorable interest rates, stringent collateral requirements, insufficient size of loans or maturity, and doubts in the applicant's mind about the loan application approval.

The second group consists of firms that are *not* credit-constrained. This group has two types of firms—firms that either have external sources of financing or they do not. It includes firms that meet the following conditions.

1. Did not apply for external funding because they had sufficient capital—in the forms of retained earnings—to satisfy their financial needs.
2. Applied for loans during the last fiscal year and had loans outstanding at the time of survey.

A probit regression model is set up in which the dependent variable takes the value of "1" if the firm is not credit-constrained and the value of "0" otherwise. Further, the regression model uses the credit-constrained status of firms as a dependent variable and that of female-owned firms as a key independent variable.

Because these new variables are based on the various financial aspects of the firms, such as financing fixed assets and working capital, bank accounts, and loans or overdraft facilities, they reflect a *true picture* of the financial health of female-owned firms. Additionally, the descriptive analysis of the data set (see figures 2) reveals that the number of female-owned firms whose loan applications get approved are more than their male counterparts. Therefore, it can be claimed that female-owned firms are not credit rationed.

Hypothesis: Female-owned firms are less credit constrained than their male counterparts.

To test this hypothesis, the following model is used.

$$Prob.of\ credit\ constrained_{ij} = \beta_0 + \beta_1\, Female - owned\ firms_{ij} + \beta_2\, Firms - level\ control_{ij} + \gamma_j\, country\ dummy$$

Thus, the probability of the ith firm in the jth country is credit constrained depends upon gender of its owner along with various firm characteristics such as size, age, sector, export activities, audited accounts, and liability status.

In the sample under study, 35.34 percent of the firms have female ownership. Among the firms with female owners, 85.22 percent have a checking and or saving accounts. As regards the size of

female-owned firms, 57 percent belong to small firms (between 5 and 19 workers), 32 percent belong to medium firms (between 20 and 99 employees), and 11 percent belong to large firms (over 100 employees). As far as trade credit for working capital is concerned, 26 percent of female-owned firms use this informal credit, while that number is 18 percent for male-owned firms. The trade credit for fixed assets is used by 6 percent of female-owned firms, whereas that number is 3 percent for male-owned firms.

Measuring credit constrained status of firms

In order test the hypothesis, it is crucial to measure the credit-constrained status of the firms correctly. To address this question, two recently introduced measures are used to identify the status. The credit-constrained status of firms, which is a dependent variable, is constructed by using the financial matters section of the Enterprise Surveys. The model uses the following two measures of credit constrained variable.

Credit-Constrained-Variable Measurement 1

In order to measure credit constraint, the operating definition used in the paper is important simply because otherwise the interpretation of results could be inaccurate. Therefore, the definition used in the paper is based on Allen et al. (2014) which states that a firm is given a value of "1" if the firm does not have a bank account or a bank loan and a firm is ascribed a value of "2" if the firm has a bank account and a firm is characterized a value of "3" if the firm has a bank loan and loan or line of credit. According to this measurement, the dependent variable takes three possible values (1, 2, and 3) corresponding to credit firms with no bank accounts or bank loans.", "firms with bank accounts," and "firms with bank loans or line of credit". The dependent variable is thus ascribed a value or a category in this case and hence it is an ordered – probit model. This makes the interpretation clear wherein a positive regression coefficient on a variable indicates that an increase in the variable will increase the likelihood of firms having bank loans and or line of credit. In the same manner, a negative regression coefficient on a variable will indicate the

opposite, which is an increase in that variable means that firms will have no bank accounts or bank loans.

Credit-Constrained-Variable Measurement 2

Following Kuntchev et al. (2012), the paper constructs two groups that measure the degree to which the firms are credit rationed during the fiscal year as indicated by the survey.

The first group consists of firms that are credit constrained. In order to be called credit constrained, this group comprises of firms that fulfill all of the following conditions.

1. Apply for loans or line of credit but their applications got rejected.
2. Do not apply for credit because the terms and conditions of loans are not favorable. These terms and conditions could be forms of a complex application process, unfavorable interest rates, stringent collateral requirements, insufficient size of loans or maturity, and doubts about the loan application approval.

The second group consists of firms that are not credit constrained. This group has both firms that have external sources of financing and firms that do not. It includes firms that meet the following conditions.

1. Do not apply for external funding because they have sufficient capital — in the forms of retained earnings — to satisfy their financial needs.
2. Applied for loans during the last fiscal year and had loans outstanding at the time of survey.

Thus, credit constrained is a dummy variable for credit-constrained firms, which is equal to one if the firm is credit not constrained, and zero otherwise.

Measuring Female-Owned Firms

The key independent variable is whether the firm is owned by females. The data set provides specific information on the structure of ownership of firms. This variable is based on a question from the Surveys. The Surveys specifically asks a question that "amongst the owners of the firm, are there any females?" Thus, the women-led firms are the firms that have women as owners. Although an answer to this question does not specifically reveal the information regarding number of female owners or percentage of ownership by females in the firm, the answer to this question certainly provides information about the female ownership. In many studies that are based on Enterprise Surveys data set, a firm is considered to be female owned if at least one of the owners is a female (Aterido et al., 2011; Bardasi et al., 2011; Hansen & Rand, 2014). Thus, the paper proposes the following variable that represents female ownership structure of the firms: A female ownership is a dummy variable for female-owned firms, which is equal to one when answer to the above-mentioned question is yes and zero otherwise.

Firm-Level Control Variables

It is critical to control for a large number of observable firm-level characteristics that may take into account firms' risk aversion behavior and creditworthiness-key components for granting loans. These control variables are vital in order to capture the existence of gender bias in access to credit because they alleviate the problem of omitted variable bias. The Surveys offer large and exhaustive set of standard firms-level control variables.

Two extensively used measures of the firms' risk averse behavior and informational murkiness are age and size. Because, younger and smaller firms usually unable to provide verifiable data about their business activities to lending institutions, these firms are more likely to be credit constrained. In the model, a firm size is the dummy variable — small firms: are those having up to 19 workers, medium firms: between 20 and 99 workers, and large firms: 100 or more workers. As regards the age of firms, the variable has three age groups — young-aged firms: up to 5 years old, medium-aged firms: from 5 to 10 years old, and old-aged firms: from 10 to 99 years old. One more measure of firm riskiness is associated with the involvement in some form of export activities — direct or indirect. Businesses that export their finished products are treated as firms

that are involved in direct-export activities. On the other hand, businesses that make products that become a part of the finished products to be exported are treated as firms that are engaged in indirect-export activities. This measure captures global economic ups and downs, currency exposure, and diverse sources of revenue.

The model also takes advantage of the available information on the legal status of the firm. The Survey provides information regarding limited liability, sole proprietorship, and partnership status of the firm. Moreover, a sector to which the firm belongs also plays a role in extending credit. Thus, the model controls for sectors of firms that belong to the manufacturing, services, or retail sectors. Finally, the model also has country dummies.

Contributions of this paper: The existing literature on the relationship between the gender of business owners and their access to finance shows mixed results. Some studies claim that gender negatively affects access to capital, whereas other studies posit the exact opposite. This paper contributes to this existing debate in three ways: 1. In order to study the credit-constrained status of firms, a key step is to first identify firms that are indeed hungry for capital. To address this issue, two recently introduced metrics for identifying the credit-constrained status of firms are used (Allen et al., 2014; Kuntchev et al., 2012) in this paper. 2. Further, the paper tests whether female-owned firms follow the Pecking-Order Hypothesis. This test is important for two reasons. Firstly, it is important to investigate whether female owners finance their capital differently than their male counterparts. Secondly, these firms are located in Eastern Sub-Saharan Africa, thus they operate in a less friendly environment in comparison to firms in developing or developed countries. 3. Finally, the paper uses more than 3000 firm-level observations from the year 2013 from four Eastern Sub-Saharan countries, making the study applicable to the present and to a large geographical area.

Results

The financial information in the Surveys is used to show that female-owned firms follow the Pecking-Order Hypothesis (see Figure 1). The Surveys specifically asked a question on reasons of not applying to loans. A statistical analysis of this question reveals that, irrespective of gender, almost fifty percent of firms report to have enough internal funds to finance business activities (see Figure 1). Furthermore, two percent of the firms in the data set have their shares listed on the stock markets. They also exhibit the similar financing behavior and claim that they do not need external financing. Surprising, female-owned firms outnumbered their male counterparts for availability of internal funds. This analysis clearly shows that both—female-owned firms and male-owned firms in the data set follow the Pecking-Order Hypothesis. The second feature that stands out from the figure is that a smaller number of prospective applicants thought that size of loans and maturity were not sufficient.

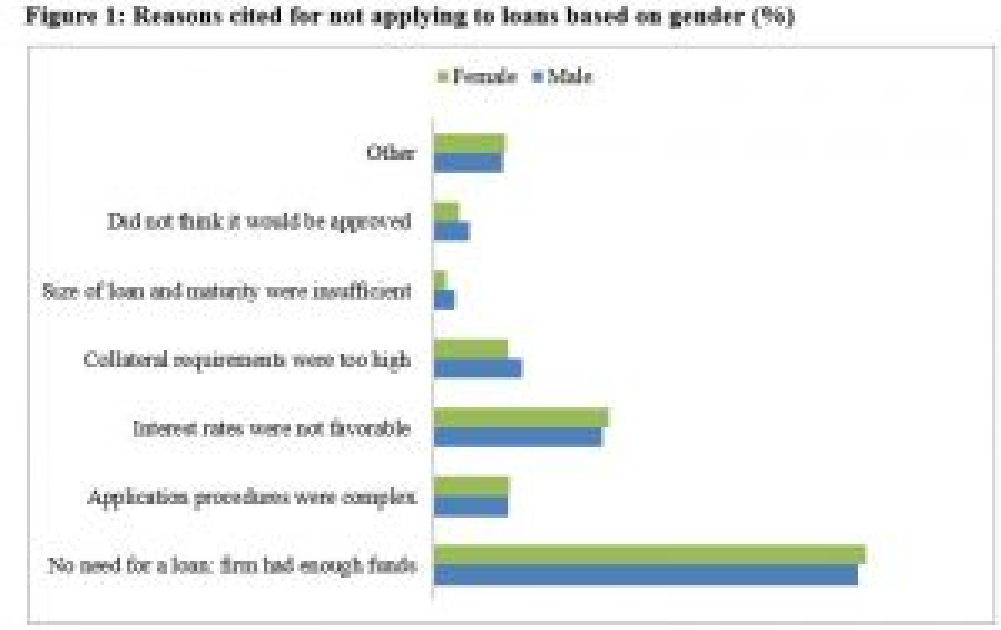

Figure 1: Reasons cited for not applying to loans based on gender (%)
Source: Based on author's calculations of the Enterprise Surveys (2013)

Another interesting aspect of financing is the analysis of the loan application status based on gender (see Figure 2). The loan application approval rate is almost 4 percent higher for female-owned firms than their male counterparts. On the other hand, the loan application rejection rate is

almost 4.5 percent lower for female-owned firms than other comparable firms. Among female-owned firms, 20 percent apply for loans.

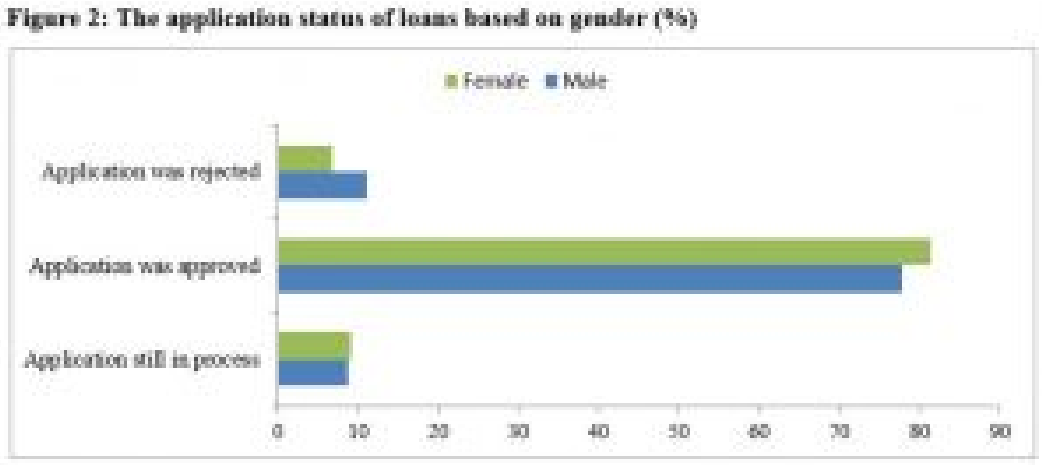

Figure 2: The application status of loans based on gender (%)
Source: Based on author's calculations of the Enterprise Surveys (2013)

The regression results for the two credit-constrained measurements vis-à-vis female-owned firms indicate that female-owned firms appear to have more credit than their male counterparts (see Table 1). In the same regression results, as far as firm-level characteristics are concerned, the signs of their coefficients are as per expectations. For example, Medium and large firms are less credit constrained than small firms. Moreover, the coefficient on large firms is greater than the coefficient on medium-sized firms. Additionally, firms that are audited are less likely to be credit rationed than other firms. Finally, sole proprietorship firms and partnership firms are less credit constrained than limited-liability firms.

Table 1: Regression results for two credit-constrained measurements vis-a-vis female-owned firms

Dependent variable: Credit constrained firms		
Measurement of credit constrained firms	*Measurement 1: Based on Allen et al. (2014)-ordered probit*	*Measurement 2: Based on(Kuntchev et al., 2012)-probit*
Independent Variables	***Regression Coefficients***	***Regression Coefficients***
Female-owned firms	0.176	0.193
	(3.41)**	(2.82)**
Firm Level Control Variables		
Age [dummy, the omitted size is youngest firms (up to 5 years old)]		
Firms age: medium (5 to 10 years old)	0.155	0.139
	(1.82)	(1.33)
Firms age: older (10 to 99 years old)	0.129	0.099
	(1.68)	(1.04)
Firm Size [dummy, the omitted size is small firms (5 to 19 workers)]		
Firm size: medium (20 to 99 workers)	0.288	0.213
	(4.92)**	(2.78)**
Firm size: large (100 or more workers)	0.566	0.488
	(6.02)**	(4.27)**
Sector type [dummy, the omitted sector is services sector]		
Sector type: manufacturing	0.002	-0.089
	(0.34)	(1.03)
Sector type: retail	-0.012	-0.069
	(0.16)	(0.74)
Export [dummy]	0.063	0.268
	(1.05)	(3.15)**
Audited accounts [dummy]	0.446	0.088
	(8.01)**	(1.26)
Firm's legal status [dummy, the omitted type is limited liability]		
Sole proprietorship firm	0.253	0.117
	(3.34)**	(1.11)
Partnership firms	0.238	-0.003
	(3.13)**	(0.03)**
Country Dummies	Yes	Yes
Pseudo R-Squared	0.0882	0.0385
Number of observations	2,513	2,287

Source: Based on author's calculations of the Enterprise Surveys (2015)

Note: t-statistics are in parentheses. ***, **, * are statistically significant at 1, 5, and 10 percent significance levels respectively.

These results suggest that various efforts that have been undertaken by various global-level financial organizations have produced an impact. The United Nation Females Organization—a branch of the UN organization—is dedicated to gender equality and the empowerment of females. Its 2013-14 report indicates the existence of various measures that have been undertaken to empower females in the Sub-Saharan African region. In Kenya, for example, legal services and grass-root organizations have educated females on land and other rights, assisted with court cases, and have established watchdog teams to guard against "property-stripping." In Tanzania, various local organizations have helped females augment their incomes and better understand their legal rights. These organizations have also granted capital for buying land and starting new businesses[ii].

The World Bank also plays an active role in bringing gender equality in the region (see Table 2). The World Bank Group Gender Action Plan is a four-year initiative to promote economic

empowerment of females and gender equality as part of smart economics. As a part of the Action Plan, the Bank is focusing on building a good credit history for females that can assist them to access credit. This credit history is useful for lenders to distinguish between business owners with good credit track records and those who pay payments late or even default on their payments. Thus, because of this Action Plan, it is possible that female-owned firms not only get more credit than their male counterparts, but also get credit at lower interest rates than their male counterparts.

Table 2: Establishing Credit History

Building Credit	*Kenya*	*Tanzania*	*Uganda*	*Zambia*
Do microfinance institutions provide information to private credit bureaus or public credit registries?	Yes	N/A	No	Yes
Do retailers provide information to private credit bureaus or public credit registries?	No	N/A	No	Yes
Do utility companies provide information to private credit bureaus or public credit registries?	No	N/A	No	Yes

Source: The World Bank- IFC: Females, Business and the Law, 2014
(Tanzania does not have a public credit registry or private credit bureau.)

Additionally, what must be taken into account is that this study used two recently introduced measures in the literature to identify credit-constrained status of female-owned firms. These measures take into account all aspects of bank financing—whether firms have bank accounts, whether they have loans or line of credit outstanding in the last fiscal year, whether they use bank financing for working capital or fixed assets, and why their loan applications gets rejected. Thus, these measures are more comprehensive in terms of identifying the credit-constrained status of the female-owned firms. In addition, it can be claimed that female-owned firms are viewed differently than their counterparts by lending institutions. One of the potential reasons can be that, usually, females are more honest than males (Ones & Viswesvaran, 1998). It has also been suggested that the presence of females in the parliaments leads to less corruption in those governments than others (Dollar, Fisman, & Gatti, 2001; Swamy, Knack, Lee, & Azfar, 2001). Therefore, one can hypothesized that when female-owned firms apply for bank loans, banks may think that there is a greater likelihood that these firms will pay back principal and interest in full and on time and that the quality of collateral for their firms may be more reliable than that of their male counterparts

The capital structure of firms plays a vital role in financing business activities because it determines the cost of capital, which firms try to minimize. The capital structure of firms consists of reserves and surplus, debt, and equity capital. There is a hierarchy in which firms select the source of capital. The Pecking Order Hypothesis—that arranges preferences for sources of capital by firms—states that when firms need capital, they first rely on their internal funds, then they apply for loans, and finally they raise equity capital. This capital financing hierarchy is more prevalent in small-sized and medium-sized firms.

This paper investigated the financing behavior of small and medium-sized firms located in Eastern-Sub Saharan Africa that were owned by females. Then, the question arose: if these female-owned firms wanted to raise capital by loans, was there any gender discrimination in granting credit? To answer these questions, the paper used World Bank's Enterprise Surveys data set for the 2013 for four Eastern Sub-Saharan countries—Kenya, Tanzania, Uganda, and Zambia. In order to find out whether there was any gender discrimination while granting credit, it was important to correctly identify the credit-constrained status of these firms. This goal is achieved by using two recently introduced measurement schemes (Allen et al., 2014; Kuntchev et al., 2012) to identify the credit-constrained status of female-owned firms.

The empirical analysis in this study showed that female-owned firms in the region did follow the Pecking Order Hypothesis. It is often claimed that female-owned firms are more credit-constrained than male-owned firms (Alesina, Lotti, & Mistrulli, 2013; Aterido et al., 2011; Coleman, 2000; Presbitero, Rabellotti, & Piras, 2014) and access to credit is the greatest challenge for these firms (Orser, Riding, & Manley, 2006). The results indicated that female-owned firms were more likely to have bank loans or line of credit than their male counterparts, revealing that these firms have more credit than their counterparts.

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Appendix

Table 3: Distribution of firms by gender

Type of firms	Female	Male	Total
Small	525	1,005	1,530
Medium	300	492	792
Large	101	175	276
Young (< 5 years)	138	261	399
Medium (between 5 & 10 years	242	462	704
Old (> 10 years)	676	1,171	1,847
Manufacturing sector	508	994	1,502
Retail sector	326	552	878
Services sector	222	348	570
Export-oriented	282	381	663
Foreign-owned	125	227	352

Source: Based on author's calculations of the Enterprise Surveys (2013)

Table 4: Summary Statistics

Table 4: Summary Statistics

Variable	*Observations*	*Mean*	*Std. Dev.*	*Min*	*Max*
Credit constrained	2616	.5775994	.4940361	0	1
Female ownership	2950	.3579661	.4794834	0	1
Closely held firm	2802	.6952177	.4603973	0	1
Female ownership*Closely held firm	2781	.2013664	.4010933	0	1
Log (age)	2846	2.547865	.7850683	0	4.882802
Small firms	2854	.5399439	.4984893	0	1
Medium firms	2854	.2803083	.4492285	0	1
Large firms	2854	.1019622	.3026516	0	1
Manufacturing sector	2986	.509712	.4999894	0	1
Retail sector	2986	.296718	.4568877	0	1
Services sector	2986	.19357	.3951619	0	1
Export-oriented firms	2745	.2462659	.4309138	0	1
Foreign-owned firms	2909	.1237539	.3293572	0	1
Government-owned firms	2909	.0044689	.0667117	0	1
Kenya	2986	.2615539	.4395545	0	1
Tanzania	2986	.2421299	.4284443	0	1
Uganda	2986	.2551909	.4360415	0	1
Zambia	2986	.2411253	.4278378	0	1

Source: Based on author's calculations of the Enterprise Surveys (2013)

Endnotes

[i] A pecking order is a feeding hierarchy of stature that is observed among animals such as hens.

[ii] For more detailed information see "UN Women Annual Report 2013-2014