Gender and Firm Performance in Middle Eastern and African Economies*

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This draft: January 5, 2017

Empirical evidence suggests that lack of access to financing is a major constraint to performance by female-owned firms in most countries. Firm performance, financing structure, and constraints have been well explored for firms in developed economies but this is not the case for firms in developing economies, especially in Africa and the Middle-East. Largely due to lack of data availability, existing literature on African firms has presented some survey-based evidence on firm performance and financing structures while detailed financial evidence is lacking. This paper aims at filling this research gap. We identify female-owned firms and examine the impact of ownership structure on financing and firm performance. We use cross-sectional financial data covering 25,500 companies in the Middle East and Africa for the years 2006 to 2014. Our results reveal a clear, but perhaps surprising, gender-specific pattern.

JEL classification: F20, J16, L22, M10

Keywords: gender, ownership, firm profitability, financing structure, MENA, Africa, FDI, globalization

Paper prepared for presentation at AEA/ASSA 2017

Session Feminist Economics: Out of Africa

* The authors would like to thank the Faculty of Management Technology at the German University in Cairo for its support. Lutz is also grateful for support by the Instituto Complutense de Analisis Economico at Universidad Complutense de Madrid, Spain.

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1. Introduction and overview

According to research by the World Bank (2011) there is a clear positive correlation between gender equality and GDP per capita, the level of competitiveness and human development. This is particularly true in the Middle East and Africa where female firm ownership and management is markedly low and female firm owners still face a variety of gender-specific obstacles.[3]

While firm performance is affected by many factors, including the legal environment, corruption, political stability, and infrastructure, there is also evidence that ownership and manager characteristics have major effects on individual firm performance. While this has been well explored for firms in developed economies this is not the case for firms in developing economies.[4]

In particular, the role of female ownership in firm performance in the Middle East and Africa remains to be investigated in detail. Empirical evidence so far suggests women managers may increase individual firm performance (Dezső and Ross, 2012; Smith et al., 2006). On the other hand, female firm owners face a variety of obstacles such as lack of access to financing. While access to financing is a critical issue for many African and Middle Eastern firms[5], this is particularly the case for female-owned firms.[6]

Largely due to lack of data availability existing literature on Middle eastern and African firms has presented anecdotal and survey-based evidence on firm performance and financing structures while detailed financial evidence (from balance sheets and profit/loss statements) is still lacking.

This paper aims at filling this research gap. We identify the ownership type of firms and examine the impact of ownership structure on financing structure and firm performance. Financing structure is measured by available equity finance and the ratio of debt to equity. Firm performance is represented by sales, profits, and returns. Other firm characteristics include a measure of risk (volatility of profits) and firms are distinguished by country and industry. Ownership types are derived from the identity of the global ultimate owner and includes the gender of individual owners. Ownership information includes, besides gender, several other attributes of the ultimate global firm owner such as state or private ownership, family ownership, number of owners, ownership concentration, form of consolidation, and degree of independence.

We use cross-sectional financial reporting data of 25,500 companies in the Middle East and Africa for the years 2006 to 2014. Data source is Bureau van Dijk's Orbis database.

Our data reveal a clear gender-specific pattern. The share of female-owned firms in the Middle East and Africa is approximately four percent on average. This share varies widely between countries but much less across industries. Female-owned firms have on average lower sales, profits and returns on equity. They also have lower levels of equity and debt capital and a lower leverage (gearing); i.e., ratios of debt to equity.

Our results also reveal a clear gender-specific pattern. Increased availability of equity and/or debt capital as well as higher leverage have significantly positive effects on firm performance, measured by sales, profits and returns on equity. Female ownership per se appears to significantly lower firm performance according to all measures used even when we control for the levels of

[3] See, for example, Ahl (2006), Baliamoune-Lutz (2016), Baliamoune-Lutz (2015), Baliamoune-Lutz and McGillivray (2009), Hallward-Driemeier (2013), Minniti (2010).

[4] See Baliamoune-Lutz (2011), Brixovia (2010), Painter and Dobie (2010), Rogerson (2000), Rugraff and Hansen (2008), Tarek and Mohamed (2008).

[5] See, for example, Quartey (2003), Rocha et al. (2011).

[6] Asiedu et al. (2013).

available capital and the degrees of leverage. However, when the interaction of ownership with capital availability is taken into account, the effects change significantly.

The remainder of the paper is structured as follows. Section 2 provides a discussion of the relevant literature. Section 3 describes the data used. Section 4 presents the general modeling and summarizes the results. Section 5 concludes. Statistical and econometric results are presented in the appendix.

2. Review of relevant literature

Evidence from both theoretical and empirical literature suggests that factors related to firm characteristics (such as age and size of the firm, and industry type) and owner/manager attributes (such as age and education, gender, and social connections and membership in networks) can determine the ability to access credit/finance (Majed, 2010; Sorooshian, 2010). These factors, in general, tend to favor male over female-owned firms, although the evidence remains somewhat mixed. Studies have documented that there is a female-male gap at market entry and women-owned firms tend to be smaller in size, younger and disproportionately operating in low-profitability and low-growth sectors or industries, and that undercapitalization is a major contributor to this outcome (Kelly et al,. 2013; World Bank, 2011; National [US] Women's Business Council, 2015).

In the following review of relevant studies, we summarize findings reported primarily in the empirical literature and related to our main focus in the empirical section of the paper: access to finance and gender, as determinant of firm performance. The main hypothesis being that because relative to their male counterparts, women firm owners/managers are generally younger, less educated, with younger and smaller firms and are in sectors that are traditionally less attractive to men (lower-risk and lower-profitability businesses), they have lower access to finance.

2.1 Firm characteristics and access to credit/finance

2.1.1 Firm's age

Some aspects related to the firm's age, such as reputation and the size of tangible assets, can reduce or mitigate the problem of information asymmetry (Berger and Udell, 1998; Pandula, 2011; Serrasqueiro and Nunes, 2012; Abdulsaleh and Worthington 2013) and thus can reduce the cost of financing (pecking order theory). Serrasqueiro and Nunes (2012) study Portuguese firm-level panel data and find that a firm's age "is relevant for: the impact of financial deficit on variations of short- and long-term debt; the level of adjustment of short- and long-term debt toward the respective optimal levels; and the relationships between usual determinants and short- and long-term debt."

2.1.2 Firm size

Large firms tend to be better positioned, relative to small firms, to access finance, especially external finance. An important reason for this easier access is the documented positive link between size and productivity and growth. For example, using data from eight European countries, Pagano and Schivard (2003) find that larger firm size has a positive impact on productivity growth through allowing firms to benefit from R&D-induced higher returns. A number of empirical studies have used firm size, typically represented by total assets, and found

that size matters for access to external finance. For example, using data from U.K. manufacturing firms over the period from 1989-1999, Bougheas *et al*. (2006) find that size (along with firm's age and profitability) is a major determinant of access to short-term and long-term credit.

Kumar and Francisco (2005) use data from Brazil and find that firm's size is a major determinant of access to credit and credit constraints. The authors find that "[l]arge and medium firms are more likely to have a loan, and less likely to have credit constraints…size appeared to have a much more significant effect on determining access to credit than performance-related variables… there is an effective quantitative limit in the allocation of credit to smaller sized borrowers" (Kumar and Francisco, 2005, p.20). Similarly, the impact of firm's size on access to finance has been documented in Gertler and Gilchrist (1994), Kashyap *et al.* (1996), and Atanasova and Wilson (2004) and the findings generally show that the firm's access to non-bank debt and long-term debt has a positive correlation with firm's size. The role of size in easing credit/finance constraints has also been identified in the case of 16 African countries studied by Kounouwewa and Chao (2011). Using survey data covering 1559 firms, the authors report that size and foreign ownership are important determinants of financial obstacles facing firms.[7]

2.1.3 Industry sector

Some theoretical studies postulate that industry classification can represent (proxy for) business risk (Hall et al., 2000; Barbosa and Moraes, 2003) and thus influence the firm's access to debt financing. Firms operating in whole sale and retail industries were found to have weakest asset and debt ratio structures while firms in the agricultural industry were found to have strongest asset and capital structures (Abor, 2007). However, a study using a large sample of firm data from Spain (González et al., 2007) finds that the industry sector (manufacturing versus service firms) did not have any impact on firms' access to external finance.

On the other hand, Kuntchev et al. (2012) found regional differences in the impact of industry type on financial constraints. Using firm-level data from Enterprise Surveys, the authors report that in Eastern Europe & Central Asia and Latin America & Caribbean countries "the distributions of the credit constrained status within the 3 sectors (manufacturing, retail and other services) are very similar"; in East-Asia and Pacific "manufacturing firms are more likely to be credit constrained" and in South Asia, the strongest credit constraints were faced by the retail sector, While in Africa, firms in the 'other services' sector faced the least credit constraints.

2.2 Effects of owner/manager attributes

2.2.1 *Owner/manager's age*

Using a sample of 87 manufacturing SMEs from Asmara City in Eritrea, Ogubazghi and Muturi (2014) find that while both the age and education of managers/owners have positive effects on access to bank loans, only the effect of age is significant. Age can influence the owner/manager's (especially in the case of SMEs) decision to use or not use bank loans (demand side effects of age) either as a result of age-related attitude towards risk or as a result

[7] It is worth noting that causality may also run from financial constraints to firm size. For theoretical models explaining this relationship, see for example, Cooley and Quadrini (2001) and Cabral and Mata (2003) . Also, see Angelini and Generale (2005) for empirical evidence based on Italian firm-level data.

of age-related differences in the motivation to become entrepreneur/business owner which varies (Nakano and Nguyen 2011; Abdulsaleh and Worthington 2013), or both.

It worth noting that age is also a major factor on the supply side of finance, since banks view younger and older firm owners/managers differently. While young owners/managers can be perceived as risky, old ones can be viewed as non-dynamic and non-innovative.

2.2.2 Owner/manager's education

A number of studies have argued that banks consider more educated firm owners or managers as more creditworthy (Abdulsaleh and Worthington 2013; Ogubazghi and Muturi, 2014). The level of education of the firm's owner/manager can have a significant effect in improving access to finance although some studies found that the effect of educational levels was not significant (see, for example, Ogubazghi and Muturi, 2014). The assumption (especially in the case of SMEs) underlying the positive effect of owner/manager's educational level on access to finance is that educational level is positively correlated with firm performance (Kasseeah and Thoplan, 2012). Tertiary education, in particular, has been shown to have a significant influence on easing access to bank capital (Bates, 1990). However, some studies have noted a negative relationship between owner/manager's educational level and/or skills and access to access to credit; for example, Le et al. (2006) in the case of Vietnamese firms.

2.2.3 Gender and access to finance

Numerous studies have documented the significant differences between female- and male-owned/managed firms in access to external financing (Carter and Rosa, 1998; Haines et al., 1999; Coleman, 2000 and 2007; Brush et al., 2001; Greene et al., 2001). These differences tend to be due not only to historical (male-owned firms are traditionally older) and cultural factors (Gupta et al., 2009 and 2013; Shinnar et al., 2012) but also to differences in access to education, networks, high-profit and high-growth industries and age demographics. Thus, the factors reviewed earlier seem to have an amplified influence on female-owned (or managed) firms. Since women, especially in developing countries, tend to be less educate and less finance literate (Baydas et al, 1995; Tsai, 2004; Marlow and Patton, 2005), they face greater constraints in accessing formal finance.[8] This is in particular the case in sub-Saharan Africa and some of the MENA countries—the regional focus of this paper—where there is empirical evidence of lower start-up capital for women-owned businesses. For example, Brixiová and Kangoye (2016), using data from a survey of entrepreneurs in Swaziland, find that "Women entrepreneurs have smaller start-up capital and are less likely to fund it from the formal sector than their men counterparts, pointing to a possible room for policy interventions." On the other hand, using SME data from Business Environment and Enterprise Performance Surveys, Yaldiz et al. (2011) document "a positive but statistically insignificant association between female ownership and trade credit use."

Based on data from a large sample of borrowing men and women business owners in Canada, Fabowale et al. (1995) find that "men and women business owners differ in systematic ways, but that when such differences are taken into account, no differences in the terms of credit

[8] However, Yaldiz et al. (2011), showed that women have more ability to access formal credit and maintain business women can be viewed as better educated and more talented compared to business men because to be able to establish a business in a field that has been traditionally dominated by men women have to have greater levels of education and talent.

persist." Furthermore, the authors find that female small business owners "feel themselves to have been treated disrespectfully by lending officers to a significantly greater extent than do male business owners". The findings in the study by Coleman and Carsky (1996) are consistent with these results, since the authors report that a high proportion of US women business owners surveyed have switched banks and that the major reasons included: "poor customer service, an arrogant and condescending attitude on the part of bank personnel, and errors and mistakes." The authors recommend that that bank managers should improve the quality of their interactions with women business owners. A male-female funding gap has also been documented by Alsos et al. (2006) who find that "[w]hile there are few detected gender differences with respect to funding perceptions and behavior, women obtain significantly less financial capital to develop their new businesses. The authors also find that this lower level of financial capital that women obtain is correlated with lower early business growth relative to their male counterparts. Saparito et al. (2013) use 696 matched firm owner/manager–bank manager pairs and show that "male–male pairs of business owner/managers and bankers had the highest levels of trust, satisfaction with credit access, and bank knowledge, while female–female pairs had the lowest levels for each measure; with mixed pairs in the middle on all accounts". This is consistent with the perception of discrimination and disrespect reported by women firm owners/managers (Fabowale et al., 2995; Coleman and Carsky, 1996).

However, Orser et al. (2006) examine gender differences among Canadian SME owners seeking external finance, including commercial debt, leasing, supplier financing, and equity capital find (after controlling for size and industry sector) that "women business owners were equally likely as men to seek all types of external financing, except for external equity capital." The authors also find that, even after controlling for systemic factors, women majority-owned businesses were significantly less likely to seek equity capital but men and women business owners were equally likely to obtain capital when they do apply.

Empirical evidence also shows that women-owned firms tend to export less compared with male-owned firms, even in developed countries. For example, Orser et al. (2010) survey a large number of Canadian SMEs and report that after controlling for sector, firm, and owner characteristics, women majority-owned firms were significantly less likely to export than male-owned firms. To the extent that exporting firms have greater access to, and seek more, external finance, this suggests an additional mechanism for women's lower access to external finance.

3. The Data

3.1 The data set

The data set used in this study presents cross-sectional financial reporting data of companies in the Middle East and Africa. It contains ownership, balance sheet and profit/loss information.

Data source: Bureau van Dijk (BvD); Orbis global firm database; 278,024 firms from Africa and the Middle East; yearly data for 2006-2015; 25,523 firms (9%) with global owner name; unbalanced panel with average panel depth of 5 years. See Table 1 in the appendix for a summary of the data source and search details.

Available firm-level data include balance sheet data, profit and loss statement data, trade descriptions, industry and peer group information, ownership information, stock price and firm valuation data. Available ownership information includes name and nationality of global ultimate owner, index variables for female/male/family/state/international ownership, number

of owners, BvD independence index (15 different ratings based on ownership concentration and type), percentage of direct and total ownership, and consolidation status of firm.

Further information about the data set is given in the appendix. Table 2 presents a list of variables and their definitions; Table 3.1 presents summary statistics of the variables used. Note that the number of firms and observations is mainly constrained by the available financial data ie revenues, profits etc. Consequently, data estimations contain up to 18,700 observations covering up to 3,600 firms.

3.2 Data characteristics

The share of female-owned firms in the Middle East and Africa is approximately about four percent on average. This share varies widely across countries but much less across industries. As Table 3.2 shows, female-ownership shares by country in our data set range from 13 percent in DRC to zero percent in countries such as Malawi, Mozambique, Namibia, Sudan, Uganda, Yemen, Zimbabwe. According to the data shown in Table 3.3, female-ownership shares by industry range from about six percent in construction, wholesale and retail trade to about two percent in agriculture, manufacturing, and media services.

Female-owned firms have on average lower sales, profits and returns on equity. Female-owned firms also have lower levels of equity and debt capital and a lower leverage (gearing); i.e., ratios of debt to equity. Table 3.4 shows that female-owned firms on average have access to less than half of the amount of equity capital compared with other firms and access less than 20 percent of the amount of debt financing relative to other firms. Similarly, female-owned firms on average generate half the sales and less than 20 percent of the profits of other firms.

4. Modeling and results

4.1 Econometric modeling

Given the panel data available, we can use the following generalized regression model to investigate the economic hypotheses presented:

$$(1) \qquad y_{i,t} = \alpha + \mathrm{B}F_i + \Gamma G_{i,t} + \Delta M_t + \varepsilon_{i,t} + \eta_i$$

where the dependent variable $y_{i,t}$ is a profit or sales level indicator (sales, profit, return) of company *i* in period *t*; F_i is a vector of determinants specific to firm i but invariant over time (such as country or industry); $G_{i,t}$ is a vector of determinants that may vary between firms and also over time (e.g., gearing); M_t is a vector of period-specific determinants outside of a particular firm (captured by year); $\varepsilon_{i,t}$ is an idiosyncratic error term that may vary between firms and also over time and is independently distributed with E($\varepsilon_{i,t}$) = 0; and η_i represents unobserved heterogeneity across firms, i.e., a company specific fixed effect or random effect (that is independently distributed).

This general specification allows for pooled ordinary least squares (OLS), random-effects (RE), and fixed-effects (FE) modeling, where the random or fixed effects are firm-specific components. The more general approach is to allow for random firm-specific effects; the case where these effects are fixed, that is determinate constants instead of random variables, is a special sub-case. All model variants reported below were estimated with OLS pooled models, FE and RE panel

models, and instrumental variable (IV) models. Models were also run with controls for years, countries and industries (where appropriate).

The data available contain several firm-specific, time-invariant variables that can be assumed to capture a significant part of present fixed effects (e.g., country, industry indicators). Hence a random-effects specification seems to be a priori more appropriate. However, Hausman tests for FE versus RE modeling undertaken for the models reported below (not reported here) tend to reject the null of consistency in the RE modeling; consequently the reported FE model should be considered more reliable and we also use an instrumental-variable (IV) specification. Nevertheless, all estimations together present a consistent picture and allow for unified conclusions regarding the role of female-owned firms in Africa and the Middle East. Estimation results are summarized below.

4.2 Results

Our results are derived from pooled OLS, FE, RE, and RE-IV estimations. In the latter RE-IV estimations we take account of the possibly endogenous nature of female ownership (i.e., that low-performance firms are not normally selected by men and hence may end up being owned by women) by instrumenting female ownership with a number of variables representing intrinsic ownership characteristics. We also take account of differences in the level of risk involved by the chosen businesses.

In a first step, we take a preliminary look at the effect of female-ownership on revenue and profits. Following Lutz (2013), we construct 3-year averages of main right-hand-side (RHS) variables, here previous capital endowments, and use their lagged values as main determinants together with a female-ownership indicator. As Table 4.1 shows, such a simple OLS model explains 50 to 70 percent of variations in revenues and profits (measured in natural logs) and female ownership appears to have a statistically significant negative effect.

An important question arises: Are women less capable entrepreneurs? When we extent the analysis to account for efficiency of use of capital, a different picture emerges. In the augmented models presented in Table 4.2 we use lagged interaction terms between female ownership and the 3-year averages of equity endowments and the gearing (debt/equity) ratios. While female ownership per se still is correlated with lower revenues, profits, and returns, both interaction terms are positive and statistically significant. Apparently, increased availability of equity and/or debt capital as well as higher leverage have significantly positive effects on firm performance. When female-owned firms acquire more equity or debt financing or when they increase their leverage, resulting performance increases are significantly greater than for other firms as indicated by the interaction terms. These preliminary results are confirmed by random-effects (Table 4.3) and fixed-effects (Table 4.4) estimations.[9]

However, female ownership may be endogenous. Additionally, female entrepreneurs may choose systematically less risky businesses. To address these issues, we instrument female ownership using a risk measure and intrinsic ownership characteristics (ownership concentration, degree of independence) while controlling for other relevant factors (country, industry, year, data availability, consolidation status). As a risk measure we use the 3-year standard deviation of profits, which has been shown to be a significant determinant of average future firm performance. As expected, risk has a negative and significant effect on the probability of the firm owner being female; see Table 4.5.

[9] Note that Hausman tests reject the null of consistency in the RE modelling; consequently the reported FE model should be considered more reliable or an instrumental-variable (IV) specification should be used.

Descriptive statistics presented earlier suggest that female entrepreneurs might be capital constraint since (on average) they have less equity and debt available to operate their firms. Estimating models with determinants of equity and debt, respectively, shown in Table 4.5, confirms this: female ownership has a negative and significant effect on levels of equity and debt.

Finally, Table 4.6 presents RE-IV estimations of the effect of female-ownership on revenue and profits where female ownership is instrumented and variations of individual business risk are taken into account. Obtained results are qualitatively identical to our earlier OLS results: while female ownership per remains correlated with lower revenues, profits, and returns, both interaction terms are positive and statistically significant.

5. Concluding remarks

In this study, we present evidence that there is a clear gender-specific pattern revealed by the data that appears to be supported by the econometric investigation. For all firms including female-owned firms, increased availability of equity and/or debt capital as well as higher leverage have significant positive effects on firm performance, measured by sales, profits and returns on equity. Female-owned firms have on average lower sales, profits and returns on equity. And female ownership per se appears to significantly lower firm performance according to all measures used even when we control for the levels of available capital and the degrees of leverage.

However, when the interplay of ownership with capital availability is taken into account, the nature of the impact of women's ownership seems to change. When female-owned firms acquire more equity or debt financing or when they increase their leverage, resulting performance improvement is significantly greater than for other firms. This suggests that female-owned firms would perform better than other firms given the same access to capital. Existing financing constraints appear as a major factor in holding female-owned firm performance back in the Middle East and Africa.

Our results are confirmed by anecdotal evidence. For example, when the EBRD launched the Women in Business programme in Egypt in October 2015 hosted by the National Bank of Egypt, present women entrepreneurs uniformly mentioned lack of capital access as a major concern. Coincidentally, all five Bank representatives present at the conference were male.[10]

The results obtained in this paper have important policy implications. First, policymakers should ensure that financial institutions (especially banks)'s decision makers personnel are not biased against women owners/managers. Specific training as well as greater gender diversity at these institutions may help to achieve this outcome. Second, while policymakers (as a result of recommendations by the World Bank and the African Development Bank through the African Women in Business Initiative) in some African and MENA countries have tried to address the supply-side constraint, there are important demand-side constraints that need to be alleviated. Women's lower use of external finance could also be due to lower demand for it. This lower demand may stem from the fact that women manage the firm while at the same time taking care of children so that firm growth is not a priority. In this case, investing early childhood education and preschool day care could significantly improve women's demand for, and access to, credit and external finance as it would free up women's time and allow them to participate more in training and support networks which should contribute to higher productivity and better performance (World Bank, 2011; Blackden and Hallward-Driemeier, 2013).

[10] EBRD (2015); Lutz attended the conference.

Finally, education can play an important role in changing the way society views female-owned businesses. For example, in most business schools (including in developed countries) educators discuss business strategies and achievements undertaken mostly (if not exclusively) by male business leaders (role models). This needs to be changed, as there are now many examples of successful female-led firms in both developed and developing countries that could serve as insightful case studies in business schools.

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Appendix

Table 1. Data source

#	Data type	Source	Downloaded / data	Date
1	African firm data (balance sheet, profit/loss)	Bureau van Dijk (BvD), Orbis database	German University in Cairo, online license	3 December 2015

Product name	**Orbis**		
Update number	**141**		
Software version	**129.00**		
Data update	**03/12/2015 (n° 14114)**		
Username	**RegistrationRequest-13965**		
Export date	**03/12/2015**		
		Step result	**Search result**
1.	**All active companies and companies with unknown situation**	**149,475,520**	**149,475,520**
2.	**World region/Country/Region in country: Africa, MENA**	**4,192,443**	**3,831,695**
3.	**Operating revenue (Turnover): All companies with a known value, 2015, 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, for at least one of the selected periods, exclusion of companies with no recent financial data and Public authorities/States/Governments**	**49,910,878**	**278,024**
4.	**P/L before tax: All companies with a known value, 2015, 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, for at least one of the selected periods, exclusion of companies with no recent financial data and Public authorities/States/Governments**	**15,278,254**	**0**
	Boolean search : 1 And 2 And 3		
		TOTAL	**278,024**

Table 2. List of variables

Variable	Definition
BvD	Firm identifier (derived from BvD ID)
Year	Year
Country	Country
Industry	NACE 2 Core Category (1 digit)
BvDIndepIndic	BvD Independence Indicator
BvDIndepA	BvDIndepIndic = A-, A, or A+
ConsCode	Consolidation Code
NoShareholders	Number of Recorded Shareholders
NoSubsidiaries	Number of Recorded Subsidiaries
GUOName	Global Ultimate Owner (GUO) Name
GUODirectPct	GUO direct ownership share (%)
GUOType	GUO type
GUOCorp	GUO = Corporation
GUOFamily	GUO = Family-owned
GUOGovt	GUO = Government-owned
GUOGender	GUO Gender
GUOFemale	GUOGender = Female
LastAvailYear	Last Available Year
NoEmployees	Number of Employees
Revenue	Operating revenue (000´s USD)
PLbeforTax	Profit/Loss before Tax (000´s USD)
NetIncome	Net Income (000´s USD)
Equity	Shareholder Funds (000´s USD)
TotalAssets	Total Assets (000´s USD)
Debt	Debt (000´s USD): TotalAssets - Equity
ROE	Return on Equity (%), use net Income
Gearing	Gearing (%), Debt / Equity
ln*	Natural log ln(*) of variable <*>
a3*	3-period average a3(*) of variable <*>
s3*	3-period standard deviation s3(*) of variable <*>
FemaleGear	Interaction term: GUOFemale*Gearing
FemaleShdf	Interaction term: GUOFemale*ln(Equity)
FemaleDebt	Interaction term: GUOFemale*ln(Debt)
FemaleA3Gear	Interaction term: GUOFemale*a3(Gearing)
FemaleA3Shdf	Interaction term: GUOFemale*a3(ln(Equity))
FemaleA3Debt	Interaction term: GUOFemale* a3(ln(Debt))
lns3PLbeforTax	Income risk measure: ln(s3(PLbeforTax)

Table 3.1. Summary statistics (selected variables)

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	229707			2006	2014
Country	229707				69
Industry	203310	4.334351	1.881647	0	9
BvDIndepA	229707	.0411785	.1987034	0	1
NoShareholders	229707	2.285586	4.465129	0	122
NoSubsidiaries	229707	2.481291	12.34119	0	591
GUOCorp	229707	.4133918	.492443	0	1
GUOFamily	229707	.0116366	.1072437	0	1
GUOGovt	229707	.0183364	.134165	0	1
GUOFemale	229707	.0372997	.1894956	0	1
GUODirectPct	171612	91.41803	20.15072	0	100
GUOTotalPct	136242	99.71207	3.286725	50.03	100
LastAvailYear	229707	2012.817	1.249588	2011	2015
NoEmployees	21426	1065.801	4914.384	0	143828
Revenue	64200	303875.8	3312367	-4900817	3.50e+08
PLbeforTax	31909	43011.33	277739.6	-7871623	1.28e+07
NetIncome	16582	60387.22	356773.3	-7976315	2.64e+07
Equity	16839	481864.9	1848227	-3195687	5.64e+07
TotalAssets	16854	3378596	8.77e+07	-10.61146	1.12e+10
ROE	8982	15.325	44.90861	-995.397	966.607
Gearing	6748	109.5777	149.672	0	996.425

Table 3.2. Share of female-owned firms by country (1)

Country	ISO Code	Obs	Mean	Std.Dev.
United Arab Emirates	AE	13086	.0350757	.1839781
Angola	AO	117	0	0
Burkina Faso	BF	108	.0833333	.2776739
Bahrain	BH	1566	.0344828	.1825239
Burundi	BI	9	0	0
Benin	BJ	99	0	0
Botswana	BW	396	.0227273	.1492212
Democratic Republic of Congo	CD	135	.1333333	.3412007
Central African Republic	CF	27	0	0
Congo	CG	162	0	0
Cote D'Ivoire	CI	477	.0566038	.2313265
Cameroon	CM	684	.0263158	.1601898
Cape Verde	CV	36	0	0
Djibouti	DJ	18	0	0
Algeria	DZ	756	.0357143	.1856997
Egypt	EG	13014	.0359613	.1862008
Ethiopia	ET	54	0	0
Gabon	GA	135	0	0
Ghana	GH	423	.0212766	.1444758
Gambia	GM	54	0	0
Guinea	GN	36	0	0
Guinea Bissau	GW	27	0	0
Israel	IL	82404	.0360419	.1863957
Iraq	IQ	1125	.008	.0891238
Iran	IR	684	.0263158	.1601898
Jordan	JO	3546	.0380711	.1913949
Kenya	KE	837	.0215054	.1451484
Comoros	KM	9	0	0
Kuwait	KW	4068	.0995575	.2994459
Lebanon	LB	5256	.0479452	.2136707
Liberia	LR	36	0	0
Lesotho	LS	54	0	0
Libya	LY	36	0	0
Morocco	MA	11556	.038162	.1915955
Madagascar	MG	81	0	0
Mali	ML	108	0	0
Mauritania	MR	45	0	0
Malta	MT	41841	.0189288	.1362753
Mauritius	MU	1485	.0545455	.2271673
Malawi	MW	198	0	0
Mozambique	MZ	153	0	0
Namibia	NA	387	0	0
Niger	NE	18	0	0
Nigeria	NG	1314	.0136986	.116281

Table 3.2. Share of female-owned firms by country (2)

Country	ISO Code	Obs	Mean	Std.Dev.
Oman	OM	1620	.0111111	.1048544
Palestine	PS	468	.0384615	.1925135
Qatar	QA	1755	.0461538	.209878
Rwanda	RW	81	0	0
Saudi Arabia	SA	25020	.0838129	.2771126
Sudan	SD	180	0	0
Sierra Leone	SL	36	0	0
Senegal	SN	918	.0098039	.0985819
South Sudan	SS	18	0	0
Sao Tome and Principe	ST	9	0	0
Syria	SY	279	.0322581	.1770022
Swaziland	SZ	72	0	0
Chad	TD	36	0	0
Togo	TG	99	0	0
Tunisia	TN	612	.0294118	.1690959
Tanzania	TZ	423	.0212766	.1444758
Uganda	UG	189	0	0
Yemen	YE	351	0	0
South Africa	ZA	9702	.0046382	.0679498
Zambia	ZM	522	.0517241	.221682
Zimbabwe	ZW	621	0	0

Table 3.3. Share of female-owned firms by industry

NACE 2	NACE 2	Obs	Mean	Std.Dev.
0	Agriculture, Forestry, Fishing, Mining, Quarrying	3771	.0190931	.1368704
1	Manufacture, food products, beverages, etc	11349	.036479	.187487
2	Manufacture, chemicals, pharmaceuticals, etc	22491	.0232093	.150571
3	Manufacture, transport equipment, machinery, furniture, etc	5373	.0217755	.1459635
4	Construction, wholesale, retail trade	92169	.0584904	.2346697
5	Transport	8721	.0206398	.1421835
6	Media, broadcasting	34416	.0180439	.1331122
7	Services, management, consulting	14787	.0316494	.1750709
8	Services, other	5616	.0352564	.1844436
9	Services arts, entertainment	4617	.0389864	.1935834

Table 3.4. Key financial indicators: Female vs other firms

Indicator		Obs	Mean	Std.Dev.	Min	max
Equity	All firms	16839	481864.9	1848227	-3195687	5.64e+07
	Female-owned	203	143995.8	1238093	-10647.65	1.76e+07
Debt	All firms	16757	2651590	8.70e+07	.0500461	1.12e+10
	Female-owned	200	342703.2	2072611	25.1991	2.76e+07
Gearing	All firms	6748	109.5777	149.672	0	996.425
	Female-owned	56	83.4762	116.2051	0	734.751
Revenue	All firms	64200	303875.8	3312367	-4900817	3.50e+08
	Female-owned	1699	161322.2	3098537	-9254.373	1.20e+08
PLbeforTax	All firms	31909	43011.33	277739.6	-7871623	1.28e+07
	Female-owned	453	7616.461	22113.76	-24081.69	172495
NetIncome	All firms	16582	60387.22	356773.3	-7976315	2.64e+07
	Female-owned	207	5983.08	16205.15	-24018.31	72091
ROE	All firms	8982	15.325	44.90861	-995.397	966.607
	Female-owned	80	14.26438	21.51995	-103.808	77.534

Table 4.1. Preliminary results: Revenues and profits (Pooled OLS estimations)

Model	**(4.1.1)** OLS	**(4.1.2)** OLS	**(4.1.3)** OLS
Dep. Variable	**lnRevenue**	**lnPLbeforTax**	**lnNetIncome**
l.a3lnEquity	0.660***	0.726***	0.803***
l.a3Gearing	0.000000038***	0.000000038***	0.00000041***
GUOFemale	-0.191*	-0.487***	-0.495***
Observations	18709	15186	7772
R-sq.	0.5167	0.6598	0.7377
R-sq. adj.	0.5167	0.6598	0.7376
Prob > F	0.0000	0.0000	0.0000

Notes.

(i) All models estimated with pooled OLS.

(ii) All models include a constant. All models include country, industry, and year dummies.

(iii) *** denotes significant at the 1%, ** at the 5%, * at the 14% level.

Table 4.2. Results summary: Revenues, profits, and returns (Pooled OLS estimations)

Model	**(4.2.1)** OLS	**(4.2.2)** OLS	**(4.2.3)** OLS	**(4.2.4)** OLS
Dep. Variable	**lnRevenue**	**lnPLbeforTax**	**lnNetIncome**	**ROE**
l.a3lnEquity	0.653***	0.707***	0.749***	-3.548***
l.a3Gearing	0.000000037***	0.000000035***	0.0000016***	0.00012***
GUOFemale	-1.252**	-2.228***	-1.842***	-104.1*
l.FemaleA3Shfd	0.083*	0.179***	0.151**	8.318*
l.FemaleA3Gear	0.00012***	0.00013***	0.00014***	0.0042
BvDIndepA	-0.372***	-0.285***	-0.261***	-6.718***
NoShareholders	0.036***	0.045***	0.029***	0.496***
NoShareholders^2	-0.00025***	-0.00034***	-0.00023***	-0.0037***
Observations	17654	14356	7534	6597
R-sq.	0.5826	0.6887	0.7689	0.0884
R-sq. adj.	0.5805	0.6868	0.7662	0.0790
Prob > F	0.0000	0.0000	0.0000	0.0000

Notes.

(i) All models estimated with pooled OLS.

(ii) All models include a constant. All models include country, industry, and year dummies.

(iii) *** denotes significant at the 1%, ** at the 5%, * at the 10% level.

Table 4.3. Results summary: Revenues, profits, and returns (RE estimations)

Model	(4.3.1) RE	(4.3.2) RE	(4.3.3) RE	(4.3.4) RE
Dep. Variable	**lnRevenue**	**lnPLbeforTax**	**lnNetIncome**	**ROE**
l.a3lnEquity	0.424***	0.584***	0.654***	-5.595***
l.a3Gearing	0.000000022***	0.000000021***	0.00000051***	0.000065
GUOFemale	-1.325***	-1.855**	-2.215**	-95.39
l.FemaleA3Shfd	0.066	0.134*	0.188*	5.550
l.FemaleA3Gear	0.00016***	0.00010**	0.00014***	0.040**
BvDIndepA	-0.423***	-0.286***	-0.252***	-8.211***
NoShareholders	0.056***	0.054***	0.042***	0.482**
NoShareholders^2	-0.00037***	-0.00040***	-0.00032***	-0.0030
Observations	17654	10595	7534	6597
Groups (Firms)	3355	2981	2550	1083
R-sq. within	0.0360	0.0264	0.0054	0.0128
R-sq. between	0.5748	0.7189	0.7415	0.1809
R-sq. overall	0.5493	0.7064	0.7565	0.0833
Prob > chi2	0.0000	0.0000	0.0000	0.0000

Notes.

(i) All models estimated with random effects.

(ii) All models include a constant. All models include country, industry, and year dummies.

(iii) *** denotes significant at the 1%, ** at the 5%, * at the 13% level.

Table 4.4. Results summary: Revenues, profits, and returns (RE estimations)

Model	**(4.4.1) FE**	**(4.4.2) FE**	**(4.4.3) FE**	**(4.4.4) FE**
Dep. Variable	**lnRevenue**	**lnPLbeforTax**	**lnNetIncome**	**ROE**
l.a3lnEquity	0.194***	0.153***	0.041	-8.290***
l.a3Gearing	-0.0000000010	-0.000000012	0.0000000012	-0.00011*
l. lns3PLbeforTax	0.089***	0.113***	0.050**	3.732***
l.FemaleA3Shfd	-0.104	-0.224	-0.144	-3.968
l.FemaleA3Gear	0.00020***	0.00015**	0.000087	0.092***
Observations	18558	15170	7769	6606
Groups (Firms)	3628	3413	2725	1085
R-sq. within	0.0448	0.0205	0.0131	0.0180
R-sq. between	0.3619	0.5052	0.6039	0.1080
R-sq. overall	0.3960	0.5233	0.6181	0.0443
Prob > chi2	0.0000	0.0000	0.0000	0.0000

Notes.

(i) All models estimated with fixed effects.

(ii) All models include a constant. All models include year dummies.

(iii) *** denotes significant at the 1%, ** at the 5%, * at the 10% level.

Table 4.5. Results summary: Female Ownership, Financing (IV estimations)

Model	(4.5.1) OLS	(4.5.2) RE-IV	(4.5.3) RE-IV
Dep. Variable	**GUOFemale**	**lnEquity**	**lnDebt**
l.lns3PLbeforTax	-0.0031***		
l.a3lnEquity		0.922***	0.571***
l.a3Gearing		-0.00000057*	0.0000066***
GUOFemale		-2.666***	-21.64***
BvDIndepA	0.00059		
NoShareholders	0.000020		
GUODirectPct	-0.00016***		
Observations	15338	6414	6506
Groups (Firms)		1893	1914
R-sq. within		0.0888	0.0792
R-sq. between		0.9264	0.2396
R-sq. (overall)	0.0348	0.9251	0.2784
R-sq. adj.	0.0302		
Prob > chi2 (>F)	0.0000	0.0000	0.0000

Notes.
(i) Model (1) estimated with pooled OLS; Models (2), (3) estimated with random effects IV regression; GUOGender instrumented by BvDIndepA, NoShareholders, GUODirectPct, lns3PLbeforTax, I.Conscode, I.LastAvailYear, I.Country, I.Industry, I.Year.
(ii) All equations include a constant; all equations include year dummies; equation (1) includes dummies for country, industry, ConsCode, and LastAvailYear.
(iii) *** denotes significant at the 1%, ** at the 5%, * at the 19% level.

Table 4.6. Results summary: Revenues, profits, and returns (IV estimations)

Model	**(4.6.1) RE-IV**	**(4.6.2) RE-IV**	**(4.6.3) RE-IV**
Dep. Variable	**lnRevenue**	**lnPLbeforTax**	**lnNetIncome**
l.a3lnEquity	0.493***	0.624***	0.738***
l.a3Gearing	0.0000021***	0.0000026***	0.0000057***
GUOFemale	-37.27***	-89.51***	-63.60***
l.FemaleA3Shfd	3.524***	8.314***	5.886***
l.FemaleA3Gear	0.0069***	0.0071***	0.044***
Observations	10652	8616	5289
Groups (Firms)	2218	2082	1739
R-sq. within	0.0347	0.0043	0.0038
R-sq. between	0.4015	0.3815	0.5373
R-sq. overall	0.3740	0.3536	0.5709
Prob > chi2	0.0000	0.0000	0.0000

Notes.
(i) All models estimated with random effects IV regression; GUOGender instrumented by BvDIndepA, NoShareholders, GUODirectPct, lns3PLbeforTax, I.Conscode, I.LastAvailYear, I.Country, I.Industry, I.Year.
(ii) All equations include a constant; all equations include year dummies.
(iii) *** denotes significant at the 1%, ** at the 5%, * at the 10% level.