ADBI Working Paper Series

GENDER AND CORPORATE SUCCESS: AN EMPIRICAL ANALYSIS OF GENDER-BASED CORPORATE PERFORMANCE ON A SAMPLE OF ASIAN SMALL AND MEDIUM-SIZED ENTERPRISES

Farhad Taghizadeh-Hesary,
Naoyuki Yoshino, and Lisa Fukuda

No. 937
March 2019

Asian Development Bank Institute

Farhad Taghizadeh-Hesary is assistant professor, Faculty of Political Science and Economics, Waseda University, Tokyo. Naoyuki Yoshino is dean and CEO, ADBI, and Professor Emeritus, Keio University, Tokyo. Lisa Fukuda is a postgraduate student, University of Queensland, Brisbane, Australia.

Suggested citation:

Taghizadeh-Hesary, F., N. Yoshino, and L. Fukuda. 2019. Gender and Corporate Success: An Empirical Analysis of Gender-Based Corporate Performance on a Sample of Asian Small and Medium-Sized Enterprises. ADBI Working Paper 937. Tokyo: Asian Development Bank Institute. Available: https://www.adb.org/publications/gender-and-corporate-success-asian-sme

Please contact the authors for information about this paper.

Email: farhad@aoni.waseda.jp

Asian Development Bank Institute
Kasumigaseki Building, 8th Floor
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

Within a patriarchal society, women are placed in a precarious societal positioning that leads to a prevalence of gender inequality in education, financial literacy, and access to finance. In the context of Asia, where small and medium-sized enterprises (SMEs) are the backbone of most Asian economies and the financial sector is dominated by banks, women in entrepreneurship are susceptible to facing greater credit constraints relative to their male counterparts, which can compromise their corporate performance. The objective of this research is to investigate whether there is a significant association between gender and success or failure of SMEs. Using a statistical analysis technique (principal component analysis) and running econometrics regressions on a random sample of 1,492 exporter SMEs from Iran, the research answers the question: is it plausible to conclude that female-owned SMEs are bound for lower corporate performance relative to those of male counterparts? Empirical results show that indeed, despite showing a good leverage status, female-owned SMEs perform lower relative to male counterparts as they have a higher default ratio and lower profitability, liquidity, and coverage. The paper will provide policy suggestions, such as establishment of credit guarantee funds for easing the female-owned SMEs' access to finance in Asia. Implementation of supportive policies for female-owned SMEs will have significant contribution to economic growth, employment, and ultimately, to gender equality.

Keywords: economics of gender, small and medium-sized enterprises, corporate performance of SMEs, financial literacy gap, access to finance, gender inequality, financial inclusion

JEL Classification: J16, G32, G21

Contents

1. INTRODUCTION

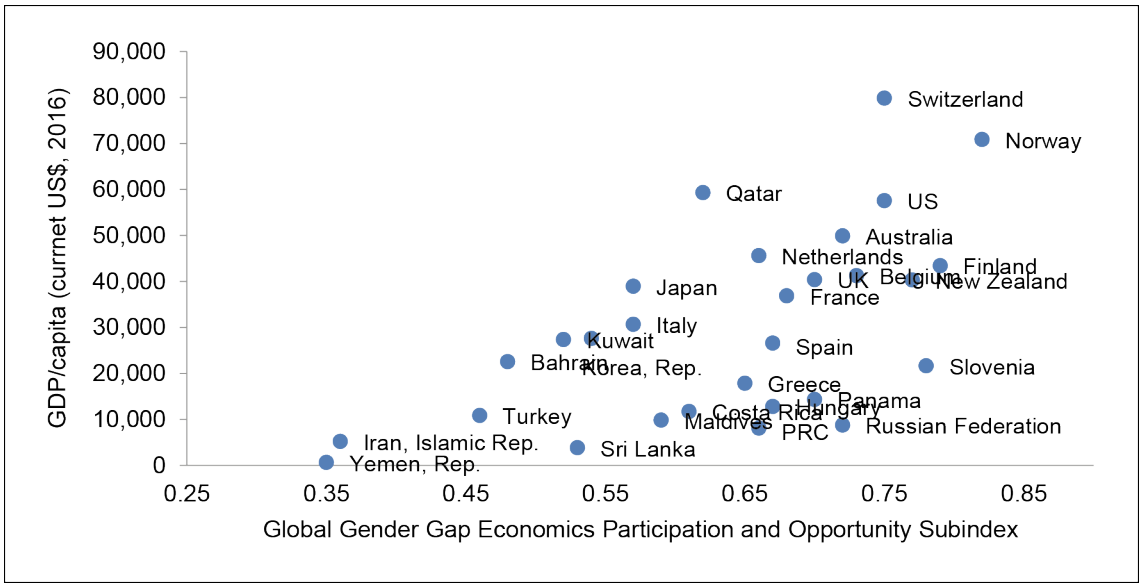
The prevalence of gender inequality in the social, economic, and corporate sphere has caused it to become culturally entrenched in society. According to the International Labour Organization (ILO) in their Global Wage Report 2018/19, women, on average, earn 20% less than men globally (International Labour Organization, 2018b). Furthermore, their labor force participation rate falls 26.5 percentage points lower than that of men as of 2018 (International Labour Organization, 2018a). In the corporate sector, they are underrepresented in CEO positions and board seats, where they comprised under 5% and 20%, respectively in 2015, despite studies signifying a strong positive correlation between gender diversity in corporate boards and financial performance (International Labour Organization, 2015).

As found by Chandani, Mehta, and Chandrasekaran (2014), positive trends in a bank's financial statement, such as increasing capital ratio and return on net worth, are observed when they are led by a female CEO. Moreover, board gender diversity is linked to lower susceptibility to bankruptcy risk, as found by in their observation of capital structure (debt-to-equity ratio and borrowings) of microfinance institutions (MFIs).

Congruency among literature in inclusiveness of women as strongly positively linked to financial performance of enterprises suggests this culminates in substantial opportunity costs in economic development, including GDP growth and employment. As empirically found by Kim, Lee, and Shin (2016b) in their theoretical model using micro-level data of Asian economies, attainment of gender parity would lead to GDP per capita being higher than the benchmark economy by 30.6% and 71.1% after one and two generations, respectively. The reasons were lower fertility and population from higher female labor force participation. This result is related to findings by Kim, Lee, and Shin (2016a), who concluded that gender parity in the labor market would lead to an increase in GDP per capita growth rate from 3.6% to 4.1% within a generation. As shown in Figure 1, there is a weak positive correlation between economic development and gender parity, measured using GDP per capita (current US$) and sub-index Economic Participation and Opportunity of the Global Gender Gap Index for the year 2016.

The sub-index *Economic Participation and Opportunity*, constructed by the World Economic Forum, captures three concepts of disparity: (i) advancement, (ii) remuneration and (iii) participation. It is derived using hard data and qualitative indicators, allowing gender disparity within a country to be quantified from 0.00 (imparity) to 1.00 (parity). Thus, global comparison of gender inequality in the corporate sector can be made across countries. For example, Yemen, Iran, and Japan are classified as least-developed, developing, and developed countries, respectively. Yemen scored the lowest in Economic Participation and Opportunity with 0.345 and Iran scored 3.48% higher with 0.357 in 2017. Compared to these two countries, Japan has the highest score toward parity with 0.580 (WEF, 2017); however, its female labor force participation rate is among the lowest compared to other OECD members (Guo, 2015).

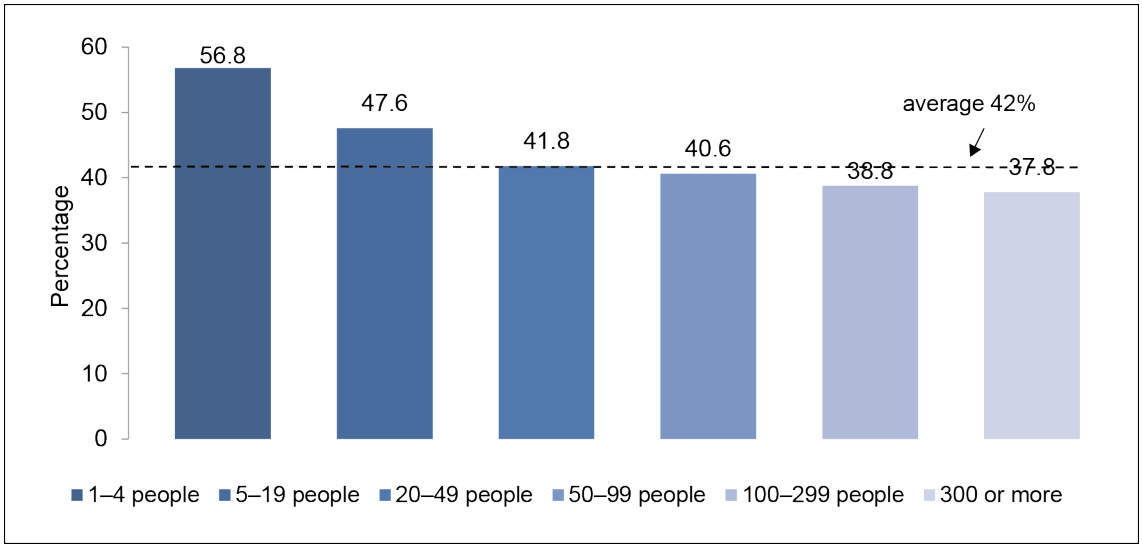
Figure 1: GDP Per Capita and Global Gender Gap Economic Participation and Opportunity Sub-Index



PRC = People's Republic of China, UK = United Kingdom, US = United States.

Source: The World Bank, 2018a, 2018b.

Figure 2: Percentage of Female Employees by Size of Enterprise in Japan
(number of employees)



Notes: "Employees" refers to people who are company members, work in a private shop, or are otherwise employed at a company, by an individual, or in a private shop; the term excludes persons employed at public agencies and other groups and corporations and furthermore excludes executive officers of companies, etc. The dotted line in the figure represents the average for all enterprises (42.0%).

Source: MIC (2012).

As shown in Figure 2, female participation in employee share declines as the enterprise size increases, where females within microenterprises with 1–4 people account for 56.8% of employee share but only account for 37.8% in companies with more than 300 employees. This is because large companies consisting of more than 200 or 300 employees have more bureaucratic corporate procedures and disciplines, and hence,

are hesitant to employ females who typically hold implicit expectation of maternity leave amid adjustment to corporate culture, honing of skills and career advancement. Therefore, large companies prefer to hire men from the beginning to avoid lost productive efficiency and its tangible and intangible costs. Micro and small enterprises are typically family-managed and, in many cases, more flexible. Thus, SMEs are a potential sector for promoting female employment.

Japan has 3.809 million SMEs, accounting for 99.7% of the total number of enterprises in the country. Furthermore, 33.61 million employees are within SMEs in Japan, and the share of SMEs in total employment is almost 70%. (METI, 2017).[1] The role of SMEs is similar in other Asian economies and are the backbone of most Asian economies, as they contribute a significant share of GDP, with 42% on average, accounting for 96% enterprises and 62% of the labor force (ADB, 2015). Therefore, it is vitally important for the Asian economies' economic success that they have fully functioning support measures for SMEs. However, SMEs face major challenges in accessing affordable finance mainly because there is an asymmetric information problem between suppliers and demanders of funds, as well as high transaction costs. This leads to more collateral requirements for lending to SMEs and higher lending interest rates, which hinders their growth (Yoshino and Taghizadeh-Hesary, 2018a).

Female-owned SMEs face particularly high prerequisites in access to finance in the form of higher collateral requirements and interest rates relative to their male counterparts. This inequality in access to finance largely stems from a financial literacy gap. Women of a lower socio-economic background are prone to lacking financial knowledge, awareness, and expertise to manage SME finances in a way that reduces their opacity to the financial sector (Scott, 2014). From the perspective of risk-adverse financial institutions, female-owned SMEs are preconceived from a weaker financial position and hence lower returns, more risk, and higher likelihood of default (ADB, 2015). As a result, they face a higher rejection rate in financial proposals—2.5 times more than their male counterparts (Caprio, Kim, and Beck, 2017). Since SMEs in Asia are heavily dependent on external sources of funding amid under-developed venture capital markets, such severe financial constraints against female-owned SMEs exacerbates their financial condition of being under-capitalized and operating in illiquid markets. This enhances their vulnerability to economic downturns and degradation of financial performance (OECD, 2018).

As previously mentioned, numerous studies (Chandani, Mehta, and Chandrasekaran, 2014; Mohan, 2014; Adusei and Yaa Takyiwah Obeng, 2019) have found that increasing the leadership of women in corporate boards has a significant positive effect on a company's financial performance. However, in the context of SMEs in Asia, where women face credit constraints and are prone to low educational attainment and financial illiteracy, their corporate leadership may not have this effect.

The objective of this research is to investigate whether any significant association exists between gender and success or failure of SMEs, determining whether it is plausible to conclude that female-owned SMEs are bound for lower corporate performance. In addition, the paper will provide examples of successful policies in Asia for improving the financial performance of female-owned SMEs and reducing the probability of default. We believe implementing the right supportive policies for female-owned SMEs will have significant contribution to economic growth, employment, and ultimately, to gender equality.

[1] http://www.chusho.meti.go.jp/pamflet/hakusyo/H29/download/2017hakushogaiyou_eng.pdf.

Gender disparity in corporate performance of SMEs in Asia is assessed using a random sample of 1,492 exporter SMEs from Iran who are customers of a bank, 84% of which are run by males and 16% run by females. Default ratio and various financial variables from bank statements are utilized. The paper meets the objective by firstly developing a theoretical model on role of gender in corporate performance, followed by using statistical analysis techniques, namely principal component analysis (PCA). Lastly, econometrics regression is run in order to answer the research question.

Section 2 of this paper reviews the literature and Section 3 provides a theoretical model, while Section 4 consists empirical analysis for the statistical analysis and econometrics. Section 5 is for concluding remarks and policy implications.

2. LITERATURE REVIEW

We reviewed four streams of literature, including: (i) gender and education; (ii) gender and financial literacy; (iii) gender-based access to finance and (iv) lack of access to finance and financial performance of SMEs. Among these, the pervasiveness of gender inequality appears as consequential and thus, provokes the (research) question: if gender inequality arises in educational and financial outcomes, is there bound to be gender disparity in financial performance of SMEs?

Males tend to be given preferential status as the primary breadwinner of a household, creating an incentive for greater investment in their education relative to females in order to increase their future potential earnings. Evidence is provided by Iddrisu, Danquah, Quartey, and Ohemeng (2018), where they observed a "pro-male bias" in households' investment decisions in education in terms of enrolment and/or expenditures across a spectrum of schooling ages (primary, post-secondary, and senior-secondary). Such gender role schemes in educational expenses are endorsed by Masterson (2012) and Kaul (2018), where the latter highlights that this is more so for households with constraints in resource allocation, as they generally rely on the eldest son for future financial support.

As studies have found, gender imbalance in education attainment can be attributed to a financial literacy gap (Cupák, Fessler, Schneebaum, and Silgoner, 2018). For example, Vieira, Potrich, and Kirch (2017) found among various explanatory variables (marital status, personal income, household income) that education was found to be strongly related to financial literacy. More importantly, women—including those with tertiary education—were subject to lower levels of education and subsequently, lower financial literacy relative to men. The most interesting observation, and the one most relevant to our research, is that there is a statistically significant relationship between gender and financial literacy.

Financial expertise in reducing the opacity of financial structure of an enterprise is an essential and integral part of SME financial sustenance. As indicated collectively by Grohmann (2018), Quarteya, Turkson, Abor, and Iddrisua (2017), and Menkhoff, Grohmann, and Klühs (2018), financial decision-making and degree of financial inclusion, such as access to finance, is largely dependent upon level of financial literacy. More importantly, it plays a critical role in minimizing asymmetric information between borrower and lender of external funds. Due to the existing financial literacy gap, there is the implication that women in entrepreneurship are ultimately positioned to face significant challenges in accessing finance (Kader, Tarmuji, and Hazudin, 2015). This is particularly the case for many developing Asian economies, as their financial sector is dominated by banks, and due to asymmetry of information and high transaction costs, many banks are reluctant to lend to SMEs,

and therefore this situation is more difficult for female-owned SMEs (Yoshino and Taghizadeh-Hesary, 2015).

Social norms of gender roles contribute to social stigma against female-owned SMEs, making gender-based access to finance plausible. Scholars are divided on this topic. Moro, Wisniewski and Mantovani (2017) and Wellalage and Locke (2017) are congruent in that gender has no effect on access to funds on the supply-side of the banking sector. However, they are outweighed by those who argue the contrary—that gender can attract (un)favorable loan conditions from banks and other formal financial institutions. Examples include Aristei and Gallo (2016), Ghosh and Vinod (2017), and Lee, Paik, and Uygur (2016), among others. The most direct evidence of gender-based access to finance is given by Mascia and P.S. Rossi (2017), where they observed that SMEs that undergo a change in leadership from female to male are more likely to benefit from lower interest rates, while female-led SMEs are more likely to be given the unfavorable condition of higher interest rates. This is further endorsed by Muravyev, Talavera, and Schäfer (2009), who find that female-owned firms are 5% less likely to be granted a loan, and additionally, they also face higher interest rates of about half a percentage point relative to their male counterparts. As a result, female-owned SMEs face lower access and obtain lower amounts of external funds from formal financial institutions compared to their male counterparts (Brixiová and Kangoye, 2016).

Gender-based access to finance is of topical importance as it is evidently linked to gender inequality in financial performance of SMEs. This is consistent among empirical results retrieved by Bakar, Sulaiman, and Osman (2014), Kersten, Harms, Liket, and Maas (2017) and Moreira (2016). Access to finance is found to be positively correlated with net profit and capital (Gichuki, Mulu-Mutuku, and N Kinuthia, 2014).

The literature that most closely relates to our research is by Abor, Agbloyor, and Kuipo (2014), as it examines export performance of SMEs in relation to bank finance. Regression results obtained from a probit model indicated that access to finance is positively related to export activities. Since this implies greater internationalization, it leads to increased activity, sales, and profitability among others. Lee, Paik, and Uygur (2016) conducted a similar study and concluded the contrary, where there is no significant statistical relationship between venture capital financing and export performance. However, their findings may serve as an anomaly, as they are outweighed by numerous studies that argue that access to finance is significantly and positively associated with financial performance of SMEs. As confirmed by Wang (2016) from the opposite perspective, access to finance is perceived as one of the most significant obstacles in sustaining financial performance among SMEs.

Since access to finance is found to be positively linked to growth rate, profitability, and capital of SMEs, it can be deduced that constraints in access to finance, as faced by female-owned SMEs, inhibit financial performance. These findings further endorse the significance of gender disparity in access to finance and the potential impact it could have throughout business phases and financial performance trajectory of female-owned SMEs.

From our examination of the relevant literature, it is evident there is limited research on the direct relationship between gender and financial performance in the context of SMEs in Asia, where education, financial literacy, and access to finance play a critical role in the financial performance of SMEs. Furthermore, our research acknowledges an unfavorable pairing of entities (SMEs and formal financial institutions) that co-exist to largely comprise the private and financial sector. This will give a clear indication of whether pervasiveness of gender disparity stemming from education, financial literacy, and access to finance also extends to the financial performance of SMEs.

3. THEORETICAL MODEL

In this section, we develop a theoretical model to show the current disparity in lending behavior of banks to two groups of companies based on their gender. Subsequently, we show that if this disparity–as caused by higher level of risk associated with female-owned companies–can be solved by establishment of credit guarantee funds to cover the risk, then lending of private financial institutions to female-owned companies will increase. We will mathematically show that solving the disparity in (gender-based) lending to companies will increase the GDP growth rate and government tax revenue, of which can be a source for credit guarantee funds.

First, we assume an economy allocates its capital into two sectors: male-owned companies and female-owned companies as in Eq.1.

$$Y = f(N, K) = f(N, K_F + K_M) \quad (1)$$

Where Y denotes the total output of the economy (GDP), N and K are total labor and capital inputs and $K_F \; and \; K_M$ are stock of capital of female-owned and male-owned companies, respectively.

Next, we assume capital of each group of companies is fully derived from bank loans, and that banks completely dominate the financial system. Equation 2 shows the bank's profit equation:

$$\text{Bank's profits: } \pi_B = r_F L_F + r_M L_M - \rho_F L_F - \rho_M L_M - r_D D - C(L_F, L_M, D) \quad (2)$$

Where π_B denotes bank's profit and r_F and r_M are lending interest rates of bank to female-owned and male-owned companies, respectively. L_F and L_M are amount of bank loans to female-owned and male-owned companies, respectively. ρ_F and ρ_M are the default ratio of females' loan and males' loan, respectively. r_D denotes the deposit interest rate and D is total amount of deposits that bank collect. C is the total operational expenditures of bank which is a function of loan to female-owned and male-owned companies and amount of deposit.

$$\text{Balance sheet of bank: } L_F + L_M = D + \bar{A} \quad (3)$$

Equation 3 shows the bank balance sheet, where $\bar{A}$ denotes the capital of bank.

Equation 4 presents a quadratic type operational cost function of bank, where the operational cost of bank is a function of loan to female-owned and male-owned companies and amount of deposit. $c_1, c_1 \; and \; c_3$ are their coefficients respectively.

$$\text{Cost function of banks: } C(L_F, L_M, D) = c_1 L_F^2 + c_2 L_M^2 + c_3 D^2 \quad (4)$$

Next, the bank maximizes the profit. In order to find the optimal loan supply to each group of companies based on gender, we get the first order conditions of bank's profit equation (Eq. 2) with respect to L_F and L_M and set the results equal to zero. Results are Eq. 5 and Eq. 6.

$$\frac{\partial \pi_B}{\partial L_F} = r_F - \rho_F - r_D - 2c_1 L_F = 0 \quad (5)$$

$$\frac{\partial \pi_B}{\partial L_M} = r_M - \rho_M - r_D - 2c_2 L_M = 0 \quad (6)$$

By writing Eq. 5 and 6 for L_F and L_M we obtain the optimal loan supply equations for female-owned and male-owned companies, which are Eq. 7 and Eq. 8, respectively:

$$L_F = \frac{1}{2c_1}(r_F - \rho_F - r_D) \tag{7}$$

$$L_M = \frac{1}{2c_2}(r_M - \rho_M - r_D) \tag{8}$$

Next, we assume that the loan default risk of female-owned companies (ρ_F) is greater than the default risk male-owned companies (ρ_M).

Loan default risk (Assumption): $\rho_F > \rho_M$

Based on this assumption, actual lending behavior of bank will be as in Eq. 9, where total loan supply to female-owned companies is less than the total loan supply to female-owned companies, as the expected default risk of lending to females is higher than males.

$$\text{Actual Loan: } L_F = \frac{1}{2c_1}(r_F - \rho_F - r_D) < L_M = \frac{1}{2c_2}(r_M - \rho_M - r_D) \tag{9}$$

Next, we assume a Cobb-Douglas production function with constant returns to scale for this economy, as in Eq. 10:

$$Y = f(N, K_F, K_M) = (N)^{\alpha}(K_F)^{\beta}(K_M)^{\gamma} \tag{10}$$

Where α , β and γ are the output elasticities of labor, female capital, and male capital, respectively. We assume that $\beta = \gamma$ for same productivity level.

Equation 11, shows the total profit of this hypothetical economy:

$$\pi = pY - wN - r_F K_F - r_M K_M$$

Where p is the price level and w denotes the wage rate, of which is equal for female and male and independent of gender. However, the lending interest rate of banks is dependent on gender. As mentioned earlier, we are assuming that the capital of each gender group's companies comes only from bank loans. With profit maximization behavior in this economy we get the first order conditions of Eq. 11 with respect to K_F and K_M. Results are Eq. 12 and Eq. 13:

$$\frac{\partial \pi}{\partial K_F} = p\frac{\partial f}{\partial K_F} - r_F = \tag{12}$$

$$\frac{\partial \pi}{\partial K_M} = p\frac{\partial f}{\partial K_M} - r_M = 0 \tag{13}$$

Writing Eq. 12 and 13 for K_F and K_M we reach Eq. 14 and Eq. 15 that show the optimal level of capital of female-owned and male-owned companies, respectively:

$$K_F^* = \frac{\beta pY}{r_F} \tag{14}$$

$$K_M^* = \frac{\gamma pY}{r_M} \tag{15}$$

If default risk of male and female are the same, then males and females will be able to borrow from banks with same level of interest rate ($r_F = r_M$). Subsequently, they will have the same level of capital stock in the economy, which is the desired case (Case A). K_F^* and K_M^* show the desired level of capital of female-owned and male-owned companies, respectively, which are equal.

Case A (Desired) $K_F^* = K_M^*$ (since $r_F = r_M$)

However, the actual case is Case B, where the optimal level of capital of male-owned companies is higher than their female counterparts, as the borrowing interest of female is higher than that of male due to higher risk ($r_F > r_M$):

Case B (Actual) $K_F^a < K_M^a$ (since $r_F > r_M$)

K_F^a and K_M^a show the actual level of stock of capital of female-owned and male-owned companies, respectively.

Next, by assuming that the labor input is constant and considering constant level of technology, then growth rate of the whole economy is a function of increase in capital stock of each group of companies, as in Eq. 16.

$$\Delta Y = \frac{\partial f}{\partial K_F} dK_F + \frac{\partial f}{\partial K_M} dK_M \quad (16)$$

The desired level of output is showed in Eq. 17 and the actual level is presented in Eq. 18. These come, respectively, from the desired level and actual level of stock of capital of female-owned and male-owned companies:

$$\text{Desired level of output } Y^* = \frac{\partial f}{\partial K_F} K_F^* + \frac{\partial f}{\partial K_M} K_M^* \quad (17)$$

$$\text{Actual level of output } Y^a = \frac{\partial f}{\partial K_F} K_F^a + \frac{\partial f}{\partial K_M} K_M^a \quad (18)$$

The actual level of output is lower than the desired level ($Y^* > Y^a$) and consequently, the actual tax revenue of government is lower than the desired level.

$$tY^* > tY^a \quad (19)$$

In Eq. 19, t denotes the government tax ratio.

$$\Delta T = tY^* - tY^a \quad (20)$$

ΔT in Eq. 20 shows the differences between the desired level of tax and actual level of tax, which are coming from differences between desired level of output and the actual level of output.

In order to solve the gender-based injustice in bank lending, we are proposing the establishment of credit guarantee scheme (CGS) for female-owned companies. CGSs are public credit guarantors that have been used in many countries and in various forms over the decades to increase the flow of funds to targeted sectors and segments of the economy, including SMEs. A CGS makes lending more attractive by absorbing or sharing its associated risks. A CGS can also increase the amount of funds lent to enterprises beyond its own collateral limits as the guarantee itself is a form of collateral.

A CGS can assume the additional role of loan assessor and monitor, thereby improve the quality of lending (Yoshino and Taghizadeh-Hesary, 2018a).

According to Mankiw (1986), the aim of a credit guarantee is to mitigate inefficient credit allocation caused by information asymmetry between borrowers and lenders. We believe that reduction of information asymmetry is an intermediate goal of the establishment of credit guarantees and that the government's ultimate goal is to provide the desired level of loans to SMEs via reduction of information asymmetry. We also believe it is possible to establish specific CGS for female-owned companies or existing CGSs to introduce exclusive programs for female-owned companies.

In an extreme case, we assume that credit guarantee is provided for all capital demand of female-owned companies ($K_F = CGS_F$). Existence of credit guarantee will reduce the default risk of loans to female-owned companies ($\rho_F \downarrow$), increasing lending of the private financial institutions (banks) to these companies. Female-owned companies can increase their actual level of capital stock, which will increase the total output of the economy. Then government tax revenue, a function of the total output, will increase.

$$CGS_F \uparrow \Longrightarrow \rho_F \downarrow \Longrightarrow L_F \uparrow \Longrightarrow K_F^a \uparrow \Longrightarrow Y^a \uparrow \Longrightarrow tY^a \uparrow \quad (21)$$

Flow no. 14 shows the impact of CGS for female-owned companies (CGS_F) on bank lending to female-owned companies, the total output, and the government tax revenue.

Those who oppose the CGS criticize that it will increase the burden on the government budget and subsequently increase public debt. However, we believe funding of the CGS could be sourced from the increase in the government tax revenue, derived from greater involvement of females in economic activities as resultant of CGS. Hence, a burden on the government budget is not created.

$$CGS_F = (tY^* - tY^a) \text{ and } CG_F = \Delta T \quad (22)$$

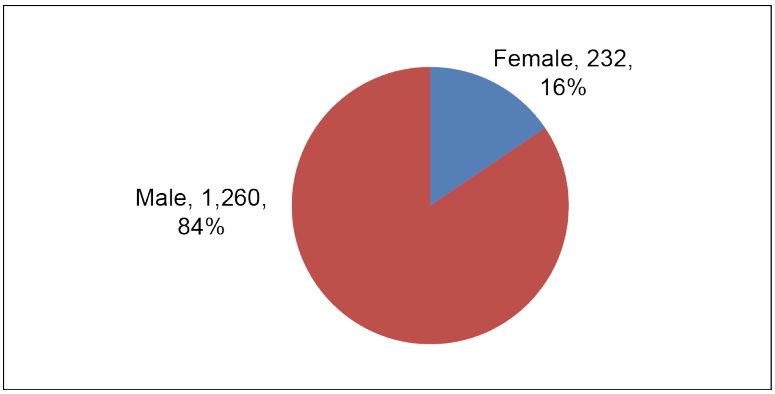
Eq. 22 shows that CGS_F amount is equal to increase in the government tax revenue (ΔT) that came from more economic activities of female-owned companies, and no burden on the government budget.

4. EMPIRICAL ANALYSIS

In this section we investigate whether there is a statistically significant correlation between gender and financial performance, for we can conclude gender (in)equality in financial performance of SMEs in Asia.

The data is collected from a sample of 1,492 exporter SMEs from Iran, comprised of 1,260 companies held by males (84%) and 232 companies held by females (16%) (Figure 3). To describe their financial performance, we followed Altman and Sabato (2007) and Yoshino and Taghizadeh-Hesary (2014a) using various financial ratios from bank statements and categorizing them into five accounting ratios: (i) leverage, (ii) liquidity, (iii) profitability, (iv) coverage and (v) activity. In the literature, these categories are identified as an extensive measure of SME financial structure and most predictive of default. The selected financial ratios and their corresponding accounting ratio categories are shown in Table 1.

Figure 3: Number and Share of Companies by Gender in Sample



Note: Data is for 1,492 exporter small and medium-sized enterprises who are customers of an Iranian bank.
Source: Authors' compilation based on the data provided by the Iranian bank.

Table 1: Examined Variables

	Variables Examined	Symbol	Accounting Ratio Category
1	Short-Term Debt/Equity (Book Value)	STD_Equity	Leverage
2	Equity (Book Value)/Total Liabilities	Equity_TD	
3	Liabilities/Total Assets	TD_Tassets	
4	Cash/Total Assets	Cash_Tassets	Liquidity
5	Working Capital/ Total Assets	WC_Tassets	
6	Cash/Net sales	LIQ_Sales	
7	Ebit/Sales	EBIT_Sales	Profitability
8	Net Income/Total Assets	ROA	
9	Retained Earnings/ Total Assets	Rinc_TA	
10	Net Income/Sales	Ninc_s	
11	Ebit/Interest Expenses	EBIT_IE	Coverage
12	Sales/Total Assets	Sales_TA	Activity
13	Account Payable/Sales	AP_Sales	
14	Account Receivable/Liabilities	AR_TD	
15	Average Export 3 Years Ago/Average Sales 3 Years Ago	EX Loan_Sales	

Notes: Retained earnings = the percentage of net earnings not paid out as dividends, but retained by the company to be reinvested in its core business or to pay debt. It is recorded under shareholders' equity in the balance sheet. EBIT = earnings before interest and taxes. Account payable = an accounting entry that represents an entity's obligation to pay off a short-term debt to its creditors. The accounts payable entry is found on a balance sheet under current liabilities. Account receivable = money owed by customers (individuals or corporations) to another entity in exchange for goods or services that have been delivered or used, but not yet paid for. Receivables usually come in the form of operating lines of credit and are usually due within a relatively short time period, ranging from a few days to a year.

4.1 Statistical Analysis (PCA)

Initially, we are confronted with the perplexity of multidimensional datasets in showing correlations between the various financial ratios. Not only is it difficult to draw meaningful interpretations, but many of them are highly correlated to each other, as highlighted in bold in Table 2. High correlation among explanatory variables implies they are not independent, which violates an ordinary least squares (OLS) assumption of little or no multi-collinearity and thus, will not allow for valid and clear regression results. Therefore, principal component analysis (PCA) was utilized in order to extract data and eliminate redundant information for meaningful interpretation.

PCA is a data-reduction technique that condenses relevant information on multiple variables into just a few components (or factors) and thus, reduces the number of dimensions. Furthermore, hidden features, and main relationships among observations are visualized for analysis. Through this method, the 15 financial variables listed in Table 1 are reduced to determine the minimum number of components in accounting for the correlated variance among SMEs.

In order to examine the suitability of the dataset for factor analysis, the Kaiser-Meyer-Olkin (KMO) test was performed. KMO is a measure of sampling adequacy that indicates the proportion of common variance that might be caused by underlying factors. KMO values less than 0.5 generally indicate that the sampling is inadequate, while high KMO values (greater than 0.6) indicate that factor analysis may be useful. The KMO value for this study is 0.71, which meets the threshold for sampling adequacy.

Next, we determine how many factors to use in our analysis. Table 3 reports the estimated factors and their eigenvalues. Only those factors accounting for more than 10% of the variance (eigenvalues > 1) are kept in the analysis. Therefore, only the first five factors are retained. Cumulatively, they explain 64% of the total variance of the financial variables.

In running the PCA, we used direct Oblimin rotation. Direct Oblimin is the standard method for obtaining a non-orthogonal (oblique) solution—that is, one in which the factors are allowed to be correlated. In order to identify which financial variables are strongly correlated to each factor and interpret the revealed PCA information, the pattern matrix must then be studied. Table 4 presents the pattern matrix, where variables with the largest loadings in absolute value for a given factor are highlighted in bold.

Table 2: Correlation Matrix of Financial Variables

	STD_ Equity	Equity_ TD	TD_ Tassets	Cash_ Tassets	WC_ Tassets	LIQ_ Sales	EBIT_ Sales	ROA
STD_Equity	1.000	–.029	.466	.054	–.292	.013	–.018	–.121
Equity_TD	–.029	1.000	–.185	.092	.156	–.001	.004	.156
TD_Tassets	.466	–.185	1.000	.019	**–.532**	.036	–.065	–.301
Cash_Tassets	.054	.092	.019	1.000	.104	.156	–.015	.038
WC_Tassets	–.292	.156	**–.532**	.104	1.000	.050	–.010	.232
LIQ_Sales	.013	–.001	.036	.156	.050	1.000	**–.876**	–.061
EBIT_Sales	–.018	.004	–.065	–.015	–.010	**–.876**	1.000	.055
ROA	–.121	.156	–.301	.038	.232	–.061	.055	1.000
Rinc_TA	–.261	–.006	**–.651**	.044	**.501**	–.020	.061	.319
Ninc_s	–.017	.004	–.058	–.024	–.023	**–.901**	**.979**	.087
EBIT_IE	–.014	.020	–.063	.261	.068	.008	.005	.068
Sales_TA	–.045	.100	–.137	.126	.232	–.066	–.011	.363
AP_Sales	.070	–.007	.057	.005	–.029	**.582**	**–.579**	–.052
AR_TD	–.015	.068	–.020	–.010	.110	–.004	.000	.090
EX Loan_Sales	.011	–.002	.028	–.015	–.003	–.003	.000	–.008

continued on next page

Table 2 *continued*

	Rinc_ TA	Ninc_ s	EBIT_ IE	Sales_ TA	AP_ Sales	AR_ TD	EX Loan_Sales
STD_Equity	–.261	–.017	–.014	–.045	.070	–.015	.011
Equity_TD	–.006	.004	.020	.100	–.007	.068	–.002
TD_Tassets	**–.651**	–.058	–.063	–.137	.057	–.020	.028
Cash_Tassets	.044	–.024	.261	.126	.005	–.010	–.015
WC_Tassets	**.501**	–.023	.068	.232	–.029	.110	–.003
LIQ_Sales	–.020	**–.901**	.008	–.066	**.582**	–.004	–.003
EBIT_Sales	.061	**.979**	.005	–.011	**–.579**	.000	.000
ROA	.319	.087	.068	.363	–.052	.090	–.008
Rinc_TA	1.000	.035	.113	.242	–.031	–.004	–.024
Ninc_s	.035	1.000	.002	–.011	**–.584**	.022	.001
EBIT_IE	.113	.002	1.000	.045	–.003	.000	–.001
Sales_TA	.242	–.011	.045	1.000	–.065	.003	–.014
AP_Sales	–.031	**–.584**	–.003	–.065	1.000	–.004	.005
AR_TD	–.004	.022	.000	.003	–.004	1.000	–.001
EX Loan_Sales	–.024	.001	–.001	–.014	.005	–.001	1.000

Source: Authors' compilation.

Table 3: Principal Component Analysis (PCA)

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**
1	**3.329**	**22.191**	**22.191**	**3.329**	**22.191**	**22.191**	**3.300**
2	**2.697**	**17.982**	**40.173**	**2.697**	**17.982**	**40.173**	**2.496**
3	**1.341**	**8.942**	**49.115**	**1.341**	**8.942**	**49.115**	**1.354**
4	**1.130**	**7.534**	**56.649**	**1.130**	**7.534**	**56.649**	**1.685**
5	**1.035**	**6.901**	**63.550**	**1.035**	**6.901**	**63.550**	**1.088**
6	.999	6.662	70.212				
7	.938	6.250	76.462				
8	.772	5.148	81.610				
9	.735	4.903	86.513				
10	.628	4.188	90.701				
11	.529	3.529	94.230				
12	.459	3.061	97.291				
13	.272	1.815	99.106				
14	.117	.780	99.886				
15	.017	.114	100.000				

Extraction Method: Principal Component Analysis.

[a] When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Source: Authors' compilation.

Table 4: Pattern Matrix

		Component				
		Z1 (Profitability)	**Z2 (Leverage)**	**Z3 (Liquidity)**	**Z4 (Activity)**	**Z5 (Coverage)**
STD_Equity	Leverage	–.009	–.731	.086	.225	.006
Equity_TD	Leverage	–.006	.025	.092	.248	.050
TD_Tassets	Leverage	–.027	**–.866**	.012	–.056	–.028
Cash_Tassets	Liquidity	–.036	–.096	**.795**	.062	.050
WC_Tassets	Liquidity	–.056	.678	.108	.155	.150
LIQ_Sales	Liquidity	–.936	.039	.084	–.044	.010
EBIT_Sales	Profitability	**.963**	.006	.035	–.030	.003
ROA	Profitability	.049	.150	–.063	.719	.102
Rinc_TA	Profitability	.011	.725	.068	.210	–.183
Ninc_s	Profitability	**.972**	–.011	.021	–.013	.023
EBIT_IE	Coverage	.042	.088	.791	–.142	**.620**
Sales_TA	Activity	–.001	–.053	.011	**.848**	–.095
AP_Sales	Activity	–.729	–.023	–.033	–.023	.004
AR_TD	Activity	.004	.036	–.047	–.007	.777
EX Loan_Sales	Activity	.003	–.013	–.010	–.061	.128

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Source: Authors' compilation.

As seen in Table 4, the first component (Z1) has two variables with the largest loadings, which are positive (ebit/sales and net income/sales). Hence, Z1 reflects the profitability of an SME. As this factor explains the most variance in the data with 22%, it is the most informative indicator of an SME's overall financial performance. Z2 reflects leverage, where its largest loading variable is liabilities/total assets, and is negative, meaning that an SME has few liabilities and mainly relies on its own assets. The largest loading variable for Z3 is cash/total assets and is positive, meaning an SME is cash-rich. Hence, Z3 reflects liquidity. Z4 reflects activity, as its largest loading variable is sales/total assets and is positive. Lastly, Z5 has two variables with large loadings and both with positive values; one reflecting an SME's activity and the other reflecting coverage. However, since another variable with a larger loading has been identified as reflecting an SME's activity (under Z4), the second largest loading variable (ebit/ interest expenses) is considered. Hence, Z5 reflects coverage.

Table 5 presents the correlation matrix of the components. It shows that there is no correlation between the five components and hence, are distinct entities. This allows for clear interpretation of their distribution, as well as to obtain clear regression results in Section 4.2.

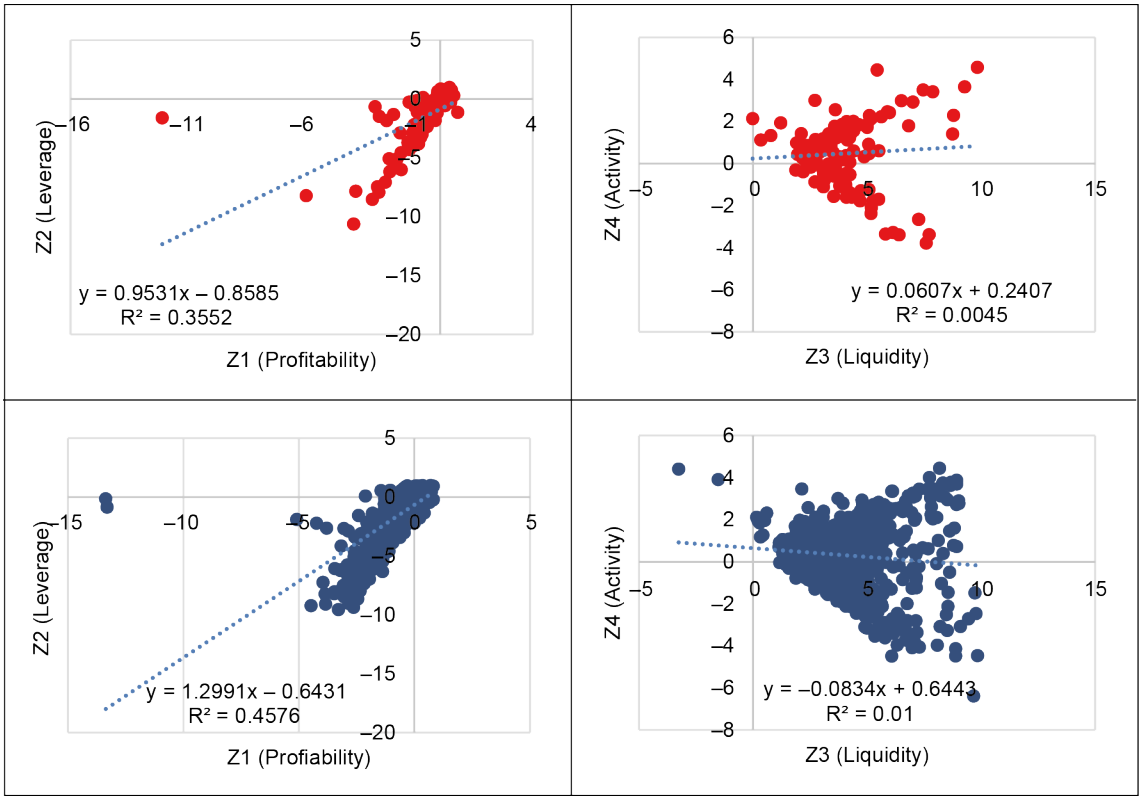
Table 5: Components Matrix

Component	1	2	3	4	5
1	1.000	.044	–.036	.030	.002
2	.044	1.000	.058	.227	.029
3	–.036	.058	1.000	.160	.001
4	.030	.227	.160	1.000	–.013
5	.002	.029	.001	–.013	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
Source: Authors' compilation.

Figure 4 shows the distribution of four components (Z1, Z2, Z3, and Z4) separated into two groups: female-owned SMEs (red) and male-owned SMEs (black). The factor distributions presented include: profitability (Z1) against leverage (Z2) and liquidity (Z3) against activity (Z4). It appears factors Z1 (profitability) and Z2 (leverage) are unable to effectively separate the underlying financial variables to distinguish between the two gender-based SMEs groups. The two groups generally financially perform similarly in terms of these financial ratios, as both are concentrated toward lower negative values of factors. This makes it difficult to clearly distinguish which group has higher financial performance in profitability and leverage. There is a similar implication for the distribution of components Z3 (liquidity) against Z4 (activity).

Figure 4: Distributions of Components (Red: Female, Black: Male)



4.2 Econometric Analysis

A regression analysis allows for a more definitive indication of the relative financial performance of SMEs of each gender. Hence, multiple regression models are constructed, where default and each factor are used as dependent variables and the remaining factors in each model used as regressors. Indicator variables are used to represent each gender, where it adopts the value of 1 when it is male and 0 when it is female.

Firstly, we determine whether there is a statistically significant association between gender and default of SMEs and subsequently, which gender has a higher likelihood of default using Eq. 23. If the coefficient of gender (β) is statistically significant and greater than zero $(\beta > 0)$, companies run by males have higher default. Conversely, if the coefficient is less than zero $(\beta < 0)$, companies run by women have higher default. If the coefficient of gender (β) is statistically insignificant, it indicates that gender does not have significant impact on default.

$$Default = \alpha_1 Z_1 + \alpha_2 Z_2 + \alpha_3 Z_3 + \alpha_4 Z_4 + \alpha_5 Z_5 + \beta Gender \quad (23)$$

Empirical results based on Eq. 23 are shown in Table 6. It shows that there is a statistically significant association between gender and default and more importantly, the coefficient of gender is negative, meaning female-owned SMEs have a higher likelihood of default relative to their male counterparts.

In order to explain the higher likelihood of default of female-owned SMEs, we next use each factor as a dependent variable in order to pinpoint in which financial variables, and hence factors, female-owned SMEs perform lower relative to their male counterparts. In these regressions, the coefficient of gender indicates the difference between the two genders in respect to the measured factor (the dependent variable). Since the indicator variable is 1 when it is male, a positive coefficient of gender $(\beta > 0)$ indicates that male-owned SMEs perform relatively higher to female counterparts in terms of the factor of interest. Conversely, a negative coefficient of gender $(\beta < 0)$ indicates that female-owned SMEs perform relatively higher to male counterparts in terms of the factor of interest.

Table 6: Empirical Results with Default as the Dependent Variable

Dependent Variable: Default
Method: Generalized Linear Model (Newton-Raphson/Marquardt steps)
Included observations: 1,492

	Coefficient	Std. Error	z-Statistic	Prob.
α_1 (Profitability)	–0.42	0.018	–23.64	0.00**
α_2 (Leverage)	–0.00	0.002	–0.19	0.84
α_3 (Liquidity)	–0.01	0.001	–8.52	0.00**
α_4 (Activity)	0.01	0.001	9.28	0.00**
α_5 (Coverage)	0.011	0.000	8.76	0.00**
β (Gender)	**–0.01**	**0.001**	**–9.40**	**0.00****

Note: ** means significant in 0.01.
Default = 1 and non-default = 0, Men = 1 and Women = 0.
Source: Authors' compilation.

Z1 is used as the dependent variable to compare gender-based financial performance in terms of profitability, as shown in Eq. (24). Its empirical results are shown in Table 7, showing that the coefficient of gender is positive ($\beta > 0$). Hence, male-owned SMEs perform relatively higher in profitability. However, the association between gender and profitability is statistically insignificant in both significance levels of 0.05 and 0.01.

$$Z_1 = \alpha_2 Z_2 + \alpha_3 Z_3 + \alpha_4 Z_4 + \alpha_5 Z_5 + \beta Gender \quad (24)$$

Table 7: Empirical Results with Z1 (Profitability) as the Dependent Variable

Dependent Variable: Z_1 (Profitability)
Method: Generalized Linear Model (Newton-Raphson/Marquardt steps)
Included observations: 1,492

	Coefficient	Std. Error	z-Statistic	Prob.
α_2 (Leverage)	-1.14	0.15	-7.23	0.00**
α_3 (Liquidity)	0.23	0.01	20.2	0.00**
α_4 (Activity)	-0.02	0.01	-2.18	0.02*
α_5 (Coverage)	0.01	0.007	1.62	0.10
β (Gender)	**0.004**	**0.004**	**0.87**	**0.37**

Note: * means significant in 0.05.
** means significant in 0.01.
Default = 1 and non-default = 0, Men = 1 and Women = 0.
Source: Authors' compilation.

Next, we determine the relative financial performance of genders in respect to Z2 (leverage) using Eq. 25. Empirical results show there is a statistically significant association between gender and leverage. Furthermore, the coefficient of gender is negative and hence, female-owned SMEs show good leverage status relative to male counterparts (Table 8).

$$Z_2 = \alpha_1 Z_1 + \alpha_3 Z_3 + \alpha_4 Z_4 + \alpha_5 Z_5 + \beta Gender \quad (25)$$

Table 8: Empirical Results with Z2 (Leverage) as the Dependent Variable

Dependent Variable: Z_2 (Leverage)
Method: Generalized Linear Model (Newton-Raphson/Marquardt steps)
Included observations: 1,492

	Coefficient	Std. Error	z-Statistic	Prob.
α_1 (Profitability)	–5.85	0.28	–20.74	0.00**
α_3 (Liquidity)	0.90	0.04	20.15	0.00**
α_4 (Activity)	0.80	0.01	69.09	0.00**
α_5 (Coverage)	0.45	0.01	47.73	0.00**
β (Gender)	**–0.31**	**0.004**	**–67.08**	**0.00****

Note: * means significant in 0.05.
** means significant in 0.01.
Default = 1 and non-default = 0, Men = 1 and Women = 0.
Source: Authors' compilation.

However, from the empirical results of Eq. 26, 27, and 28, it is evident that male-owned SMEs continue to outperform female counterparts, as they measure relatively higher across measures of liquidity (Z3), activity (Z4) and coverage (Z5), respectively. This is indicated by the positive coefficients of gender for when each factor is used as the dependent variable, all of which have a statistically significant association with gender (as shown in Table 9, 10, and 11, respectively).

$$Z_3=\alpha_1 Z_1 + \alpha_2 Z_2 + \alpha_4 Z_4 + \alpha_5 Z_5 + \beta Gender \quad (26)$$

$$Z_4=\alpha_1 Z_1 + \alpha_2 Z_2 + \alpha_3 Z_3 + \alpha_5 Z_5 + \beta Gender \quad (27)$$

$$Z_5=\alpha_1 Z_1 + \alpha_2 Z_2 + \alpha_3 Z_3 + \alpha_4 Z_4 + \beta Gender \quad (28)$$

Table 9: Empirical Results with Z3 (Liquidity) as the Dependent Variable

Dependent Variable: Z_3 (Liquidity)
Method: Generalized Linear Model (Newton-Raphson/Marquardt steps)
Included observations: 1,492

	Coefficient	Std. Error	z-Statistic	Prob.
α_1 (Profitability)	5.81	0.28	20.25	0.00**
α_2 (Leverage)	–0.11	0.054	–2.054	0.04*
α_4 (Activity)	0.94	0.013	69.31	0.00**
α_5 (Coverage)	–0.62	0.003	–204.76	0.00**
β (Gender)	**0.38**	**0.001**	**324.23**	**0.00****

Note: * means significant in 0.05.
** means significant in 0.01.
Default = 1 and non-default = 0, Men = 1 and Women = 0.
Source: Authors' compilation.

Table 10: Empirical Results with Z4 (activity) as the Dependent Variable

Dependent Variable: Z_4 (Activity)
Method: Generalized Linear Model (Newton-Raphson/Marquardt steps)
Included observations: 1,492

	Coefficient	Std. Error	z-Statistic	Prob.
α_1 (Profitability)	9.595	0.452	21.22	0.00**
α_2 (Leverage)	0.151	0.086	1.759	0.07
α_3 (Liquidity)	1.323	0.0276	47.89	0.00**
α_5 (Coverage)	-1.546	0.007	-204.70	0.00**
β (Gender)	**0.596**	**0.003**	**149.60**	**0.00****

Note: * means significant in 0.05.
** means significant in 0.01.
Default = 1 and non-default = 0, Men = 1 and Women = 0.
Source: Authors' compilation.

Table 11: Empirical Results with Z5 (coverage) as the Dependent Variable

Dependent Variable:Z_5 (Coverage)
Method: Generalized Linear Model (Newton-Raphson/Marquardt steps)
Included observations: 1,492

	Coefficient	Std. Error	z-Statistic	Prob.
α_1 (Profitability)	-17.71	0.73	-24.09	0.00**
α_2 (Leverage)	0.107	0.140	0.770	0.44
α_3 (Liquidity)	-2.39	0.035	-67.20	0.00**
α_4 (Activity)	2.53	0.007	323.72	0.00**
β (Gender)	**1.57**	**0.010**	**149.39**	**0.00****

Note: * means significant in 0.05.
** means significant in 0.01.
Default = 1 and non-default = 0, Men = 1 and Women = 0.
Source: Authors' compilation.

5. CONCLUSION AND POLICY IMPLICATIONS

In most Asian economies, SMEs are the backbone, while banks dominate the financial sector. The former is characterized by weak accounting systems; a lack of book-keeping and auditing; a lower level of financial education and a lower level of managerial skills compared to larger enterprises, and therefore have higher risk, while the latter is highly risk-averse. Pairing of these entities not only causes asymmetric information between lender (banks) and borrower (SMEs) to be one of the most significant challenges for SMEs, but poses an inducement of gender disparity in financial performance of SMEs, given that there is congruency among the literature we reviewed of gender disparity in education, financial literacy, and access to finance.

For confirmation, our research investigates whether gender influences financial performance in order to interrogate the reality of gender inequality in financial performance of SMEs in Asia. Using a statistical analysis technique (PCA) and econometrics models, empirical results with the backbone of a mathematical model show that there is a statistically significant association between gender and default ratio of SME, where female-owned SMEs have a higher default ratio. This is because, despite showing relatively good leverage status, they perform financially lower relative to their male counterparts in profitability, liquidity, coverage, and activity.

Financial outperformance of male-owned SMEs against female counterparts suggests implications of disparity in education and a subsequent financial literacy gap and gender-based access to finance for SMEs in Asia. Policy actions in each of these areas is of political, economic, and social interest, as the importance of SMEs can be gauged across four indicators: (i) share of enterprises; (ii) employment; (iii) domestic GDP, and (iv) export trade (Yoshino and Taghizadeh-Hesary, 2018c). SMEs inclusive of women would amplify each of these measures.

Firstly, policy interventions should be directed to address the foundation of the demand-side issues of female-owned SMEs' access to external funds, which improves women's educational outcome. This can lead to their empowerment within households and alleviate financial dependency upon males, subsequently leading to greater confidence in approaching and managing financial means to access external finance for entrepreneurship (Sell and Minot, 2018).

Moreover, financial education of SMEs run by women would help them to increase their coverage, manage debt, and improve strategic management for higher profitability as they are better equipped to minimize asymmetric information in the financial market (Bayrakdaroğlu & Botan Şan, 2014). Many cases show that for small businesses and start-ups lead by females have better productivity performance. Thus, Yoshino and Taghizadeh-Hesary (2014b) introduced hometown investment trust funds (HIT) as new source of community-based trust funds. Accordingly, Music Securities co., which is a HIT fund management company based in Japan began to lend to start-up businesses in Cambodia and Viet Nam. Their experience shows that female-owned start-ups have better performance compared to their male counter parts.

Female entrepreneurs already face unique challenges when interfacing with customers and business partners. Access to finance on the supply-side of the financial market should not be another struggle. To target and cater to those with higher creditworthiness, the role of credit-risk assessment is important, especially given strict Basel capital requirements that challenges access to finance on both sides of the financial market. However, SMEs in Asia lack efficient credit rating schemes due to difficulties in collection and storage of data on SMEs' financial health. Yoshino and Taghizadeh-Hesary (2014a) constructed an analytical framework on credit risks as part of a government-supported project, where financial and non-financial data of Japanese SMEs were compiled by credit guarantee corporations. The data is stored at a private corporation (Credit Risk Database) and utilized via statistical analysis to provide an accurate rating of credit risk of SMEs in Japan. A similar system could be established and utilized among other Asian economies.

Policy-based financing that provides government-guaranteed loans for business owners with excellent credit is also important in order to diversify channels of financing. For example, credit guarantee schemes (CGSs) have been implemented by governments, increasing the attractiveness of lending by providing a guarantee for a certain portion of the debt in case of default. For a certain fee, default risks associated with provision of loans are absorbed and shared, ultimately reducing the demand-supply gap of external financing via higher supply of external funds (Yoshino and Taghizadeh-Hesary, 2018b).

There is conclusive evidence among the literature on gender disparity in education, financial literacy, and access to finance. From empirical results of our study, it is evident that gender disparity is also prevalent in financial performance of SMEs in Asia. Policy interventions are necessary to narrow the demand–supply gap of external financing within Asian economies, as it will boost the success of women in entrepreneurship. In doing so, their purchase decisions in input and output markets will trigger a multiplier effect for an amplified and continuous cycle of income and employment generation; economic empowerment of women; gender equity in various realms (including education, financial literacy, and access to finance), and economic development. This is exhibited via the positive correlation between gender parity and GDP per capita across countries, regardless of their level of economic development.

REFERENCES

Abor, J. Y., Agbloyor, E. K., and Kuipo, R. (2014). Bank finance and export activities of Small and Medium Enterprises. *Review of Development Finance, 4*(2), 97–103.

ADB. (2015). *Asia SME Finance Monitor 2014.* Asian Development Bank. Philippines: Asian Development Bank.

Adusei, M., and Yaa Takyiwah Obeng, E. (2019). Board gender diversity and the capital structure of microfinance institutions: A global analysis. *The Quarterly Review of Economics and Finance, 71*, 258–269.

Altman, E. I., and Sabato, G. (2007). Modeling Credit Risk for SMEs: Evidence from the US Market. *Global Finance Journal, 43*(3), 332–57.

Aristei, D., and Gallo, M. (2016, April). Does gender matter for firms' access to credit? Evidence from international data. *Finance Research Letters, 18*, 67–75.

Bakar, S. A., Sulaiman, M., and Osman, I. (2014). Exploring the Relationship between Business Factors and Performance in the Malaysian Halal Biotechnology SMEs Context. *Social and Behavioral Sciences, 121*, 243–252.

Bayrakdaroğlu, A., and Botan Şan, F. (2014). Financial Literacy Training As a Strategic Management Tool Among Small – Medium Sized Businesses Operating In Turkey. *Social and Behavioral Sciences, 150*, 148–155.

Brixiová, Z., and Kangoye, T. (2016). Gender and constraints to entrepreneurship in Africa: New evidence from Swaziland. *Journal of Business Venturing Insights, 5*, 1–8.

Caprio, A. D., Kim, K., and Beck, S. (2017). *2017 Trade Finance Gaps, Growth and Jobs Survey.* Asian Development Bank. Asian Development Bank.

Chandani, A., Mehta, M., and Chandrasekaran, K. (2014). A Working Paper on the Impact of Gender of Leader on the Financial Performance of the Bank: A Case of ICICI Bank. *Economics and Finance, 11*, 459–471.

Cupák, A., Fessler, P., Schneebaum, A., and Silgoner, M. (2018, April). Decomposing gender gaps in financial literacy: New international evidence. *Economics Letters, 168*, 102–106.

Ghosh, S., and Vinod, D. (2017). What Constrains Financial Inclusion for Women? Evidence from Indian Micro data. *World Development, 92*, 60–81.

Gichuki, C. N., Mulu-Mutuku, M., and N Kinuthia, L. (2014). Performance of women owned enterprises accessing credit from village credit and savings associations in Kenya. *Journal of Global Entrepreneurship Research, 4*(16), 1–13.

Grohmann, A. (2018, April). Financial literacy and financial behavior: Evidence from the emerging Asian middle class. *Pacific-Basin Finance Journal, 48*, 129–143.

Guo, F. (2015, March 31). *How to encourage women into the workforce*. Retrieved from World Economic Forum: https://www.weforum.org/agenda/2015/03/how-to-encourage-women-into-the-workforce/.

Iddrisu, A. M., Danquah, M., Quartey, P., and Ohemeng, W. (2018). Gender bias in households' educational expenditures: Does the stage of schooling matter? *World Development Perspectives, 10–12*, 15–23.

International Labour Organisation. (2018a, March 8). *ILO: Women still less likely to be active in the labour market than men in most of the world*. Retrieved from International Labour Organisation: https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_619119/lang--en/index.htm.

———. (2015). *Women on Boards.* International Labour Organization. Geneva: International Labour Organization (ILO).

———. (2018b). *Global Wage Report 2018/19.* International Labour Organization. Geneva: International Labour Organization.

Kader, M. A., Tarmuji, N. H., and Hazudin, S. F. (2015). Discovering Small Business Start up Motives, Success Factors and Barriers: A Gender Analysis. *Economics and Finance, 31*, 436–443.

Kaul, T. (2018, April). Intra-household allocation of educational expenses: Gender discrimination and investing in the future. *World Development, 104*, 336–343.

Kersten, R., Harms, J., Liket, K., and Maas, K. (2017). Small Firms, large Impact? A systematic review of the SME Finance Literature. *World Development, 97*, 330–348.

Kim, J., Lee, J.-W., and Shin, K. (2016a, January). Impact of Gender Inequality on the Republic of Korea's Long-Term Economic Growth: An Application of the Theoretical Model of Gender Inequality and Economic Growth. *ADB Economics Working Paper Series, 473*.

Kim, J., Lee, J.-W., and Shin, K. (2016b, February). A Model of Gender Inequality and Economic Growth. *ADB Economics Working Paper Series, 475*.

Lee, I. H., Paik, Y., and Uygur, U. (2016). Does Gender Matter in the Export Performance of International New Ventures? Mediation Effects of Firm-specific and Country-specific Advantages. *Journal of International Management, 22*, 365–379.

Mankiw, N. (1986, August). The allocation of credit and financial collapse. *Quarterly Journal of Economics, 101*(3), 455–470.

Mascia, D. V., and P.S. Rossi, S. (2017, July 12). Is There a Gender Effect on the Cost of Bank Financing? *Journal of Financial Stability, 31*, 136–153.

Masterson, T. (2012, March). An Empirical Analysis of Gender Bias in Education Spending in Paraguay. *World Development, 40*(3), 583–593.

Menkhoff, L., Grohmann, A., and Klühs, T. (2018, July 17). Does financial literacy improve financial inclusion? Cross country evidence. *World Development*, *111*, 84–96.

Ministry of Economy, Trade and Industry. (2017, April). *White Paper on Small and Medium Enterprises in Japan.* Retrieved from Ministry of Economy, Trade and Industry: http://www.chusho.meti.go.jp/pamflet/hakusyo/H29/download/2017hakushogaiyou_eng.pdf.

Mohan, N. (2014, July). A review of the gender effect on pay, corporate performance and entry into top management. *International Review of Economics and Finance, 34*, 41–51.

Moreira, D. F. (2016). The microeconomic impact on growth of SMEs when the access to finance widens: evidence from internet and high-tech industry. *Social and Behavioral Sciences, 220*, 278–287.

Moro, A., Wisniewski, T. P., and Mantovani, G. M. (2017, April 17). Does a manager's gender matter when accessing credit? Evidence from European data. *Journal of Banking and Finance, 80*, 119–134.

Muravyev, A., Talavera, O., and Schäfer, D. (2009). Entrepreneurs' gender and financial constraints: Evidence from international data. *Journal of Comparative Economics, 37*, 270–286.

OECD. (2018). *Enhancing SME access to diversified financing instruments.* OECD. Mexico City: OECD.

Quarteya, P., Turkson, E., Abor, J. Y., and Iddrisua, A. M. (2017). Financing the growth of SMEs in Africa: What are the constraints to SME financing within ECOWAS? *Review of Development Finance, 7*, 18–28.

Scott, L. (2014, June 8). *Women's financial literacy and skills*. Retrieved from Empower Women: https://www.empowerwomen.org/en/community/discussions/2014/5/women-financial-literacy-and-skills.

Sell, M., and Minot, N. (2018). What factors explain women's empowerment? Decision-making among small-scale farmers in Uganda. *Women's Studies International Forum, 71*, 46–55.

The World Bank. (2018a). *GDP per capita (current US$)*. Retrieved from The World Bank: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD.

———. (2018b). *Global Gender Gap Economic Participation and Opportunity Subindex*. Retrieved from The World Bank: https://tcdata360.worldbank.org/indicators/a07f867b?country=BRAandindicator=28159andviz=line_chartandyears=2006,2016.

Vieira, K. M., Potrich, A. C., and Kirch, G. (2017, December 23). How well do women do when it comes to financial literacy? Proposition of an indicator and analysis of gender differences. *Journal of Behavioral and Experimental Finance, 17*, 28–41.

Wang, Y. (2016, September). What are the biggest obstacles to growth of SMEs in developing countries? An empirical evidence from an enterprise survey. *Borsa Istanbul Review, 16*(3), 167–176.

WEF. (2017). *The Global Gender Gap Report 2017.* Geneva: World Economic Forum.

Wellalage, N., and Locke, S. (2017, May 2). Access to Credit by SMEs in South Asia: Do Women Entrepreneurs Face Discrimination. *Research in International Business and Finance, 41*, 336–346.

Yoshino, N., and Taghizadeh-Hesary, F. (2014a). Analytical Framework on Credit Risks for Financing SMEs in Asia. *Asia-Pacific Development Journal, 21*(2), 1–21.

———. (2014b). Hometown Investment Trust Funds: An Analysis of Credit Risk. *ADBI Working Papers 505*. Tokyo: Asian Development Bank Institute.

———. (2015). Analysis of Credit Risk for Small and Medium-Sized Enterprises: Evidence from Asia. *Asian Development Review, 32*(2), 18–37.

———. (2018a). Optimal credit guarantee ratio for small and medium-sized enterprises' financing: Evidence from Asia. *Economic Analysis and Policy*. doi:10.1016/j.eap.2018.09.011.

———. (2018b). Remedies for Mitigating Asian SMEs' Access to Finance Difficulties. In U. Volz, P. J. Morgan, and N. Yoshino (Eds.), *Routledge Handbook of Banking and Finance in Asia* (pp. 371–385). London: Routledge.

———. (2018c, December). *The Role of SMEs in Asia and their Difficulties in Accessing Finance.* Retrieved from ABDI: https://www.adb.org/sites/default/files/publication/474576/adbi-wp911.pdf.