Impacts Of Female Leadership On Business Outcomes: Evidence From South Asia And Middle East And North Africa

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Abstract

Research purpose:
This paper aims to explore the impacts of female top managers on various business outcomes, including firm performance, financial investment decisions, access to finance, bribery practices, and technology adoption across South Asia and Middle East and North Africa (MENA).

Research motivation:
Women's empowerment and gender equality have increasingly become central themes in discussions on economic and social development. There is a growing body of evidence suggesting that gender diversity, particularly in leadership positions, can have significant positive impacts on business outcomes. However, significant gender disparities persist, particularly in regions such as South Asia and MENA. This study aims to address these disparities, providing critical insights that could inform policies and initiatives designed to promote broader gender equality in these regions, ultimately paving the way for more inclusive and successful businesses.

Research design, approach, and method:
Our sample includes 4,746 firms in 12 countries located in MENA and South Asia regions from 2009 to 2023. We employ a firm fixed effects model to ddress the endogeneity issues often inherent in empirical research. By controlling for unobserved, time-invariant firm-specific characteristics that could be correlated with both business outcomes and the gender composition of top management, the firm fixed effects model can produce an unbiased estimate of the impacts of female top managers.

Main findings:
Our findings reveal that the inclusion of at least one woman in the top management board significantly enhances firm performance, resulting in higher revenue, revenue growth, and labor productivity. Besides, female-led firms have better access to finance and are more likely to adopt technologies compared to their male-led counterparts. Moreover, we detect no significant difference in the inclination towards corruption practices between female-led and male-led businesses, nor do female-headed firms face discrimination in the financial market.

Practical/managerial implications:

Our study offers meaningful policy implications to address barriers to gender diversity and promote inclusive leadership practices among firms. These policies not only enhance business outcomes such as increased revenue and innovation adoption but also contribute to broader societal goals of gender equality and economic empowerment.

Keywords: Female leadership, gender diversity, firm performance, business outcomes, sustainable development goals.

1. INTRODUCTION

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1. INTRODUCTION

Women's empowerment and gender equality have increasingly become central themes in discussions on economic and social development. International organizations such as the World Bank (WB) and the United Nations Development Program (UNDP) have identified gender as a critical and intersecting issue that must be tackled within both economic and social science frameworks (World Bank, 2024; UNDP, 2022). These organizations emphasize that empowering women and promoting gender equality are not only fundamental human rights but also essential for sustainable economic growth and development.

Globally, there is a growing body of evidence suggesting that gender diversity, particularly in top leadership positions, can have significant positive impacts on business outcomes. Companies with greater gender diversity among top executive teams are 25% more likely to have above-average profitability (McKinsey and Company, 2020). Furthermore, gender diversity in top management positions is associated with improved organizational performance, including higher levels of innovation and better financial results (ILO, 2019). Despite these findings, significant gender disparities persist, particularly in regions such as South Asia and the Middle East and North Africa (MENA). MENA and South Asia rank among the lowest globally in gender equality, with countries like Jordan and Afghanistan placing 126th and 146th, respectively (World Economic Forum, 2023). Female labor force participation remains critically low in these regions, with South Asia averaging 32% and MENA around 19% (World Bank, 2023). These statistics highlight the urgent need for policies and initiatives aimed at closing the gender gap and promoting women's participation in the workforce, especially in leadership roles.

The cultural and religious contexts of South Asia and MENA play a significant role in shaping the impact of female top managers on business outcomes. In these regions, traditional gender roles often restrict women's access to leadership positions, confining them primarily to domestic responsibilities, while men dominate public and business spheres. This results in a scarcity of female role models in management, and when women do ascend to top positions, they often face heightened scrutiny and resistance. However, the success of these women can be especially impactful, as they tend to introduce distinctive leadership styles, such as collaborative decision-making and relational management, which can have a positive influence on firm outcomes (Metcalfe and Mimouni, 2012). Female leaders who overcome these societal barriers might also be more likely to foster diversity, innovation, and ethical business practices, contributing to enhanced overall performance. In patriarchal societies where gender biases are deeply entrenched, examining the success of female top managers is crucial. Their achievements not only challenge prevailing stereotypes but also highlight the potential for women in leadership to drive better business outcomes and create pathways for more gender-equal leadership opportunities. Understanding these impacts can help policymakers and businesses create environments that support female leadership and contribute to sustainable economic development.

This research aims to contribute to this discourse by examining the impacts of female top managers on various business outcomes in firms across South Asia and MENA. By investigating a comprehensive range of outcomes, including firm performance, financial investment decisions, access to finance, bribery practices, and technology adoption, this study provides a holistic view of the benefits of gender diversity in top management. Moreover, by focusing on regions that lag in gender equality, this research highlights the potential for substantial economic and social benefits from promoting female leadership. Ultimately, this study seeks to inform policymakers and stakeholders about the importance of gender diversity in leadership and its broader implications for sustainable development.

In terms of methodology, this paper addresses the endogeneity issues often inherent in empirical research by employing a firm fixed effects model. This methodology leverages variations in the gender structure within a firm's top management over time, enabling a within-firm comparison that provides a more unbiased estimate than models that compare across different firms utilized in prior studies (Martınez-Zarzoso, 2023). By controlling for unobserved, time-invariant firm-specific characteristics that could be correlated with both business outcomes and the gender composition of top management, the firm fixed effects model ensures a more accurate estimation of the impacts of female top managers. This robust approach contributes significantly to the existing literature on gender diversity and business performance, offering reliable insights that are essential for informed policy-making and advocacy.

This research is expected to generate findings with significant policy implications, especially for regions such as South Asia and MENA, where gender disparities in leadership positions are pronounced. Specifically, if promoting gender diversity in leadership can enhance firm performance, then policies encouraging the inclusion of women in top management positions can lead to more competitive and resilient businesses, contributing to broader economic growth. This study aligns with SDG-5 by examining the impacts of female top managers on business outcomes, which can produce results supporting gender equality and women's empowerment in leadership roles.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Conceptual Framework and Litterature Review

Our research on the influence of female managers on business outcomes is based on three main theoretical foundations that highlight the divergence between men and women in terms of knowledge, experiences, values, beliefs, choices, and preferences (Post and Byron, 2015). These differences are further shaped by distinct cognitive frameworks stemming from variations in educational backgrounds, roles outside of work, and personal interests (Singh et al., 2008).

First, according to the resource-based view, firms can gain competitive advantage through unique resources and capabilities. By employing a larger number of female managers, firms can benefit from diverse perspectives and leadership styles, which are valuable resources for the firm. As a result, firms with female managers exhibit better firm performance due to diverse leadership perspectives, inclusive decision-making, and improved governance practices (Terjesen et al., 2009; Dezso and Ross, 2012).

Second, the upper echelons theory posits that the characteristics of top executives, including their experiences, values, and personalities, significantly influence their interpretations and choices, thereby impacting organizational outcomes (Hambrick and Mason, 1984). This theory suggests that the strategic decisions and performance of organizations are reflections of the cognitive bases and values of their top executives. Specifically, in terms of experience, female top managers often have diverse career paths, sometimes involving overcoming significant barriers to reach top management positions. These experiences can lead to a higher level of resilience, adaptability, and innovative thinking. As for value, female leaders are also frequently associated with transformational leadership styles, emphasizing collaboration, ethical behavior, and inclusive decision-making. Finally, the presence of female executives can bring demographic diversity (personality aspect) to the top management team, which can enhance creativity and problem-solving capabilities through diverse perspectives (Dezso and Ross, 2012; Liu et al., 2014).

According to the social role theory, societal expectations influence behavior and roles, including gender roles in leadership. Female leaders may adopt transformational leadership styles that emphasize collaboration and ethical behavior. For instance, women are frequently linked to higher levels of altruism and a greater focus on social values compared to men (Burgess and Tharenou, 2002; Dufwenberg and Muren, 2006). Eckel and Grossman (2008) indicates that women generally exhibit more risk aversion, while Niederle and Vesterlund (2007) highlight gender differences in competitive tendencies. Women are often described as being more relational, participative, and inclined towards democratic leadership styles (Wood and Eagly, 2009). Additionally, the social construction of gender creates different perceptions of reality and specific societal expectations for gender roles (Cech, 2013; Correll, 2004; Pedulla, 2016). Finally, Ferrary (2018) notes differences between men and women in professional preferences, which influence their career expectations and contributions.

2.2 Hypothesis Development

The resource-based view, upper echelons theory, and social role theory discussed above serve as the theoretical guidelines for empirical studies exploring the influence of female leadership on business outcomes. In this section, we aim to test whether the findings from prior studies hold true in our context. We have classified these studies into five categories, each demonstrating evidence of the impacts of female leadership on (i) performance, (ii) investment, (iii) corruption, (iv) access to finance, and (v) adoption of technology.

First, empirically, there are multiple reasons why female leadership can lead to better business performance. Firms with female managers exhibit better firm performance due to diverse leadership perspectives, inclusive decision-making, and improved governance practices (Glass and Cook, 2018). Encouraging gender diversity in leadership positions through the inclusion of more women can enhance enterprises' operational effectiveness by accessing a wider range of talent. Empirical studies have provided supporting evidence for this point. For example, Krishnan and Parsons (2008) discovered a positive association between gender diversity among senior management and the quality of earnings. Moreover, their study revealed that post-initial public offering (IPO), companies with a greater representation of women in senior management positions tend to exhibit higher profitability and enjoy superior stock returns compared to those with fewer female executives. Similarly, Erhardt, et al. (2003), focusing on Fortune 500 firms, uncovered evidence suggesting that companies with a greater proportion of female executives outperform their sector peers in terms of profitability. Additionally, Welbourne (1999) provided evidence from longitudinal analyses that the inclusion of women in top management teams translates into enhanced earnings and increased shareholder wealth. Therefore, we form our first hypothesis as follows:

Hypothesis 1: female-led firms tend to have better performance metrics than male-led counterparts

Regarding financial investment, it is argued that female-led firms are more likely to prioritize sustainable growth and risk management, leading to smaller investments than male-led counterparts (Kappal and Rastogi, 2020; Theodor and Gustav, 2024). Prior studies have found that women are generally more risk-averse than men (Croson and Gneezy, 2009; Niederle and Vesterlund, 2007), and therefore may adopt different strategic investment decisions compared to men, such as choosing lower-risk strategies. Besides, female-led firms often adopt more conservative growth strategies. Women business owners tend to focus on sustainable growth and are less likely to engage in aggressive investment strategies, which can result in smaller investments (Coleman and Robb, 2009). As a result, our second hypothesis can be stated as follows:

Hypothesis 2: female-led firms tend to make smaller investments than male-led counterparts

Additionally, gender differences in ethical reasoning and concerns about legitimacy may influence how female leadership may yield different outcomes for firms. Women, often more attuned to ethical considerations, may prioritize values such

as fairness and social responsibility in decision-making (Post and Byron, 2015). This inclination toward ethical behavior may foster a more transparent and accountable organizational culture, potentially enhancing trust among stakeholders. Moreover, women's heightened concerns about legitimacy could lead to greater adherence to regulatory standards and ethical norms, reducing the likelihood of legal and reputational risks for the firm (Glass et al., 2016; Glass and Cook, 2018). Furthermore, female leaders' emphasis on ethical principles and legitimacy may shape organizational practices in ways that promote sustainability and long-term growth. Therefore, we form our third hypotheses as follows:
Hypothesis 3: female-led firms are less likely to engage in bribery than male-led counterparts

As for access to finance, it is possible that female-led firms often encounter significant challenges when seeking external financing (Muravyev et al., 2009; Eddleston et al., 2016; Mertzanis et al., 2024). Gender biases within financial institutions can create barriers that hinder women entrepreneurs and executives from obtaining the necessary funding to grow and sustain their businesses. Gender biases in financial institutions manifest in various ways, including discriminatory lending practices, stereotypical perceptions of women's business acumen, and lack of trust in women-led ventures. These biases can result in less favorable loan terms, higher collateral requirements, or outright rejection of loan applications from female entrepreneurs (Watson, 2007; Eddleston et al., 2016). Therefore, our fourth hypothesis is as follows:
Hypothesis 4: female-led firms tend to have less access to finance than male-led counterparts

Finally, as gender diversity can foster firm creativity and innovation (Ali et al., 2011; Yang and Konrad, 2011; Ruiz-Jiménez et al., 2016; Fuentes-Fuentes et al., 2023), employing more women in top manager positions can enhance a team's information processing and decision-making capabilities as women provide valuable insights into questions concerning female consumers, employees, and trading partners (Ross, 2012). Aligning employee diversity with customer demographics can enhance a firm's understanding of markets, facilitating the exploitation of existing niches and entry into new markets (Carter et al., 2010; Fuentes-Fuentes et al., 2023). This argument leads to our fifth hypothesis:
Hypothesis 5: female-led firms are more likely to adopt new technologies and innovations than male-led counterparts

3. METHODOLOGY

3.1 Data

The data for this study is obtained from the World Bank Enterprise Surveys (WBES). The WBES provides comprehensive firm-level data from developing economies around the globe. These surveys cover a wide range of business environment topics, allowing for in-depth analysis of firm behavior and performance. Surveys are conducted every few years in participating countries. Random sampling stratified by industry, firm size, and location to ensure representativeness.

The WBES dataset is particularly well-suited to investigating the impacts of female managers on business outcomes due to its extensive and detailed nature. The WBES provides rich information about firm characteristics such as industry, establishment year, ownership structure, firm size (i.e., number of full time employees), and importantly, whether the top management board includes a woman. Our main explanatory variable is Female Manager, a dummy variable taking a value of one if there is at least one woman in the firm's top management positions, and zero otherwise.

The WBES dataset also provides a variety of business outcomes that fit the purpose of our study. First, we use the firm's revenue in the past 12 months as a metric of firm performance. We also use revenue growth (as the log differences in revenue) and labor productivity (revenue generated per worker) as additional performance metrics.

Second, to capture a firm's investment decision, we draw from the firm's total expenditure on fixed equipment (Equipment Exp) and total expenditure on land and buildings (Land and Building Exp) in the past 12 months.

Third, a firm's bribery practice is measured by (i) whether the firm provided any bribe to government officials (Bribe, a 0-1 indicator), and (ii) the percentage of the contract to be paid as bribe (Bribe Proportion), all in the past 12 month

Fourth, firm's access to finance is measured by a wide range of indicators: (i) percentage of working capital purchased that is financed from banks in the past 12 months (Working Capital Bank), (ii) percentage of working capital purchased that is financed from non-bank institutions in the past 12 months (Working Capital Nonbank), (iii) percentage of fixed assets purchased that is financed from banks in the past 12 months (Fixed Asset Bank), (iv) percentage of fixed assets purchased that is financed from non-bank institutions in the past 12 months (Fixed Asset Nonbank), (v) whether the firm has overdraft facilities in the survey year (Overdraft, a 0-1 indicator), (vi) whether the firm has have a line of credit or loans from financial institutions in the survey year (Credit Line, a 0-1 indicator).
Finally, firm's adoption of technology and innovation is proxied by (i) firm's R&D spending in the past 12 months (RD Spending), (ii) whether the firm has a website (Website, a 0-1 indicator), and (iii) whether the firm uses emails to communicate with clients and suppliers (Email, a 0-1 indicator)
Because our empirical strategy requires the within-firm comparison, we only draw from countries which have panel data. Therefore, we end up with 12 countries in MENA and South Asia with 4,746 unique firms from 2009 to 2023. The total number of observations is around 12,000 as our panel is unbalanced. The list of countries is provided in Appendix Table

A1. The descriptive statistics of the variables used in the paper are presented in Table 1.

Table 1: Summary Statistics

	Mean	SD	N
	(1)	(2)	(3)
Panel A: Firm Characteristics			
Female Manager	0.076	0.265	12,165
Firm's Age	21.763	14.558	12,165
Domestic Ownership	97.284	14.381	12,165
Foreign Ownership	1.127	9.041	12,165
Manager's Experience	17	10.478	12,165
Firm Size	126.626	406.418	12,165
Panel B: Business Outcomes			
Performance and Investment			
Revenue	528,486,862.6	5,586,342,266	11,201
Revenue Growth	0.013	1.572	1,453
Productivity	5,458,484	133,000,000	11,201
Equipment Expenditure	26,055,002.39	341,919,513.6	2,578
Building and Land Expenditure	36,929,527.25	1,266,866,997	1,558
Bribery Practice			
Bribe	0.382	0.486	2,493
Bribe Proportion	0.653	9.277	1,320
Access to Finance			
Working Capital Bank	18.206	26.92	11,590
Working Capital Nonbank	1.445	7.164	11,590
Fixed Asset Bank	21.841	32.902	2,537
Fixed Asset Nonbank	1.32	8.414	2,547
Overdraft	0.522	0.5	12,165
Credit Line	0.244	0.43	11,728
Adoption of Technology and Innovation			
RD Spending	1.274	0.892	7,637
Website	0.537	0.499	12,150
Email	0.715	0.451	7,640

3.2 Empirical Model

To evaluate the impacts of female managers on business outcomes, we can estimate the following OLS regression model:

$$Y_{it} = \beta_0 + \beta_1 Female\ Manager_{it} + X'_{it}\Omega + \epsilon_{it} \quad (1)$$

where the subscript *i* and *t* refer to firm and survey year. Business outcome, Y_{it} represents the five groups of outcomes as discussed in Section 3.1, including, firm performance, investment decision, access to finance, bribery practice, and adoption of technology and innovation. $Female\ Manager_{it}$ is a dummy variable taking the value of one if there is at least a female top manager in top management positions, and zero otherwise. X'_{it} is a vector of firm characteristics,

including industry, firm's age, ownership structure (percentage of firm owned by domestic identities and foreign identities), firm size (i.e., number of full time employees), and manager's experience. ϵ_{it} is the error term. Standard errors are clustered at the firm level.

The coefficient β_1 can summarize the impact of female leadership on business outcomes. However, in the OLS model in equation (1), we make across firm comparisons, i.e., comparing one firm with another firm, while firms might be systematically different in many unobserved characteristics which could jointly affect gender structure in top management positions and business outcomes. For instance, a firm might have a progressive culture and therefore may be more likely to have female top managers. If that firm could also tend to have better business outcomes, then the impacts on firm performance and strategic decisions might be as well attributed to culture rather than the gender structure of management positions. In other words, using the OLS model in equation (1) and comparing outcomes across firms, we might fail to isolate the impacts of female top managers on business outcomes because the effects might be ascribed to the firm's unobserved characteristics rather than female leadership. To overcome these confounding characteristics, we make the comparison within a firm and employ the firm fixed effects model as follows,

$$Y_{it} = \beta_0 + \beta_1 Female\ Manager_{it} + X'_{it}\Omega + \varphi_i + \lambda_t + \epsilon_{it} \quad (2)$$

We control for year fixed effects, λ_t, to account for aggregate macro trends affecting all firms. We further control for firm fixed effects, φ_i; therefore, our identification hinges upon the within-firm variation in the gender structure of the top management position in the firm, rather than the variation or differences in the gender structure of the top management position across different firms. In other words, the variation in our empirical model comes from firms which experience changes in the gender structure of the top management position. Making the within-firm comparison, the firm fixed effects model eliminates the unobserved time-invariant firm-specific unobserved characteristics which can be simultaneously correlated with both business outcomes and the gender structure in the top management position such as culture as discussed above. Assuming unobserved firm heterogeneity is time-invariant, the coefficient β_1 in equation (2) can reflect the impact of female leadership on business outcomes.

4. RESULTS AND DISCUSSION

4.1 Result

4.1.1 Impacts of female leadership on firm performance

The impacts of female top managers on firm performance proxied by revenue, revenue growth, and productivity are displayed in Table 2. In Columns 1-3, only controlling for industry and year fixed effects, besides firm's characteristics, we detect positive association between female leadership and all performance metrics. In Columns 4-6, we include country fixed effects to account for characteristics specific to a country that could jointly influence the gender structure in top management positions and business outcomes. For instance, countries with high levels of economic development and gender equal attitude can have more female-led businesses and more better performing firms. In contrast, some countries which experience low economic development and uphold traditional cultural norms that emphasize distinct gender roles might have fewer female-headed businesses and more poor performing firms. To account for the within-country unobserved confounding factors that could jointly influence the gender structure in top management positions and business outcomes, we make the within-country comparison through the country fixed effects, as in Columns 4-6. Female leadership is still positively associated with firm revenue and firm productivity, although the magnitude of the impact is smaller than the estimate in Columns 1 and 3, which implies the presence of within-country unobserved confounding factors which need to be controlled for. The effect on revenue growth is positive but statistically insignificant.

Finally, we control for firm fixed effects in Columns 7-9 to account for firm-specific unobserved heterogeneity. Changing from the situation with no woman in the top management position to the situation with female top managers could raise firm's revenue by 35%, raise firm's revenue growth rate by 44%, and raise firm's productivity by 21%. Overall, Table 2 provides supporting evidence for hypothesis 1: female-led firms tend to have better performance metrics than male-led counterparts.

Better firm performance could be explained by several factors. First, since gender-diverse leadership teams make better decisions and manage risks more effectively, female managers can bring different perspectives and approaches to problem-solving, which can lead to more balanced and well-considered business strategies, which are crucial for sustaining growth and increasing revenue as well as productivity (Bear and Woolley, 2011; Post and Byron, 2015). In other words, having female top managers might raise firm performance through enhanced decision-making and better risk management. Besides, female leaders often foster a culture of innovation and adaptability. In regions like South Asia and MENA, where markets are rapidly evolving, the ability to innovate and adapt is vital for business success. Female managers can drive the adoption of new technologies and business practices, contributing to improved firm performance and revenue growth (Dezso and Ross, 2012). Our subsequent analyses shed more light on the linkage between the gender structure in top management position and firm performance.

Table 2: The Estimated Impacts of Female Leadership on Firm Performance

	log Revenue (1)	Revenue Growth (2)	log Productivity (3)	log Revenue (4)	Revenue Growth (5)	log Productivity (6)	log Revenue (7)	Revenue Growth (8)	log Productivity (9)
Female Manager	0.512***	0.443	0.171***	0.483***	0.443	0.151***	0.356***	0.443**	0.214***
	(0.069)	(0.199)	(0.049)	(0.063)	(0.199)	(0.040)	(0.104)	(0.191)	(0.082)
Industry FE	x	x	x	x	x	x	x	x	x
Year FE	x	x	x	x	x	x	x	x	x
Country FE				x	x	x	x	x	x
Firm FE							x	x	x
Observations	26,124	1,491	26,106	26,124	1,491	26,106	11,092	1,491	11,091

Note: *** p<0.01, ** p<0.05, * p<0.1. All regressions control for firm's age, ownership structure (percentage of firm owned by domestic identities and foreign identities), firm size (i.e., number of full time employees), and manager's experience.

4.1.2 Impacts of Female Leadership on Firm's Investment Decisions

Table 3 presents the estimated effects of female top managers on firm's investment decisions proxied by firm's expenditure in large assets such as equipment, land and building. In the most parsimonious specifications in Columns 1 and 2, female leadership is positively associated with firm's expenditure on land and building but the estimate on equipment expenditure is statistically indistinguishable from zero. Controlling for country fixed effects to account for country-specific unobserved confounding characteristics in Columns 3 and 4 leaves our estimates virtually unchanged. However, with the inclusion of firm fixed effects in Column 5 and 6, changing from all male top managers to include at least one female in the top management board has no effect on firm's large capital investment. As indicated in Table 3, we do not find supporting evidence for hypothesis 2 that female-led firms tend to make smaller investments than male-led counterparts.

The finding that female-led firms in South Asia and MENA do not make smaller investments in building, land, and equipment compared to their male-led counterparts suggests that female entrepreneurs are equally capable of engaging in significant capital investments. It is possible that female-headed businesses in South Asia and MENA have seen improvements in their access to financial resources due to targeted financial products and services aimed at women (Klapper and Parker, 2011; IFC, 2014). Besides, female-led businesses may adopt effective strategies and leverage networks that enable them to access capital for large investments. Specifically, female entrepreneurs tend to excel in building and maintaining professional networks, which can be crucial for securing financing for substantial investments (Marlow and McAdam, 2013).

Table 3: The Estimated Impacts of Female Leadership on Investment Decisions

	Log Equipment Expenditure (1)	Log Building and Land Expenditure (2)	Log Equipment Expenditure (3)	Log Building and Land Expenditure (4)	Log Equipment Expenditure (5)	Log Building and Land Expenditure (6)
Female Manager	0.168	1.566***	0.221	1.650***	-0.288	0.242
	(0.169)	(0.409)	(0.161)	(0.413)	(0.951)	(1.071)
Industry FE	x	x	x	x	x	x
Year FE	x	x	x	x	x	x
Country FE			x	x	x	x
Firm FE					x	x
Observations	5,822	3,609	5,822	3,609	944	707

Note: *** p<0.01, ** p<0.05, * p<0.1. All regressions control for firm's age, ownership structure (percentage of firm owned by domestic identities and foreign identities), firm size (i.e., number of full time employees), and manager's experience.

4.1.3 Impacts of Female Leadership on Corruption

Table 4 displays the results on the relationship between female leadership and firm's bribery practice. The most parsimonious specifications in Columns 1 and 2 point to the increase in the incidence of bribery in female-led businesses but a decrease in the value of bribery, i.e., a lower proportion of the contract paid as bribe. Making within-country comparison yields similar results (Columns 3 and 4), suggesting an increase in the extensive margin of corruption but a

decline in the intensive margin of corruption in female-led businesses.

However, in our preferred specification as we account for the time-invariant firm-specific unobserved heterogeneity in the firm fixed effects, the statistical significance vanishes and the estimate in the *Bribe* dummy regression flips sign and considerably shrinks in value (Column 5). In other words, making the within firm comparison, we no longer detect the positive impact of female leadership on the probability of bribery. The effect on the value of briber is still negative but falls short of statistical significance. Together, there is not evidence supporting hypothesis 3 that female-led businesses tend to engage less in corruption relative to male-led businesses.

Our finding that female-led businesses in South Asia and MENA do not differ from male-led businesses in terms of engagement in corruption can be attributed to several region-specific and broader contextual factors. First, it is cultural conformity in patriarchal societies, since women in leadership roles may feel compelled to conform to established business practices, including corrupt practices, to gain acceptance and legitimacy. This conformity can reduce any differences in behavior between male and female business leaders (Goetz, 2007; Esarey and Chirillo, 2013). Second, weak legal and institutional frameworks in the region may fail to effectively deter corruption. This creates an environment where corruption is normalized and business leaders, regardless of gender, may feel that engaging in bribery is necessary to operate effectively (Transparency International, 2019). Finally, business operations in South Asia and MENA often rely on patronage networks, which can include corrupt practices. Female leaders may find it necessary to participate in these networks to access opportunities and resources, similar to their male counterparts (Esarey and Schwindt-Bayer, 2019).

Table 4: The Estimated Impacts of Female Leadership on Corruption

	Bribe (1)	Bribe Proportion (2)	Bribe (3)	Bribe Proportion (4)	Bribe (5)	Bribe Proportion (6)
Female Manager	0.203***	-1.447**	0.204***	-1.484***	-0.010	-1.595
	(0.053)	(0.564)	(0.053)	(0.558)	(0.012)	(1.444)
Industry FE	x	x	x	x	x	x
Year FE	x	x	x	x	x	x
Country FE			x	x	x	x
Firm FE					x	x
Observations	4,649	3,347	4,649	3,347	1,390	350

Note: Note: *** p<0.01, ** p<0.05, * p<0.1. All regressions control for firm's age, ownership structure (percentage of firm owned by domestic identities and foreign identities), firm size (i.e., number of full time employees), and manager's experience.

4.1.4 Impacts of Female Leadership on Firm's Access to Finance

Table 5 shows the estimated impact of female top managers on firm's access to finance. Access to finance is categorized into three groups displayed in three panels. Making across country and within country comparisons (Columns 1 through 4), we find that female-led businesses tend to have higher proportion of their working capital financed by banks and nonbank institutions (Panel A), and they are also more likely to have overdraft facilities and credit lines (Panel C). However, the effect of female leadership on the financing of fixed assets is not statistically distinct from zero (Panel B).

With the firm fixed effects model, we detect a decrease in magnitude but the same statistical significant level for our estimates on the impacts of female leadership (Columns 5 and 6). According to Columns 5 and 6, changing from all male top managers to include at least one female in the top management board, firms tend to have around 5.2 and 1.5% more of their working capital financed by banks and nonbanks (Panel A), they are also 8.4 and 12.5 percentage points more likely to have overdraft facilities and credit lines (Panel C). Magnitude of the estimates fall relative to that in prior models, suggesting that failure to account for firm-specific unobserved characteristics could overstate the impacts of female leadership. As shown in Panel B, the impacts on the financing of fixed assets remain statistically insignificant. The finding is consistent with the results in Table 4 where female-led businesses are not different from male-led businesses in terms of the size of large fixed asset investment.

Overall, the results in Table 5 do not support hypothesis 4 that female-led firms tend to have less access to finance relative to their male-led counterparts. The findings highlight important dynamics in the financing landscape for female-led firms in South Asia and MENA.

The greater access to working capital and credit facilities can be attributed to financial prudence, a focus on liquidity management by female managers, and targeted support programs. Female managers tend to be more risk-averse and financially prudent compared to their male counterparts, and are thus more likely to seek out and secure reliable sources of working capital financing to ensure the smooth operation of their businesses (Barber and Odean, 2001; Croson and Gneezy, 2009). Besides, female managers might place a higher emphasis on liquidity management to avoid cash flow problems. This focus on liquidity ensures that they actively seek out and maintain overdraft facilities and credit lines to

manage short-term financial needs (Watson and Robinson, 2003). Finally, many banks in South Asia and MENA regions have implemented financial inclusivity programs aimed at increasing the financial participation of women. These programs often include easier access to overdraft facilities and credit lines for women-led businesses (IFC, 2014).
The results are consistent with the positive impacts on revenue in Section 4.1.1 Here, adequate access to finance allows firms to manage their working capital effectively. This includes maintaining inventory, meeting payroll, and managing accounts receivable and payable. Efficient working capital management reduces operational disruptions and enhances revenue stability (Petersen and Rajan, 1997; Tauringana and Afrifa, 2013; Singh and Kumar, 2014).

Table 5: The Estimated Impacts of Female Leadership on Firm's Access to Finance

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Financing Working Capital						
	Working Capital Bank	Working Capital Nonbank	Working Capital Bank	Working Capital Nonbank	Working Capital Bank	Working Capital Nonbank
Female Manager	5.750***	1.066***	5.556***	0.991***	5.181***	1.497***
	(0.687)	(0.243)	(0.671)	(0.241)	(1.212)	(0.545)
Observations	26,336	26,358	26,336	26,358	11,392	11,389
Panel B: Financing Fixed Assets						
	Fixed Asset Bank	Fixed Asset Nonbank	Fixed Asset Bank	Fixed Asset Nonbank	Fixed Asset Bank	Fixed Asset Nonbank
Female Manager	1.861	0.013	2.013	-0.137	-3.386	2.067
	(1.501)	(0.484)	(1.436)	(0.529)	(2.773)	(1.945)
Observations	5,559	5,582	5,559	5,582	982	1,003
Panel C: Other Measures						
	Overdraft Facilities	Credit Line	Overdraft Facilities	Credit Line	Overdraft Facilities	Credit Line
Female Manager	0.071***	0.128***	0.066***	0.118***	0.084***	0.125***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.023)	(0.023)
Observations	27,169	26,604	27,169	26,604	12,165	11,635
Industry FE	x	x	x	x	x	x
Year FE	x	x	x	x	x	x
Country FE			x	x	x	x
Firm FE					x	x

Note: *** p<0.01, ** p<0.05, * p<0.1. All regressions control for firm's age, ownership structure (percentage of firm owned by domestic identities and foreign identities), firm size (i.e., number of full time employees), and manager's experience.

Nevertheless, when it comes to securing large fixed asset investments, lenders may perceive large fixed asset investments as higher risk, and this risk perception might not differ significantly between male-led and female-led firms. As a result, both types of firms face similar challenges in securing financing for large investments (Faccio et al., 2016). Also, female entrepreneurs in South Asia and MENA are often more prevalent in the SME sector, which typically requires more working capital than large fixed asset investments. The focus on SMEs might explain why female-led firms have better access to working capital but do not show significant differences in accessing finance for large fixed assets (World Bank, 2020).

4.1.5 Impacts of Female Leadership on Firm's Innovation and Technology Adoption

The estimated impacts of female leadership on firm's innovation and technology adoption is presented in Table 6. Changing from all male top managers to include at least one female in the top management board, while firms are no more likely to increase in research and development spending, they are more likely to have websites and to adopt email correspondence with customers and supplier

The findings in Table 6 support the hypothesis 5 that female-led firms are more likely to adopt new technologies and innovations than male-led counterparts. That female-led firms are more likely to adopt technologies like websites and email correspondence reflects the positive impact of gender diversity on technology adoption and digital engagement. This trend is consistent with studies showing that diverse management teams, including women, can drive technological innovation and improve organizational practices. While the increase in technology adoption does not directly translate into higher R&D spending, it highlights a strategic approach to leveraging technology for business growth and efficiency. Female managers are often associated with a greater openness to innovation and technology adoption since more gender diverse teams tend to bring new perspectives and are more likely to embrace technological advancements (Bear and Woolley, 2011). The inclusion of women in top management may therefore encourage firms to adopt new technologies and improve their digital presence. Furthermore, women managers might place a higher value on effective communication tools and digital engagement. Particularly, women often value and utilize technology for enhancing communication and collaboration (Qazi et al., 2022), which could explain the increased likelihood of adopting websites and email correspondence in firms with female top managers. Lastly, female managers may prioritize the strategic use of technology to improve operational efficiency and customer engagement. This can lead to greater investments in digital tools and platforms, even if the focus on research and development (R&D) spending remains unchanged (Post and Byron, 2015). Implementing websites and email systems aligns with a strategic approach to enhancing business operations and customer interactions.

The effect on technology adoption is consistent with the positive impacts on firm performance in Section 5.1. Adopting technology, specifically the use of emails and websites, is crucial for firms to enhance communication, expand market reach, improve operational efficiency, and gain a competitive edge. These technologies enable firms to engage better with customers, streamline operations, and make data-driven decisions, all of which contribute to increased revenue (Chaffey and Smith, 2017; Cusolito et al., 2020).

Table 6: The Estimated Impacts of Female Leadership on Innovation and Technology Adoption

	Log RD Spending	Website	Email	Log RD Spending	Website	Email	Log RD Spending	Website	Email
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Female Manager	0.003	0.142***	0.118***	0.008	0.143***	0.108***	0.091	0.105**	0.257***
	(0.014)	(0.016)	(0.019)	(0.013)	(0.016)	(0.019)	(0.057)	(0.041)	(0.028)
Industry FE	x	x	x	x	x	x	x	x	x
Year FE	x	x	x	x	x	x	x	x	x
Country FE				x	x	x	x	x	x
Firm FE							x	x	x
Observations	15,939	27,746	15,639	15,939	27,746	15,639	3,362	12,409	3,339

Note: *** p<0.01, ** p<0.05, * p<0.1. All regressions control for firm's age, ownership structure (percentage of firm owned by domestic identities and foreign identities), firm size (i.e., number of full time employees), and manager's experience.

4.1.6. Robustness Checks

So far we have provided evidence for the impacts of female leadership on business outcomes. First, this research shows that including at least one woman on the top management board results in significantly improved firm performance, as indicated by higher revenue, higher growth, and increased productivity. Second, firms led by women have better access to finance, especially when it comes to securing working capital and credit lines. Third, our findings also demonstrate that female-led firms are more inclined to adopt new technologies compared to those led by men.

To test for the robustness of our results, in this section, we use a different model, the propensity score matching (PSM) model, to estimate the impacts of female top managers. The PSM method is used to create a more comparable control group to the treatment group (firms with female top managers), which allows us to control for potential confounding factors that could influence both the likelihood of a firm having a female top manager and its business outcomes. First, propensity scores are calculated for each firm, representing the probability of the firm having a female top manager based on a set of observed covariates (firm size, industry, age of the firm, ownership structure, manager's experience). Propensity scores are calculated using a logit model.

Table 7: Robustness Checks

	(1)	(2)	(3)	(4)
Panel A: Firm Performance				
	log Revenue	Revenue Growth	log Productivity	
Female Manager	0.448***	0.770**	0.225***	
	(0.088)	(0.304)	(0.062)	
Observations	26,124	1,468	26,106	
Panel B: Access to Finance				
	Working Capital Bank	Working Capital Nonbank	Overdraft	Credit Line
Female Manager	6.975***	0.661***	0.067***	0.104***
	(0.936)	(0.306)	(0.016)	(0.015)
Observations	26,337	26,359	27,653	26,605
Panel C: Technology Adoption				
	Website	Email		
Female Manager	0.133***	0.128***		
	(0.015)	(0.015)		
Observations	27,605	15,498		

Note: *** p<0.01, ** p<0.05, * p<0.1. This table reports coefficients from the PSM model. Control variables include firm size, industry, age of the firm, ownership structure, manager's experience.

Second, each firm with at least one female top manager (the treated group) is matched with one or more firms without a female top manager (the control group) that have similar propensity scores. The matching is done by the nearest neighbor matching, to ensure that the firms in both groups are similar in terms of the observed covariates. Third, the average treatment effect on the treated (ATT) is estimated by comparing the business outcomes of the matched firms. The difference in these outcomes between the treated and control firms is attributed to the presence of a female top manager, assuming that the matching process has balanced the covariates between the groups. A balance check is conducted and the results are reported in Table A2 in the appendix. The results suggest that treated and control firms are comparable in terms of observed characteristics.

Evident from Table 7, we still find that female-headed businesses tend to have better performance metrics, access to finance, and technology adoption. The PSM model generates consistent results with the firm fixed effects model in our main result. However, it should be noted that the PSM does not take into account firm-specific unobserved characteristics, therefore the estimates from PSM models tend to be larger in magnitude compared to those in firm fixed effects models.

4.1.7 Falsification Test

To provide further evidence for the internal validity of our estimated impacts of female leadership, we conduct a falsification test as follows. We estimate the "effect" of female top managers in the current year on business outcomes in previous years, i.e. how female top managers in the current year can affect business outcomes of in at least four years before (four rounds of survey prior). If the effect of today's gender structure in top management positions on past business outcomes is statistically significant, our estimates would be biased. To conduct the falsification test, we run the regression of the business outcomes in prior years on female top managers in the current year, using the same control variables in the fixed effects model. We only run the test for outcomes with significant results in Part 4.1.1 through 4.1.5. Because of the lagged variables, the number of observations drops substantially.

As shown in Table 8, all estimates from the falsification regressions are both economically and statistically insignificant, suggesting that our estimated effects of female leadership generated from the firm fixed effects model can be interpreted as internally valid, accurately capturing the true effects of the gender structure in top management positions on business outcomes.

Table 8: Falsification Test

	(1)	(2)	(3)	(4)
Panel A: Firm Performance				
	log Revenue	Revenue Growth	log Productivity	
Female Manager	0.005	0.186	0.086	
	(0.304)	(0.124)	(0.192)	
Observations	1,698	1,363	1,696	
Panel B: Access to Finance				
	Working Capital Bank	Working Capital Nonbank	Overdraft	Credit Line
Female Manager	-2.221	-0.691	-0.023	0.021
	(0.251)	(0.371)	(0.020)	(0.042)
Observations	2,428	2,429	2,524	2,515
Panel C: Technology Adoption				
	Website	Email		
Female Manager	0.051	0.018		
	(0.033)	(0.034)		
Observations	2,638	2,641		

Note: *** p<0.01, ** p<0.05, * p<0.1. Estimates come from the firm fixed effects model with a full set of control variables, in a specification similar to Column 7 of Table 2. Dependent variables are business outcomes in at least four years before survey date, depending on the country (in the previous four waves).

4.2 Discussion

Our findings resonate with studies uncovering positive relationship between female top managers and firm performance (Khan and Vieto, 2013; Christiansen et al., 2016; Amore et al., 2014; Conyon and He, 2017; Moreno-Gomez et al., 2020; Sieweke et al., 2023). While prior studies look at different financial metrics such as ROA, stock price, liquidity, our paper provides evidence on other performance and additional metrics like revenue, productivity, financial decisions, access to finance, bribery practice, and technology adoption.

Our findings on the impacts of female top managers underscore the transformative potential of gender diversity in leadership. By showing that firms with female top managers experience higher revenue, better access to finance, and greater adoption of new technologies, our study highlights the economic and innovative advantages of inclusive leadership. In regions like South Asia and MENA, where gender equality often lags behind global standards, these insights are particularly significant (World Economic Forum, 2023; ILO, 2023). They offer a compelling case for promoting women in leadership roles as a strategy to enhance business performance and drive economic development.

Our findings on the impacts of female top managers align with SDG 5 (Gender Equality) and SDG 10 (Reduced Inequalities). By demonstrating that female leadership leads to higher firm revenue, better access to finance, and greater adoption of new technologies, our study provides evidence of the value of gender diversity in leadership roles. This directly supports SDG 5 by promoting the empowerment of women and advocating for their equal participation in economic decision-making. Additionally, our findings contribute to SDG 10 by addressing gender-based disparities in the workplace, fostering more equitable opportunities, and reducing inequalities within firms and the broader society. By highlighting the positive outcomes of female leadership, our research underscores the necessity of inclusive policies and practices that support women's advancement, ultimately contributing to a more just and balanced economic landscape.

5. Conclusion

Overall, our paper provides evidence on the positive effects of female top managers on business outcomes within firms in South Asia and the MENA region. First, we find that the inclusion of at least one woman on the top management board leads to significantly better firm performance, as evidenced by higher revenue, higher revenue growth, and increased

productivity. Second, female-led firms experience enhanced access to finance, particularly in terms of obtaining working capital and credit lines. Third, our study also reveals that female-led firms are more likely to adopt new technologies and innovations compared to their male-led counterparts. The findings on access to finance and the adoption of technologies and innovations are consistent with the improved firm performance observed in female-led firms; better access to financial resources and a greater propensity for technological adoption directly contribute to their higher revenue and increased productivity. Fourth, we provide evidence that female-led businesses are no less inclined to corruption practice compared to male-led bussinesses. Finally, our analysis suggests that female-headed firms do not seem to face discrimination in the financial market relative to male-headed firms. Overall, our findings underscore the substantial benefits of gender diversity in leadership, highlighting its role in driving both economic and innovative advancements within businesses. Our results pass various robustness and falsification tests.

Our study offers meaningful policy implications with practical applications for business leaders, policymakers, financial institutions, and investors. First, business leaders and entrepreneurs in South Asia and MENA can leverage the evidence that female top managers significantly enhance firm performance, innovation, and financial access, promoting gender diversity in leadership roles. Policymakers and government institutions should prioritize initiatives that support female leadership in business by implementing policies such as mandatory gender quotas or voluntary targets for female representation on top management boards, accelerating women's integration into decision-making roles (Sojo et al., 2016; Hamplová et al., 2022). In addition, investing in leadership training programs tailored for women can enhance their skills and confidence, preparing them for senior positions (Clarke, 2011; Ely et al., 2011). Policymakers should also incentivize firms to invest in education and vocational training programs targeting women to prepare them for leadership roles, while creating mentorship and networking opportunities that enable women to connect with established leaders and advance their careers.

Financial institutions can apply these findings to reassess lending practices, recognizing that female-led firms, which are more likely to adopt new technologies and innovations, also achieve better financial performance, positioning them as strong candidates for credit and working capital. Investors and corporate boards should integrate gender diversity into their strategies, understanding that firms with female top managers are better positioned for growth, innovation, and sustainability.

Lastly, governments, non-governmental organizations (NGOs), and advocacy groups should take the lead in launching public awareness campaigns that highlight the benefits of gender diversity in leadership. These campaigns can play a pivotal role in challenging entrenched stereotypes and cultural norms that limit women's roles in society and business. By addressing these barriers and promoting the advantages of inclusive leadership, such initiatives can not only improve business outcomes—such as increased revenue and innovation adoption—but also contribute to broader societal goals like gender equality and economic empowerment.

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7. References

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APPENDIX

Table A1: List of Countries

Country	Numb of Observations	Percent
(1)	(2)	(3)
Afghanistan	2,568	7.21
Bangladesh	3,196	8.98
Bhutan	503	1.41
India	18,657	52.4
Jordan	1,174	3.3
Lebanon	1,093	3.07
Morocco	1,503	4.22
Nepal	1,432	4.02
Pakistan	2,243	6.3
Westbank and Gaza	1,200	3.37
Tunisia	1,207	3.39
Yemen	830	2.33

Table A2: Balance Check

	Mean		t-test
	Treated	Control	p>t
Firm's Age	20.551	20.732	0.722
Domestic Ownership	91.899	92.605	0.379
Foreign Ownership	2.1307	2.0396	0.825
Manager's Experience	16.443	16.016	0.237
Firm Size	164.85	141.94	0.131
Industry	8.8889	8.847	0.856