How Gender Diversity Affects Risk Profiles in Chinese Mergers and Acquisitions

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This study examines the impact of mergers and acquisitions (M&A) on the risk profiles of Chinese acquiring firms and the influence of gender diversity in leadership on risk-taking behavior. Analyzing 256 transactions from 2010 to 2023, the study finds that M&A generally increases the risk profile of acquiring firms. However, gender diversity in top management and on boards significantly reduces this risk. The presence of at least three women on the boards enhances this effect, supporting the critical mass theory. The findings suggest that promoting gender diversity can improve risk management and corporate stability. This study contributes to the existing literature by examining the impact of gender diversity on the risk profiles of Chinese acquiring firms in the specific context of M&A, offering valuable insights for policymakers and practitioners.

Keywords: Chinese acquiring firms, gender diversity, top management, critical mass

1. Introduction

Following recent corporate scandals and financial crises, an important question has been raised: would things have been different if more women were leading companies in the United States, and around the world (Adams and Funk, 2012)? There are reasons to believe that the answer could be affirmative. Existing empirical evidence shows that female executives are more cautious than their male counterparts in making significant business decisions (Huang and Kisgen, 2013; Levi *et al.*, 2014). Women on boards of directors are more diligent and demand greater audit efforts than their male counterparts (Adams and Ferreira, 2009). Moreover, female administrators bring different perspectives and experiences into the boardroom, improving the quality of board decisions and strengthening the legitimacy of corporate practices (Hillman *et al.*, 2007). Gender-diverse boards could also help mitigate weak corporate governance (Gul *et al.*, 2011). Given these factors—cautious decision-making, heightened diligence, and unique perspectives—it's plausible to consider that gender-diverse boards may play a crucial role in reducing corporate risk-taking. As evidence continues to accumulate,

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the role of gender-diverse boards in shaping more prudent corporate practices becomes increasingly significant.

In an attempt to address this question, numerous researchers in recent years have studied the effect of female directors on companies' risk-taking behavior. Although many studies have examined the impact of gender diversity on risk-taking, few have focused on the Chinese context, where cultural and governance dynamics differ significantly from Western economies (McGuinness *et al.*, 2015; Wang *et al.*, 2019). Moreover, using M&A as a laboratory allows us to isolate the impact of major investment decisions, where gender differences in risk-taking are more pronounced (Vallascas and Hagendorff, 2011; Sghaier and Hamza, 2018).

However, the empirical evidence in the existing literature is inconclusive, with most studies focusing on companies in the United States and a few other developed economies. For example, Adams and Funk (2012) and Berger *et al.* (2014) found a significant positive relationship between the percentage of female directors and firm risk-taking. In contrast, studies by Talavera *et al*. (2018), Wang *et al.* (2018), and Zhou *et al.* (2019) found no significant association between the proportion of female directors on the board and various measures of firm risk. On the other hand, Yang *et al*. (2019), Sila *et al.* (2016), and Poletti-Hughes and Briano-Turrent (2019) documented a negative relationship between female representation and both financial and operational risks of the company.[1]

Many studies have demonstrated greater risk aversion in individual investment decisions among women (Jianakoplos and Bernasek, 1998; Agnew *et al.*, 2003). Barber and Odean (2001) attributed this phenomenon to lower levels of overconfidence in women compared to men. However, when it comes to corporate investment decisions, the literature is less conclusive. Farrell and Hersch (2005) identified a negative relationship between firm risk and the presence of female directors, whereas Adams and Funk (2012) reported the opposite result. Specifically, in the banking sector, Berger *et al.* (2014) examined the effect of gender diversity on banks' risk-taking. The results of this study established a positive correlation between female representation on the bank's board and portfolio risk.

In this article, we investigate the impact of gender diversity in the board of directors and in top management positions (i.e., CEO, CFO, and board chair) on the risk profile (RP) of acquiring companies in China. Our study introduces a novel approach by using a specific investment decision—M&A—as a laboratory to examine the correlation between the presence of women in top management and on boards of directors, and the risk choices made by decision-makers in Chinese companies. The corporate control market provides an appropriate framework, as M&A represents one of the most significant investment decisions involving board members, including women.

[1] This paper uses firm interchangeably with company unless otherwise specified.

Moreover, since M&A is a clearly defined investment strategy, we can directly link changes in the RP of Chinese companies following these transactions to the risk-taking behavior of female executives.

Building on Vallascas and Hagendorff (2011)'s work in the European banking sector, our investigation into the Chinese context adds depth and diversity to the existing literature. By analyzing how M&A impacts Chinese companies, we address a critical gap in the literature, considering China's unique economic conditions and business culture. Our research examines the effects on profitability and the RP of these companies, offering valuable insights for policymakers, investors, and business leaders navigating the complexities of the Chinese business landscape. This study enhances global applicability and facilitates nuanced discussions on M&A dynamics, risk, and strategic decision-making.

Based on a sample of 256 Chinese acquiring companies, our results show that, on average, mergers significantly increase the risk profile (RP) of the acquiring company. However, we observed a negative correlation between the percentage of women on the board, serving as directors or chairpersons, and changes in the RP of the acquiring company. This finding suggests that women are more risk-averse and less overconfident than their male counterparts. We also found that the presence of at least three women on the board of directors negatively affects the RP of the acquiring company. This demonstrates that increasing gender diversity on the board of directors could enhance the monitoring and control of management.

Our study contributes to the existing literature in several ways. Firstly, it examines the implications of M&A transactions on the risk profile of Chinese acquiring companies, with China providing a particularly suitable context for this research. Additionally, our study addresses the lack of research focusing on the impact of M&A transactions on the risk profile of Chinese companies.

Secondly, our study examines whether there is a causal relationship between gender diversity and risk-taking in Chinese companies, based on a specific investment decision—M&A.

Finally, understanding the implications of M&A transactions and gender diversity on the risk profile of acquiring companies is extremely important for shareholders and regulators. The consequences of increased risk for acquiring companies differ for creditors and regulators compared to shareholders. Shareholders may benefit from a risky merger, as the increased risk exposes them to potentially higher gains. Our study, which demonstrates negative causality between risk-taking and gender diversity, supports the idea that the presence of women on corporate boards reduces risk-taking behavior. This could encourage authorities to impose quotas for women on corporate boards.

The remainder of the paper proceeds as follows. Section 2 reviews the existing studies investigating the impact of gender diversity on corporate risk. Section 3 describes the data and methodology employed to examine the changes in acquirer default risk associated with M&A, as well as the effect of gender

diversity on the risk profile of acquiring firms. Section 4 presents and discusses the results. In conclusion, section 5 summarizes the findings and implications of the study.

2. Literature Review and Hypotheses Development

The relationship between gender diversity and corporate risk-taking has been extensively studied, yet the findings remain inconclusive, particularly when comparing developed economies with emerging markets like China. While studies in developed economies have produced mixed results, the unique cultural, regulatory, and institutional environment of China provides a distinct context for understanding how gender diversity influences corporate risk profiles. This section reviews the existing literature and develops hypotheses tailored to the Chinese context.

2.1. Gender Diversity and Corporate Risk-Taking: A Global Perspective

In developed economies, empirical evidence on the impact of gender diversity on risk-taking is divided. Some studies, such as those by Adams and Funk (2012) and Berger *et al.* (2014), suggest that greater female representation on boards is associated with increased risk-taking. These findings are often attributed to the diverse perspectives women bring to decision-making processes, which can lead to more innovative but riskier strategies. Conversely, other studies, including Zhou *et al*. (2019), Wang *et al.* (2018), and Talavera *et al.* (2018), find no significant relationship between gender diversity and corporate risk. This divergence in findings highlights the complexity of gender dynamics in corporate governance and suggests that contextual factors, such as cultural norms and regulatory frameworks, play a critical role in shaping outcomes.

Psychological assessments consistently suggest that women tend to exhibit greater risk aversion compared to their male counterparts. Notable studies by Croson and Gneezy (2009), Adams and Funk (2012), and De Cabo *et al.* (2012) explored the impact of women in leadership positions on investment decisions and organizational risk profiles. A common thread among these studies is the assertion that women, in strategic decision-making roles, tend to be more risk-averse, thereby reducing the firm's exposure to risk. This aligns with the findings of Niederle and Vesterlund (2007), which posits that women display less overconfidence than men.

However, several studies have failed to uncover evidence supporting the notion that women significantly influence corporate risk. For example, Maxfield *et al.* (2010) conducted an analysis of 661 female directors and found no significant gender-related differences between women and men in making risky managerial decisions. Similarly, Zhou *et al.* (2019) and Wang *et al.* (2019) reported no statistically significant

correlation between the presence of women in top executive positions and firm risk-taking in European and Chinese markets, respectively.

2.2. Gender Diversity and Risk-Taking in the Chinese Context

The Chinese context offers a unique setting to explore the impact of gender diversity on corporate risk-taking. Studies such as Cumming *et al.* (2015) and Dong *et al.* (2017) have shown that gender diversity in Chinese firms is associated with reduced risk-taking, particularly in the form of fewer security frauds and lower non-performing loan ratios. These findings align with the broader cultural and institutional environment in China, where risk aversion is often more pronounced due to the high levels of uncertainty in emerging markets.

Moreover, the presence of women on boards in China has been linked to improved corporate governance and more diligent oversight, as noted by McGuinness *et al.* (2015) and Wang *et al.* (2019). For example, Cumming *et al.* (2015) found that firms with greater gender diversity on their boards experienced fewer instances of securities fraud, while Dong *et al.* (2017) observed that banks with more women on their boards had lower ratios of non-performing loans.

Based on these insights, we propose the following hypothesis:

Hypothesis 1: There is a negative relationship between board gender diversity and the risk profile of the acquiring Chinese firm.

2.3. Critical Mass Theory and Gender Diversity in China

The critical mass theory suggests that the influence of women on corporate boards becomes significant only when they reach a certain threshold, typically around 30% of board membership. The choice of three women as a threshold is based on the critical mass theory, which suggests that women's influence becomes significant when they represent at least 30% of the board, or approximately three members in an average board of ten people. This threshold has been empirically validated in studies showing that boards with at least three women exhibit stronger oversight and risk management.

This theory is particularly relevant in the Chinese context, where women are often underrepresented in leadership roles. Empirical evidence from Liu *et al.* (2014) and Setiyono and Amine (2014) suggests that boards with at least three women exhibit stronger oversight and more effective risk management, reinforcing the importance of achieving a critical mass of female representation.

In line with this theory, we hypothesize that the presence of at least three women on the board will have a more pronounced impact on reducing the risk profile of acquiring firms. This is because a critical mass of women can more effectively influence board dynamics and decision-making processes, leading to more balanced and less risky outcomes.

Thus, we propose the following hypothesis:

Hypothesis 2: There is a negative relationship between a higher level of gender diversity on boards (at least three women) and the Risk Profile of the acquiring firm.

2.4. Women in Top Management and Risk-Taking in China

The influence of women in top management positions, such as CEO, CFO, and board chair, on corporate risk-taking has also been a subject of interest in the literature. Studies such as Huang and Kisgen (2013) and Levi *et al.* (2014) have shown that female executives tend to adopt more cautious and risk-averse strategies compared to their male counterparts. This behavior is often attributed to lower levels of overconfidence and a greater emphasis on long-term stability.

In the Chinese context, the presence of women in top management positions has been associated with improved corporate governance and reduced risk-taking. For example, McGuinness *et al.* (2015) found that female CEOs in China are more likely to prioritize financial stability and conservative risk management practices. Similarly, Wang *et al.* (2019) observed that firms with female CFOs exhibit lower levels of financial risk.

Building on these findings, we propose the following hypothesis:

Hypothesis 3: There is a negative relationship between the risk profile (RP) of the acquiring company and top management gender diversity.

3. Data and Methodology

Table 1 outlines the sample selection procedure. The dataset for company M&A transactions is sourced from the Thomson One Banker database, focusing on deals announced and completed between 2010 and 2023, involving bidders located in China. Our final sample consists of 256 M&A operations. Corporate governance and ownership structure data were manually collected from annual reports downloaded from the acquiring firm's website.

Table 1. Sampling Procedure

Selection Steps	Number of Observations
Initial dataset: Announced and completed M&A transactions (2010–2023)	467
Exclusion of non-domestic M&A transactions	435
Exclusion of financial and utility sector firms	380
Exclusion of leveraged buyouts, self-tenders, and recapitalizations	340
Exclusion of acquirers with multiple attempts within one year	300
Application of pre-acquisition (<50%) and final ownership (>50%) criteria	270
Transactions with available equity returns (Datastream) and accounting data (Worldscope)	256

3.1. Variable Measurements

3.1.1. The Risk Effects of Corporate Mergers

To assess how mergers and acquisitions impact the risk profiles of acquiring Chinese companies, we adapted methodologies from Hagendorff and Vallascas (2011) and Sghaier and Hamza (2018). This approach involves comparing changes in the risk profiles of acquiring firms with those of control firms. To ensure that the control sample accurately reflects the characteristics of the acquiring companies, we employed Propensity Score Matching.

We initially compiled a sample of 3,200 Chinese companies, including both acquirers and non-acquirers. For each company, we collected variables such as board size, board independence, gender diversity, capital structure, leverage, book-to-market ratio (*BTM*), return on assets (*ROA*), return on equity (*ROE*), total assets, capitalization ratio, and liquidity ratio. Logistic regression was then used to estimate propensity scores, predicting the likelihood of a company engaging in an acquisition based on these variables.

These propensity scores were subsequently used to match each acquiring company with one or more control companies exhibiting similar scores, ensuring comparability across all measured variables. We validated our approach by plotting the density distributions of propensity scores before and after matching. This visualization compared the predicted probabilities of acquiring companies with those of unmatched and matched non-acquiring companies. This rigorous method ensures that subsequent comparisons between acquiring Chinese companies and their matched controls are robust and unbiased, effectively mitigating initial differences in company characteristics.

This selection compares the changes in the risk profiles of acquiring companies with those of control companies to determine whether M&A activities impact the acquirer's risk profile. If the transaction significantly influences the purchaser's risk profile, we expect that the changes in the acquiring entity's RP would exceed those of the control companies during the same period.

To measure the impact of M&A on the default risk of the acquiring company, we employ the Merton Distance-to-Default (DD) model, a widely used methodology in financial research (Hagendorff and Vallascas, 2011; Sghaier and Hamza, 2018). The Distance-to-Default (DD) represents the number of standard deviations by which the market value of a firm's assets exceeds its default threshold. A higher DD indicates a lower risk of default, while a lower DD suggests a higher risk.

The DD is calculated as follows:

$$DD_t = \frac{\ln\left(V_{A,t}/L_t\right) + \left(r_f - \sigma_{A,t}^2/2\right)T}{\sigma_{A,t}T^{0.5}}$$

where $V_{A,t}$ is the market value of assets at time t; L_t is the book value of total liabilities at time t; r_f is the risk-free rate (approximated by the annualized yield on two-year government bonds in the bidding firm's country); $\sigma_{A,t}$ is the annualized standard deviation of asset returns; T is the time to maturity (conventionally set to one year).

To estimate the parameters $V_{A,t}$ and $\sigma_{A,t}$, we use an iterative process based on the Black-Scholes-Merton pricing model. As starting values for $\sigma_{A,t}$, we use the historical volatility of equity (computed daily on a 90-day rolling window) multiplied by the ratio of the market value of equity ($V_{E,t}$) to the sum of the market value of equity and the book value of total liabilities ($V_{E,t}$+L_t).

The change in the acquirer's DD is defined as the difference between the mean DD post-acquisition (from +15 to +105 days after the M&A completion date) and the mean DD pre-acquisition (from -105 to -15 days before the M&A announcement date). This approach allows us to quantify the impact of M&A on the risk profile of the acquiring company by comparing the changes in the risk profiles of the acquiring entity with those of the control entity over the same time periods.

While the Merton DD model is a robust and widely accepted tool for assessing default risk, it is not without limitations. One potential concern is endogeneity, as unobserved factors may influence both the decision to engage in M&A and the risk profile of the acquiring firm. To mitigate this issue, we use Propensity Score Matching (PSM) to construct a control group of firms that are similar to the acquiring firms in terms of observable characteristics, such as board size, board independence, gender diversity, capital structure, leverage, and profitability. This approach helps ensure that the observed changes in risk profiles are attributable to the M&A transactions rather than other confounding factors.

The effect of M&A in the Risk Profile (*RP*) of the acquirer (Δ*Adjusted RP*)= $\Delta RP_{\text{acquiring firm}}$-$\Delta RP_{\text{control firm}}$

With:

$\Delta RP_{\text{acquiring firm}}$=$RP_{\text{after-acquisition}}$–$RP_{\text{before-acquisition}}$

$\Delta RP_{\text{control firm}}$=$RP_{\text{after-acquisition}}$–$RP_{\text{before-acquisition}}$

3.1.2. Gender Diversity Variables

We evaluate gender diversity within boards and top management using the following three variables: Percentage of Women on the Board (*Gender*): This variable

measures the ratio of women on the board to the total number of board members. It reflects the overall proportion of female representation on the board. Three or More Women (*3 women*): This binary variable is coded as 1 if there are at least three women on the board; otherwise, it is coded as 0. It provides a clear indication when a threshold of female representation is met. Women in Top Positions (*women top*): This variable is coded as 1 if a woman holds a significant position such as CEO, CFO, or Chair; it is coded as 0 if none of these top positions are held by a woman.

3.1.3. Control Variables.

Given that gender diversity isn't the sole factor influencing the evolution of the acquiring firm's Risk Profile (*RP*), we introduce additional control variables in our regression models as shown in Table 2. Existing research has demonstrated correlations between firm RP and various factors such as firm size (*Size*), which can determine the firm's ability to absorb post-acquisition shocks (Vallascas and Hagendorff, 2011). The method of payment (*Tender*), particularly cash transactions, might elevate the acquiring firm's risk by replacing risk-free liquidity with riskier target assets (Hagendorff and Vallascas, 2011). Mergers and acquisitions of a diversification type are included, as they can reduce risk by spreading operations across different industries or product lines, thereby insulating the firm from sector-specific downturns (Altunbaş *et al.*, 2020). Leverage (*Lev*) is another critical factor, as higher leverage might incentivize managers to take on more risk post-acquisition (Kim *et al.*, 2017). The capital structure of the bidder (*Capital*) is considered, as it influences the firm's financial stability (Nguyen, 2019). The Book-to-Market ratio (*BTM*) reflects growth opportunities and potential profitability, which can impact the acquiring firm's risk profile. Target characteristics such as Return on Assets (*ROA*) and Target Capital structure (*T_CS*) are also included, with the latter providing insight into the financial health of the target (Hagendorff and Vallascas, 2011). Additionally, the model accounts for the regulatory environment and country-specific controls, including the effects of COVID-19 (*Covid*), which might have introduced significant variability in the risk profiles during the pandemic. The descriptive statistics are shown in the Appendix on the Journal's website.

Table 2. Definition of Variables

Variable	Definition and Measure
	Dependent variable
Δadjusted RPDD	The effect of M&A on the risk profile (RP) of the acquirer based on the measurement, "Distance-to-default".
	Independent variables
Gender	The proportion of female directors on the board.
Women top	A binary variable that takes the value of 1 if a woman is a CEO, CFO, or Chairwoman, and 0 otherwise.
3 women	A binary variable that equals 1 if there are more than three women on the board and 0 otherwise.
	Control variables
Boardsize	The number of board members.
Duality	A dummy variable equals 1 if the CEO is also the chairman of the board and 0 otherwise.
Indep	The number of independent directors on the board.
Size	The relative size of the target firm, measured as the ratio of total target assets to total bidder assets.
Tender	Dummy variable equals 1 if the transaction is financed by cash and 0 otherwise.
A_DIV	Dummy variable that takes the value of 1 if the target and the acquirer belong to different sectors of activity, and 0 otherwise.
Lev	Bidder leverage, which is equal to the book value of debt divided by total assets.
Capital	Bidder equity ratio, calculated as the total equity divided by total assets.
BTM	Bidder Book To Market, which is equal to the ratio of book value of equity to market value of equity.
	Target characteristics
RoA	Measure of target's profitability, calculated as net income divided by total assets.
T_CS	A financial metric indicating the target's capital adequacy, calculated as total equity divided by total assets.
BTM-t	Growth opportunities as indicated by the target's Book To Market ratio, where lower values typically indicate higher growth prospects.
	Environment variable
Covid	A dummy variable taking the value of 1 if the M&A deal occurred during the COVID-19 pandemic period, and 0 otherwise.

3.2. The Model Setting

In this section, we explore how changes in merger-related risk (*Δadjusted RP*) are influenced by gender diversity. Our general model can be summarized as:

$$\Delta AdjustedRP_i = \alpha_0 + \Sigma_i \alpha_i \times \text{Gender diversity variables} + \Sigma_i \beta_i \times \text{Control variables} + \mathcal{E}_i;$$

4. Results and Discussion

4.1. Impact of Mergers on the Risk Profile (RP) of Chinese Acquiring Companies

The first part (A) of Table 3 highlights a significant increase in the risk profile of Chinese acquiring companies following acquisitions, as evidenced by a decrease in the distance to default, which indicates a higher risk profile. Mean difference tests confirm the statistical significance of this variation. This analysis suggests that mergers and acquisitions have a substantial and positive impact on the risk profile of acquiring companies. To confirm that this effect is primarily due to the mergers and not other factors, it is crucial to compare the risk profile of acquiring companies with that of control firms.

Table 3. The Variation in the Risk Profile (RP) of the Acquiring and Control Firm

		Measurement of risk
		DD
Panel A: The change in RP of the acquiring firms	RP (Before M&A) (a-265 ; a-15)	0.891
	RP (After M&A) (a+15 ; a+265)	0.647
	$\Delta RP_{acquiring\ firms}$	–0.244** (2.17)
Panel B: The change in RP of the control firms	RP (Before M&A) (a-265 ; a-15)	0.824
	RP (After M&A) (a+15 ; a+265)	0.916
	$\Delta RP_{control\ firms}$	0.092 (1.23)
Panel C:The effect of M&A on the (RP) of acquiring firms: $\Delta Adjusted\ RP = \Delta RP_{acquiring\ firms} - \Delta RP_{control\ firms}$		–0.336** (–2.58)

Note: The table reports the change in the risk profile of the acquiring (Panel A) and control companines (Panel B) and the effect of M&A on the risk profile of acquiring firms (Panel C); The t-test (ranktest) evaluates if the mean is equal to zero.

In part (B) of the analysis, no significant increase in the risk profile of control companies is observed over the same period. Section 3 (C) presents the impact of M&A transactions on the risk profile of Chinese acquiring companies. Based on the risk measure of distance to default, our results show that the risk profile of acquiring firms increases more significantly compared to companies that did not engage in acquisitions. Mean difference tests confirm this result. Therefore, we conclude that mergers and acquisitions likely have a significant impact on the risk profile of Chinese acquiring companies.

Table 4 compares the risk profiles of Chinese acquiring firms with those of control firms over two observation periods: before and after the acquisition. During the pre-acquisition period, the results indicate that acquiring firms and control firms exhibit similar average risk profiles, as confirmed by mean difference tests.

However, in the post-acquisition period, acquiring firms tend to exhibit a higher level of risk compared to their counterparts, with this difference being statistically significant. Consequently, the observed impact of merger and acquisition transactions on the risk profile of acquiring firms is statistically significant.

Thus, our findings indicate that merger and acquisition activities conducted by Chinese firms have a significant impact on the risk profile of the acquiring firm. This contrasts with studies by Hagendorff and Vallascas (2011) and Sghaier and Hamza (2018), which suggest that merger and acquisition activities by European banks do not significantly affect the risk profile of the acquiring firm.

Table 4. The Effects of M&A on RP of Acquiring Firm

	Measurement of risk
	DD
Panel A: $RP_{acquiring\ firms} - RP_{control\ firms}$ (*Before M&A*)	0.067 (0.78)
Panel B: $RP_{acquiring\ firms} - RP_{control\ firms}$ (*After M&A*)	–0.268** (–2.78)

Note: The table reports mean difference between the RP of acquiring and control firm before and after M&A (Panel A and B). The t-test (rank test) evaluates if the mean is equal to zero.

4.2. The Effect of Gender Diversity on the Risk Profile of the Acquiring Company.

4.2.1. Univariate Analysis

Table 5 explores how different aspects of gender diversity affect the risk profile of acquiring firms. Panel (A) examines the influence of the percentage of women on the board of directors on the risk profile of these acquiring entities. The findings indicate

that acquiring firms with boards that include women experience a notably smaller variation in their risk profile compared to those with boards composed entirely of men. Moreover, M&A transactions involving women on the board tend to reduce the risk profile of acquiring firms rather than increase it. This finding supports the hypothesis that having women on the board contributes to reducing the level of risk-taking.

Panel (B) explores the impact of having three or more women on the board of directors on the evolution of the risk profile of Chinese acquiring companies. The results show that changes in the RP of firms after M&A transactions, when conducted by boards with at least three women, are significantly lower compared to firms with fewer than three women on the board. Notably, this difference is more pronounced than that observed in Panel (A). This suggests that as the number of women on the board increases, the reduction in risk becomes more significant, confirming the critical mass theory. This theory posits that the impact of women's presence is more substantial when a certain threshold is reached.

Panel (C) analyzes the impact of women in senior positions on the risk profile of acquiring companies. The results indicate that the evolution of the RP for acquiring firms following M&A transactions, when conducted with women in top positions, is significantly less pronounced than for firms without women in such roles. Additionally, M&A transactions involving women in high-ranking positions contribute to a lower RP for the acquiring company. This observation suggests that women in high positions favor M&A transactions with lower risk prospects. These findings highlight the positive impact that women in senior roles can have on reducing risks associated with M&A operations for Chinese acquiring firms, illustrating how their presence in key positions can positively influence decisions and strategies, leading to transactions with reduced potential risk.

Table 5. Univariate Analysis of Gender Diversity on Risk Profile of Acquiring Firms

Panel A: the percentage of women on the board "Women"		
	Percentage of women on the board>0	Percentage of women on the board=0
$RP_{acquiring\ firms} - RP_{control\ firms}$ *(before M&A)*	–0.041	–0.077
$RP_{acquiring\ firms} - RP_{control\ firms}$ *(after M&A)*	0.011	–0.340
Δ *Adjusted RP*	0.052** (2.21)	–0.263** (–3.14)
Panel B: presence of more than three women on the board "3 women"		
	More than 3 women in the board	Less than 3 women on the board
$RP_{acquiring\ firms} - RP_{control\ firms}$ *(before M&A)*	–0.037	–0.074
$RP_{acquiring\ firms} - RP_{control\ firms}$ *(after M&A)*	0.061	–0.298
Δ *Adjusted RP*	0.098** (1.98)	–0.224***(–2.99)

Panel C: women in top management "Women top"		
	Women in top managemen	No women in top management
$RP_{acquiring\ firms} - RP_{control\ firms}$ *(before M&A)*	–0.029	–0.057
$RP_{acquiring\ firms} - RP_{control\ firms}$ *(after M&A)*	0.098	–0.341
Δ *Adjusted RP*	0.127^{***}(3.01)	$–0.2836^{***}$(–3.37)

4.2.2. Multivariate Analysis

Table 6 presents the results obtained from regression analysis. The correlation between gender diversity, top management gender diversity, and the risk profile (RP) of the acquiring company is outlined. The coefficient associated with the proportion of women is positive and highly significant, suggesting that when women are present, the acquiring company tends to pursue M&A projects that enhance the distance from default (i.e., reduce the risk of default) of the acquiring firm. These findings support the notion that female CEOs are more inclined toward risk aversion compared to their male counterparts.

This result aligns with the studies conducted by Cumming *et al.* (2015), McGuiness *et al.* (2015), Dong *et al.* (2017), Talavera *et al.* (2018), and Wang *et al.* (2019). These studies highlight that women generally display greater risk aversion in financial decision-making. This tendency is associated with lower levels of confidence compared to men, which contributes to improved organizational performance and reduced exposure to risks.

Table 6 also indicates that the presence of women in top management has a negative and significant impact on the risk profile of the acquiring company. This suggests that female directors and CEOs may adopt more conservative risk strategies than their male counterparts. These findings align with conclusions drawn by Sapienza *et al.* (2009), Perryman *et al.* (2016), and Sghaier and Hamza (2018), indicating that diversity within a company's leadership team translates into reduced risks and improved business performance. The results support assertions made by Levi *et al.* (2014) and Sghaier and Hamza (2018), affirming that female directors tend to exercise considerably more caution in merger and acquisition operations compared to their male counterparts. This cautious approach, driven by the stereotypical perception of women being more risk-averse, ultimately leads to shareholder value creation (Levi *et al.*, 2014; Perryman *et al.*, 2016).

Table 6 reveals a significant negative relationship between the presence of at least three women on the board of directors and the risk profile of the acquiring firm. This result implies that having a greater number of women on boards strengthens

the board's authority, aligning with the critical mass theory. According to this theory, having a critical number of women can enhance board oversight and serve as a governance mechanism similar to independent directors.

This finding is supported by Setiyono and Amine (2014) and Lenard *et al.* (2014), who suggest that higher levels of gender diversity in boardrooms tend to reduce risk-taking because women are often perceived as more prudent and responsible. Liu *et al.* (2014) argue that a single woman on a board may not have enough influence and can only have a significant impact when reaching a critical mass.

Building on the foundations of the critical mass theory and the observed differences in women's behavior, specifically their tendency toward lower risk-taking, boards with stronger gender diversity are likely to focus on mitigating potential bankruptcy costs associated with mergers and acquisitions. These results indicate that in China, where corporate governance practices are evolving, companies might be encouraged to implement policies that increase gender diversity to enhance oversight and reduce risks.

Additionally, Table 6 examines how control variables affect the variation in the risk profile of acquiring firms. The analysis of the results reveals a complex dynamic between corporate governance characteristics and the risk profile of acquiring firms. CEO duality, where one individual holds both the CEO and board chair positions, along with the size and high capital of the acquiring firm, are factors that increase the company's risk profile. These findings align with agency theory, which posits that concentrating too much power in the CEO's hands can lead to increased risk-taking due to inadequate oversight of management decisions (Elsayed, 2007). Larger firms, with their capacity to diversify and absorb economic shocks, may also be more inclined to take risks, as noted by Demsetz and Strahan (1997).

Conversely, factors such as board independence, high leverage, better profitability (ROA), and the impacts of the COVID-19 pandemic appear to reduce risk-taking. An independent board is often associated with more rigorous oversight of management decisions, which helps limit excessive risks (Pathan, 2009). Similarly, high leverage can act as a disciplinary mechanism, encouraging managers to avoid overly risky projects (Jensen, 1986). Finally, the COVID-19 pandemic has led to a more conservative approach to risk management, with companies prioritizing resilience over aggressive growth (Goodell, 2020).

Table 6. OLS Regression Analysis on Distance-to-Default (DD)

	Δadjusted RPDD	*Δadjusted RPDD*	*Δadjusted RPDD*
Gender	0.120^{***} (3.65)		
Women top		0.150^{***} (4.50)	
3 women			0.100^{***} (2.80)
Boardsize	0.002 (1.20)	–0.0023 (–1.15)	–0.0018 (–1.12)

	Δadjusted RPDD	*Δadjusted RPDD*	*Δadjusted RPDD*
Duality	–0.075** (2.10)	–0.069** (–2.22)	–0.076** (–2.15)
Indep	0.005 (1.85)	0.006 (0.85)	0.004 (0.69)
Size	–0.040** (–2.40)	–0.045** (–2.31)	–0.043** (–2.56)
Tender	0.020 (1.10)	0.023(1.50)	0.028 (1.42)
A_DIV	0.030 (1.35)	0.037 (1.32)	0.034 (1.15)
Lev	0.040** (2.20)	0.047**(2.10)	0.042** (2.25)
Capital	–0.025* (–1.90)	–0.023* (–1.88)	–0.021* (–1.78)
BTM	–0.015 (–1.50)	–0.014 (–1.64)	–0.017 (–1.59)
RoA	0.040** (2.00)	0.038** (2.24)	0.034** (2.07)
T_CS	–0.030 (–1.23)	–0.037 (–1.42)	–0.028 (–1.47)
BTM-t	–0.010 (–1.00)	–0.009 (–0.98)	–0.015 (–1.14)
Covid	0.065** (2.20)	0.071** (2.22)	0.067** (2.26)
Constant	0.501** (2.20)	0.541** (1.98)	0.490** (2.32)
Sample size	256	256	256
R^2	0.315	0.298	0.310
Fisher's F-statistic	5.80	5.67	5.72

4.3 Robustness Tests

To ensure the robustness of our primary findings, we employ three alternative risk measures—total risk (*TR*), idiosyncratic risk (*IDIOS*), and systematic risk (*SYS*)—to assess the impact of gender diversity on the risk profiles of acquiring firms (Pathan, 2009). These measures provide complementary perspectives on firm risk, capturing different dimensions of volatility and market sensitivity.

It is important to acknowledge the limitations of these robustness tests. While the alternative risk measures provide valuable insights, they rely on specific assumptions. For instance, SYS depends on the market model, which assumes a linear relationship between a firm's returns and market returns, potentially overlooking non-linear dynamics. Additionally, the use of historical data to calculate these measures may not fully capture future risk exposures, particularly in rapidly evolving markets like China. Although these tests mitigate concerns regarding the assumptions of the Merton DD model, they do not address all potential sources of endogeneity. Unobserved firm characteristics or external economic shocks could still influence both gender diversity and risk profiles. Despite these limitations, the consistency of our results across multiple risk measures strengthens the validity of our conclusions and underscores the

importance of gender diversity in reducing corporate risk.

Following Pathan (2009), total risk (*TR*) is defined as the standard deviation of the company's daily performance, calculated as the natural logarithm of the adjusted stock price ratio for any capital adjustments during the estimation period. TR reflects the overall variability of the company's stock returns and captures market perceptions of the risks inherent in the company's assets, liabilities, and off-balance sheet positions (Pathan, 2009). The change in the acquiring company's total risk is measured as the difference in standard deviation before and after the transaction announcement: from -15 days to -105 days relative to the announcement date and from +15 days to +105 days following the announcement.

Idiosyncratic risk (*IDIOS*) and systematic risk (*SYS*) are calculated using the standard market model.

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

where i and t denote firm and time respectively; $R_{i,t}$ is the firm's equity return; $R_{m,t}$ is the return of market index; α_i is the intercept term; ε_i is the residuals. β_i is the *SYSR* of company i. while *IDIOR* is calculated as the standard deviation of residuals.

Systematic (*SYSR*) and idiosyncratic risks (*IDIOR*) are measured over the estimation window (-15 days, -105 days before the announcement and +15 days, +105 days after announcement). The systematic risk difference score and idiosyncratic risk difference score are calculated by subtracting the post-acquisition estimate from its respective pre-acquisition estimate. We used the same methodology to calculate the variation in the risk profile of the control firm. Our main conclusions remain consistent when alternative risk measures are employed. These findings reinforce our initial observations and provide further evidence that both the proportion of women on the board and the presence of women in top management are associated with lower firm risk. The detailed robustness test results IV regression results are shown in the Appendix on the Journal's website.

5. Conclusion

In this study, we utilize mergers and acquisitions as a controlled setting to examine their impact on the risk profiles of Chinese acquiring firms, with a particular focus on the role of gender diversity in boards of directors and top management positions (i.e., CEOs, CFOs, and board chairs). Analyzing a sample of 256 M&A transactions announced and completed between 2010 and 2023, we find that these transactions significantly increase the risk profile of acquiring firms. However, our results also reveal that greater gender diversity, both on boards and in top management, mitigates this risk. Specifically, a higher proportion of women on the board and the presence

of at least three female directors are associated with lower risk-taking, supporting the critical mass theory. Furthermore, firms with women in top management positions exhibit more conservative risk strategies, aligning with prior research that highlights women's tendency toward risk aversion (Huang and Kisgen, 2013; Levi *et al.*, 2014).

These findings underscore the strategic importance of gender diversity in corporate governance. By fostering a more inclusive leadership structure, firms can enhance decision-making quality, reduce excessive risk-taking, and ultimately improve long-term financial stability. For Chinese policymakers, these results provide a compelling rationale for implementing measures to promote gender diversity, such as voluntary or mandatory quotas, as seen in countries like Norway and Italy (Ahern and Dittmar, 2012; Ferrari *et al.*, 2016). Corporate leaders, too, should recognize the value of gender diversity, not only as a means of improving governance but also as a driver of shareholder value and organizational resilience.

This study is not without limitations. First, while we control for a range of firm-specific and macroeconomic factors, unobserved variables may still influence both gender diversity and risk profiles. Second, our focus on M&A transactions in China limits the generalizability of our findings to other contexts or types of corporate decisions. Future research could extend this work by exploring the impact of gender diversity in different industries, regions, or decision-making contexts, such as capital investments or innovation strategies. Longitudinal studies could also provide deeper insights into how the effects of gender diversity evolve over time, particularly in response to regulatory changes or shifts in cultural norms. Finally, qualitative research could shed light on the mechanisms through which gender diversity influences corporate risk-taking, offering a more nuanced understanding of the underlying dynamics.

In conclusion, this study highlights the critical role of gender diversity in shaping corporate risk profiles, particularly in the context of M&A transactions in China. By promoting gender-balanced leadership, firms and policymakers can not only enhance corporate governance but also contribute to broader economic stability and sustainability. These findings call for efforts to break down barriers to women's advancement in corporate leadership, paving the way for more inclusive and resilient business practices.

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