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RESEARCH ARTICLE

Do women empower other women? Empirical evidence of the effect of female pervasiveness on firm risk-taking

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Abstract
This study examines the relationship between female pervasiveness within the entire company and firm-risk taking. We exploit The UK Equality Act (2010), further enforced in 2017, which was made mandatory for firms operating in UK to disclose their gender pay gap. We use this measure to proxy female pervasiveness and we find it to be negatively associated with firm risk-taking. These results are robust to several tests using female participation in each pay quartile and the difference in bonus payments between men and women. Our findings provide insights into the role played by women consistent with tokenism theory predictions.

KEYWORDS
compensation, firm risk, gender diversity, gender pay gap, women on board

JEL CLASSIFICATION
G32, M14, J31, M51, D22

1 | INTRODUCTION

Men and women seem to diverge in their attitudes and behaviour, including risk-taking (Croson & Gneezy, 2009), but previous studies still report mixed results on this association (Pandey et al., 2019; Sila et al., 2016; Sun et al., 2019; Van Vo et al., 2021). On the one hand, female managers seem significantly more risk-averse and conservative than their male counterparts (Croson & Gneezy, 2009). Faccio et al. (2016) and Van Vo et al. (2021) find that female-led firms are risk-averse, and Dong et al. (2017) show a similar result on female directors. On the other hand, the literature argues that female traits existing in the general population are not reflected in decision-making when they reach the top echelons (García Lara et al., 2017; Matsa & Miller, 2013). in parallel, tokenism theory (Kanter, 2008) posits that women contribute to decision-making only if empowered to form coalitions through which they can convey their opinions. Without a supportive corporate environment that facilitates female solidarity and alliances, women risk becoming 'tokens' and being discriminated against, even when they hold executive-level positions. However, prior studies only consider the female presence in the firm's corporate echelons when examining the association between women and risk-taking (e.g., Pandey et al., 2019; Sun et al., 2019; Van Vo et al., 2021). We fill this gap by studying female pervasiveness within firms and its association with risk-taking.

We rely on a set of listed firms subject to the UK Gender Pay Gap regulation from 2017 to 2019. We measure female pervasiveness throughout the gender pay gap (hereafter, GPG), computed as the weighted difference in hourly salary between men and women at any organisational level. Smaller compensation gaps indicate more female pervasiveness and potentially more decision power (not only on the board of directors or exclusively as CEO or CFO in a masculine environment). Moreover, we extend the analysis on the role of female pervasiveness in each pay quartile and on the payment of bonuses. Consistent with the existing literature (Faccio et al., 2016; John et al., 2008), we measure firm risk-taking by the volatility of cash flow margin and firm profitability. Our results suggest that female pervasiveness across the entire company is negatively associated with the firm's risk-taking. We also show that the influence of women in decision-making not only depends on their presence in the apical roles but on their participation in the entire company and how their presence at different levels can empower female top corporate echelons. Moreover, our study shows that a holistic approach is needed to understand the impact of the presence of women on firm outcomes, especially risk-taking.

This study makes several contributions to the existing literature. First, to the best of our knowledge, this is the first study exploring the influence of women across the entire company and firm outcomes. Prior studies explore the consequences of having more women in the upper echelons (e.g., Pandey et al., 2019; Sila et al., 2016). Given the critical attention paid to gender diversity by shareholders and policymakers (Van Vo et al., 2021), how companies manage firm outcomes remains a relevant research question. This study sheds light on the association between female pervasiveness and firms' risk-taking, adding a novel perspective to the gender studies in accounting and finance fields (e.g., Faccio et al., 2016; García Lara et al., 2017). Specifically, we employ several measures of female participation within the firm, focusing on their presence in each pay quartile. Our results provide evidence that firms with more female pervasiveness take less risk.

Second, this study relies on a sample of listed firms subjected to the UK GPG regulation. The UK represents an ideal context to study female pervasiveness as it has emphasised the role of corporate governance and made companies particularly innovative in this field (García Lara et al., 2017). Specifically, the UK became the primary mandator of disclosure of GPG at all levels in firms (Brown, 2019). Finally, this study adds features consistent with tokenism theory predictions and provides consistent evidence by exploring different company levels. In particular, women's participation in the second most paid quartile is negatively associated with firm risk-taking. These findings offer new insights to be considered in gender diversity research in that a female environment can support decisions at the top levels of the firm hierarchy.

The remainder of this paper is organised as follows: Section 2 reviews previous literature and presents the hypothesis development, Section 3 describes the sample selection process and research methodology. The results are presented and discussed in Section 4, Section 5 reports additional analyses and Section 6 concludes.

2 | LITERATURE REVIEW, INSTITUTIONAL BACKGROUND, AND HYPOTHESIS DEVELOPMENT

2.1 | Previous literature on female risk-taking

Prior literature in psychology acknowledges that men and women differ in their attitudes, including conservatism, overconfidence, and risk tolerance (Croson & Gneezy, 2009). Because these differences can affect decision-making, the gender diversity issue has received increased attention in corporate finance and accounting literature over the past decade. Indeed, prior research suggests that board characteristics influence firm risk-taking. According to agency theory (Jensen & Meckling, 1979), Farrell and Hersch (2005) found that firms are more likely to select women directors when those firms are characterised by lower participation of women in the board or requiring female directors to be replaced. Gregory-Smith et al. (2014) reported a similar finding for UK firms. Moreover, women directors are associated with higher profit and cost efficiency, lower risk, and reduced financing costs (Dong et al., 2017; Pandey et al., 2019). These findings generally agree that women reflect their lower risk tolerance in decision-making settings.

Nevertheless, Adams and Funk (2012) further explore how women behave after breaking through the glass ceiling. They find that female directors in Swedish firms are more risk-tolerant than their male counterparts. Matsa and Miller (2013), Sila et al. (2016), and Chen et al. (2019) also demonstrate that women directors' decisions are not always an expression of their less risky behaviour. For example, Chen et al. (2019) find that female directors in US firms are risk-averse when their firm's reputation is at risk but are not averse to accepting a certain level of financial risk. Most research on gender diversity focuses on the presence of women on boards. However, existing literature reports inconsistent findings on female behaviour, which indicate that women might behave more like men in their approach to decision-making when they reach the top echelons (e.g., García Lara et al., 2017; Kanter, 2008; Sila et al., 2016). Otherwise, women might be marginalised if they cannot fit into the male-dominated environment and follow their stereotypical approach. Indeed, Kanter (1977) explained that top management's behaviour reveals critical differences among the positions in the hierarchies.

Previous studies on female executives drew on the upper echelon's theory (Hambrick & Mason, 1984), which posits that top corporate managers' cognitive structures and values are reflected in firms' outcomes (Hambrick, 2007). Executives' decisions are influenced by their personal experiences, interpretations, and values. Given the psychological differences between men and women, upper echelons theory supports critical consideration of the effect of gender on firms' outcomes because the CEO/CFO makes significant decisions related to investment and financial policy (Huang & Kisgen, 2013; Pandey et al., 2019). Women serving as CFOs help firms enhance accrual quality and strengthen accounting conservatism (Francis et al., 2015). Sun et al. (2019) find how female CFOs are less likely to engage in financial reporting fraud, and Harris et al. (2019) demonstrate how the presence of female CEOs is less associated with earnings management, and they are confined to lower levels of equity-based compensation. Similarly, Huang and Kisgen (2013) and Faccio et al. (2016) find that female CEOs exhibit greater risk aversion by reducing the debt level, leverage ratio, and performance volatility. Van Vo et al. (2021) report similar findings in emerging economies, showing how female-led Vietnamese companies accept fewer risks.

Overall, these findings support how women are more cautious and conservative in decision-making than their male counterparts, and these characteristics might determine female risk tolerance (Bachmann & Spiropoulos, 2020; Levi et al., 2014).

2.2 | GPG and UK institutional background

Prior literature on gender diversity explores the existence of GPG, focusing on top corporate positions. For example, Bertrand and Hallock (2001) document how gender pay differentials favour male over female executives by 13.0%, and Geiler and Renneboog (2015) show substantial pay discrimination (almost 23.0%) between executive directors, excluding the CEO. On the contrary, Bugeja et al. (2012) do not find significant differences among US CEOs.

Prior studies on GPG are only based on top corporate positions. However, discussions are underway to introduce a GPG reporting law across EU countries that consider GPG at all levels of the organisation (WSJ, 2021). Specifically, the UK has very progressive legislation, making it mandatory for companies (the first country in the world) to disclose information about GPG at any organisational level. The UK Equality Act (2010), furtherly enforced in 2017, aims to achieve gender equality through pay transparency reporting. When the GPG reporting law became effective, men earned 18.4% more than women in the United Kingdom (Office for National Statistics, ONS, 2017) and Citigroup also disclosed a 29.0% GPG (Citigroup, 2018).

The Equality Act applies to public, private, and voluntary employers who employ at least 250 employees (Brown, 2019). Companies must publish their GPG figures as a snapshot of their situation on 4 April of the preceding year. Specifically, employers must upload a GPG report which includes the percentage difference in mean (median) hourly pay rate between full-time male and female employees, the mean (median) bonus for full-time male and female employees, and the percentage of men and women in each pay quartile – on both the UK Government's and their website. Not complying with mandatory reporting could prompt action by the Equality and Human Rights Commission to enforce the law.

2.3 | Hypothesis development

Prior studies show how women's empowerment grows as their relative numbers increase. Matsa and Miller (2013) find that women directors proxy the likelihood of women becoming CEOs and executives' participation in decision-making. Women in top leadership roles are more cordial and collaborative in a female-dominated environment and are willing to include employees in decision-making (Melero, 2011; Tate & Yang, 2015; Van Vo et al., 2021). However, female pervasiveness is a determining factor in increasing the number of women on boards (Hillman et al., 2007; Pandey et al., 2019). Kanter (1977, 2008) also reports this as the mechanism for women to empower their peers and explain that the inherent gender-related differences between men and women in similar job positions might determine women directors' lack of power. Then, gender-based differences in the firm should be significant, and we expect increasing female pervasiveness to be the one distinction within corporate roles that influences the risk-taking by a firm. As women are typically considered more risk-averse than men, we hypothesise that:

H1 Firms with higher female pervasiveness assume less risk than those with less female pervasiveness.

3 | EMPIRICAL TESTS

3.1 | Sample selection

Our sample selection process started by including listed firms subject to the UK GPG disclosure regulations and covered by the Thomson Reuters Datastream database from 2017 to 2019. The sample period begins in 2017 because of the enactment of the GPG regulations and ends in 2019, the most recent year for which GPG and accounting data were available before the COVID-19 pandemic. We obtain accounting and financial information from Thomson Reuters Datastream and gender-related measures from BoardEx. Additionally, we gathered information

TABLE 1 Sample selection.

3035	Firm-year observations of listed firms as provided in Asset4 and subject to the UK gender pay-gap disclosure regulation.
No observations dropped	Reason for dropping
248	Missing accounting or financial data from Datastream.
259	Missing BoardEx data for the percentage of women on board.
528	Missing BoardEx data for the female CEO.
12	Missing data from the gender pay gap data.
1.988	Final sample [t = 2017–2019; 776 firms]

TABLE 2 Sample composition by Industry and Year.

Industry	2017	2018	2019	Total
Basic materials	40	42	30	112
Consumer discretionary	175	181	133	489
Consumer staples	54	57	54	165
Energy	21	22	15	58
Health care	51	58	44	153
Industrials	222	231	186	639
Real estate	15	17	16	48
Technology	73	82	68	223
Telecommunications	18	18	15	51
Utilities	16	17	17	50
Total	685	725	578	1988

on ownership structures from Bureau van Dijk's Orbis database, while the UK Government's official website[1] provided GPG data.

In Table 1, we report information on the data selection process. From our initial sample of 3035 firm-year observations, we drop those with missing accounting and financial data (248), information related to women on board (259), female CEOs (528), and gender pay gap data (12). As presented in Table 1, applying these refining criteria leads us to a final sample of 1988 firm-year observations from 776 individual firms.

In Table 2, we assert information about the year and industry of our sample. The 3 years under analysis are almost equally populated. Nevertheless, there is an over/under-representation of specific industries over others. Specifically, the two most populated industries are Industrials (639) and Consumer Discretionary (489), and the least are Real Estate (48) and Utilities (50).

3.2 | Measuring female pervasiveness

Female pervasiveness indicates women's participation throughout the firm. Following Kanter's (2008) approach, women's participation is inversely related to their likelihood of being marginalised in firms' decision-making or treated as 'tokens'. Additionally, Kanter (2008) points out that the increase in minority members may allow the development of tacit empowerment phenomena among the same social group members (e.g., gender). Therefore, considering

[1]Source: https://gender-pay-gap.service.gov.uk (Accessed 10 September 2022).

women as belonging to the same social group, greater female pervasiveness should increase tacit mechanisms of empowerment and reduce the likelihood of women being excluded from decision-making.

In this study, the gender pay gap across the company is used to capture female pervasiveness (*FEMPERV*). The gender pay gap is measured by the difference in pay between men and women. As long as men cover roles of greater power and responsibility in the company than women, they receive higher compensation than their female counterparts, thereby generating a gender pay gap. From a different but related perspective, considering that men and women receive equal pay at each organisational level, the existence of a gender pay gap also reveals that the number of men in higher roles is greater than that of women and captures the lower spread of women across company levels. Consequently, a greater gender pay gap explains lower female pervasiveness as women, on average, hold a job position of lower prestige and consequently receive lower compensation than men (Blau & Kahn, 2017; Joshi et al., 2015).

Companies must calculate their GPG by determining a weighted average hourly remuneration for men based on each hour's earnings and the number of employees who receive it, followed by the weighted average pay for women. Finally, the difference in compensation between men and women is calculated.[2]

We build our GPG variable as follows: from the initial 26,585 employer-year observations from 2017 to 2019, we exclude: (i) 3620 observations with missing firm registration numbers; (ii) 1546 observations related to public sector organisations; and (iii) three observations due to duplicated employer-year data.[3] Then, we collapse the GPG information – also filed at the subsidiary level – into a parent firm-level measure. If the parent firm had subsidiaries, we calculated an average GPG for the business group. We rely on ownership data from Orbis and, following Markle (2016), we use the Global Ultimate Owner (GUO)[4] and ownership shares[5] in our analyses.

3.3 | Measuring firm risk-taking

The volatility of the cash flow margin (*SDCFLOW*) is our first risk-taking measure (John et al., 2008). This variable is the standard deviation in a firm's operating cash flow margin (ratio of cash flow from operations to sales) over 5-year rolling windows (Kobelsky et al., 2008).

We also compute a firm's operating return on sales (*SDROS*) volatility as our second measure to capture firms' risk-taking (Amit & Livnat, 1988; Bettis & Hall, 1982). Return on sales is defined as the standard deviation of the ratio between operating income and sales calculated over 5-year rolling windows. These variables are alternative measures of performance volatility (e.g., return on assets), which are less sensitive to an inaccurate accounting valuation of assets (Zingales, 1998).

3.4 | Control variables

As per prior literature (García Lara et al., 2017), we control for the percentage of female directors (*WOB*). We also create a dummy variable that takes 1, if the CEO is a woman, and 0 otherwise.

[2]We thank an anonymous reviewer for highlighting the possible limitations of the GPG calculation, as suggested by Chen et al. (2022) for a similar proxy. Unfortunately, information on compensation for individual employees is not available. Whether this information is available, it could hardly be used between companies because of different job tasks and responsibilities. However, we believe the GPG can be used to compare companies because the UK GPG reporting law defines how it must be computed and reported. These features make the measure homogeneous between firms. Nevertheless, we provide additional analyses relying on other proxies capturing female pervasiveness.

[3]Employers can potentially upload the same GPG data twice, a few seconds apart, in which case, we retain the latest update, for example, Group Employment Services Limited filed its data on 3 April 2019, at 09:56:07 a.m., referring to 5 April 2018. Subsequently, the same data was uploaded on 3 April 2019, at 09:56:26 a.m., for the same reporting date.

[4]The GUO controls at least 50.01% of one subsidiary, whereas it is not controlled by other shareholders.

[5]We assume stable group structures over the period 2017–2019 (Shroff et al., 2014). As a robustness test, we also calculate the GPG for each UK ultimate owner and results are similar to the ones in the main model.

Further, we include a set of firm-level characteristics that may affect firms' risk-taking. Prior literature associates firm risk with investment and growth opportunities (Chen et al., 2019; Sila et al., 2016). Notably, we control for growth potential by return on assets (*ROA*) and investments in fixed assets (*FIX*). Because firms with higher risk levels are less likely to survive, we consider their complexity and life stage, including the firm's age as the natural logarithm of the number of years since incorporations (*AGE*) and the firm's size as the natural logarithm of total assets (*SIZE*). Moreover, we include leverage as total long-term debt on total assets (*LEV*), a proxy for firms' complexity and risk driver (Hossain et al., 2018; Van Vo et al., 2021). Finally, we control if the company registers a loss in the previous year (*LOSS*).

All the variables are Winsorised at the top and bottom 1% of the distribution. Online Appendix S1 provides additional information on the source and description of variables.

3.5 | Empirical model

We tested our hypothesis using ordinary least squares (OLS) regression model with errors cluster at the firm-level. We also employ robust regression model because it is found to produce less biased estimates than the OLS regression model (Dal Maso et al., 2018). Specifically, we followed the model of Faccio et al. (2016) to investigate whether there was a gender effect on firm risk-taking:

$$\begin{aligned} RISK_t &= \beta_0 + \beta_1\, FEMPERV_t + \beta_2\, WOB_t + \beta_3\, FCEO + \beta_4\, LEV_t \\ &+\beta_4\, MTB_t + \beta_5\, AGE_t + \beta_6\, SIZE_t + \beta_7\, FIX_t + \beta_8\, LOSS \\ &+\beta_9\, ROA + \Sigma\, \beta_i\, Industry\ FE + \Sigma\, \beta_j\, Year\ FE + \varepsilon_{t.} \end{aligned} \quad (1)$$

4 | RESULTS

4.1 | Descriptive statistics and correlation matrix

Descriptive statistics for the dependent and independent variables in the multivariate analysis are reported in Table 3. *FEMPERV* ranged from −64.00% to 59.00%, with a mean (median) of

TABLE 3 Descriptive statistics.

Variables	Obs.	Mean	St. dev.	Min	Median	Max
SDCFLOW	*1988*	3.272	3.823	0.204	2.228	64.017
SDROS	*1988*	2.394	3.205	0.080	1.507	55.257
FEMPERV	*1988*	−16.248	11.589	−64.000	−16.267	59.000
WOB	*1988*	0.239	0.120	0.000	0.250	0.583
FCEO	*1988*	0.037	0.189	0.000	0.000	1.000
LEV	*1988*	0.233	0.156	0.000	0.218	0.947
MTB	*1988*	3.299	39.016	−1423.217	2.471	722.515
AGE	*1988*	3.200	0.739	0.000	3.367	4.025
SIZE	*1988*	16.409	2.447	11.017	16.039	26.576
FIX	*1988*	0.220	0.189	0.002	0.165	0.973
LOSS	*1988*	0.111	0.314	0.000	0.000	1.000
ROA	*1988*	0.093	0.124	−0.225	0.078	3.260

Note: See online Appendix S1 for variables definition.

16.25% (16.27%). Further analysis revealed that only 6.39% of firm-year observations in our sample showed a female predominance throughout the company (*FEMPERV* above 0). An average firm in the sample had 23.90% *WOB*, ranging between 0.00% and 58.30%. These values are as might be expected in the absence of a gender quota law in the UK. Stated differently, an average firm in our sample reported an average gender pay gap of 16.25%, despite having 23.90% female directors.

Additionally, the firms in our sample had an average (median) market value of equity of £3,299,000 (£2,471,000). The mean (median) *LEV* is 23.30% (21.80%), while the mean (median) of *FIX* is 22.00% (16.50%). Moreover, an average firm in the sample reported an average (median) *SIZE* £16,409,000 (£16,039,000) and a mean (median) *AGE* of 3.2 (3.37).

Table 4 presents Pearson's correlation coefficients between variables. As expected, *FEMPERV* shows a significantly positive association with all firm-risk measures (*SDCFLOW*, *SDROS*). When we consider the association between *WOB*, we find how the presence of women on the board is generally negatively associated only with *SDROS*. *AGE* is significantly negatively associated with all firm-risk measures (statistically significant at the 1% level), and it is consistent with the findings of Faccio et al. (2016) and Sila et al. (2016) that older firms assume less risk and are more likely to survive. Moreover, investments in tangible assets (*FIX*) show a positive and strong correlation (significant at the 1% level) with *SDROS*. Accordingly, firms that invest more are more exposed to risk-taking.

4.2 | Multivariate analysis

We start by regressing our risk variables on the *FEMPERV* to analyse the hypothesised relation. Table 5 reports our main findings.[6] First, multicollinearity is examined using variance inflation factors (VIF) and found to be consistently smaller than 4. Prior literature suggests that values below 10 limit multicollinearity problems (Hair et al., 2009).

Columns (1) and (2) show the results using the volatility of the firm-level cash flow margin (*SDCFLOW*) as a dependent variable. The coefficient of *FEMPERV* is negative and significant at 5%. Consistent with the initial conjectures, the pervasiveness of women in a firm reduces firm risk-taking. Columns (3) and (4) show that the volatility of a firm's profitability (*SDROS*) is significantly higher for firms with lower female pervasiveness at 5%. *LEV* and *LOSS* are positively and significantly associated with firm risks, consistent with a positive association between high-leverage and loss-making companies with risk. Moreover, *AGE*, *SIZE*, and *ROA* are negatively associated with firm risk, suggesting how bigger, mature, and more profitable companies are less associated with risk. Overall, lower values of pervasiveness are negatively associated with more company risk (i.e., a high value of standard deviations of *SDCFLOW* and *SDROS*, respectively). Specifically, this evidence leads us to accept the main hypothesis consistent with the findings from psychological studies that there is a significant difference in the tendency of men and women to make decisions fraught with risk (Croson & Gneezy, 2009). Our results are further supported by the tokenism theory predictions (Kanter, 2008; Liu, 2018).

5 | ADDITIONAL ANALYSES

5.1 | Female pervasiveness in each pay quartile

Under the tokenism theory (Kanter, 2008), women need to reach a certain critical threshold to gain enhanced opportunities and be able to influence the decision-making process. Torchia et al. (2011) identified the need for three women to reach that threshold on the board of directors.

[6]In online Appendix S3, we conducted additional tests. The estimation results of these analyses qualitatively resemble those reported in Table 5.

TABLE 4 Pearson correlation coefficients.

		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
SDCFLOW	1	1.000											
SDROS	2	0.556***	1.000										
FEMPERV	3	−0.106***	−0.116***	1.000									
WOB	4	−0.013	−0.047**	−0.006	1.000								
FCEO	5	0.069***	0.012	−0.011	0.171***	1.000							
LEV	6	0.066***	0.077***	0.186***	−0.006	0.005	1.000						
MTB	7	0.011	−0.022	−0.007	−0.009	0.008	−0.005	1.000					
AGE	8	−0.169***	−0.090***	0.011	0.023	0.001	−0.154***	−0.060***	1.000				
SIZE	9	−0.096***	−0.055**	−0.017	−0.207***	−0.039*	0.009	−0.038*	0.278***	1.000			
FIX	10	0.029	0.073***	0.122***	−0.009	0.010	0.191***	−0.050**	0.062***	0.034	1.000		
LOSS	11	0.111***	0.202***	−0.005	−0.085***	−0.010	0.100***	−0.013	−0.065***	−0.106***	0.012	1.000	
ROA	12	−0.044**	−0.050**	−0.024	0.134***	0.015	−0.042*	0.229***	−0.045**	−0.177***	−0.058**	−0.189***	1.000

Note: Number of observations: 1988. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

TABLE 5 The influence of female pervasiveness on firm risk-taking.

	(1)	(2)	(3)	(4)
Dependent Variable	**SDCFLOW**	**SDCFLOW**	**SDROS**	**SDROS**
Constant	8.029***	7.053***	4.266***	3.998***
	(1.193)	(1.081)	(0.838)	(0.738)
FEMPERV	**−0.022*** **	**−0.021** **	**−0.024*** **	**−0.021** **
	(0.008)	**(0.010)**	**(0.008)**	**(0.011)**
WOB	−0.282	−1.134	−0.414	−1.079
	(1.104)	(0.996)	(0.792)	(0.664)
FCEO	1.129*	1.207	0.216	0.156
	(0.638)	(0.826)	(0.319)	(0.418)
LEV	1.526**	1.136	1.241**	1.329*
	(0.758)	(0.884)	(0.608)	(0.718)
MTB	0.000	0.000	−0.002	−0.002
	(0.003)	(0.003)	(0.002)	(0.002)
AGE	−0.675***	−0.664***	−0.235**	−0.208*
	(0.148)	(0.183)	(0.097)	(0.124)
SIZE	−0.205***	−0.121***	−0.138**	−0.094***
	(0.065)	(0.045)	(0.061)	(0.036)
FIX	−0.607	−0.583	0.727*	0.591
	(0.673)	(0.829)	(0.390)	(0.544)
LOSS	0.524*	0.621**	1.401***	1.432***
	(0.284)	(0.295)	(0.258)	(0.279)
ROA	−2.479***	−2.321***	−0.827**	−0.685
	(0.609)	(0.851)	(0.395)	(0.475)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	No	Yes	No
Observations	1,988	1,988	1,988	1,988
Errors	Robust	Cluster	Robust	Cluster
Adjusted R-squared	0.126	0.118	0.145	0.137
F-Statistics	8.210***	4.862***	9.597***	5.037***

Note: This table presents the results of Model (1). Dependent and independent variables are as described in online Appendix S1. Dependent variables are multiplied by 100. *t* statistics in parentheses. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively. Variables Winsorised at the 1st and 99th percentiles.

Main variables are in bold.

The theory of tokenism has been mainly oriented to top management roles from the accounting and finance strands of study (Liu, 2018).

However, Kanter (1977, p. 209) suggests this theory to all organisational levels where one group is dominant over the other and explains that 'if the ratio of women to men in various parts of the organization begins to shift, as affirmative action and new hiring and promotion policies promised, forms of relationships and peer culture should also change'. According to the author, the minority should reach at least 15% to achieve critical mass.

Moreover, Regenburg and Seitz (2021) use the quartiles based on the employees' salaries to identify their authority within the decision-making process because they expect that the most-paid employees will have more power (e.g., authority) to influence the decision-making process. Consistently, we consider the percentage of women in each quartile of the firm's pay distribution and employ a dummy variable that captures the female participation in each pay quartile. Specifically, each dichotomous variable assumes the value of 1 if women are at least 15% and 0 otherwise. Table 6 shows the results.

In Table 6, we report the results of *FEMPERV* on *SDCFLOW* and *SDROS* when we consider the proportion of women in the first (*FEMQ1*), second (*FEMQ2*), third (*FEMQ3*), and fourth (*FEMQ4*) quartile of salary, respectively. In Panel A, *FEMQ1* is negatively and significantly associated with *SDROS* (columns (5) and (6)) while negatively but insignificantly associated with *SDCFLOW* (columns (1) and (2)), suggesting the higher presence of women in the first quartile of company's salaries is negatively associated with firms' risks. Similarly, we find that *FEMQ2* is negatively and significantly associated with *SDCFLOW* (columns (3) and (4)) and *SDROS* (columns (7) and (8)), respectively. In Panel B, we report the results of *FEMPERV* on *SDCFLOW* and *SDROS* when we consider the proportion of women in the third (*FEMQ3*) and fourth (*FEMQ4*) quartile of salary, respectively. Although we find a negative association between *FEMQ3*, *SDCFLOW*, and *SDROS* (columns (1), (2), (5), (6)), the results are not significant at conventional levels. Similarly, we find how *FEMQ4* is only negatively and significantly associated with *SDCFLOW* (columns (3) and (4)) while negatively but insignificantly associated with *SDROS* (columns (7) and (8)).

Overall, our results show that female pervasiveness influences firm risk-taking when considering the presence of women in quartiles. Under the tokenism theory, our additional analyses show that female participation must reach the critical threshold of at least 15% in the company's highest-paid roles and in the second quartile to influence risk-taking.

5.2 | The role of bonus

This study explores female pervasiveness across the entire firm, measured as the wage difference between men and women. This procedure is consistent with previous studies showing that occupational prestige and the social and economic value associated with job positions are predictor variables of male–female distribution of organisational roles and employment outcomes (Joshi et al., 2015). Indeed, while one strand of research has documented a lack of women in the firm upper echelons and a persistent gap in salaries in favour of men, another strand of studies has found that women are less likely to be subject to promotion mechanisms across the firm than their male counterparts (Blau & Kahn, 2017).

A possible explanation for the above discussion is related to the demographic composition of corporate roles, particularly the complexity and prestige of these roles. Indeed, these features shape employees' corporate outcomes and performance appraisal as they are critical predictors of rewards allocation (e.g., pay, bonuses, and incentives). Considering the lower involvement of women in prestigious roles, performance evaluation and awarding could be assigned to the dominant social group as opposed to the token minority (Joshi et al., 2015).

Consistent with previous literature, bonus payments capture an employee's role appreciation and perceived capabilities (Kulich et al., 2011). Therefore, women's participation in bonus payments captures a distinct perspective of the distribution of women across the firm. We proxy female pervasiveness as the difference in bonus payments between men and women multiplied by −1. In Table 7, we report the analysis of the association of the difference between men and women when receiving bonuses from their companies (*BONUS*) and firm risk (*SDCFLOW* and *SDROS*).

In columns (1) and (3), we find that female pervasiveness (*BONUS*) is negatively and significantly associated with risk-taking ($p < 0.10$). However, these results do not hold when we cluster the errors by firm (columns (2) and (4)).

TABLE 6 The influence of female pervasiveness break down into quartiles on firm risk-taking.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Dependent variable	**SDCFLOW**	**SDCFLOW**	**SDCFLOW**	**SDCFLOW**	**SDROS**	**SDROS**	**SDROS**	**SDROS**
Constant	8.123***	7.154***	8.200***	7.352***	4.494***	4.305***	4.454***	4.364***
	(1.206)	(1.109)	(1.196)	(1.099)	(0.848)	(0.798)	(0.839)	(0.775)
FEMPERV	**−0.021*** **	**−0.020***	**−0.023*** **	**−0.023** **	**−0.021*** **	**−0.019***	**−0.025*** **	**−0.023** **
	(0.008)	**(0.010)**	**(0.008)**	**(0.010)**	**(0.008)**	**(0.011)**	**(0.008)**	**(0.011)**
FEMQ1	**−0.174**	**−0.155**			**−0.426*** **	**−0.472** **		
	(0.186)	**(0.221)**			**(0.146)**	**(0.225)**		
FEMQ2			**−0.541*** **	**−0.481** **			**−0.599*** **	**−0.590*** **
			(0.169)	**(0.213)**			**(0.176)**	**(0.211)**
WOB	−0.142	−1.033	−0.046	−0.977	−0.061	−0.775	−0.138	−0.886
	(1.133)	(1.018)	(1.108)	(0.997)	(0.789)	(0.656)	(0.791)	(0.661)
FCEO	1.131*	1.215	1.133*	1.229	0.218	0.181	0.218	0.181
	(0.638)	(0.825)	(0.637)	(0.826)	(0.319)	(0.416)	(0.319)	(0.415)
LEV	1.544**	1.151	1.560**	1.155	1.306**	1.385*	1.301**	1.363*
	(0.757)	(0.882)	(0.757)	(0.882)	(0.607)	(0.718)	(0.605)	(0.716)
MTB	0.000	0.000	0.000	0.000	−0.002	−0.002	−0.002	−0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
AGE	−0.681***	−0.669***	−0.678***	−0.664***	−0.238**	−0.210*	−0.227**	−0.198
	(0.148)	(0.184)	(0.147)	(0.183)	(0.095)	(0.122)	(0.096)	(0.123)
SIZE	−0.202***	−0.121***	−0.196***	−0.119***	−0.134**	−0.095***	−0.131**	−0.093***
	(0.065)	(0.045)	(0.065)	(0.045)	(0.060)	(0.036)	(0.061)	(0.036)
FIX	−0.653	−0.615	−0.760	−0.699	0.608	0.491	0.553	0.447
	(0.682)	(0.840)	(0.674)	(0.833)	(0.397)	(0.555)	(0.392)	(0.549)
LOSS	0.522*	0.620**	0.507*	0.606**	1.406***	1.439***	1.392***	1.425***
	(0.284)	(0.295)	(0.282)	(0.294)	(0.257)	(0.278)	(0.256)	(0.277)
ROA	−2.470***	−2.304***	−2.438***	−2.272***	−0.807**	−0.632	−0.785**	−0.623
	(0.610)	(0.851)	(0.613)	(0.861)	(0.397)	(0.489)	(0.396)	(0.488)

TABLE 6 (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Dependent variable	**SDCFLOW**	**SDCFLOW**	**SDCFLOW**	**SDCFLOW**	**SDROS**	**SDROS**	**SDROS**	**SDROS**
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	No	Yes	No	Yes	No	Yes	No
Observations	1988	1988	1988	1988	1988	1988	1988	1988
Errors	Robust	Cluster	Robust	Cluster	Robust	Cluster	Robust	Cluster
Adjusted R-squared	0.125	0.117	0.128	0.119	0.147	0.140	0.149	0.142
F-Statistics	7.824***	9.299***	8.268***	4.570***	9.302***	4.775***	9.407***	4.800***
	Column(1)	**Column(2)**	**Column(3)**	**Column(4)**	**Column(5)**	**Column(6)**	**Column(7)**	**Column(8)**
Panel B: Dependent variable	**SDCFLOW**	**SDCFLOW**	**SDCFLOW**	**SDCFLOW**	**SDROS**	**SDROS**	**SDROS**	**SDROS**
Constant	8.022***	7.122***	8.432***	7.507***	4.261***	4.049***	4.267***	4.021***
	(1.193)	(1.085)	(1.202)	(1.100)	(0.838)	(0.742)	(0.850)	(0.744)
FEMPERV	**−0.023*** **	**−0.022** **	**−0.027*** **	**−0.025** **	**−0.025*** **	**−0.022** **	**−0.024*** **	**−0.021* **
	(0.008)	**(0.011)**	**(0.009)**	**(0.011)**	**(0.008)**	**(0.011)**	**(0.009)**	**(0.012)**
FEMQ3	**−0.216**	**−0.155**			**−0.117**	**−0.115**		
	(0.196)	**(0.264)**			**(0.161)**	**(0.216)**		
FEMQ4			**−0.754*** **	**−0.600* **			**−0.003**	**−0.031**
			(0.270)	**(0.336)**			**(0.212)**	**(0.271)**
WOB	−0.202	−1.085	−0.115	−1.035	−0.371	−1.042	−0.414	−1.074
	(1.125)	(1.015)	(1.123)	(1.003)	(0.805)	(0.665)	(0.806)	(0.671)
FCEO	1.137*	1.218	1.146*	1.232	0.220	0.164	0.216	0.157
	(0.638)	(0.827)	(0.637)	(0.826)	(0.320)	(0.419)	(0.319)	(0.418)
LEV	1.537**	1.145	1.547**	1.145	1.247**	1.335*	1.241**	1.329*
	(0.757)	(0.882)	(0.757)	(0.884)	(0.607)	(0.716)	(0.608)	(0.718)

(Continues)

TABLE 6 (Continued)

	Column(1)	Column(2)	Column(3)	Column(4)	Column(5)	Column(6)	Column(7)	Column(8)
Panel B: Dependent variable	**SDCFLOW**	**SDCFLOW**	**SDCFLOW**	**SDCFLOW**	**SDROS**	**SDROS**	**SDROS**	**SDROS**
MTB	0.000	0.000	0.000	0.000	−0.002	−0.002	−0.002	−0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
AGE	−0.676***	−0.663***	−0.673***	−0.661***	−0.235**	−0.207*	−0.235**	−0.208*
	(0.148)	(0.183)	(0.147)	(0.184)	(0.097)	(0.125)	(0.097)	(0.125)
SIZE	−0.198***	−0.119***	−0.198***	−0.121***	−0.134**	−0.093***	−0.138**	−0.094***
	(0.065)	(0.045)	(0.064)	(0.045)	(0.060)	(0.036)	(0.060)	(0.036)
FIX	−0.660	−0.616	−0.666	−0.615	0.698*	0.567	0.726*	0.589
	(0.668)	(0.830)	(0.669)	(0.827)	(0.384)	(0.539)	(0.390)	(0.544)
LOSS	0.516*	0.615**	0.500*	0.601**	1.397***	1.428***	1.401***	1.431***
	(0.284)	(0.296)	(0.282)	(0.292)	(0.258)	(0.280)	(0.258)	(0.280)
ROA	−2.463***	−2.306***	−2.488***	−2.318***	−0.818**	−0.674	−0.827**	−0.685
	(0.611)	(0.853)	(0.610)	(0.854)	(0.394)	(0.476)	(0.395)	(0.475)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	No	Yes	No	Yes	No	Yes	No
Observations	1988	1988	1988	1988	1988	1988	1988	1988
Errors	Robust	Cluster	Robust	Cluster	Robust	Cluster	Robust	Cluster
Adjusted *R*-squared	0.126	0.118	0.128	0.119	0.144	0.137	0.144	0.136
F-Statistics	8.312***	4.561***	8.077***	4.567***	9.387***	4.698***	9.199***	4.689***

Note: Dependent variables are multiplied by 100. *t* statistics in parentheses. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively. Variables Winsorised at the 1st and 99th percentile.

Main variables are in bold.

TABLE 7 Female pervasiveness measured as the difference in bonus payments.

	(1)	(2)	(3)	(4)
Dependent Variable	**SDCFLOW**	**SDCFLOW**	**SDROS**	**SDROS**
Constant	8.042***	7.152***	4.318***	4.113***
	(1.216)	(1.132)	(0.849)	(0.753)
BONUS	**−0.123***	**−0.134**	**−0.111***	**−0.126**
	(0.074)	**(0.091)**	**(0.063)**	**(0.080)**
WOB	−0.292	−1.107	−0.418	−1.050
	(1.102)	(0.996)	(0.795)	(0.666)
FCEO	1.134*	1.219	0.219	0.168
	(0.637)	(0.826)	(0.316)	(0.414)
LEV	1.292*	0.914	0.979	1.106
	(0.767)	(0.887)	(0.612)	(0.719)
MTB	0.000	0.000	−0.002	−0.002
	(0.003)	(0.003)	(0.002)	(0.002)
AGE	−0.686***	−0.675***	−0.246**	−0.219*
	(0.147)	(0.182)	(0.096)	(0.124)
SIZE	−0.201***	−0.121***	−0.132**	−0.094***
	(0.064)	(0.045)	(0.060)	(0.036)
FIX	−0.635	−0.605	0.685*	0.565
	(0.677)	(0.835)	(0.394)	(0.549)
LOSS	0.537*	0.630**	1.414***	1.441***
	(0.285)	(0.294)	(0.258)	(0.279)
ROA	−2.484***	−2.343***	−0.833**	−0.707
	(0.611)	(0.852)	(0.397)	(0.477)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	No	Yes	No
Observations	1988	1988	1988	1988
Errors	Robust	Cluster	Robust	Cluster
Adjusted R-squared	0.124	0.116	0.140	0.134
F-Statistics	8.181***	5.016***	9.477***	4.946***

Note: This table presents the results of Model (1). Dependent and independent variables are as described in online Appendix S2. Dependent variables are multiplied by 100. t statistics in parentheses. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively. Variables Winsorised at the 1st and 99th percentiles.

Main variables are in bold.

Overall, these results suggest how pervasiveness computed on those most likely to have a role of power (e.g., those receiving bonuses linked to firm performance) is still negatively associated with risk-taking. Still, its role seems to be reduced compared with the gender pay gap. A possible explanation is linked to the aim of bonuses that might be related to more risk-taking; still, it might not be the primary driver.

Finally, we run several additional analyses to test our main findings; tabulated results are reported in online Appendix S3. Specifically, we provide evidence considering the UK ultimate owner, and we control for the CFO gender in the UK context and full sample. Furthermore, we run our models for different proxies of female pervasiveness (e.g., we consider female pervasiveness in the most paid quartiles, and we create a variable capturing whether the critical mass is 'reachieved' in each pay quartile). Finally, we also control for country-level measures following Dal Maso et al. (2018). Overall, additional analyses support our main findings that firms with higher female participation in the entire company take less risk.

6 | SUMMARY AND CONCLUSIONS

Existing literature provides a partial understanding of the effect of women's presence and firm risk-taking because prior studies only consider the percentage of females on the board of directors or whether a woman is a CEO/CFO as a measure of gender diversity (e.g., Faccio et al., 2016; Sila et al., 2016). The reason is that prior studies rely on the implicit assumption that firms have the same organisational structure and did not consider female pervasiveness and internal mechanisms of coalitions. However, some firms make decisions with top executives' consensus, not CEOs/CFOs alone. Therefore, the gender composition of the decision-making group may determine women's empowerment in decision-making (Kanter, 2008) thus influencing firms' risk-taking. Therefore, we assume the perspective of women's pervasiveness to measure gender-based differences using a larger sample of individuals. This helps us to capture more cross-sectional variations in personal and firms' characteristics that are expected to influence firm risk-taking. As a result, we find female pervasiveness in the entire company to be associated with lower firm risk-taking.

Our study contributes to the existing literature on gender diversity in the accounting and finance field by using a novel proxy for gender diversity based on job positions between men and women within a firm. Female pervasiveness can capture the internal mechanism of female-to-female empowerment and reveal how women influence firm decisions in different job roles. Indeed, GPG information may be important to determine women's power in decision-making (Bugeja et al., 2012; Geiler & Renneboog, 2015; Kanter, 2008) and to describe how women's pervasiveness affects firm risk-taking. The results indicate that female pervasiveness might be a commentary proxy for gender equality than the number of female directors or whether the CEO/CFO of a firm is female. This is because if women are not represented adequately at all levels in a firm, they might be marginalised in the top management groups in male-dominated firms and would be unable to influence the firm's risk-taking.

This study contributes further to the existing literature by providing evidence that not all women affect firms' risk-taking similarly. Our evidence reveals that to measure gender diversity, we should analyse the firm's compensation policy rather than just the top management composition. Indeed, several countries are currently discussing the business case argument over the need for GPG transparency (Harvard Business Review, 2020). Our empirical findings can aid policymakers in delineating future policies to achieve gender equality and promote women's progress in business because it provides timely evidence on the effect of gender-related pay differentials on firms' outcomes. Our results prove that gender equality cannot be achieved by increasing the number of women in top corporate positions and female representation in all corporate roles.

One potential limitation of this study is that it does not examine female pervasiveness at each organisational level (e.g., top management teams, middle-management positions, or individual power roles other than CEO/CFO) due to data constraints. Therefore, future research can add to the literature by investigating the effects of GPG at each organisational level and exploring whether there are significant effects on firms' decisions. Future research may also investigate the effect of implementing GPG transparency considering an international context. It might be worthy to use GPG information as a proxy for gender equality to explore the role of women in countries that have not adopted GPG transparency regulations.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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