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RESEARCH ARTICLE

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Corporate board and dynamics of capital structure: Evidence from UK, France and Germany

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Abstract

Theoretical arguments suggest that capital structure will adjust to the dynamics of the corporate governance environment. In line with this prediction, we examine the impact of board characteristics on capital structure dynamics and the speed of adjustment. Using 2690 firm-year observations for 2009–2018, we find that firms in a stakeholder-oriented corporate governance environment adjust their leverage faster than those in a shareholder-oriented environment. We also find that corporate board characteristics influence firms' capital structure and speed of adjustment towards target leverage. Our findings are robust to alternative measures of leverage and endogeneity. The overall evidence supports the relevance of the corporate board's composition in both shareholder-oriented and stakeholder-oriented corporate governanc (CG) environments. We conclude that board composition mitigates agency conflict.

KEYWORDS

board characteristics, capital structure, corporate governance, speed of adjustment

1 | INTRODUCTION

The relationship between corporate governance and capital structure has a long history in the finance literature. One salient way corporate governance impacts capital structure and speed of adjustment (SOA) is by moving debt to the shareholder's desired level (Liao et al., 2015). In particular, board characteristics have implications for capital structure decisions for firms. This view is consistent with recent studies that show the importance of board activities in mitigating agency theory (Adams et al., 2010; Ezeani et al., 2021) and influencing firms' decisions (Hu et al., 2020).

This study investigates the effects of board characteristics on the capital structure for firms in shareholder and stakeholder-oriented corporate governance environments. While our sample consists of only European firms, there are variations in their corporate governance environment. The UK operates a market-based economy, while Germany and France have a bank-based economy (Ezeani et al., 2021). These countries, therefore, offers an interesting setting to investigate the impact of board characteristics on firms' leverage and speed of adjustment.

The intuition for suggesting the effects of board characteristics and the firm's capital structure decision in different governance environments is simple. First, firms in shareholder corporate governance environments use leverage to benefit shareholders by reducing managers' perquisite consumption. This view is consistent with

earlier studies (see Jensen, 1993; Mccall et al., 1982). In the Anglo-Saxon environment, investors' right has priority1[1] (La Porta et al., 1997; Smith & McSweeney, 2007), capital markets are more developed (Barroso et al., 2018), and high-quality information is provided to mitigate asymmetric information (Ball et al., 2000).

Second, in contrast, firms in a stakeholder-oriented CG environment, such as Germany and France, do not consider the stock market their primary source of finance since banks play a significant role in providing external finance.[2] In this CG model, firms resolve agency conflicts by involving various stakeholders in the monitoring process. Although France and Germany have a similar CG system, distinct from the UK's CG environment, there is a slight variation in their corporate governance environment (Ezeani et al., 2021). For instance, Germany has a two-tier board system which implies more scrutiny and higher monitoring for firms' management (Tran, 2014). However, unlike German firms, French firms can adopt either a unitary board system (one-tier) or a two-tier board system.

We are motivated by the work of Bradley and Chen (2011), who show that governance mechanisms that benefit shareholders have an adverse effect on stakeholders. A recent study by (Barroso et al., 2018) finds that the varying effects of corporate governance mechanisms on agency conflict have implications for leverage.

The idea that corporate governance environment influence firms' capital structure decision and the speed of adjustment is not yet supported by empirical evidence. Our study offers evidence in line with shareholder and stakeholder-oriented hypotheses. This study extends the work of (Hansmann & Kraakman, 2000), who show that the shareholder-centred CG model in an Anglo-Saxon environment differs from the stakeholder approach used in the French and German CG landscape.

France and Germany have a similar CG system, distinct from the UK's CG environment. For instance, Tran (2014) and Ezeani et al. (2021) show Germany has a two-tier board system that enhances scrutiny and higher monitoring of firms' management. These studies found that German creditors place a lower value on CG attributes due to other channels of protecting their rights. This implies a negative relationship between board characteristics and leverage. (Morellec et al., 2012) document a positive relationship between board characteristics and leverage in the Anglo-Saxon (shareholder-oriented) environment.

We find a negative relationship between board gender diversity and leverage (MKLev) across all samples, implying that women's presence on board reduces firms' use of debt irrespective of the CG environment. We document evidence of higher statistical significance in a stakeholder approach to CG (France and UK). Board independence, board size and board meeting are also negatively associated with leverage in France and Germany. However, a positive relationship is found between board independence, board size, and leverage among UK firms. Overall, our result indicates that the impact of board characteristics on the capital structure decision and SOA of firms depends on the CG environment examined. Additional analysis based on whether a firm is underleveraged or over-leveraged shows that board mechanisms are positively related to leverage if firms' level of indebtedness is low and vice versa. This study's result is unaffected by zero-debt firms' behaviour (See Byoun, 2008) or influenced by mechanical mean reversion (e.g., Chang & Dasgupta, 2009). The *t* test and Wilcoxon sign tests show a significant difference (in all study variables) between the UK, France and German firms.

Our study makes three important contributions to the capital structure literature. First, we extend the existing theoretical work of Ball et al. (2000) and Ezeani et al. (2021) by documenting that board characteristics impact firms' capital structure and the speed of adjustment in shareholder-oriented and stakeholder-oriented CG environments. Therefore, we contribute to the on-going capital structure debate by examining the impact of board characteristics on firms' capital structure in three major European countries that represent shareholder-oriented CG (UK) and stakeholder-oriented environments (Germany and France).

Second, we provide evidence of a lower book and market leverage ratio of UK firms compared to German and French firms, indicating that a firms' CG environment can alter the pecking order of finance and influence firms' borrowing. Third, we show that SOA is faster in a stakeholder-oriented CG environment than a shareholder-oriented CG environment. Our result suggests that firms' closeness to their lenders (France and Germany) influences their speedier adjustment.

The paper's remainder is structured as follows: Section 2 discusses the institutional environment and reviews the related literature. Section 3 provides details of the study methodology. Section 4 presents the main results and robustness test. Section 5 concludes and discusses policy implications.

1.1 | Institutional background

Germany and France's corporate governance model has a unique feature that differentiates it from the model used in the Anglo-Saxon environment (Ezeani et al., 2021). The UK has a typical shareholder-oriented CG environment, with high investors' protection (La Porta et al., 1997). Due to its shareholder approach to corporate governance, the UK has a highly-developed stock market (Ezeani et al., 2021). In a shareholder approach to CG, the board's primary function is to protect the interest of the shareholders. In such an environment, board members are also directly selected by shareholders (Ezeani et al., 2021).

On the contrary, the stakeholder-oriented CG environment offers low investor protection (La Porta et al., 1997) and low litigation risk. Firms in a stakeholder approach do not overly rely on the stock market for their financing needs since banks play an active role in firms' financing. One important aspect of the stakeholder CG model is that various stakeholders' interests are relatively balanced, which makes such a model less appealing to shareholders. Unlike UK firms, public firms in Germany operate a two-tier board system consisting of management and supervisory board (Tran, 2014). The supervisory board (*Aufsichtsrat*) encourages different stakeholders' participation, such as employees' representatives and firms' creditors. Specifically, the degree of control accorded to employees and banks goes beyond the traditional firm-stakeholder relationship. The protection of creditors is at the forefront of boards' composition and activity. For instance, the adoption of the prudence principle in recognition and valuation criteria of Handelsgesetzbuch (HGB) highlights the importance of creditor protection in the German business environment. This broader level of representation is another distinguishing factor when this CG approach is compared with the shareholder-oriented approach used in the UK.

Like Germany, firms in France are also required to consider stakeholders' interests. Traditionally, corporate governance reflects the collectivism and involvement of employees in the management through the work council (Antal & Sobczak, 2007). For instance, French law passed in 1982 requires consultation with employees before any major corporate restructuring. However, since the mid-1990, there have been changes in the French CG environment that tend towards the UK model. These changes include the diversification of the source of finance resulting from stock market reorganization and institutional investors' rise (Morin, 2000). Despite these, the French corporate governance environment maintained its traditional stakeholder orientation. These differences in the corporate governance environment make it necessary to examine the impact of board characteristics on firms' capital structure in these two competing CG environments.

2 | RELATED LITERATURE

2.1 | Board characteristics, capital structure and SOA

The trade-off theory suggests a target debt ratio for each firm. The idea is that firms that deviates from this target leverage will shoulder some adjustment costs to return to their optimum leverage. On the other hand, the pecking order theory offers an alternative explanation relating to a firm's preference for internal funds due to adverse selection (Myers & Majluf, 1984). When the internally generated funds are preferred, the SOA is likely influenced by a firm's financial surplus or deficits. The idea is supported by the dynamic pecking order theory (Chang & Dasgupta, 2009), which suggests that adverse selection will make a firm with financial surplus and a higher cost of equity conserve its debt capacity, resulting in asymmetry in the SOA.

Studies suggest that firms adjust at the same speed (Flannery & Rangan, 2006; Hovakimian et al., 2001). However, empirical findings show that SOA varies across firms and is influenced by several factors (Dang et al., 2014; Kieschnick & Moussawi, 2018; Liao et al., 2015; Öztekin & Flannery, 2012). These factors include transaction cost (Öztekin & Flannery, 2012), cost of equity issuance (Warr & Inceoglu, 2012; Zhou et al., 2016), firms' institutional environment (Drobetz et al., 2015; Öztekin & Flannery, 2012) and macroeconomics condition (Cook & Tang, 2010).

Although few studies suggest that good corporate governance will result in speedier adjustment (Kieschnick & Moussawi, 2018; Liao et al., 2015), these studies focused on firms in the Anglo-Saxon CG environment, where leverage is expected to benefit shareholders (see Jensen, 1993; Mccall et al., 1982). In the stakeholder approach to corporate governance, where firms rely on external debt finance, we expect that good corporate governance will reduce the cost of borrowing by influencing lenders perception of the firm. In line with Lockhart's (2010) study, we argue that firms' closeness to their lenders in the stakeholder approach to CG will result in a higher SOA. Therefore, we expect that board characteristics will lead to a speedier adjustment in stakeholder and shareholder CG environments. Furthermore, Byoun (2008) found that underleveraged firms have less costly financing choices than overleverage firms. Following the above discussions, we test the following hypothesis:

> **H1.** *SOA will be higher for underleveraged firms than firms above their leverage target.*

Regarding the impact of board characteristics on leverage, prior studies suggest that board gender diversity will influence its discussion quality and the ability to offer better oversight of firms' activities and disclosure (Adams & Ferreira, 2009; Brieger et al., 2019; Gul et al., 2011). Gul et al. (2011) argue that the diversity of board gender will reduce the unstructured nature of the boards' decisions. Female directors encourage the board to discuss tough issues, which may not be considered if all board members were men (McInerney-Lacombe et al., 2008). The presence of female board members

encourages greater openness and improves the flow of information, limiting managers' ability to exploit the information gap to the disadvantage of firms' shareholders. However, Barber and Odean (2001) and Komal et al. (2021) found that female directors have less appetite for risk-taking.

These studies suggest that the presence of women board members will result in low-risk strategies that reduce the agency cost of debt. However, for UK firms, women's presence may lead to the enforcement of disciplining effect of debt (Jensen, 1993; Mccall et al., 1982), ensuring that firms' leverage does not move towards managers' desired level (Liao et al., 2015). Following the above discussions, we test the following hypothesis:

H2. *Board gender diversity is negatively related to leverage for French and German firms but positively associated with leverage for UK firms.*

Boards' independence is another board characteristic that influences firms' capital structure. In an agency context, the board's independence depends on how it can decide without managers' influence. Both Cadbury report in the UK and the Sarbanes—Oxley Act of 2002[3] emphasized the importance of boards' independence and its role in reducing agency conflict. Weisbach (1988) found that shareholders' interest is better protected if outsiders dominate the board following this CG model. Fama and Jensen (1983) suggest that firms' insiders usually hinder the board's independence. Coles et al. (2008). Yekini et al. (2015) argue that the proportion of outside directors is an indicator of boards' independence.

Similarly, Kim et al. (2007) suggest that outside directors raise boards' desirability. The current study uses the number of supervisory board members who are not part of the management in measuring board independence. Following Kim et al. (2007), we expect that board independence will ensure that shareholders' interests will be protected, which implies a positive association with leverage for UK firms. However, since the interest of employees' representatives and creditors, who represent a large proportion of board members in German and French firms, are not entirely aligned with that of shareholders, a negative relationship between board Independence (BI) and leverage is expected for German and French firms. Following the above discussions, we test the following hypothesis.

H3. *Board Independence is negatively related to leverage for French and German firms but positively related to leverage for UK firms.*

Regarding board size, studies have overwhelmingly emphasized its impact in moderating extreme and unfavourable decisions (Cheng, 2008; Kogan & Wallach, 1966). However, the size of the board depends on its purpose (Hermalin & Weisbach, 2001). In line with agency theory, smaller boards are considered more effective if the board of directors is needed for monitoring roles (Pillai & Al-Malkawi, 2018). On the other hand, the resource dependence theoretical perspective suggests that larger boards are useful when a firm seeks quality advice (Coles et al., 2008). Cheng (2008) indicates that the final decision in firms with a larger board is likely to be less extreme due to more compromises in their decision-making process. Coles et al. (2008) argued that a larger board would improve the quality of its deliberation. This study measures board size (BZ) as the total number of directors on the board. Since German and French firms have a relatively higher number of directors compared to the UK, we expect that BZ will be negatively correlated with leverage for German and French firms and positively related to leverage for UK firms. Following the above discussions, we test the following hypothesis.

H4. *Board Size is negatively related to leverage for French and German firms but positively associated with leverage for UK firms.*

The impact of the board meeting on its capital structure decision is not yet answered. Some studies found that a board that meets often is likely to make decisions that benefit shareholders (Conger et al., 1998; Sharma et al., 2009). According to this view, the frequency of meetings will help the board monitor managers effectively, thereby achieving outcomes beneficial to firms' shareholders. In this case, board meeting frequency is expected to be positively related to leverage in the Anglo-Saxon CG approach. Other studies in the shareholder-oriented CG approach suggest that meeting frequency is not useful in exerting meaningful control (Jensen, 1993; Vafeas, 1999). This view is because the meaningful exchange is not always achievable due to less time spent by external directors to cover all relevant issues (Vafeas, 1999). In the CG approach used in Germany and France, the board of directors extends their duty to all stakeholders. Therefore, it is unlikely that their deliberation will increase leverage if it benefits shareholders in any way. Following Vafeas (1999), we define board meeting (BM) as the number of meetings annually held by the board of directors and expect a negative relationship in all countries in our study sample. Based on the above discussions, we test the following hypothesis.

H5. *Board meeting is negatively related to leverage for French, German and UK firms.*

3 | RESEARCH METHOD

3.1 | Data and method

We select samples from the UK, France and German firms, which are three major EU economies. These countries also have different financial traditions and are categorizable into bank-based and market-based economies (Antoniou et al., 2008; Ezeani et al., 2021), corresponding to shareholder-oriented (UK) and stakeholder-oriented CG (Germany and France).

Our sample consists of all German firms in the DAX, MDAX and SDAX index between 2009 and 2018. These indexes comprise the 130 largest firms in Germany. In addition, we selected the French sample from SBF 120 index since it includes the largest firms in the Paris stock exchange. Regarding UK firms, our sample is selected from the FTSE 350 index. We excluded industries with specific regulations, such as financial, utility and mining industries. We considered 2009 until 2018 to ensure recent and reliable observation and consider recent corporate governance changes in the European Union. All data are mainly from the Data-Stream. The final sample consists of 1180, 820 and 690 firm-year observations for the UK, German and French firms, respectively, resulting in a total firm-year observation of 2690 (see Table A1 in Appendix A).

3.2 | Measuring of dependent and independent variables

Consistent with Morellec et al. (2012) and Öztekin (2015), we measure leverage based on its market value and book value. Kieschnick and Moussawi (2018) argued that the book equity is a plug number in accounting and is insufficient when examining the firm's capital structure decision. Our dependent variable is measured as follows,

$$\mathrm{MKLev_{it}} = \frac{\mathrm{D_{it}}}{\mathrm{D_{it}} + \mathrm{S_{it}P_{it}}} \quad (1)$$

Where D_{it} is the firm's (i) financial debt at time t, which is the combination of long-term and short-term debt. S_{it} denotes the number of outstanding ordinary shares of a firm (i) at time t while P_{it} represents each firm's (i) price per share at time t.

Our book leveraged is measured as follows,

$$\mathrm{BKLev_{it}} = \frac{\mathrm{LTD} + \mathrm{STD}}{\mathrm{TA}} \quad (2)$$

Where BKLEV represents book leverage, LTD represents long term debt, STD represents short-term debt; TA represents total assets.

We consider four board characteristics, which are relevant for effective monitoring and are likely to influence the SOA. These variables are board gender diversity (BGD), BI, BZ and BM. BGD is measured as the number of female directors on the board; BI is the percentage of non-executive directors on the board; BZ is the number of directors on the board, while BM represents the number of meetings held by the board of directors annually.

3.3 | Control variables

Firm characteristics are included as control variables to isolate firm-level factors' effect on firms' capital structure. Previous studies found that firm characteristics explain firms' capital structure and adjustment behaviour (Byoun, 2008; Dang et al., 2014) due to the differential adjustment cost that results from variation in firm characteristics (Dang et al., 2014). Overwhelming evidence shows the relevance of profitability, asset tangibility, firm size and growth opportunity (MVB, market-to-book value) in firms' capital structure decisions (Antoniou et al., 2008; Dang et al., 2014; Flannery & Rangan, 2006; Rajan & Zingales, 1995; Titman & Wessels, 1988). Öztekin and Flannery (2012) controlled for tax effect, while Ozkan (2001) reported that liquidity and non-debt tax shield influence capital structure dynamics. Following Öztekin and Flannery (2012), we also control for the impact of macroeconomic factors. The measurement of all study variables is discussed in Table A1.

Our empirical model is in line with the partial adjustment model and is stated as follows,

$$\mathrm{Lev_{ij,t}} - \mathrm{Lev_{ij,t-1}} = \lambda_{\mathrm{j}} \left(\mathrm{Lev^{*}_{ij,t}} - \mathrm{Lev_{ij,t-1}} \right) + \delta_{\mathrm{ij,t}} \quad (3)$$

Where $\mathrm{Lev}^{*}_{ij,t}$, is the optimal leverage of individual firm in country j and year t. $\delta_{ij,t}$, represents the error term. Our specification allows variation of optimal leverage over time. The SOA is captured by λ_j. It is usually less than one but greater than zero ($1 > \lambda > 0$) and is assumed to be one ($\lambda = 1$) when there is a full adjustment. However, if no adjustment occurs, the λ will be equal to zero. λ_j allows partial yearly adjustment.

Prior studies suggest that optimal leverage (LEV^{*}) is a function of macroeconomic factors, corporate governance and firm-level factors (Flannery & Rangan, 2006; Huang & Ritter, 2009; Kieschnick & Moussawi, 2018). Following Öztekin and Flannery (2012), we controlled for unobserved heterogeneity by involving a set of firms fixed effects.

$$Lev^{*}_{ij,t} = \beta_j X_{ij,t-1} + F_{ij,} \quad (4)$$

Where $\delta_{ij,t}$, represents the error term. F_{ij} and β_j are the vectors of the coefficients, which are to be estimated. $X_{ij,t-1}$ represents the vectors of macroeconomic factors, board characteristics, and firm-level factors that are likely to influence the benefits and costs of a certain level of leverage.

We substituted Equation (4) into the partial adjustment model in Equation (3) and rearranged different factors to achieve the specification below,

$$Lev_{ij,t} = \left(\lambda_j \beta_j\right) X_{ij,t-1} + \left(1-\lambda_j\right) Lev_{ij,t} + \lambda_j F_{ij,} + \delta_{ij,t} \quad (5)$$

We used a dynamic model[4] (Equation (4)) to capture the unobserved heterogeneity and dynamic aspects of capital structure decisions. Unlike the OLS, where regressors and μ_i are correlated (Hsiao, 1985), the system GMM uses additional instruments. It also employs the existing orthogonal conditions between lagged dependent variables and the disturbances in its estimation (Arellano & Bond, 1991). GMM's efficiency lies in exploiting all linear moment restrictions (Hansen, 1982). The system GMM estimation is based on levels and first differences. Consequently, the System GMM retains variation among firms by controlling individual heterogeneity (Antoniou et al., 2008). The two-step GMM system estimator, which we employed in this study, uses orthogonal condition on the variance–covariance matrix to control heteroskedasticity, measurement error and correlation of errors over time (Blundell & Bond, 1998). Furthermore, we also used Sargan's test of overidentifying restriction to check serial correlation issues. Finally, we employed Arellano and Bond (1991) test to control second-order autocorrelation.

4 | RESULTS AND DISCUSSION

4.1 | Descriptive statistics

Table 1 presents the summary statistics of dependent (leverage), independent (CG variables), and control variables used in the study. It shows that on average, German firms' book leverage (0.2481) is slightly higher than that of France (0.2299) and significantly higher than that of the UK (0.1823). This higher book leverage reflects the German (stakeholder-oriented) CG system's unique nature, where firms are very close to their lenders (Tran, 2014).

Regarding the market leverage, we found that the French firms' average (0.2394) is higher than that of German firms (0.2199), while the UK market leverage (0.2004) is the lowest of the three countries. Our result is consistent with Antoniou et al. (2008), who found that German and French firms use more debt. It also confirms that firms in a stakeholder-oriented environment do not depend on equity investors. The higher average market leverage for French companies may be due to capital market reforms since the mid-1990s (Morin, 2000), bringing France closer to the shareholder-oriented CG system.

The lower book and market leverage ratio of UK firms (compared with French and German firms) suggests that managers in the Anglo-Saxon environment prefer equity finance to debt. This preference is related to the UK's developed capital market and the lack of closer relationships with lenders. Our result indicates that the CG environment can alter the pecking order assumptions of Myers and Majluf (1984), implying that that firms' CG environment may influence how they borrow. The *SD* of MKLev and BKLev show variation across these countries (Table 2).

The respective mean value of BGD and BI in France is higher than Germany the UK, reflecting the higher level of women board representation and board independence in stakeholder-oriented countries. We found that UK firms meet more regularly than French and German firms. Furthermore, Germany has the highest (30.89) average board size, which may be due to the increased representation of employees and other stakeholders in German firms. We compared the mean using both Wilcoxon signed-rank test and the *t* test and confirmed that the mean values of variables obtained from German and French samples are significantly different from UK firms. We also used a correlation matrix to test for multicollinearity among our study variables. Gujarati and Porter (1999) argue that severe multicollinearity has a cut-off point of 80%. In Table 3, the highest correlation (Coef = 0.6357) is between BI and BZ (see Panel B, Germany), indicating that multicollinearity issues do not exist among CG and firm-level variables used in this study. Using the Arellano Bond test, we found that the idiosyncratic errors are identically and independently distributed. As expected, we found evidence of serial correlation in the first differenced errors. However, the result of AR 2 is insignificant and show no evidence of serial correlation in our study. We confirmed the validity of our instrument using the Sargan test since the P-value is consistently higher than 5%.

4.2 | Regression analysis

Table 4 presents the study result based on the full sample and sub-samples for UK, German, and French firms. In contrast, the comparative result (Shareholder CG vs. Stakeholder CG) is presented in Table 5. We reported

TABLE 1 Descriptive statistics: Board, firm-level, macroeconomics and institutional variables

	UK				Germany				France			
Variable	**Mean**	***SD***	**Min**	**Max**	**Mean**	***SD***	**Min**	**Max**	**Mean**	***SD***	**Min**	**Max**
MKLev	0.2004	0.1339	0.00002	0.9582	0.2399	0.1676	0.0002	0.7496	0.2194	0.1501	0.0006	0.7458
BKLev	0.2423	0.1433	0	0.7221	0.2481	0.1807	0	0.7496	0.2599	0.1534	0	0.7371
BGD	11.05	2.13	0	18	13.42	1.25	0	26	15.4	5.63	0	23
BI	12.02	0.81	0	20.47	12.34	3.29	0	32	13.2	1.91	0	28.6
BZ	26	4.38	3	40	30.89	2.023	3	52	28	4.6	4	40
BM	8.89	3.3275	1	14	5.67	1.67	3	16	8.14	3.12	4	24
PROF	0.0914	0.0833	−0.8007	0.4035	0.0516	0.0759	−0.4673	0.6793	0.1019	0.0741	−0.0973	0.6090
Astang	0.2547	0.2220	0.0007	0.9528	0.2557	0.1440	0.0153	0.7442	0.2165	0.2065	0.0006	0.9645
FSZ	14.9284	1.3021	12.62	19.7069	15.2868	1.6094	12.1802	19.2566	15.7458	1.4401	13.1187	19.0212
MVB	1.2396	40.8945	1245.37	69.86	1.7725	1.4346	0.0679	10.1933	2.0474	1.8362	−5.2700	16.0100
Liq	1.0047	1.2545	0.03	29.27	1.3824	0.7687	0.1800	5.87	1.1854	0.6007	0.0000	4.52
NDTS	0.0388	0.0218	0.0003	0.1495	0.2440	0.1569	0	0.7496	0.0627	0.0457	−0.2098	0.3520
TX	0.1974	4.5086	−95	85.9758	0.1564	19.9666	−466.00	236.3333	0.1860	0.4831	−7.41	5.6021
Inf	2.4700	1.3044	0.4000	5.2	1.3100	0.7209	0.4000	2.6000	1.0000	0.8017	0.1000	3.2000
GDP	−0.0142	0.0828	−0.1870	0.0940	0.0078	0.0765	−0.1430	0.1020	−0.0039	0.0734	−0.1510	0.0950

Note: This table shows the summary statistics (Mean, *SD*, Min and Max) for the main study variables across three major EU economies (UK, Germany and France) that have different financial traditions and are categorizable into bank-based and market-based economies, respectively. Our data set consists of the largest German firms listed in DAX, MDAX and SDAX index (130), the largest firms listed in the Paris stock exchange (SBF 120 index), and the largest UK firms listed in the FTSE 350 index. Our data are obtained from Data-Stream and covers 10-years period from 2009 until 2018.

Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BKLev, book value of leverage; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

TABLE 2 Comparison tests of board variables

Variables	Mean				Mean			
	UK	France	*t* test	Wilcoxon	UK	Germany	*t* test	Wilcoxon
MkLev	0.2003	0.2193	0.003***	0.02**	0.2003	0.2398	0.001***	0.001***
BGD	21.0576	25.4326	0.001***	0.001***	21.0576	23.4459	0.006***	0.008***
BI	55.0463	25.256	0.001***	0.001***	55.0463	21.3406	0.001***	0.001***
BZ	9.8084	13.3841	0.001***	0.001***	9.8084	30.8962	0.001***	0.001***
BM	8.8957	8.1439	0.001***	0.001***	8.8957	5.6739	0.001***	0.001***
PROF	0.0914	0.1018	0.003***	0.012***	0.0914	0.0515	0.001***	0.001***
Astang	0.2547	0.2165	0.001***	0.001***	0.2547	0.2557	0.9134	0.001***
FSZ	14.9284	15.7457	0.001***	0.001***	14.9284	15.2867	0.001***	0.001***
MVB	1.2396	2.0474	0.5741	0.1492	1.2396	1.7724	0.7336	0.001***
Liq	1.0046	1.1853	0.001***	0.001***	1.0046	1.3823	0.001***	0.001***
NDTS	0.03884	0.0626	0.001***	0.001***	0.0388	0.2439	0.001***	0.001***
TX	0.1974	0.1859	0.9423	0.001***	0.1974	0.1563	0.946	0.001***

Note: This table provides the comparison tests used (Wilcoxon signed-rank test and *t* test) to examine the difference in the mean values of our main variables. ***, ** and * show that the differences are statistically significant at 1%, 5%, and 10% levels, respectively.

Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

the result of the additional analysis (for overleveraged and underleveraged firms) in Tables 6 and 7. In addition, firms' adjustment behaviour is reported in Table 8.

We estimated our dependent variable (MKLEV) as a function of lagged leverage, board characteristics and a set of firm-level variables. The coefficient of lag variables is significant at a 1% level. It is consistent with the trade-off theory's prediction and suggests a firm's dynamic and frequent adjustment towards target leverage. Based on the full sample (including CG characteristics), the average SOA is 48%. However, we re-estimated the study's Equation (4) for the entire sample without board characteristics (see Table A2 in Appendix A for all results without CG variables) and achieved the SOA of 45%.

The individual country's result shows that German firms' SOA is 43% when CG variables are included in the regression. The SOA drops to 41% if estimated without CG characteristics. Similarly, the SOA of French firms is 36% when estimated with CG variables and reduced by 3% when these variables are excluded. Similarly, UK firms' SOA is 33% (including CG variables), closer to the average adjustment speed of 32% reported by Antoniou et al. (2008), but it reduced to 28% after excluding CG variables. Therefore, we found that board characteristics influence firms' speedier adjustment towards their target, which is in line with our expectations. This result may be due to the impact of corporate governance in resolving agency conflict. We also found higher SOA and lower adjustment differentials (the difference between calculated SOA with or without corporate governance variables) among German and French firms compared to UK firms, which confirms that firms' CG environment influences are adjustment behaviour.

With regards to the speed of adjustment, we show a 10 percentage-point difference between German and their UK counterparts. This result confirms the study of Dang (2013), who found that German firms show speedier adjustment compared with UK firms. This varying speed of adjustment may be attributable to the level of access to debt finance. For instance, Dang (2013) argue that firms in bank-based economies (Germany and France) are more likely to use debt finance as a result of their closer relationship with lenders (banks). Thus, firms' closeness to their lenders reduces their cost of debt and influences their speedier adjustment.

Table 4 presents results for all countries. Leverage (MKLev) declines with an increase in the number of women on board, implying that board gender diversity reduces firms' use of debt irrespective of the CG environment. As proposed for German and French firms, the result contradicts our expectation for UK firms, where a positive relationship is proposed. However, we document evidence of higher statistical significance in Stakeholder oriented economies (France and UK). The BGD coefficient maintains its negative sign in the full sample and subsamples (for UK, France and Germany). It is, therefore, the key determinant of the capital structure of these major European firms. It also shows that women's presence on

TABLE 3 Correlation matrix analysis

	BGD	BI	BZ	BM	PROF	Astang	FSZ	MVB	Liq	NDTS	TX
Panel A (UK)											
BGD	1.0000										
BI	0.3000	1.0000									
BZ	0.2175	0.1395	1.0000								
BM	0.1241	0.1387	0.0895	1.0000							
PROF	0.1747	0.1027	0.0033	−0.0491	1.0000						
Astang	−0.0476	−0.0956	0.0374	−0.0318	−0.0053	1.0000					
FSZ	0.0242	0.1590	0.1297	−0.0230	−0.0888	0.0738	1.0000				
MVB	−0.0132	0.0229	0.0024	−0.0414	0.0376	−0.0219	−0.0270	1.0000			
Liq	−0.0435	0.0264	0.0148	−0.0114	−0.0476	−0.0521	0.0465	0.0044	1.0000		
NDTS	−0.0404	−0.0804	0.0356	−0.1152	0.1572	0.4055	−0.1236	0.0070	−0.0382	1.0000	
TX	0.0324	0.0367	−0.0169	−0.0543	0.0368	0.0135	−0.0225	0.0009	−0.0162	−0.0057	1.0000
Panel B (Germany)											
BGD	1.0000										
BI	0.3640	1.0000									
BZ	0.2674	0.6357	1.0000								
BM	0.0639	0.0559	0.1142	1.0000							
PROF	0.2370	0.2265	0.2493	0.0734	1.0000						
Astang	−0.0314	−0.1231	−0.1589	0.0423	−0.1200	1.0000					
FSZ	−0.0630	0.0725	0.0831	0.1039	−0.0327	−0.0524	1.0000				
MVB	−0.0543	−0.1721	−0.1810	−0.0991	−0.0900	−0.0230	−0.0686	1.0000			
Liq	−0.0205	0.1464	0.1168	−0.0798	0.1136	0.0850	0.0589	−0.1421	1.0000		
NDTS	−0.2245	−0.1782	−0.4135	−0.0402	−0.2919	0.2063	0.0491	0.1136	−0.0571	1.0000	
TX	0.0281	0.0081	0.0108	0.0161	0.0087	0.0299	0.0895	−0.0292	0.0285	−0.0887	1.0000
Panel C (France)											
	BGD	BI	BZ	BM	PROF	Astang	FSZ	MVB	Liq	NDTS	TX
BGD	1.0000										
BI	0.7938	1.0000									
BZ	0.4453	0.4455	1.0000								
BM	0.4311	0.3410	0.3778	1.0000							

(Continues)

TABLE 3 (Continued)

	BGD	BI	BZ	BM	PROF	Astang	FSZ	MVB	Liq	NDTS	TX
PROF	0.2525	0.2172	0.0935	0.2160	1.0000						
Astang	−0.1927	−0.2367	−0.0616	−0.1218	0.0650	1.0000					
FSZ	0.1357	0.1401	0.3659	0.0581	−0.2121	−0.0959	1.0000				
MVB	0.1093	0.1123	0.0050	0.1125	0.4144	−0.0025	−0.1666	1.0000			
Liq	−0.0286	0.0042	−0.0187	−0.0068	−0.0440	−0.0719	−0.0515	−0.0120	1.0000		
NDTS	−0.0319	−0.0446	−0.1248	0.0455	0.6308	0.1824	−0.1796	0.2290	−0.0859	1.0000	
TX	−0.0781	−0.0573	−0.0536	−0.0127	0.0319	0.0272	−0.0209	0.0468	0.0283	0.0196	1.0000

Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BKLev, book value of leverage; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

the corporate board helps firms avoid risky finance options. This result is expected since studies suggest that women are more likely to embark on a low-risk strategy (Barber & Odean, 2001; McInerney-Lacombe et al., 2008). According to McInerney-Lacombe et al. (2008), female directors help the board discuss tough issues, which could be ignored if all board members were men. Such an issue may include the risk of increasing firms' leverage. The impact of gender diversity on the capital structure of firms in our sample may be due to the relentless campaign for women representation on corporate boards across the European Union (Tables A3 and A4 in Appendix A).

Regarding the Board Size, we found a negative association with leverage in France and Germany. This result implies that the board's number is a vital capital structure determinant for firms in a stakeholder-oriented CG environment. This negative relationship is expected for German and French firms since they have a traditionally larger number of representations on the board. We found that leverage increases with the board size in line with our expectations for UK firms. The result reflects previous literature on the role of debt in a shareholder-oriented environment (Grossman & Hart, 1992; Jensen, 1986; Morellec et al., 2012). In line with these studies, the large board will act in the interest of the shareholders in the Anglo-Saxon CG environment by constraining managerial opportunism, such as perquisites consumption. Board meeting frequency is inversely related to leverage across all countries, which implies that board meetings' frequency reduces firms' use of debt. This result is as expected and is in line with prior studies (Jensen, 1993; Sharma et al., 2009; Vafeas, 1999). Our result suggests that the board meeting frequency is a more effective control mechanism in a stakeholder approach to CG.

As expected, board independence shows an inverse relationship with leverage in France and Germany but is positively related to leverage in the UK. This result may be due to the idea of independence in these two approaches. In the Anglo-Saxon CG environment, the higher outside director proportion strengthens the board's independence, enabling members to act in the interest of shareholders by increasing leverage. On the other hand, in a stakeholder-based approach, board members are not independent per se due to a broader stakeholder approach. The negative relationship between leverage and board independence in this stakeholder approach is understandable since (unlike in the Anglo-Saxon CG approach), the interest of these (independent) board members may not necessarily align with those of shareholders, implying a negative relationship with leverage.

We divided our sample to reflect two CG approaches investigated and re-estimated Equation (4) without country-level variables [gross domestic product (GDP)

TABLE 4 Regression result (MKLEV)

Variables	All sample	UK	Germany	France
BGD	−4.11	−1.82	−5.9	−6.95
	(0.001***)	(0.068*)	(0.001***)	(0.001***)
BI	−0.76	1.83	−4.93	−4.86
	(−0.448)	(0.069*)	(0.001***)	(0.001***)
BZ	−1.98	0.0010	−3.69	−2.15
	(0.047**)	(0.099*)	(0.001***)	(0.032**)
BM	−2.81	−3.07	−3.41	−7.92
	(0.005***)	(0.002***)	(0.001***)	(0.001***)
PROF	−5.23	−13.25	0.07	−1.94
	(0.001***)	(0.001***)	(0.945)	(0.052*)
Astang	−2.14	−2.59	6.02	0.34
	(0.032**)	(0.009***)	(0.001***)	(0.731)
FSZ	−2.47	2.97	−3.94	−10.7
	(0.014***)	(0.003***)	(0.001***)	(0.001***)
MVB	−1.42	−1.87	−0.27	2.18
	(0.155)	(0.062*)	(0.785)	(0.030**)
Liq	0.74	1.89	−0.02	2.52
	(0.461)	(0.058*)	(0.983)	(0.012**)
NDTS	−1.15	0.81	−1.35	−0.02
	(0.248)	(0.420)	(0.178)	(0.987)
TX	−1.83	0.6	−3.91	−1.42
	(0.067*)	(0.548)	(0.001***)	(0.155)
Inf	−2.61	-	-	-
	(0.009***)	-	-	-
GDP	−0.02	-	-	-
	(0.98)	-	-	-
_cons	4.11	−1.45	7.57	15.13
	(0.001***)	(0.001***)	(0.001***)	(0.001***)
SOA (%)	48%	33%	43%	39%
AR 1	0.013	0.022	0.072	0.052
AR 2	0.131	0.632	0.342	0.153

Note: This table presents the regression analysis of generalized method of moments (GMM), which is used in our estimation. SOA is the estimated speed of adjustment. ***, ** and * indicate 1%, 5% and 10% statistical significance, respectively.
Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BKLev, book value of leverage; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

TABLE 5 Shareholder versus stakeholder CG approach

Variables	UK	Germany and France
BGD	−1.82	−5.15
	(0.068*)	(0.001***)
BI	1.83	−1.08
	(0.069*)	(0.02**)
BZ	0.0010	−2.49
	(0.001*)	(0.013**)
BM	−3.07	−3.76
	(0.002***)	(0.001***)
PROF	−13.25	−1.48
	(0.001***)	(0.139)
Astang	−2.59	−0.37
	(0.009***)	(0.713)
FSZ	2.97	−4.7
	(0.003***)	(0.001***)
MVB	−1.87	2.69
	(0.062*)	(0.007***)
Liq	1.89	1.04
	(0.058*)	(0.298)
NDTS	0.81	−1.67
	(0.420)	(0.095*)
TX	0.6	−2.45
	(0.548)	(0.014**)
_cons	−1.45	7.21
	(0.001***)	(0.001***)
SOA (%)	31	42%
AR 1	0.003	0.052
AR 2	0.281	0.458

Note: This table presents the regression analysis of generalized method of moments (GMM), which is used in our estimation. SOA is the estimated speed of adjustment. ***, ** and * indicate 1%, 5% and 10% statistical significance, respectively.
Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BKLev, book value of leverage; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

and Inflation] and reported the result in Table 5. Similar to the main result, we confirmed a negative relationship between BGD and leverage in both approaches. Board independence, the board size and board meeting maintain their inverse relationship with leverage in France and Germany, while board independence and board size are positively related to leverage among UK firms. We found the SOA of 42% for France and Germany (combined), significantly higher than 31% reported for UK firms. In line with our main result, we found that firms in a stakeholder-oriented CG environment have higher SOA than UK firms.

As an additional analysis, we divided our sample using median leverage to show the impact of board

TABLE 6 Additional analysis—Underleveraged firms (MKLev)

Variable	All sample	UK	Germany	France
BGD	−2.42	−2.2	−6.97	−2.92
	(0.016**)	(0.028**)	(0.001***)	(0.003***)
BI	1.75	−4.24	1.2	−1.84
	(0.081*)	(0.001***)	(0.232)	(0.766)
BZ	−3.31	1.26	0.28	5.4
	(0.001***)	(0.209)	(0.077)	(0.001***)
BM	−0.55	−4.79	1.74	2.11
	(0.58)	(0.001***)	(0.083*)	(0.035**)
PROF	−5.53	6.18	−0.35	−9.5
	(0.001***)	(0.001***)	(0.729)	(0.001***)
Astang	−1.29	−0.58	1.55	−8.35
	(0.198)	(0.562)	(0.122)	(0.001***)
FSZ	3.31	−23.76	5.02	6.74
	(0.001***)	(0.001***)	(0.001***)	(0.001***)
MVB	1.45	−14.32	6.13	−2.57
	(0.148)	(0.001***)	(0.001***)	(0.001***)
Liq	−0.66	4.63	−2.21	0.3
	(0.507)	(0.001***)	(0.027**)	(0.768)
NDTS	−1.58	12.52	2.26	−2.93
	(0.113)	(0.001***)	(0.024**)	(0.003***)
TX	−1.06	−1.19	−1.77	0.1
	(0.288)	(0.234)	(0.077*)	(0.917)
Inf	−3.57	-	-	-
	(0.001***)	-	-	-
GDP	1.65	-	-	-
	(0.099*)	-	-	-
_cons	−2.3	23.84	−4.25	−2.17
	(0.02**)	(0.001***)	(0.001***)	(0.03**)
SOA (%)	56%	37%	42%	48%
AR 1	0.031	0.022	0.042	0.046
AR 2	0.648	0.713	0.357	0.525

Note: This table presents the regression analysis of generalized method of moments (GMM), which is used in our estimation. SOA is the estimated speed of adjustment. ***, ** and * indicate 1%, 5% and 10% statistical significance, respectively.
Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BKLev, book value of leverage; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

TABLE 7 Additional analysis—Overleveraged firms (MKLEV)

Variables	All sample	UK	Germany	France
BGD	−4.42	−2.57	−3.05	−19.84
	(0.001***)	(0.01***)	(0.002***)	(0.001***)
BI	−0.06	−6.08	−2.3	−2.52
	(0.949)	(0.001***)	(0.022**)	(0.012**)
BZ	−2.2	−7.15	0.17	−2.68
	(0.028**)	(0.001***)	(0.862)	(0.007***)
BM	−6.94	−6.04	0.57	−11.28
	(0.001***)	(0.001***)	(0.568)	(0.001***)
PROF	−15.11	−21.08	−20.24	−6.51
	(0.001***)	(0.001***)	(0.001***)	(0.001***)
Astang	−0.71	2.79	−5.14	−1.38
	(0.475)	(0.005***)	(0.001***)	(0.169)
FSZ	−3.25	−7.71	−3.95	−4.59
	(0.001***)	(0.001***)	(0.001***)	(0.001***)
MVB	−3.54	−2.42	4.15	10.08
	(0.001***)	(0.015**)	(0.001***)	(0.001***)
Liq	1.02	−2.53	11.8	−2.98
	(0.31)	(0.01***)	(0.001***)	(0.003***)
NDTS	−1.44	−0.54	1.72	2.84
	(0.15)	(0.589)	(0.085*)	(0.004***)
TX	−4.21	1.74	−8.33	−6.91
	(0.001***)	(0.083)	(0.001***)	(0.001***)
Inf	−1.08	-	-	-
	(0.278)	-	-	-
GDP	−0.91	-	-	-
	(0.363)	-	-	-
_cons	5.6	9.26	7.46	12.7
	(0.001***)	(0.001***)	(0.001***)	(0.001***)
SOA (%)	29%	27%	32%	40%
AR 1	0.011	0.022	0.052	0.072
AR 2	0.331	0.237	0.253	0.855

Note: This table presents the regression analysis of generalized method of moments (GMM), which is used in our estimation. SOA is the estimated speed of adjustment. ***, ** and * indicates 1%, 5% and 10% statistical significance respectively.
Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BKLev, book value of leverage; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

characteristics on the capital structure of overleveraged and underleveraged firms and reported the result in Tables 6 and 7. The dependent variable is market leverage, which was used in our main result. As reported in Table 7, most board variables show a negative relationship with leverage when firms are above the median debt ratio. However, for overleveraged firms, we found a positive relationship between board size, board meeting and leverage for German and French firms.

TABLE 8 SOA results

Variables	SOA (all countries)	SOA (UK)	SOA Germany	SOA France
With CG	48%	33%	43%	39%
Without CG	45%	28%	41%	36%
Differences	3%	5%	2%	3%
Underleveraged	56%	37%	48%	42%
Overleveraged	29%	27%	40%	32%
Differences	27%	2%	8%	10%

Note: This table presents the regression analysis of generalized method of moments (GMM), which is used in our estimation. SOA is the estimated speed of adjustment. We examined the impact of CG variables and firms' level of indebtedness (overleveraged and underleveraged firms) on SOA.

This result implies that the degree of indebtedness may affect the relationship between board characteristics and leverage. We compared the SOA of underleveraged firms with those of overleveraged firms. We document speedier adjustment for underleveraged firms irrespective of the country. This result implies that firms below their leverage targets are more likely to adjust their leverage faster. Table 7 summarizes study findings regarding adjustment speed and shows that continental European firms adjust faster than UK firms.

To ensure our study's robustness, we used an alternative (book leverage) measure and found a similar result. We also controlled for the endogeneity by using the lagged value of CG variables as instruments in 2SLS regression rerun the main equation for the sub-samples (for UK, French and German firms). Our result is similar to the result reported in Table 4. Our findings suggest that our study is not affected by the endogeneity problem.

5 | CONCLUSION

In this study, we examine two important issues associated with capital structure. First, we investigate the impact of board characteristics of non-financial firms in shareholder-oriented and stakeholder-oriented environments. Second, we investigate whether capital structure adjustment speed is unique to the firm's corporate governance environment.

Our result shows that capital structure adjustment speed is faster in a stakeholder-oriented CG environment than a shareholder-oriented CG environment, which suggests that firms' closeness to their lenders (in France and Germany) influences their speedier adjustment. The SOA of German and French firms are significantly higher than those of UK firms. This result is attributable to the governance characteristics in a stakeholder-oriented environment. We mainly find that corporate governance leads to higher adjustment speed. The average SOA achieved is significantly higher than the value achieved when these variables are excluded. This finding highlights the importance of the corporate board in influencing speedier leverage adjustment. We also found a speedier adjustment if a firm is below its leverage target.

We also find an inverse relationship between board gender diversity and leverage in both CG environments, which shows that women's presence on board restrains management from increasing debt levels. However, we document evidence of higher statistical significance in a stakeholder approach to CG (France and UK). We find that all board characteristics are inversely related to leverage among German and French firms, representing a stakeholder-oriented environment. However, board independence and board size are positively related to leverage in the UK.

One important implication of our study is that a firm's CG environment can alter the pecking order of finance and influence firms' borrowing. This finding is important as the Anglo-Saxon finance literature has traditionally generalized theoretical prediction in line with its shareholder-oriented environment. Furthermore, the inverse relationship between board gender diversity and leverage across the countries in our sample has a policy implication for board composition. It highlights the importance of involving more women on the corporate boards.

While our study finds the impact of board characteristics on capital structure, it remains to be seen whether this result will be unchanged if a larger sample involving other countries with similar corporate governance environments is used. Furthermore, the current study focused on firms in developed countries. However, it may be interesting to compare the result obtained from both developed and developing countries. Future research can address this limitation by including many countries with shareholder and stakeholder environments. It may also be beneficial to use a longer time-period to better understand how the impact change over time.

ENDNOTES

[1] The impact of the corporate board on firms' capital structure may depend on whether it operates in a common law or code law country. La Porta et.al (1998) and La porta et al. (2000) argued that firms that operate under English common law are more likely to protect shareholder interest. In such firms, the board role will mainly focus on protecting shareholders' interest.

[2] In a code law country such as Germany, the board's role is to protect the interest of stakeholders. In such countries, the monitoring function is mainly exercised by debtholders such as banks (Filatotchev, 2019). Therefore, the capital structure decision is not without governance implication.

[3] In response to past corporate scandals, the Cadbury report (1992) in the UK offered recommendations that strengthened corporate governance. This was followed by the Sarbanes -Oxley Act (2002) which strengthened the monitoring role of the corporate board.

[4] Another advantage of using GMM system is that it enables us control for potential endogeneity of all independent variables, which includes board variables and firm-level variables. We viewed these variables as predetermined and used their lags as instruments. We also employed 2SLS regression to control for endogeneity (see appendix 4)

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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APPENDIX A

Tables A1–A4

TABLE A1 Sample selection criteria: 2009–2018

The initial observation of non-financial firms	UK	France	Germany
	1260	890	700
Less: Firms with missing data	80	70	60
Final firm-year observations	1180	820	690
Total Observation	2690		

Measurement of variables		
CG variables	**Definition**	**Measurement**
MKLev	Market leverage	Financial debt divided by financial debt + market value of common stock
BKLev	Book leverage	The ratio of the book value of total debt to total assets
BGD	Board gender diversity	The number of female directors on the board
BI	Board independence	Percentage of non-executive directors on the board
BZ	Board size	Number of directors on the board
BM	Board meeting	Number of meetings held by the board of directors annually
PROF	Profitability	The ratio of operating profit to total assets' book value
Astang	Asset tangibility	The ratio of fixed assets to total assets
FSZ	Firm size	Natural log of sales
MVB	Growth opportunity	Book liabilities plus the market value of equity divided by book value of assets
LIQ	Liquidity	Total current asset divided by total current liability
NDTS	Non-debt tax shield	Depreciation divided by total asset
TX	Tax	Current income tax divided by income before taxes
INF	Inflation	Annual inflation rate
GDP	Gross domestic product	Annual growth in gross domestic product

Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BKLev, book value of leverage; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

TABLE A2 Additional regression result (MKLev)

Variable	All sample	UK	Germany	France
PROF	−5.62	−12.410	−2.600	−1.460
	(0.001***)	(0.001***)	(0.009***)	(0.144)
Astang	−1.000	−2.500	1.440	4.760
	(0.318)	(0.012***)	(0.150)	(0.001***)
FSZ	−3.300	2.330	−12.590	−6.000
	(0.001***)	(0.02**)	(0.001***)	(0.001***)
MVB	−0.750	−1.450	2.020	−1.240
	(0.453)	(0.146)	(0.043**)	(0.214)
Liq	0.300	1.630	1.030	0.340
	(0.762)	(0.104)	(0.304)	(0.734)
NDTS	−0.170	1.000	2.760	−1.440
	(0.861)	(0.319)	(0.006***)	(0.151)
TX	−1.240	0.440	−1.060	−0.400
	(0.241)	(0.658)	(0.290)	(0.687)
Inf	−2.110	-	-	-
	(0.035**)	-	-	-
GDP	0.490	-	-	-
	(0.624)	-	-	-
SHRGT	2.000	-	-	-
	(0.046**)	-	-	-
CRRGT	−0.740	-	-	-
	(0.458)	-	-	-
_cons	3.77	−1.110	14.070	7.240
	(0.001***)	(0.267)	(0.001***)	(0.001***)
SOA (%)	45%	28%	41%	36%
AR 1	0.002	0.007	0.012	0.049
AR 2	0.5511	0.197	0.645	0.458

Note: *** ** and * indicate 1%, 5% and 10% statistical significance, respectively.

Abbreviations: Astang, asset tangibility; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

TABLE A3 Alternative analysis (BKLev)

Variable	All sample	UK	Germany	France
BGD	−5.32	−2.00	−5.86	−6.04
	(0.001***)	(0.045**)	(0.001***)	(0.001***)
BI	−1.91	1.98	−0.12	−1.68
	(0.056*)	(0.048**)	(0.904)	(0.094*)
BZ	−4.74	2.04	−2.44	−7.32
	(0.001***)	(0.041**)	(0.015**)	(0.001***)
BM	2.29	−2.38	2.09	3.28
	(0.02**)	(0.017**)	(0.037**)	(0.001***)
PROF	−5.00	−6.44	−4.06	−9.90
	(0.001***)	(0.001***)	(0.001***)	(0.001***)
Astang	−3.05	−2.32	0.82	−3.2
	(0.002***)	(0.02**)	(0.412)	(0.001***)
FSZ	−2.53	1.98	−4.21	−9.96
	(0.01***)	(0.047**)	(0.001***)	(0.001***)
MVB	0.21	1.73	1.74	−0.71
	(0.831)	(0.083*)	(0.082*)	(0.475)
Liq	−3.48	−3.09	−3.54	−2.67
	(0.001***)	(0.002***)	(0.001***)	(0.008***)
NDTS	6.4	−2.77	0.089	17.52
	(0.001***)	(0.006***)	(0.990)	(0.001***)
TX	−1.22	2.35	−2.16	−0.13
	(0.223)	(0.019**)	(0.031**)	(0.895)
Inf	−3.22	-	-	-
	(0.001***)	-	-	-
GDP	−0.24	-	-	-
	(0.808)	-	-	-
_cons	4.33	3.01	10.65	15.16
	(0.001***)	(0.001***)	(0.001***)	(0.001***)

Note: *** ** and * indicate 1%, 5% and 10% statistical significance, respectively.

Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BKLev, book value of leverage; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.

TABLE A4 2SLS analysis

Variables	UK	Germany	France
LBGD	−5.1	−2.3	0.42
	(0.001***)	(0.021**)	(0.676)
LBI	−5.76	−1.28	−5.01
	(0.001***)	(0.199)	(0.001***)
LBZ	1.84	−1.85	−2.04
	(0.065*)	(0.064*)	(0.042**)
LBM	3.83	−2.49	−2.26
	(0.001***)	(0.013**)	(0.024**)
PROF	−1.64	−2.51	−3.00
	(0.101)	(0.012**)	(0.003***)
Astang	0.48	−3.98	4.2
	(0.628)	(0.001***)	(0.001***)
FSZ	2.76	−3.78	−3.71
	(0.006***)	(0.001***)	(0.001***)
MVB	−1.9	5.29	1.34
	(0.057*)	(0.001***)	(0.179)
Liq	−0.94	−0.43	−0.21
	−0.345	(0.668)	(0.837)
NDTS	5.98	3.6	−0.22
	(0.001***)	(0.001***)	(0.826)
TX	0.65	−0.41	−0.46
	(0.518)	(0.684)	(0.649)
_cons	6.45	8.38	11.43
	(0.001***)	(0.001***)	(0.001***)

Note: ***, ** and * indicate 1%, 5% and 10% statistical significance, respectively.

Abbreviations: Astang, asset tangibility; BGD, board gender diversity; BI, board independence; BM, board meeting; BZ, board size; FZZ, firm size; GDP, gross domestic product; Infl, inflation; Liq, liquidity; MKLev, market value of leverage; MVB, market-to-book value (measure of firms' growth opportunity); NDTS, non-debt tax shield; PROF, profitability; Tx, tax.