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Article

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Credit Rating and Board Evaluation of Family Firms

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ARTICLE INFO	ABSTRACT
<p>Article History</p> <p>Received 15 April 2023 Accepted 03 July 2023</p> <p><i>JEL Classifications</i> G18, M41, M48</p>	<p>Purpose: The purpose of this paper is to shed the light on board evaluation for following analyses that will explore whether and how does credit rating agencies react to board performance evaluation.</p> <p>Design/methodology/approach: To test our research questions, we hand-collect board evaluation information for Taiwan publicly firms from annual reports and firm websites for the years 2019 to 2021. Then, we use the ordered probit model to examine our research questions.</p> <p>Finding: First, our results show that there is a relationship between family firms and unfavorable ratings. However, effective board evaluation was shown to strengthen transparency and accountability in internal governance environment, thereby moderating such negative relationships. Second, when family firms are mandated to establish audit committees or change auditors, they are more likely to receive unfavorable ratings. Specifically, effective board evaluation moderates' negative effects on ratings and positively impacts rater perceptions. Third, rating agencies assign a more unfavorable rating to family firms that ignore gender diversity on audit committees, however, effective audit committee's evaluation could moderate the concern whether gender diversity on audit committees affect the effectiveness of corporate governance.</p> <p>Research limitations/implications: First, we focus on the context of family governance to examine the effect of board evaluation on credit ratings. Therefore, our findings may not be applicable to non-family firms. Second, we are not able to directly observe the mechanism of board evaluation because our study uses hand-collected data of board evaluation obtained from publicly available MOPS reports and website news. In addition, our sample period is limited from 2019 until 2022 due to the significantly higher hand-collecting cost of using board evaluation data. Third, with respect to our extended analyses on audit changes, we didn't consider the types of auditor changes because it is difficult to distinguish between auditor resignations and dismissals. Finally, although we include control variables consistent with prior studies, our research models may have not fully captured variables associated with credit ratings.</p> <p>Originality/value: First, our results contribute to the family firm literature on the relationship between corporate governance and economic consequence by focusing on the importance of board evaluation. Second, our findings can be useful to regulators and policy-makers in making governance policies aiming to mandate the establishment of audit committees' complementary rules by encouraging family firms to fulfill the board evaluation for improving the quality of governance environment. Third, our findings not only contribute to the auditing literature but also imply that the board's performance evaluation plays a positive factor in credit raters' considerations. Fourth, our findings contribute to the audit committee literature examining the effects of gender diversity and performance evaluation.</p>
<p>Keywords: board evaluation, credit rating, family firm</p>	

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1. Introduction

Family firms have a specific ownership structure, and their ownership structure is unique and heterogeneous in the capital market (Galavotti & D'Este, 2022; Daspit et al., 2021; Min, 2021). In Taiwan, family firms are a common organizational form in the capital market, more than 70% of listed companies are family firms (Chen et al., 2022). Compared with non-family firms, family firms are more likely to experience more conflict of interest between family controlling shareholders and minority shareholders (Chen et al., 2020). This highlights the importance of board effectiveness in the family ownership structure because the board is the core of the corporate governance system that directly formulates and supervises internal governance environment and decision-making structure (Lel & Miller, 2019; Balsam et al., 2018; Souther, 2018). Additionally, board effectiveness is particularly relevant to fund-raising activities and future development plans, because market participants view the board performance and governance as a key determinant of firm risk and growth. Board evaluation has an important role in corporate governance, it is the first defense of board effectiveness in improving and maintaining the board performance and governance. In 2020, Taiwan's regulator also amended rules relating to board effectiveness to heighten the importance of board evaluation. Furthermore, the relationship between board effectiveness and credit ratings is particularly relevant because maintaining or obtaining the major capital source is one of board's central tasks and debt financing is a major capital source for publicly firms, and debt financing is dominated by credit ratings (Driss et al., 2021; Badoer et al., 2019; Chava et al., 2019). With the growing importance of board evaluation, investigating the effect of board evaluation in family firms is thus critical to better understand the risk perception of credit raters in making rating decisions.

The purpose of this study is thus to investigate whether and how does credit rating agencies react to board evaluation of family firms? To test our research questions, we hand-collect board evaluation information for Taiwan publicly firms from annual reports and firm websites for the years 2019 to 2021. Empirical results from our study suggest four major findings and contributes. First, our study provides more significant evidence that board evaluation enhances a family firm's board effectiveness, as reflected by the risk perception of credit raters in making rating decisions. Our results imply that credit raters can understand firms' governance strategies and react accordingly. These results contribute to the family firm literature on the relationship between corporate governance and economic consequence by focusing on the importance of board evaluation. Second, we find that credit raters do perceive family firms being mandatorily required to establish their audit committees to be associated with higher risk and react unfavorably to them. However, credit raters view board evaluation that improves governance effectiveness and thereby react positively to them. Our results imply that credit raters view board evaluation as a governance strategy that improves governance effectiveness and thereby react positively to them. Our findings can be useful to regulators and policymakers in making governance policies aiming to mandate the establishment of audit committees' complementary rules by encouraging family firms to fulfil the board evaluation for improving the quality of governance environment.

Third, our results show that family firms with auditor changes are viewed as a potential red flag of corporate governance particularly when their audit committee members experience turnover. Specifically, our empirical findings highlight the importance of board evaluation in moderating the negative effect of auditor changes on governance performance. These findings not only contribute to the auditing literature but also imply that the board's performance evaluation plays a positive factor in credit raters' considerations. Fourth, we find that credit raters positively react to audit committees' evaluation because they perceive that audit committees' evaluation plays a governance role in audit committees' performance and, therefore, are more likely to moderate the effect of gender inequality of audit committees, leading to a moderate effect on a firm's governance function. Our findings contribute to the audit committee literature by examining the effects of gender diversity and performance evaluation. Overall, our empirical results suggest a positive effect of board evaluation on credit ratings.

This paper proceeds as follows. Section 2 provides related literature review. We describe our sample selection and research design in Section 3. In Section 4, we present the empirical results. In Section 5, we list our conclusions and limitations.

2. Related Literature

2.1 The importance of board evaluation

Corporate governance mechanism plays a crucial role in improving and maintaining the quality of governance environments. The structure of corporate governance mechanism¹ mainly includes (1) board of directors that their duties related to financial reporting, strategy evaluation and corporate governance, (2) audit committees that their duties related to internal control and financial accountability, and (3) auditors that their duties related to reasonable assurance of the financial statements. These three central elements contribute to ensure efficient corporate governance and quality financial reporting as they can efficiently perform and promote the governance function (Cimini et al., 2022; Haman et al., 2020). Specifically, the board of directors plays a bidirectional role in the structure of corporate governance mechanism, it is also responsible for protecting shareholders' interests and moderating agency problems between managers and shareholders (Hettler et al., 2021; Hope et al., 2019). In an internal mechanism of corporate governance, the board of directors plays a pivotal role in communicating governance issues to audit committees and auditors, and its' main responsibility is focused on identifying strategy effectiveness in decision-making and monitoring governance quality in performance management (Lel & Miller, 2019; Balsam et al., 2018; Souther, 2018). In general, the board of directors not only plays a monitoring role in the governance field, but also

¹ See Cohen et al. (2004) for related literature reviews and discussions.

plays an advisory role in providing valuable advice to improve governance environment (Baldenius et al., 2021; Chen et al., 2020; Golden & Kohlbeck, 2019). Thus, there is no doubt that the board of directors is one of the most important factors affecting governance environment through connecting various governance roles.

The board of directors plays a pivotal role as a governance intermediary in a communicating network of corporate governance, and it is obviously a core role of corporate governance in improving transparency and accountability of governance performance. Thus, board evaluation is particularly important in the board's operation because questionable board performance had adversely affected board's effectiveness and firm's risk management. In 2020, the issue of board evaluation has received much public attention, and Taiwan's regulator has amended the Sample Template of "Rules for Performance Evaluation of Board of Directors"² for evaluating the board performance and improving the board effectiveness. Despite board evaluation having practical importance, the board effectiveness literature provides little insight into the board evaluation and its effects. Instead, much of the board literature (Al-Hadi et al., 2022; García Lara et al., 2022; Hovakimyan and Mkrtchyan, 2022; Adams & Jiang, 2020; Chen et al., 2020; Peteghem et al., 2018) focuses on the board structure (e.g., independence, diversity, expertise, etc.), and emphasizes the importance of the composition effect of boards in a governance system. In contrast, this study focuses not only on the board structure but also on the board effectiveness by examining the importance of board evaluation and its effects on the economic consequences.

2.2 Economic consequence analysis

Prior studies in corporate governance research focus primarily on the economic consequences of corporate governance.³ For example, there is a large empirical literature documenting corporate governance and its impacts on financial reporting quality (Fuller et al., 2021; Ge et al., 2021; Maroun, 2019; Ng et al., 2019; Cheng et al., 2018; Rinaldi et al., 2018). Some studies further find that quality corporate governance contributes to the efficiency of debt contracts (Gallimberti, 2021; Christensen et al., 2019; Balsam et al., 2018; Guttman & Marinovic, 2018), moderates the effect of analyst coverage and related party transaction (Christensen et al., 2021; Hope et al., 2019; Lehmann, 2019), affects the determinants of audit pricing and cybersecurity audits (Hansen et al., 2021; Abernathy et al., 2019; Islam et al., 2018; Steinbart et al., 2018), increases the usefulness of accounting information (Cascino et al., 2021), has a low risk of litigation (Al-Hadi et al., 2022). Furthermore, several studies extend the corporate governance research by focusing on the topics of CSR/ESG as alternative economic activities to examine the association between corporate governance and CSR/ESG performance (Bartov et al., 2021; Christensen et al., 2021; Brooks & Oikonomou, 2018).

Different from prior studies which discussed the relationship between corporate governance and its impacts from the economic consequence perspective, this study extends and complements the existing literature by investigating the importance of board evaluation and its effects from the effectiveness perspective. We highlighted that board evaluation plays a vital role as one of the governance performance mechanisms in improving board governance and increasing board effectiveness. Strong board governance represents an essential element for fulfilling directors' responsibilities and thereby enhancing board efficacy. Furthermore, board governance is closely associated with credit ratings because maintaining or obtaining the major capital source is one of board's central tasks and debt financing is a major capital source for publicly firms, and debt financing is dominated by credit ratings (Driss et al., 2021; Badoer et al., 2019; Chava et al., 2019). Credit ratings represent the prudent economic response that not only presents the quality of board governance but even generates substantial economic consequences in terms of affected the costs of debt and capital source (Driss et al., 2020; Badoer et al., 2019; Chava et al., 2019).⁴ Therefore, this paper sheds the lights on board evaluation for following analyses that will explore whether and how does credit rating agencies react to board performance evaluation.

3. Sample distribution and research design

3.1 Sample and data

Our initial sample consists of all firms listed on the Taiwan Stock Exchange (TWSE). The credit rating data, company-level financial data, and corporate governance information were obtained from the Taiwan Economic Journal (TEJ) annual file. Board evaluation information was hand-collected from annual reports of the Market Observation Post System (MOPS) and information disclosure of firm websites. After merging these data sources, we exclude the financial services industry (banking, securities, insurance, etc.) and observations with insufficient data required for regression analysis. The sample period is from 2019 to 2021, and our final sample consists of 3,825 firm-year observations.⁵

Panel A of Table 1 illustrates the distribution of ownership structure and board evaluation among firm-year observations, showing that approximately 61.33% of the final sample (in which approximately 83.16% of family firms

² According to the Sample Template of "Rules for Performance Evaluation of Board of Directors", evaluating methods of board performance include the internal board evaluation, self-evaluation by individual board members, peer evaluation, and evaluation by appointed external professional institutions, experts, or other appropriate methods.

³ See Cohen et al. (2002, 2004) for related literature that reviews research on corporate governance and its impacts on financial reporting quality.

⁴ See Balsam et al. (2018) and Ashbaugh-Skaife et al. (2006) for related literature that reviews research on governance features and rating methodologies.

⁵ To implement corporate governance and enhance the company's board functions, the Government of Taiwan has amended the Sample Template of "Rules for Performance Evaluation of Board of Directors" in 2020; moreover, TWSE listed companies shall comply with this law to improve the operation efficiency of the board of directors. Our sample period employed in this study is from 2019 to 2021 to cover one year before and after the Amendment of the Sample Template of "Rules for Performance Evaluation of Board of Directors". Accordingly, our sample period starts from 2019 and ends in 2021.

performed evaluations of board performance) were family firms. Notably, the numbers of performing board evaluations increase monotonically from 2019 to 2021. This indicates that firms are willing to comply with regulatory requirements in promoting evaluations of board performance. As shown in Panel B, approximately 19.27% of the final sample (in which approximately 53.32% of family firms were low risk ratings) were low risk firms. Most notably, approximately 53.32% of family firms (in which approximately 85.75% of family firms with low-risk ratings performed evaluations of board performance) were low risk ratings. This result implies when family firms perform evaluations of board performance to enhance the board functions, they are more likely to receive favorable ratings.

Table 1 Sample distribution

Panel A: Distribution of ownership structure and board evaluation by YEAR						
Ownership ^a BE ^b YEAR		Family obs. (n = 2,346)		Non-family obs. (n = 1,479)		Total
		BE	Non-BE	BE	Non-BE	
		378	371	258	218	1,225(32.03%)
		773	19	487	12	1,291(33.75%)
		800	5	501	3	1,309(34.22%)
Total		1,951(51.00%)	395(10.33%)	1,246(32.58%)	233(6.09%)	3,825(100%)
Panel B: Distribution of ownership structure and board evaluation by TCRI						
Ownership ^a BE ^b TCRI ^c		Family obs. (n = 2,346)		Non-family obs. (n = 1,479)		Total
		BE	Non-BE	BE	Non-BE	
low	1	3	0	7	2	12(0.31%)
	2	17	4	14	0	35(0.92%)
	3	73	16	74	12	175(4.58%)
	4	244	36	204	31	515(13.46%)
moderate	5	406	85	226	35	752(19.66%)
	6	531	98	365	74	1,068(27.92%)
high	7	369	79	195	37	680(17.78%)
	8	182	51	106	29	368(9.62%)
	9	112	21	53	11	197(5.15%)
	10	14	5	2	2	23(0.60%)
Total		1,951(51.00%)	395(10.33%)	1,246(32.58%)	233(6.09%)	3,825

^a Family denotes the firm belongs to family firm, but not versa. The information of family firm is as defined in TEJ.

^b BE denotes the firm performs evaluations of board performance, but not versa.

^c TCRI denotes the credit rating is divided into ten degrees, with the highest degree representing the highest credit risk.

3.2 Research design

We examine our research questions by investigating whether and how does credit rating agencies react to board evaluation of family firms? We specify the following ordered probit model:

$$TCRI_{it} = \beta_1 FAMILY_{it} + \beta_2 BE_{it} + \beta_3 FAMILY \times BE_{it} + \sum Control Variables_{it} + \varepsilon_{it} \quad (1)$$

where, for firm i and year t :

- $TCRI$ = Taiwan Corporate Credit Rating Index, where the credit rating is divided into ten degrees, with the highest degree representing the highest credit risk;
- $FAMILY$ = 1 if the firm belongs to family firms, else 0;⁶
- BE = 1 if the firm performs evaluations of board performance, else 0;
- $FAMILY \times BE$ = the interaction is the $FAMILY$ and BE ;
- ROA = net income divided by total assets;
- OCF = cash flow from operations divided by total assets;
- DE = total debt divided by total assets;
- $ZSCORE$ = bankruptcy risk from Altman's (1968) Z-Score model;⁷
- $INDBOD$ = number of independent directors divided by total board size;
- $SIZE$ = dummy variables controlling for size based on total assets;
- $YEAR$ = dummy variables controlling for years;
- IND = dummy variables controlling for industries;
- ε = error term.

⁶ $FAMILY$ follows the definition of the TEJ database: (1) both the board chair and the CEO are members of same family group; or (2) family members occupy over 50% of the board seats while affiliated firms and outside directors occupy less than 33% of the board seats; or (3) family members occupy over 33% of the board seats and at least three family members are board directors, supervisors, and managers; or (4) the family holds control rights exceeding critical control rights.

⁷ Altman's Z-score is equal to $1.2 \times (\text{net working capital} / \text{total assets}) + 1.4 \times (\text{retained earnings} / \text{total assets}) + 3.3 \times (\text{earnings before interest and taxes} / \text{total assets}) + 0.6 \times (\text{market value of equity} / \text{book value of liabilities}) + 0.99 \times (\text{sales} / \text{total assets})$. A lower Z-score represents greater risk of bankruptcy.

Our dependent variable, *TCRI*, represents the corporate credit risk as determined by the Taiwan Corporate Credit Rating Index (TCRI ratings). As defined by TCRI, TEJ indicates that TCRI employs semi-expert procedure, a quantitative model, and manual determination to assess the corporate credit risk based on the theory of financial analysis, domestic situation, and public information. The methodology is public, transparent, and with discriminatory power, which provides reference for financial institutions in investment and lending. TCRI ratings range from 1 (highest rating) to 10 (lowest rating-debt in payment default).

Our main test variables, *FAMILY*, is a dummy variable that takes the value of 1 if the firm belongs to family firms and zero otherwise. Its coefficient, β_1 , captures the difference in TCRI ratings between the family and non-family samples after controlling for all other variables that may affect credit risks included in Equation (1). *BE*, is a dummy variable that takes the value of 1 if the firm performs evaluations of board performance and zero otherwise. If board evaluations contribute to moderate the credit risks, then β_2 should be negative, but not vice-verse. In addition, we further include *BE* and its interaction with *FAMILY* into Equation (1). By examining the significance of the coefficient of *FAMILY*×*BE*, we can shed light on the association between board evaluations of family firm and evaluations of credit risk.

Our control variables include factors considered major determinants affecting firms' credit risks. Previous research (Hung et al., 2022; Yue et al., 2022; Bao and Tanyi, 2020; Hepfer et al., 2020; Hinkel et al., 2020; Hong et al., 2019; Ames et al., 2018; Akins, 2018; Bonsall IV et al., 2018) provides evidence indicating that a firm's financial conditions can potentially explain significant variation in credit risks. Firms with poor financial performance might face greater credit risks and thereby receive unfavorable ratings. We thus include proxies for the firm's financial conditions (*ROA*, *OCF*, *DE*, and *ZSCORE*) to control the effect of firm performance on TCRI ratings. We include *INDBOD* to control the effect of corporate governance differentiation and expect that a more effective governance environment is more likely to manage credit risks and hence receive a favorable rating. Finally, we also controlled size (*SIZE*), year (*YEAR*), and industry (*IND*) effects (Reynolds & Francis, 2000).

4. Descriptive statistics and empirical results

4.1 Descriptive statistics

Table 2 presents descriptive statistics for variables in our research models partitioned based on whether the firm performs evaluations of board performance. As shown in Table 2, the 3,197 observations (approximately 83.58 percent of the sample) that do perform evaluations of board performance have an average *TCRI* of 5.8611 with a median of 6, while the 628 observations that do not perform evaluations of board performance (approximately 16.42 percent of the sample) have an average *TCRI* of 6.0573 with a median of 6. The mean and median differences are statistically significant at the 1 percent level. These descriptive statistics suggest that firms that evaluate their directors exhibit lower credit risks and more favorable TCRI ratings, suggesting that board evaluation plays a complementary role in corporate governance. In addition, firms that do perform evaluations of board performance perform better (*ROA*), have more payable (*DE*), and have stronger corporate governance (*INDBOD*) compared to firms that do not perform evaluations of board performance.

Table 2 Descriptive statistics

Variable ^b	BE obs. ^a (n = 3,197)			Non-BE obs. (n = 628)			Test of Differences ^c	
	Mean	Med.	S.D.	Mean	Med.	S.D.	t-test	Wilcoxon
<i>TCRI</i>	5.8611	6.0000	1.5710	6.0573	6.0000	1.5914	2.86***	2.88***
<i>ROA</i>	0.0565	0.0554	0.1019	0.0444	0.0444	0.0953	-2.74***	-3.57***
<i>OCF</i>	0.0613	0.0604	0.1456	0.0675	0.0649	0.1341	0.98	1.68*
<i>DE</i>	0.4327	0.4340	0.1867	0.4090	0.4196	0.1869	-2.90***	-2.75***
<i>ZSCORE</i>	2.7332	2.4391	1.7913	2.8389	2.4396	1.9058	1.34	0.83
<i>INDBOD</i>	0.3709	0.3750	0.0829	0.3510	0.3333	0.0858	-5.46***	-6.31***

^a BE denotes the firm performs evaluations of board performance, but not versa.

^b The definition of the variables reported in this table are: *TCRI* = Taiwan Corporate Credit Rating Index, where the credit rating is divided into ten degrees, with the highest degree representing the highest credit risk; *ROA* = net income divided by total assets; *OCF* = cash flow from operations divided by total assets; *DE* = total debt divided by total assets; *ZSCORE* = bankruptcy risk from Altman's (1968) Z-Score model; *INDBOD* = number of independent directors divided by total board size.

^c Asterisks *, **, *** indicate significance at the 0.10, 0.05, 0.01 levels, respectively.

Table 3 presents Pearson correlation coefficients for all variables considered. The correlation shows that *TCRI* is significantly and positively associated with *FAMILY* ($p < 0.01$), showing that family firms are more likely to receive unfavorable ratings compared to non-family firms. As well, *TCRI* is significantly and negatively associated with *BE* ($p < 0.01$), indicating that evaluations of board performance decrease raters' risk perception and then lead to receive favorable ratings. Although the correlations between several control variables are above 0.35, the highest variance inflation factor (VIF) observed is 2.78 for all models. Both are below the suggested multicollinearity problem threshold of 10 (Hair et al., 2006; Kennedy, 1998; Gujarati, 1995; Marquandt, 1980), suggesting that multicollinearity is not likely to be a problem in our study.

Table 3 Pearson correlation matrix

Variable ^a	<i>TCRI</i>	<i>FAMILY</i>	<i>BE</i>	<i>ROA</i>	<i>OCF</i>	<i>DE</i>	<i>ZSCORE</i>
<i>FAMILY</i>	0.0757						
<i>BE</i>	-0.0461	-0.0142					
<i>ROA</i>	-0.5027	-0.0364	0.0443				
<i>OCF</i>	-0.3839	-0.0754	-0.0159	0.5355			
<i>DE</i>	0.1528	0.0455	0.0469	-0.1625	-0.1358		
<i>ZSCORE</i>	-0.2805	-0.0985	-0.0216	0.3934	0.2156	-0.7455	
<i>INDBOD</i>	0.0831	-0.0337	0.0880	0.0104	-0.0177	-0.0449	0.0701

^a The definition of the variables reported in this table are: *FAMILY* = 1 if the firm belongs to family firms, else 0; *BE* = 1 if the firm performs evaluations of board performance, else 0; *ROA* = net income divided by total assets; *OCF* = cash flow from operations divided by total assets; *DE* = total debt divided by total assets; *ZSCORE* = bankruptcy risk from Altman's (1968) Z-Score model; *INDBOD* = number of independent directors divided by total board size.

4.2 How credit ratings react to board evaluation of family firms

Board evaluation

Table 4 presents the results of the ordered probit regression model used to investigate whether and how credit ratings react to the family ownership structure with consideration of board performance. As shown in Column (1), the coefficient on *FAMILY* is positively significant ($p < 0.01$), indicating that family firms are more likely to receive unfavorable ratings. This result also implies that the family ownership structure seems more likely to increase credit raters' perceived risk of corporate governance and, therefore, are associated with more unfavorable ratings. Further, we examine whether there is a relationship between board evaluation and credit rating. In Column (2), the coefficient on *FAMILY* is still positively significant ($p < 0.01$). Notably, the estimated coefficient on *BE* is negative and significant ($p < 0.01$), indicating that firms that evaluate their board performance are more likely to receive more favorable TCRI ratings. This result also implies that credit raters view board performance evaluation as a corporate governance improving mechanism and, therefore, react favorably to firms that perform board evaluation. Next, our primary variables of interest in Column (3), *FAMILY* and *FAMILY*×*BE*, are insignificant positive that indicate that family firms are more likely to receive a positive rating reaction when they perform an evaluation of board performance. Given the above-mentioned findings, these results imply that board evaluation plays an important role in improving the board effectiveness of family ownership structure and positively influences the risk perception of credit raters in making rating decisions. With respect to the coefficients on control variables, most control variables, such as *ROA*, *OCF*, *DE*, and *ZSCORE*, are significantly associated with credit ratings in the expected directions and consistent with prior studies (e.g., Hung et al., 2022; Yue et al., 2022; Bao & Tanyi, 2020; Hepfer et al., 2020; Hinkel et al., 2020).

Table 4 Family firm, board evaluation and credit rating

Variable ^a	Pred. Sign	(1)		(2)		(3)	
		Coef.	z-value ^b	Coef.	z-value	Coef.	z-value
<i>FAMILY</i>	+/-	0.1135	3.10***	0.1121	3.06***	0.0390	0.45
<i>BE</i>	-			-0.1430	-2.56***	-0.1973	-2.36***
<i>FAMILY</i> × <i>BE</i>	+/-					0.0873	0.93
<i>ROA</i>	-	-4.2895	-11.20***	-4.2961	-11.22***	-4.2974	-11.22***
<i>OCF</i>	-	-1.2628	-5.33***	-1.2672	-5.34***	-1.2660	-5.33***
<i>DE</i>	+	1.6329	9.18***	1.6422	9.24***	1.6414	9.24***
<i>ZSCORE</i>	-	-0.0542	-2.65***	-0.0541	-2.65***	-0.0542	-2.65***
<i>INDBOD</i>	-	0.3391	1.52*	0.3580	1.61*	0.3569	1.60*
<i>SIZE</i>		Included		Included		Included	
<i>YEAR</i>		Included		Included		Included	
<i>IND</i>		Included		Included		Included	
Pseudo R ²		22.32%		22.36%		22.37%	
n		3,825		3,825		3,825	

^a The definition of the variables reported in this table are: *FAMILY* = 1 if the firm belongs to family firms, else 0; *BE* = 1 if the firm performs evaluations of board performance, else 0; *FAMILY*×*BE* = the interaction between *FAMILY* and *BE*; *ROA* = net income divided by total assets; *OCF* = cash flow from operations divided by total assets; *DE* = total debt divided by total assets; *ZSCORE* = bankruptcy risk from Altman's (1968) Z-Score model; *INDBOD* = number of independent directors divided by total board size; *SIZE* = dummy variables controlling for size based on total assets; *YEAR* = dummy variables controlling for years; *IND* = dummy variables controlling for industries.

^b Asterisks *, **, *** indicate significance at the 0.10, 0.05, 0.01 levels, respectively. One-tailed for directional expectations, and two-tailed for others.

Mandatory establishment of audit committee

Audit committees play an important and essential role in reinforcing corporate governance pillars and improving board effectiveness, and their importance has received particular attention from the public (García Lara et al., 2022; Das et al., 2022; Aobdia et al., 2021; Carr et al., 2021; Free et al., 2021; Fuller et al., 2021; Hansen et al., 2021; Park et al., 2021). The Financial Supervisory Commission (FSC) of Taiwan mandates all listed firms to establish an audit

committee composed of independent directors after 2021.⁸ This gives us a good opportunity to examine how board evaluation of family firms affects the relationship between mandatory establishment of audit committees and credit ratings by using the sample before the enforcement date of audit committee establishment. To investigate our research issues, we include an indicator variable *MANAC* and its interaction with board evaluation to capture the interactive effect of mandatory establishment and board evaluation on rating reactions. We specify the following ordered probit model:

$$TCRI_{it} = \beta_1 MANAC_{it} + \beta_2 BE_{it} + \beta_3 MANAC \times BE_{it} + \sum Control\ Variables_{it} + \varepsilon_{it} \quad (2)$$

Where *MANAC* equals one if the firm is mandatorily required to establish an audit committee, and zero otherwise. *MANAC*×*BE* equals the interaction between *MANAC* and *BE*. Control variables are the same as previously mentioned in Equation (1).

As shown in Column (1) of Table 5, the coefficient on *MANAC* is positively significant ($p < 0.01$), indicating that family firms are more likely to receive unfavorable ratings when they are mandatorily required to establish their audit committees. This result implies that it is viewed as a potential red flag of warned governance quality when family firms are mandatorily required to improve governance environment. In Column (2), the coefficient on *MANAC* is still positively significant ($p < 0.01$) whereas the coefficients on *MANAC* and *MANAC*×*BE* are insignificant positive in Column (3). These findings suggest that credit raters do perceive family firms being mandatorily required to establish their audit committees to be associated with higher risk and react unfavorably to them. However, credit raters view board evaluation that improves governance effectiveness and thereby react moderately to them.

Table 5 Mandatory establishment of audit committee, board evaluation and credit rating

Variable ^a	Pred. Sign	(1)		(2)		(3)	
		Coef.	z-value ^b	Coef.	z-value	Coef.	z-value
<i>MANAC</i>	+/-	0.1710	3.37***	0.1716	3.39***	0.1160	0.96
<i>BE</i>	-			-0.1245	-1.79**	-0.1446	-1.91**
<i>MANAC</i> × <i>BE</i>	+/-					0.0647	0.51
<i>ROA</i>	-	-4.2892	-9.10***	-4.2961	-9.13***	-4.2993	-9.14***
<i>OCF</i>	-	-1.1556	-3.86***	-1.1602	-3.87***	-1.1581	-3.87***
<i>DE</i>	+	1.7066	7.55***	1.7212	7.60***	1.7229	7.61***
<i>ZSCORE</i>	-	-0.0812	-3.09***	-0.0805	-3.07***	-0.0804	-3.07***
<i>INDBOD</i>	-	0.1467	0.48	0.1706	0.56	0.1688	0.55
<i>SIZE</i>		Included		Included		Included	
<i>YEAR</i>		Included		Included		Included	
<i>IND</i>		Included		Included		Included	
Pseudo R ²		22.62%		22.65%		22.65%	
n		2,346		2,346		2,346	

^a The definition of the variables reported in this table are: *MANAC* = 1 if the firm is mandatorily required to establish an audit committee, else 0; *BE* = 1 if the firm performs evaluations of board performance, else 0; *MANAC*×*BE* = the interaction between *MANAC* and *BE*; *ROA* = net income divided by total assets; *OCF* = cash flow from operations divided by total assets; *DE* = total debt divided by total assets; *ZSCORE* = bankruptcy risk from Altman's (1968) Z-Score model; *INDBOD* = number of independent directors divided by total board size; *SIZE* = dummy variables controlling for size based on total assets; *YEAR* = dummy variables controlling for years; *IND* = dummy variables controlling for industries.

^b Asterisks *, **, *** indicate significance at the 0.10, 0.05, 0.01 levels, respectively. One-tailed for directional expectations, and two-tailed for others.

The effect of auditor change

The external auditor plays a pivotal role in the corporate governance system by constraining firm's opportunistic accounting choices through providing reasonable assurance for the reliability of financial reporting (Hallman et al., 2022; Lee, 2022; Adams et al., 2021; Frankel et al., 2021; Cassell et al., 2020). Auditor's governance functions are more likely to face more challenges when auditees are family firms because family firms are typically high control and detection risks. When family firms change their auditors, capital market participants may perceive such auditor changes to be a signal of risk information regarding financial reporting failures. To investigate how credit raters react auditor changes of family firms and their board efficiency, we include an indicator variable *CHANGE* and its interaction with board evaluation to capture the interactive effect of auditor changes and board evaluation on rating reactions. We specify the following ordered probit model:

$$TCRI_{it} = \beta_1 CHANGE_{it} + \beta_2 BE_{it} + \beta_3 CHANGE \times BE_{it} + \sum Control\ Variables_{it} + \varepsilon_{it} \quad (3)$$

Where *CHANGE* equals one if the firm changes their auditor, and zero otherwise. *CHANGE*×*BE* equals the interaction between *CHANGE* and *BE*. Control variables are the same as previously mentioned in Equation (1).

As shown in Column (1) of Table 6, the coefficient on *CHANGE* is positively significant ($p < 0.05$), indicating that family firms are more likely to receive unfavorable ratings when they change their auditors. This result also implies that credit raters perceive an increase in the family firms' risk exposures due to auditor changes, which in turn

⁸ Please refer to the Financial-Supervisory-Securities-Corporate-10703452331 for detailed regulations about the mandatory establishment of audit committee.

increases perceived risks in their rating decisions. In Column (2), the coefficient on *CHANGE* is still positively significant ($p < 0.05$) whereas the coefficients on *CHANGE* and *CHANGE*×*BE* are insignificant positive in Column (3). These results indicate that board evaluation strengthens the corporate governance effectiveness and moderates the negative relation between auditor changes and credit ratings.

Table 6 Auditor change, board evaluation and credit rating

Variable ^a	Pred. Sign	(1)		(2)		(3)	
		Coef.	z-value ^b	Coef.	z-value	Coef.	z-value
<i>CHANGE</i>	+/-	0.3009	2.58***	0.3019	2.59***	0.1931	0.90
<i>BE</i>	-			-0.1237	-1.78**	-0.1308	-1.84**
<i>CHANGE</i> × <i>BE</i>	+/-					0.1350	0.53
<i>ROA</i>	-	-4.2412	-8.96***	-4.2480	-8.99***	-4.2485	-8.99***
<i>OCF</i>	-	-1.1648	-3.87***	-1.1695	-3.88***	-1.1679	-3.88***
<i>DE</i>	+	1.6687	7.41***	1.6831	7.47***	1.6809	7.47***
<i>ZSCORE</i>	-	-0.0833	-3.17***	-0.0827	-3.15***	-0.0826	-3.15***
<i>INDBOD</i>	-	0.2307	0.76	0.2547	0.83	0.2509	0.82
<i>SIZE</i>		Included		Included		Included	
<i>YEAR</i>		Included		Included		Included	
<i>IND</i>		Included		Included		Included	
Pseudo R ²		22.58%		22.61%		22.62%	
n		2,346		2,346		2,346	

^a The definition of the variables reported in this table are: *CHANGE* = 1 if the firm changes their auditor, else 0; *BE* = 1 if the firm performs evaluations of board performance, else 0; *CHANGE*×*BE* = the interaction between *CHANGE* and *BE*; *ROA* = net income divided by total assets; *OCF* = cash flow from operations divided by total assets; *DE* = total debt divided by total assets; *ZSCORE* = bankruptcy risk from Altman's (1968) Z-Score model; *INDBOD* = number of independent directors divided by total board size; *SIZE* = dummy variables controlling for size based on total assets; *YEAR* = dummy variables controlling for years; *IND* = dummy variables controlling for industries.

^b Asterisks *, **, *** indicate significance at the 0.10, 0.05, 0.01 levels, respectively. One-tailed for directional expectations, and two-tailed for others.

Audit committee turnover and auditor change

The relationship between the audit committees and external auditors is highly related to the effects of corporate governance on the firm's prospect and performance. Audit committees are not only responsible for the auditor's selection (hiring and retention) and supervision, but also support the auditor's work to enhance the performance of corporate governance and the quality of financial reporting (Hurley et al., 2019; Kowaleski et al., 2018). This raises an interesting question on whether the auditor-client relationship becomes more uncertain when their audit committee members experience turnover. Therefore, we further extend our analysis considering the effect of audit committee turnover on the relationship among auditor change, board efficiency, and rater reaction.

In this section, we partition the sample into two sub-samples based on whether audit committee members experience turnover and compare the above results. As such, comparing Panels A and B of Table 7 provides evidence as to whether credit raters regard the audit committee turnover as an important factor for auditor change and board evaluation. In Panel A, the result of coefficients on *CHANGE*, *BE* and *CHANGE*×*BE* is like those reported in Table 6 whereas the coefficients on *CHANGE*, *BE* and *CHANGE*×*BE* are all insignificant in Panel B. These results seem to imply that family firms with auditor changes are viewed as a potential red flag of corporate governance particularly when their audit committee members experience turnover. Again, our findings highlight the importance of board evaluation in moderating the negative effect of auditor changes on governance performance.

Table 7 Auditor change, board evaluation and credit rating (consider audit committee turnover)

Panel A: Audit committee turnover ^a							
Variables ^b	Pred. Sign	(1)		(2)		(3)	
		Coef.	z-value ^c	Coef.	z-value	Coef.	z-value
<i>CHANGE</i>	+/-	0.3029	1.72*	0.2977	1.70*	0.3551	1.09
<i>BE</i>	-			-0.3032	-2.28**	-0.2988	-2.16**
<i>CHANGE</i> × <i>BE</i>	+/-					-0.0665	-0.18
<i>ROA</i>	-	-2.7091	-3.97***	-2.7489	-4.01***	-2.7500	-4.02***
<i>OCF</i>	-	-2.0123	-3.54***	-2.0354	-3.56***	-2.0336	-3.55***
<i>DE</i>	+	1.4062	3.84***	1.4562	3.96***	1.4582	3.96***
<i>ZSCORE</i>	-	-0.1575	-3.54***	-0.1524	-3.43***	-0.1522	-3.43***
<i>INDBOD</i>	-	-0.3274	-0.61	-0.2555	-0.47	-0.2539	-0.47
<i>SIZE</i>		Included		Included		Included	
<i>YEAR</i>		Included		Included		Included	
<i>IND</i>		Included		Included		Included	
Pseudo R ²		23.69%		23.86%		23.87%	
n		686		686		686	

Panel B: Non-audit committee turnover							
Variables	Pred. Sign	(1)		(2)		(3)	
		Coef.	z-value	Coef.	z-value	Coef.	z-value
<i>CHANGE</i>	+/-	0.2234	1.41	0.2239	1.41	0.0250	0.09
<i>BE</i>	-			-0.0581	-0.68	-0.0702	-0.81
<i>CHANGE</i> × <i>BE</i>	+/-					0.2582	0.75
<i>ROA</i>	-	-5.0179	-8.31***	-5.0170	-8.31***	-5.0193	-8.33***
<i>OCF</i>	-	-0.8677	-2.84***	-0.8690	-2.85***	-0.8654	-2.85***
<i>DE</i>	+	1.9117	6.77***	1.9168	6.78***	1.9143	6.78***
<i>ZSCORE</i>	-	-0.0510	-1.58*	-0.0510	-1.58*	-0.0506	-1.57*
<i>INDBOD</i>	-	0.4089	1.09	0.4179	1.11	0.4136	1.10
<i>SIZE</i>		Included		Included		Included	
<i>YEAR</i>		Included		Included		Included	
<i>IND</i>		Included		Included		Included	
Pseudo R ²		23%		23.01%		23.02%	
n		1,660		1,660		1,660	

^a Audit committee turnover denotes that firm's audit committee experiences members turnover.

^b The definition of the variables reported in this table are: *CHANGE* = 1 if the firm changes their auditor, else 0; *BE* = 1 if the firm performs evaluations of board performance, else 0; *CHANGE*×*BE* = the interaction between *CHANGE* and *BE*; *ROA* = net income divided by total assets; *OCF* = cash flow from operations divided by total assets; *DE* = total debt divided by total assets; *ZSCORE* = bankruptcy risk from Altman's (1968) Z-Score model; *INDBOD* = number of independent directors divided by total board size; *SIZE* = dummy variables controlling for size based on total assets; *YEAR* = dummy variables controlling for years; *IND* = dummy variables controlling for industries.

^c Asterisks *, **, *** indicate significance at the 0.10, 0.05, 0.01 levels, respectively. One-tailed for directional expectations, and two-tailed for others.

Audit committee's evaluation and gender diversity

Gender diversity in firm performance has been an important issue in the corporate governance areas, and as a result, there has been growth in the number of this research stream (Wang et al., 2022; Doan & Iskandar-Datta, 2021; Lee et al., 2019). Prior empirical findings suggest that female directors play an effective role in improving board efficacy and decision-making quality (Friedman, 2020; Nekhili et al., 2020; Oradi & Izadi, 2019). Prior studies focus attention on the impact of gender diversity and ignore the moderating effect of governance mechanism in corporate governance studies. In this section, we consider audit committees' evaluation as a determinant in our analyses to extend prior literature by examining whether gender diversity is associated with credit ratings and how audit committees' evaluation moderates the effect of gender diversity on credit ratings. To investigate our research issues, we include a variable *GENDER* to capture the effect of gender diversity on rating reactions. We specify the following ordered probit model:

$$TCRI_{it} = \beta_1 GENDER_{it} + \sum Control\ Variables_{it} + \varepsilon_{it} \quad (4)$$

Where *GENDER* equals the difference between female and male audit committee members, divided by the size of audit committee. Control variables are the same as previously mentioned in Equation (1).

As shown in Table 8, we partition the sample into two sub-samples based on whether the firm performs performance evaluation of audit committees. Table 8 shows that the coefficient of *GENDER* is only significant and positive in the non-ACE group, whereas it is insignificant in the ACE group. These results indicate that the lack of gender diversity in the audit committees is viewed as a risk factor to be more likely to receive unfavorable ratings if such family firms didn't perform performance evaluation of audit committees. Our findings imply that credit raters positively react to audit committees' evaluation because they perceive that audit committees' evaluation plays a governance role in board performance and, therefore, are more likely to moderate the effect of gender inequality of audit committees, leading to a moderate effect on a firm's governance function.

Table 8 Gender diversity of audit committee, board evaluation and credit rating

Variables ^b	Pred. Sign	ACE obs. ^a (n = 1,211)		Non-ACE obs. (n = 1,135)	
		Coef.	z-value ^c	Coef.	z-value
<i>GENDER</i>	+/-	0.1384	1.37	0.1904	2.24**
<i>ROA</i>	-	-3.9177	-6.67***	-4.7701	-6.60***
<i>OCF</i>	-	-1.5321	-4.23***	-1.0564	-2.43***
<i>DE</i>	+	0.5976	1.93**	2.8341	8.58***
<i>ZSCORE</i>	-	-0.1440	-4.02***	-0.0351	-0.89
<i>INDBOD</i>	-	0.9296	1.96**	-0.5501	-1.23
<i>SIZE</i>		Included		Included	
<i>YEAR</i>		Included		Included	
<i>IND</i>		Included		Included	
Pseudo R ²		21.46%		26.09%	
n		1,211		1,135	

^a ACE denotes the firm performs evaluations of audit committee performance, but not versa.

^b The definition of the variables reported in this table are: *GENDER* = the difference between female and male audit committee members, divided by the size of audit committee; *ROA* = net income divided by total assets; *OCF* = cash flow from operations divided by total assets; *DE* = total debt

divided by total assets; *ZSCORE* = bankruptcy risk from Altman's (1968) Z-Score model; *INDBOD* = number of independent directors divided by total board size; *SIZE* = dummy variables controlling for size based on total assets; *TEAR* = dummy variables controlling for years; *IND* = dummy variables controlling for industries.

° Asterisks *, **, *** indicate significance at the 0.10, 0.05, 0.01 levels, respectively. One-tailed for directional expectations, and two-tailed for others.

5. Conclusion

Remarking on the prominence of “Rules for Performance Evaluation of Board of Directors”, we focus on family structure to examine whether board evaluation affects raters’ risk evaluation. Effective board evaluation leads to improved corporate governance efficiency, and thereby increasing the transparency of corporate performance and reducing the credit risk of financial condition. Further, effective board evaluation strengthens the moderating role of board function. We predict and find that board evaluation plays an important role in improving the board effectiveness of family ownership structure and positively influences the risk perception of credit raters in making rating decisions.

To further shed light on the efficacy of board evaluation about the credit rating reaction, we conducted a series of extended analyses. First, our results suggest that credit raters do perceive family firms being mandatorily required to establish their audit committees to be associated with higher risk and react unfavorably to them. However, credit raters view board evaluation that improves governance effectiveness and thereby react moderately to them. Second, we find that family firms with auditor changes are viewed as a potential red flag of corporate governance particularly when their audit committee members experience turnover. Specifically, our findings highlight the importance of board evaluation in moderating the negative effect of auditor changes on governance performance. Third, we also find that credit raters positively react to audit committees’ evaluation because they perceive that audit committees’ evaluation plays a governance role in audit committees’ performance and, therefore, are more likely to moderate the effect of gender inequality of audit committees, leading to a moderate effect on a firm’s governance function.

This study is subject to various limitations. First, we focus on the context of family governance to examine the effect of board evaluation on credit ratings. Therefore, our findings may not be applicable to non-family firms. Second, we are not able to directly observe the mechanism of board evaluation because our study uses hand-collected data of board evaluation obtained from publicly available MOPS reports and website news. In addition, our sample period is limited from 2019 until 2022 due to the significantly higher hand-collecting cost of using board evaluation data. Third, with respect to our extended analyses on audit changes, we didn’t consider the types of auditor changes because it is difficult to distinguish between auditor resignations and dismissals. Finally, although we include control variables consistent with prior studies, our research models may have not fully captured variables associated with credit ratings.

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