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Impact of CEO duality and business education on the cost of debt

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Abstract: The purpose of this study is to investigate the impact of CEO duality (*CD*) and business education (*BUS_EDU*) of small family business owners on the cost of debt (*INT*). This study used a survey design to collect data from the owners of unlisted small family business firms in India. The empirical analysis shows that *CD* and *B_EDU* decrease the cost of debt. In addition, gender plays a moderating role in the association between *BUS_EDU* and *INT*. Further, *CD* and *B_EDU* increase the chances of decreasing the cost of debt by 0.70% and 0.50%, respectively. The empirical results contribute to the literature on the impact of *CD* and *B_EDU* on the cost of debt. The empirical analysis may be helpful to academia to extend the studies on the impact of *CD* and *B_EDU* on the cost of debt.

Keywords: CEO duality; business education; financial leverage; cost of debt; India.

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1 Introduction

Small businesses are considered financially constrained (Joeveer, 2013) and face greater growth volatility (Bottazzi et al., 2014). As a result, they face tighter borrowing terms and conditions (Drakos, 2013), leading to paying a higher cost of debt. In addition, the COVID-19 pandemic hit small business firms in India (Ashwani, 2020), increasing their financial leverage, (i.e., total debt ratio) and the cost of debt. A higher level of financial leverage and higher debt costs negatively impact financial performance, increasing the chances of bankruptcy of small firms in India (Dawar, 2014). Therefore, CEO duality and business education are critical in helping small family business owners decrease the cost of debt. Ameer and Othman (2021) also showed the importance of business education, (e.g., professional accounting and finance education) to increase the financial performance of the firm. Modigliani and Miller (1958) developed a capital structure theory that included the cost of debt. Furthermore, small family business owners serve as CEOs and on the board of directors in most family-owned firms, which helps lower the cost of debt (Gill et al., 2022). Berle and Means (1932) pioneered corporate governance theory.

Business education covers capital structure theory that includes financial leverage and the cost of debt (Ross et al., 2022). Bartell (2003) and Schworm et al. (2017) defined business education as a synergistic and transformative learning process resulting in awareness, competence, and expertise in business management. A synergistic and transformative learning process can help small family business owners have the optimal level of financial leverage to reduce the chances of bankruptcy and lower debt costs. In this study, business education refers to professional degrees that small family business

owners earned (i.e., Bachelor of Commerce or Business Administration, Master of Commerce or Business Administration, and Doctor of Philosophy in Business Management).

A previous study by Gill et al. (2022) concentrated on family-controlled firms and showed a negative correlation between CEO duality and the cost of debt in Canada. On the other hand, Moura et al. (2020) collected data from publicly traded Brazilian firms and showed that CEO duality reduces the cost of debt. In addition, other studies by Gill and Mathur (2018) and Li et al. (2019) documented negative correlations between education and the cost of debt in India. However, previous studies did not test the relationship between business education and the cost of debt. Therefore, the current study concentrated on the impact of CEO duality and business education on financial leverage and the cost of debt by using the following research questions:

- Does CEO duality decrease the cost of debt for small family business firms?
- Does the business education of small family business owners decrease financial leverage for small family business firms?
- Does the business education of small family business owners decrease the cost of debt for small family business firms?

Our empirical analysis shows that small family business owners' CEO duality and their business education decrease the cost of debt for small family-owned firms in India. In addition, gender plays a moderating role in the relationship between business education and the cost of debt. Results support the findings of Gill et al. (2022) and Moura et al. (2020) in that CEO duality reduces the cost of debt. The results related to the relationship between business education and the cost of debt lend some support to the findings of Gill and Mathur (2018) and Li et al. (2019), who showed negative correlations between education and the cost of debt.

The empirical results contribute to the literature on the impact of CEO duality and business education on the cost of debt. The empirical analysis may be helpful to academia to extend the studies on the impact of CEO duality and business education on the cost of debt. Small family business owners may find the results helpful in decreasing the cost of debt. Besides, family business management consultants may find results beneficial in providing consulting services. Remaining sections of the research paper show survey of the literature, methodology, empirical models, data analysis, and results and provide discussion and recommendations for future research.

2 Survey of literature

Firms separate the power between the chairman of the board and the CEO to assure transparency through the induction of more independence in the board room (Ali et al., 2022). As described earlier, business education has been considered a synergistic and transformative learning process resulting in awareness, competence, and expertise in business management (Bartell, 2003; Schworm et al., 2017), leading to CEO duality in small business firms in India (Gill et al., 2018). Ali et al. (2022) indicated that the business financial education of the CEO moderates the link between a CEO's duality and a firm's financial performance, showing the connection between duality and business education. While the following Section 2.1 shows the relationships between CEO duality

and the cost of debt, Section 2.2 shows the impact of business education on financial leverage and the cost of debt.

2.1 CEO duality and the cost of debt

Most small family business owners act as CEO and directors of the board and play an essential role in reducing the cost of debt. For example, Gill et al. (2018) showed that 70% of the owners of food production firms serve as CEO and directors of the board in India. Under CEO duality, firms combine the CEO and board chairperson positions into a single role (Gill et al., 2022). Thus, CEO duality strengthens the CEO to counteract the powers of the board of directors (Pérez-Calero et al., 2016) and make complex decisions such as borrowings for the firm to lower the cost of debt. Prasad et al. (2019) showed that CEO duality improves working capital management (WCM) in India; WCM, in turn, reduces the cost of debt (Gill et al., 2020).

Mishra and Mohanty (2018) indicated that solid corporate governance improves firm performance; sound financial performance reduces the cost of debt. However, the upper echelons theory of Hambrick and Mason (1984) explained that a solid managerial background of the top-level management team, (i.e., CEO) could partially predict organisational outcomes. Nevertheless, small family business owners act as CEO and directors of the board to make complex optimal capital structure decisions reducing the cost of capital. Agency cost theory states that an optimal capital structure maximises a company's value and increases its operating performance (Jensen and Meckling, 1976).

An empirical study by Gill et al. (2022) showed a negative correlation between CEO duality and the cost of debt in Canadian family-controlled firms. Furthermore, Moura et al. (2020) collected data from Brazilian publicly traded firms and documented that CEO duality reduces the cost of debt. Finally, Lorca et al. (2011) hypothesised a negative association between CEO duality and the cost of debt but found no relationships between the two. However, Jabbouri et al. (2019) indicated that family control increases the cost of debt for firms in Morocco. In summary, the limited availability of literature shows that CEO duality decreases the cost of debt. Hence the first hypothesis:

First hypothesis Small business owners' CEO duality decreases the cost of debt in small family business firms.

2.2 Impact of business education on financial leverage and the cost of debt

Business education is an essential human capital resource since it represents an individual's knowledge and skills base gained by small family business owners through schooling (Chua et al., 2021). Business education develops corporate finance and financial management skills using theories such as the capital structure theory of Modigliani and Miller (1958), agency theory of Jensen and Meckling (1976), and pecking order theory suggested by Donaldson (1961) and modified by Myers and Majluf (1984). As a result, one expects CEOs and board members with extensive expertise in financial management would make appropriate decisions regarding the use of debt, resulting in reduced default risk and overall cost of debt.

The theories mentioned above help small family business owners manage debt wisely and reduce the cost of debt. For example, pecking order theory assumes that financing costs increase with asymmetric information where borrowers have more information than

capital suppliers. Therefore, capital suppliers are unwilling to supply funds (Myers, 1984; Myers and Majluf, 1984) and charge a higher cost of debt because of the chances of bankruptcy. However, business education helps business owners to achieve optimal financial leverage to reduce the chances of bankruptcy and reduce debt costs by improving their business management skills, such as ethical skills, to reduce information asymmetry.

As described earlier, business education covers general and financial management theories that improve business-educated owners' decision-making skills. For example, stewardship theory of Donaldson and Davis (1991) suggested that the board of directors' primary role is to advise a firm's managers by acting as stewards rather than disciplining them. In addition, cognitive legitimacy theory of Scott (1995) has been considered acceptable since it shows that firms' actions, such as socially responsible investments, are desirable. Thus, business education enables small family business owners to make, for example, better capital structure planning decisions (Kissi et al., 2017) to reduce the cost of debt.

Business education develops capital structure skills and reduces/changes financial leverage (Borres et al., 2021) resulting in an optimal capital structure (i.e., the point at which the weighted average cost of capital can be minimised while maximising the stock price and earnings per share such that shareholders' wealth can be maximised). Business education skills make a significant difference in the ability of small family business owners who act as CEOs to make financial leverage decisions to lower the cost of debt. Firms have a target capital structure, and the owners' business education influences their firms' financial leverage (Chua et al., 2021) through their financial management skills. Chua et al. (2021) also indicated that owner education makes a difference in making complex decisions concerning the firm's financial leverage.

A higher level of financial leverage increases the chances of bankruptcy (Dawar, 2014), and the higher chance of bankruptcy increases the cost of debt. Bertrand and Schoar's (2003) study showed that CEO education helps make optimal capital expenditure decisions. A study by Zhou and Wang (2014) took a sample of Chinese listed firms and found that highly educated CEOs tend to have significantly lower financial leverage. However, Bertrand and Schoar's (2003) finding suggested that CEOs with business education have higher financial leverage in the USA. Moreover, Ting et al. (2015) took a sample of Malaysian firms and also found that CEOs with higher education prefer operating the firm with higher financial leverage.

Earlier studies show that the education of business owners improves capital structure efficiency by having optimal financial leverage and reducing the cost of debt. For example, a study by Gill and Wilson (2021) reported a positive correlation between owner education and capital structure efficiency and a negative correlation between capital structure efficiency and the cost of debt in Canada. However, Battisti et al. (2020) examined 319 companies listed on the Indonesia stock exchange (IDX) and documented that a lower level of leverage increased the cost of capital for Indonesian firms indicating that optimal financial leverage is necessary to reduce the cost of debt. However, Gill and Mathur (2018) documented a negative correlation between owner education and the cost of debt in Indian small family business firms. In addition, Li et al. (2019) reported a negative correlation between owner education and the cost of debt in India.

In summary, the limited availability of literature suggests mixed results related to the relationship between education, financial leverage, and the cost of debt. For example, while Zhou and Wang (2014) and Borres et al. (2021) reported that higher education

decreases financial leverage, Bertrand and Schoar (2003) and Ting et al. (2015) found that higher education increases financial leverage. However, earlier studies by Gill and Mathur (2018) and Li et al. (2019) documented a negative correlation between owner education and the cost of debt in India. Accordingly, the following hypotheses:

Second hypothesis Small family business owners' business education decreases financial leverage for small business firms.

Third hypothesis Small family business owners' business education decreases the debt cost for small business firms.

2.3 Business education and the cost of debt: role of gender

Small family business owners' gender plays a moderating role in the association between business education and the cost of debt. Rational decision theory predicts that women make choices to maximise the subjective expected utility (Koechlin, 2020). For example, small business owners may perceive a decrease in the cost of debt as an attractive economic opportunity to maximise their wealth and shop around to lower the cost of debt. However, the conservative culture in India (Goyal and Parkask, 2011) may not allow women to establish a network of lenders who can help lower the cost of debt.

On the other hand, men establish social media networks (Mazman and Usluel, 2011) and find lenders to shop around to lower the cost of debt. Moreover, studies have shown a negative association between female directors and the cost of debt (Fields et al., 2012). Finally, evidence suggests the negative association between gender-diverse boards and the cost of debt is partly due to board quality, including the absence of CEO duality (Benjamin and Biswas, 2019). In summary, gender plays a moderating role in the relationship between business education and the cost of debt. Hence, the fourth hypothesis:

Fourth hypothesis The effect of business education on the cost of debt is pronounced for gender.

3 Methods

3.1 Research design and measurements

Gall et al. (1996) recommended a survey research design to collect sensitive information from a large population. Therefore, we used a survey research design to collect data from small family business owners in India. In addition, we calculated the natural logarithm of internal financing sources, assets, sales, firm age, number of employees, owner age, and owner experience to reduce the variance and heteroscedasticity, (i.e., stabilise variance) in data. The followings are the measurements of the variables.

- *Net profit margin* (*NPM*) is measured as net income divided by sales revenue.
- *Financial leverage* (*F_LEV*). (F_LEV) is measured as total debt ÷ total assets.
- *The cost of debt* (*INT*) is measured as the average interest rate that small family business owners paid on debt financing over the last five years.

- *Business education* (*B_EDU)* is measured as a categorical variable with assigned value of 0 = No business education, 1 = BCom/BBA, 2 = MCom/MBA degrees, and 3 = PhD in business management.
- *Internal financing sources* (*IFS*) variable is measured as the personal and family savings over the last five years.
- *Assets* (*ASSETS*) variable is measured as the actual average assets of the small family business firm.
- *Sales revenue* (*SALES*) is measured as the actual average sales of the small family business firm.
- *Firm age* (*F_AGE*) is measured as the actual age of the small family business firm.
- *CEO duality* (*CD*) is measured as a dummy variable with an assigned value of 1 if the small family business owner performs the role of CEO and the board's chairperson; otherwise, 0.
- *The number of employees* (*EMP*) variable is measured as the actual number of paid employees that a small family business firm uses to operate.
- *Firm location* (*F_LOC*) is measured as a dummy variable with an assigned value 1 if a research participant lives in an urban and 0 if a research participant lives in a rural area.
- *Owner age* (*O_AGE*) is measured as the actual age of a small family business owner.
- *Owner experience* (*O_EXP*) is measured as the number of years of small family business owner experience.
- *Gender* (*GENDER*) is measured as a dummy variable with an assigned value of 0 = female and 1 = male.
- *Industry* (*IND*) is measured as a dummy variable with an assigned value of 0 for service firms and 1 for manufacturing firms.

3.2 Sampling and data collection

Based on our best knowledge, there is a lack of research that tests the impact of business education on financial leverage and the cost of debt; therefore, we selected small family business firms operating in India. Huck (2008) considered population as an abstract in which all members of the focal population cannot be contacted. Therefore, we obtained a non-probabilistic (purposive) sample to collect data. Our sampling frame consisted of small family business owners from Punjab, Haryana, Himachal, Utter Pradesh, Rajasthan, and Maharashtra states of India. We created an exhaustive list of small family business owners' names and telephone numbers to obtain a convenience sample and conduct telephone interviews. We trained and instructed data collection team members to choose and collect data from small Indian family business owners and exclude all non-Indian small family business owners from the target population.

Our sample to collect data included 900 small family business owners. We assured all the small family business owners, (i.e., research participants) that their confidentiality would be maintained. Moreover, all subjects, (i.e., small family business owners) were

requested not to disclose their names on the questionnaire in e-mail responses. Thus, none of the small family business owners was forced to answer questions over the telephone, through emails, or in person. Unfortunately, because of the COVID-19 pandemic, we faced a lack of cooperation from research participants. Therefore, the sample size is small, and most surveys were completed over the telephone. However, we successfully collected 209 surveys of small family business owners, and seven of them were non-usable. Thus, the response rate was 23.22%. We assumed all other subjects to be like the research participants who participated in the study.

4 Econometric models, analysis, and results

4.1 Econometric models

Literature shows that CEO duality (*CD*) and education decreases financial leverage (Zhou and Wang, 2014; Borres et al., 2021) and the cost of debt (Gill and Mathur, 2018; Li et al., 2019; Gill et al., 2022). Therefore, we used small family business owners' *CD* and business education (*B_EDU*) as main explanatory variables and developed the following baseline ordinary least square (OLS) regression models:

$$Y_i = \alpha_0 + \alpha_1 CD_i + \alpha_2 B\_EDU_i + \sum \beta_i X_i + \varepsilon_i \tag{1}$$

$$INT_i = \alpha_0 + \alpha_1 B\_EDU * GENDER_i + \sum \beta_i X_i + \varepsilon_i \tag{2}$$

In regression model (1), *Y* represents dependent variables, [i.e., financial leverage (*F_LEV*) and the cost of debt (*INT*)], *i* refers to small family business firm, *X* represents the control variables (*j*) corresponding to small family business firm *i*, and ε_i is a normally distributed disturbance term. In estimated model (1), α_1 and α_2 measure the magnitude at which CEO duality and business education decrease financial leverage and the cost of debt. In estimated model (2), α_1 measures the magnitude at which gender plays a moderating role in the association between business education and the cost of debt. We extended models (1) and (2) by considering a different set of control variables once at a time and used it to test the first, second, third, and fourth hypotheses.

We also adopted a two-stage instrumental variables regression because of endogeneity and reverse causality between changes in CEO duality, business education, financial leverage, and the cost of debt. For example, the lower cost of debt could be associated with greater retained earnings, (i.e., internal financing sources) with the use of CEO duality and business education, and it could affect financial leverage choices. On the other hand, internal financing sources are likely to affect the cost of debt mainly through their effect on financial leverage. Therefore, CEO duality, business education, and internal financing sources are good candidates to function as instruments in the case of lowering the cost of debt through a decrease in financial leverage. The first stage involves regressing the financial leverage on CEO duality, business education, internal financing sources, and other control variables. For the second stage, we regress the change in the cost of debt on the fitted values of financial leverage from the first stage regression. Models (3) and (4) show the first and second-stage regressions:

First stage regression model:

$$Z_i = \beta_0 + \beta_1 CD_i + \beta_2 B\_EDU_i + \beta_3 IFS_i + \sum \delta_i X_i + \varepsilon_i \quad (3)$$

Second stage regression model:

$$Y_i = \gamma_0 + \gamma_1 \overline{Z}_i + \sum \delta_i X_i + \varepsilon_i \quad (4)$$

In equation (3), Z_i represents financial leverage (*F_LEV*) of individual small family business firm *i*, and *CD*, *B_EDU*, and *IFS* imply CEO duality, business education of a small family business owner, and internal financing sources associated with firm *i*. β_1, β_2, and β_3 measure the magnitude at which *CD*, *B_EDU*, and *IFS* influence the probability of a decrease in *F_LEV*. In equation (4), Y_i is the small family business owner's perception of a decrease in the cost of debt, whereas $\overline{Z}_i$ is the predicted probability of *F_LEV*. Hence, γ_1 estimates the effect of the *CD*, *B_EDU*, and *IFS* on the cost of debt through a decrease in either *F_LEV*. The coefficients of equations (1) to (4) were estimated by applying the OLS method, and the expected probability of *F_LEV* obtained from model (3) was used in model (4).

Table 1 Descriptive statistics

	Mean	*Standard deviation*	*Minimum*	*Median*	*Maximum*
INT	0.101	0.023	0.070	0.090	0.190
F_LEV	0.217	0.154	0.002	0.175	0.889
CD	0.82	0.384	0	1	1
B_EDU	0.31	0.603	0	0	2
IFS	13.332	0.884	9.90	13.46	16.12
ASSETS	15.863	0.965	12.21	15.89	18.52
SALES	15.068	0.893	12.21	15.20	17.73
NPM	0.163	0.102	0.010	0.137	0.600
F_AGE	2.457	0.509	0.00	2.48	3.69
EMP	1.372	1.009	0.00	1.39	4.25
F_LOC	0.57	0.496	0	1	1
O_AGE	3.744	0.222	2.30	3.74	4.25
O_EXP	2.754	0.512	0.69	2.77	4.01
GENDER	0.87	0.336	0	1	1
IND	0.47	0.500	0	0	1

Notes: Variables include the cost of debt (*INT*), financial leverage (*F_LEV*), CEO duality (*CD*), business education (*B_EDU*), internal financing sources (*IFS*), assets (*ASSETS*), sales (*SALES*), net profit margin (*NPM*), firm age *(F_AGE*), number of employees (*EMP*), firm location (*F_LOC*), owner age (*O_AGE*), owner experience (*O_EXP*), gender (*GENDER*), and industry (*IND*).

4.2 Descriptive statistics

Table 1 provides descriptive statistics, showing that 82% of small family business owners reported acting as CEOs and directors of the board. Our sample included 32 small family business owners with BCom/BBA degrees, 15 small family business owners with

MCom/MBA degrees, and 155 small family business owners with no professional degrees. In addition, the average assets of our sampled firms came to INR12,699,505, and the average sales came to INR5,021,287. Mishra (2021) documented all the firms within the small enterprise category that have invested less than ten crore rupees, (i.e., 100,000,000 rupees) and turnover of up to 50 crore rupees (i.e., 500,000,000 rupees) in India. Thus, our sampled small family business firms fall within the small business category. Besides, our sample included 176 male research participants and only 26 female research participants. The lower number of female respondents may be because male owners dominate India's small family business sector (Gill and Mathur, 2018).

4.3 Correlation analysis

Table 2 reports Pearson correlation analysis. As reported in Table 2, *CD*, *B_EDU*, *IFS*, *ASSETS*, *SALES*, *NPM*, *GENDER*, and *IND* are negatively and significantly correlated with *INT* ($\rho_{CD,\ INT}$ = –0.245; $\rho_{B\_EDU,\ INT}$ = –0.293; $\rho_{IFS,\ INT}$ = –0.360; $\rho_{ASSETS,\ INT}$ = –0.158; $\rho_{SALES,\ INT}$ = –0.287; $\rho_{NPM,\ INT}$ = –0.281; $\rho_{F\_LOC,\ INT}$ = –0.182; $\rho_{GENDER,\ INT}$ = –0.253 and $\rho_{IND,\ INT}$ = –0.216) and *F_LEV* positively and significantly correlated with *INT*, suggesting that CEO duality, business education, internal financing sources, assets, sales, net profit margin, gender, and industry decrease and financial leverage increases the cost of debt for the small family business firms in India. Likewise, Table 2 shows that *CD*, *B_EDU*, *IFS*, and *ASSETS* are negatively and significantly correlated with *F_LEV* ($\rho_{CD,\ F\_LEV}$ =–0.174; $\rho_{B\_EDU,\ F\_LEV}$ = –0.204; $\rho_{IFS,\ F\_LEV}$ = –0.193 and $\rho_{ASSETS,\ F\_LEV}$ = –0.289) and *EMP* positively and significantly correlated with *INT* ($\rho_{EMP,\ F\_LEV}$ = 0.167), suggesting that CEO duality, business education, internal financing sources, and assets decrease and the higher number of employees increases the cost of debt for the small family business firms in India.

4.4 Empirical analysis and results

Table 3 reports the results calculated using equations (1) to (4). The findings show that *INT* is negatively and significantly associated with *CD*, *B_EDU*, *B_EDU***GENDER*, *IFS*, *SALES*, *NPM*, *F_LOC*, *GENDER*, and *IND*, and positively and significantly associated with *F_LEV* and *ASSETS*. In addition, results show that *F_LEV* is negatively and significantly associated with *B_EDU*, *IFS*, and *ASSETS*, and positively and significantly associated with *SALES*, *CD*, and *EMP*.

The coefficients of *CD* and *B_EDU* in column (1) of *INT* are negative and significant at the 5% level, implying that CEO duality and business education decrease the cost of debt for the small family business firms in the small Indian family business industry. Similarly, the coefficient of *B_EDU* in column (1) of *F_LEV* is negative and significant at the 5% level, indicating that business education decreases financial leverage for small family business firms in India. Likewise, the coefficient of *B_EDU***GENDER* in column (2) of *INT* is negative and significant at the 1% level, implying that gender plays a moderating role in the association between business education and the cost of debt. Thus, our analysis supports the first, second, third, and fourth hypotheses.

Table 2 Correlation analysis

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	*INT*	1														
2	*F_LEV*	0.217**	1													
3	*CD*	–0.245**	–0.174*	1												
4	*B_EDU*	–0.293**	–0.204**	0.044	1											
5	*IFS*	–0.360**	–0.193**	0.130	0.208**	1										
6	*ASSETS*	–0.158*	–0.289**	0.106	0.059	0.476**	1									
7	*SALES*	–0.287**	–0.015	0.066	0.015	0.447**	0.566**	1								
8	*NPM*	–0.281**	–0.065	0.066	0.202**	0.140*	0.052	–0.243**	1							
9	*F_AGE*	–0.036	0.014	0.102	–0.024	0.221**	0.174*	0.168*	0.076	1						
10	*EMP*	–0.004	0.167*	–0.019	–0.030	0.365**	0.291**	0.327**	–0.006	0.104	1					
11	*F_LOC*	–0.182**	0.040	0.070	0.040	0.082	–0.005	0.082	0.011	0.005	0.371**	1				
12	*O_AGE*	–0.119	0.055	0.141*	0.033	0.143*	0.148*	0.147*	0.073	0.536**	0.132	0.027	1			
13	*O_EXP*	–0.047	–0.014	0.156*	0.043	0.178*	0.272**	0.215**	0.083	0.777**	0.094	–0.007	0.627**	1		
14	*GENDER*	–0.253**	–0.031	0.207**	0.000	0.115	–0.009	0.085	0.042	0.020	–0.052	–0.002	0.054	0.080	1	
15	*IND*	–0.216**	–0.129	0.024	0.080	0.114	0.250**	0.283**	–0.028	0.055	–0.191**	–0.111	0.014	0.167*	0.155*	1

Notes: *$p < 0.05$ and **$p < 0.01$; variables include the cost of debt (*INT*), financial leverage (*F_LEV*), CEO duality (*CD*), business education (*B_EDU*), internal financing sources (*IFS*), assets (*ASSETS*), sales (*SALES*), net profit margin (*NPM*), firm age (*F_AGE*), number of employees (*EMP*), firm location (*F_LOC*), owner age (*O_AGE*), owner experience (*O_EXP*), gender (*GENDER*), and industry (*IND*).

Table 3 CEO duality, business education, and the cost of debt[1]

Variables	*Ordinary least square regressions*			*2SLS*
	INT (1)	*INT (2)*	*F_LEV (3)*	*INT (4)*
CD	–0.007*	–0.009**	0.050†	
	(–2.23)	(–2.70)	(–1.78)	
B_EDU	–0.005*		–0.039*	
	(–2.49)		(–2.22)	
*B_EDU*GENDER*		–0.006**		
		(–2.71)		
F_LEV	0.019*	0.019*		
	(2.13)	(2.11)		
F_LEVfit				0.157**
				(5.17)
IFS	–0.004*	–0.004*	–0.031*	
	(–2.19)	(–2.40)	(–2.01)	
ASSETS	0.003†	0.004*	–0.065**	0.012**
	(1.86)	(2.25)	(–4.66)	(4.41)
SALES	–0.007**	–0.008**	0.036*	–0.012**
	(3.65)	(–3.95)	(2.19)	(5.86)
NPM	–0.053**	–0.054**	0.109	–0.068**
	(–3.92)	(–3.96)	(0.98)	(–5.25)

Notes: Dependent variables = *F_LEV* and *INT*; †$p < 0.10$, *$p < 0.05$, and **$p < 0.01$; in the regression models, the dependent variables include the cost of debt (*INT*) and financial leverage (*F_LEV*). Independent variables include CEO duality (*CD*), business education (*B_EDU*), financial leverage (*F_LEV*), fitted value of financial leverage (*F_LEVfit*), internal financing sources (*IFS*), assets (*ASSETS*), sales (*SALES*), net profit margin (*NPM*), firm age (*F_AGE*), number of employees (*EMP*), firm location (*F_LOC*), owner age (*O_AGE*), owner experience (*O_EXP*), gender (*GENDER*), and industry (*IND*). Note that we used model (3) to calculate the fitted value of the financial leverage. [1]The lowest tolerance is 0.297, and the highest variance inflation factor (VIF) is 3.362, indicating that multicollinearity is not a serious issue.

Table 3 CEO duality, business education, and the cost of debt[1] (continued)

Variables	*Ordinary least square regressions*			*2SLS*
	INT (1)	*INT (2)*	*F_LEV (3)*	*INT (4)*
F_AGE	0.001	–0.001	0.003	0.000
	(0.08)	(–0.27)	(0.09)	(0.00)
EMP	0.002	0.002	0.044**	–0.004*
	(1.26)	(1.22)	(3.50)	(–2.09)
F_LOC	–0.006*	–0.006*	–0.023	–0.003
	(–2.18)	(–2.07)	(–1.02)	(–0.99)
O_AGE	–0.011	–0.011	0.062	–0.020**
	(–1.62)	(–1.56)	(1.06)	(–2.78)
O_EXP	0.006	–0.005	–0.001	0.006
	(1.29)	(–1.09)	(–0.01)	(1.30)
GENDER	–0.011**		0.004	–0.011**
	(–2.84)		(0.13)	(–3.08)
IND	–0.007*	–0.007	–0.005	–0.006*
	(–2.45)	(2.60)	(–0.24)	(–2.14)
Constant	0.264**	0.261**	0.865**	0.146**
	(7.41)	(7.20)	(2.98)	(3.52)
N	202	202	202	202
F-value	8.75**	8.73**	4.68**	10.63**
R^2/Pseudo R^2	0.406	0.387	0.253	0.391

Notes: Dependent variables = *F_LEV* and *INT*; †$p < 0.10$, *$p < 0.05$, and **$p < 0.01$; in the regression models, the dependent variables include the cost of debt (*INT*) and financial leverage (*F_LEV*). Independent variables include CEO duality (*CD*), business education (*B_EDU*), financial leverage (*F_LEV*), fitted value of financial leverage (*F_LEVfit*), internal financing sources (*IFS*), assets (*ASSETS*), sales (*SALES*), net profit margin (*NPM*), firm age (*F_AGE*), number of employees (*EMP*), firm location (*F_LOC*), owner age (*O_AGE*), owner experience (*O_EXP*), gender (*GENDER*), and industry (*IND*). Note that we used model (3) to calculate the fitted value of the financial leverage. [1]The lowest tolerance is 0.297, and the highest variance inflation factor (VIF) is 3.362, indicating that multicollinearity is not a serious issue.

The coefficients of *SALES*, *NPM*, and *GENDER* in columns (1) and (2) of *INT* are negative and significant at the 1% level, implying that sales, net profit margin, and gender decrease the cost of debt. Similarly, the coefficients of *IFS*, *F_LOC*, and *IND* in columns (1) and (2) of *INT* are negative and significant at the 5% and 1% levels, indicating that internal financing sources, firm location, and industry decrease the cost of debt. Likewise, the coefficients of *F_LEV* and *ASSETS* in columns (1) and (2) of *INT* are positive and significant at the 5% and 10% levels, suggesting that financial leverage and assets increase the cost of debt. Further, the coefficients of *IFS* and *ASSETS* in column (3) of *F_LEV* are negative and significant at the 5% and 1% levels, indicating that internal financing sources and assets decrease financial leverage. Finally, the coefficients of *SALES*, *CD*, and *EMP* in column (3) of *F_LEV* are positive and significant at the 5%, 10%, and 1% levels, suggesting that sales, CEO duality, and the higher number of employees increase the financial leverage in India.

In summary, CEO duality and business education are critical in decreasing financial leverage and the cost of debt. In addition, this study used 2SLS as a robustness check to reduce the endogeneity issues and to test the indirect relationship between business education and the cost of debt. 2SLS model shows that business education decreases the cost of debt by decreasing financial leverage. Thus, business education, directly and indirectly, decreases the cost of debt for small family business firms in India. Besides, data analysis shows that gender plays a moderating role in the association between business education and the cost of debt.

5 Discussion, conclusions, limitations, and recommendations for future research

This study intended to test the impact of CEO duality and business education on the cost of debt. The empirical analysis shows that the CEO duality and business education of small family business owners decrease the cost of debt in India. In addition, the business education of small business owners reduces the financial leverage of small family business firms. Furthermore, data analysis shows that gender plays a moderating role in the association between business education and the cost of debt. Results support the findings of Moura et al. (2020) and Gill et al. (2022) in that CEO duality reduces the cost of debt. The empirical analysis lends some support to the findings of Zhou and Wang (2014) and Borres et al. (2021), who reported that education decreases financial leverage but contradicts the findings of Bertrand and Schoar (2003) and Ting et al. (2015), who documented a positive association between education and financial leverage. Similarly, the results related to the relationship between business education and the cost of debt lends some support to the findings of Gill and Mathur (2018) and Li et al. (2019). These authors showed negative correlations between education and the cost of debt.

Table 3 shows that internal financing sources decrease financial leverage and the cost of debt for small family business firms. On the other hand, the increase in assets and financial leverage increases the cost of debt. These findings may be because the higher level of financial leverage increases the chances of bankruptcy and, thus, the cost of debt increases. Furthermore, while assets decrease financial leverage, sales and the higher number of employees increase financial leverage for small family business firms. These findings may be because we collected data during the COVID-19 pandemic and small family business firms need more borrowing to return to regular operating positions.

In conclusion, business education is crucial for decreasing financial leverage and the cost of debt for small family business firms in India. Table 3 shows that CEO duality and business education increase the chances of a decrease in the cost of debt by 0.70% and 0.50%, respectively. Furthermore, Table 3 shows that business education increases net profit margin and internal financing sources for small family business firms. Therefore, small family business owners should receive business training to increase net profit margin and internal financing sources.

Since CEO duality decreases the cost of debt, small family business owners should consider having CEO duality. In addition, internal financing sources decrease financial leverage to reduce the chances of bankruptcy and debt costs; therefore, small family business owners should consider building internal financing sources with the help of retained earnings. Finally, Gill et al. (2018) study reported that non-resident family members provide financial support to Indian small family business firms. Therefore, small Indian family business owners may seek financial support from non-resident family members (if available) to build internal financing sources and return to normal operating situations during and after the COVID-19 pandemic.

5.1 Limitations and recommendations for future research

Although this study documents some valuable results for the academic, small family business owners, and small family business management consultants, the study's limitations should not be ignored. We completed data collection during the COVID-19 pandemic; therefore, most surveys were completed through telephone interviews and had to rely on a small sample size limited to Punjab, Haryana, Himachal Utter Pradesh, Rajasthan, and Maharashtra states of India. Besides, this study relied on the perceptions of the research participants.

The limitation related to implementing the findings is that if small family business owners perceive higher business education, they tend to perceive a lower level of financial leverage and the cost of debt, and vice versa. Besides, the empirical findings may not be generalised to the small family business firms dissimilar to those we used in this study. Since this study relied on a small sample size, future studies should seek a large sample size and include additional variables such as family control. In addition, future studies should seek samples from different countries to compare results.

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