Foreign family directors, gender diversity, and debt costs for family business firms

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Abstract: The current study surveyed Indian family business owners to assess the link between foreign family directors (FFDs), gender diversity, and debt costs in family business firms (FBFs). We used ordinary and two-stage least squares methods to address endogeneity issues. According to the survey analysis, having FFDs in a company can increase gender diversity and internal financing sources while decreasing debt costs. Gender diversity and internal financing sources reduce the debt costs for FBFs in India. The survey results analysis adds to the current literature on the connection between FFDs, gender diversity, and debt costs in family-owned businesses. This survey analysis can assist academia in conducting more studies on this subject. The results can also benefit family-owned businesses by gaining insights into reducing debt costs.

Reference to this paper should be made as follows: Gill, A., Mand, H.S. and Kaur, G. (2025) 'Foreign family directors, gender diversity, and debt costs for family business firms', *Int. J. Corporate Governance*, Vol. 15, No. 1, pp.28–45.

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1 Introduction

Foreign family members, including foreign family directors (FFDs), play a crucial role in India's economic development by providing financial support and serving on the board of directors (Gill et al., 2016). This study defines FFDs as family members living abroad who participate in business decisions for family business firms (FBFs). Small FBFs often face financial constraints and higher volatility, which result in higher debt costs (Bottazzi et al., 2014). Board diversity, (e.g., FFDs and gender diversity) helps improve family business performance by increasing the utilisation of assets (Shehata et al., 2017) and, thus, decreasing debt costs for FBFs. Better profitability and smooth earnings reduce debt costs (Li and Richie, 2016).

Family business owners invest more than 69% of their wealth, and they are therefore interested in control by having majority shareholding and long-term survivability since they seek to pass the family businesses to their heirs (Anderson et al., 2003). However, studies lack the association between FFDs, gender diversity, and debt costs. Therefore, the current study intends to test the association among FFDs, gender diversity, and debt costs by collecting data from Indian FBFs. Theoretically, one can argue that FFDs can play a stewardship role in FBFs to increase gender diversity, inject funds to build internal financing sources (IFS) and reduce debt costs, which is crucial for India's family business and economic development.

Berle and Means (1932) laid the groundwork for the corporate governance theory, which is believed to enhance corporations' effectiveness. A previous study by Gill et al. (2016) indicated that foreign family members financially support FBFs and serve as FFDs in India. Thus, foreign family members help FBFs to increase board diversity in India. Previous studies measured gender diversity as a percentage of females serving on the board of directors and used the Blau Index and Shannon Index (Campbell and Antonio, 2008; Martin-Ugedo and Antonio, 2014; Shehata et al., 2017). While Blau (1977) developed the Blau Index, Shannon (1948) pioneered the Shannon Index. In line with previous studies, this study measured gender diversity using the Blau Index, Shannon Index, and the percentage of females serving on the family business board of directors.

A study conducted by Shehata et al. (2017) found that board diversity significantly impacts firm performance. They reported a negative correlation between gender diversity and firm performance. On the other hand, Ozdemir (2020) focused on the US tourism sector and discovered a positive connection between board diversity and financial performance. Another study by Li and Richie (2016) investigated the relationship

between income smoothing and debt cost. They found that earnings smoothing can reduce debt costs.

Bradley and Chen (2011) researched the correlation between corporate governance and debt costs. They discovered that companies that offer limited liability and indemnification for their directors have better credit ratings and lower yield spreads. Similarly, Ghouma et al. (2018) investigated the impact of corporate governance on debt financing costs in Canada and found that board composition and structure quality can reduce these costs. Furthermore, Usman et al. (2019) explored the relationship between gender diversity and debt costs for Chinese listed firms. They found that having female directors on the board can lower debt costs.

In a recent study, Kamil and Appiah (2022) collected data from the Ghana Stock Exchange and tested the relationship between gender diversity and debt cost. The authors argued that the good moral character of women helps lower the cost of debt negotiation. However, most of the studies mentioned above concentrated on publicly traded firms. Therefore, the current study emphasises the association among FFDs, gender diversity, and debt costs for FBFs in India. This study relied on the following research questions to remain consistent with previous studies:

- Do FFDs enhance gender diversity?

- Do FFDs decrease debt costs?

- Does gender diversity decrease debt costs?

According to the survey analysis, the presence of FFDs tends to increase gender diversity and decrease debt costs. Moreover, gender diversity and the use of IFS are also associated with lower debt costs. These findings provide some empirical support to the results of previous studies conducted by Ghouma et al. (2018), Usman et al. (2019), and Kamil and Appiah (2022), which suggest that board diversity is associated with lower debt costs. The empirical results from the survey analysis contribute significantly to the existing literature on the relationship between FFDs, gender diversity, and debt costs. Furthermore, these findings are expected to be useful for academic researchers who wish to conduct further studies on this topic. Finally, the survey analysis may help FBFs reduce debt costs.

The current study provides a literature review in Section 2, methodology in Section 3, econometric models and data analysis in Section 4, and a discussion of the conclusion, limitations, and recommendations for future research in Section 5.

2   Survey of literature

2.1   Foreign family director and gender diversity

Li et al. (2023) indicated that gender diversity is crucial to effective corporate governance. However, a study conducted by Usman et al. (2019) has revealed that women face significant challenges in getting elected to the board of directors. Peterson and Philpot (2007) have also argued that women are less likely to serve on the board of directors. This underrepresentation of women on the board of directors may be due to the conservative cultural norms that have been prevalent in India for a long time, as noted by Vijayan (2018). Such cultural norms can deter women from seeking board positions.

Research studies conducted in India have shown that non-resident family members financially support FBFs and serve as FFDs (Gill et al., 2016). Both men and women from foreign family members can financially support family businesses and serve on the board of directors. Moreover, male family members from abroad may have spouses in India who could also serve on the boards of the family businesses.

Social norms affecting gender diversity can vary from one country to another, and people's thoughts and emotions may also differ. According to social norms theory, people's behaviour is influenced by their perception of others in their social group (Scholly et al., 2005). Additionally, gender equality varies from culture to culture. For instance, Western cultures are considered more gender-equal than Asian and Middle Eastern cultures (Fitzgerald, 2022). Dewally and Flaherty (2017) demonstrated that local social norms impact the decisions of individuals and corporate decision-makers. Based on their country's norms and cultures, FFDs from Western countries can increase the involvement of female directors in family boards in India. As a result, FFDs help enhance gender diversity in Indian family business boards. Hence, the first hypothesis:

- First hypothesis: FFDs are contributing to increasing gender diversity in family boards in India.

2.2 Foreign family director and debt costs

In FBFs, family members play a crucial role in business management. A study by Gill et al. (2022) highlights the importance of family members' involvement in FBFs for achieving these positive outcomes. In addition, FFDs play an essential role in improving firm performance by acting as stewards and supporting the board members to align the interests of FBFs and their employees (Donaldson and Davis, 1991; Davis et al., 1997) and thus reduce debt costs.

FFDs advise family board members rather than disciplining them. Gill et al. (2016) found that FFDs provide financial support to lower debt costs. A study by Hashim and Amrah (2016) collected data from family and non-family businesses in Oman. The study found that an effective board of directors is linked to lower debt costs. Similarly, Zhu (2014) discovered that good governance practices are associated with lower debt capital costs across international markets. Corporate governance also plays an essential role in reducing agency problems between creditors and the firm, ultimately leading to lower financing costs. According to agency theory, family businesses have comparatively lower agency problems between stakeholders, such as lenders and managers, than non-family businesses (El Ghoul et al., 2016) and thus reduce debt costs.

Studies conducted by Myers (1984) and Myers and Majluf (1984) have shown that financiers who provide debt financing are hesitant to lend money to business owners who possess more information about their business than the investors. Another study by Andres (2011) found that family members' involvement in managing and governing a firm can reduce information asymmetries between financiers and family businesses. In their research, Kyere and Ausloos (2020) found that implementing genuine corporate governance mechanisms can improve firms' financing and reduce debt costs. However, family business owners often work as managers and directors in their firms, including FFDs, so they can quickly mitigate information asymmetry issues by aligning their interests with debt financiers. To summarise, despite limited literature on the subject,

having FFDs can help businesses leverage their assets and reduce debt costs. Accordingly, the following hypothesis:

- Second hypothesis: FFDs can help family businesses reduce debt costs.

2.3 *Gender diversity and debt costs*

Board gender diversity enhances the monitoring role (Kamil and Appiah, 2022) to improve firm performance and reduce debt costs by reducing opportunistic behaviour to lower agency costs (Reguera-Alvarado et al., 2017). Studies also show that female executives, (e.g., CEOs) maintain lower financial leverage (Faccio et al., 2016), reducing the chances of bankruptcy and debt costs. In addition, literature shows that agency conflicts and corporate governance influence corporate financing decisions (Berger et al., 1997; Friend and Lang, 1988), and female directors play an essential role in reducing agency problems (Usman et al., 2019; Harford et al., 2008). Bradley and Chen (2015) collected data from the Standard and Poor (S&P) database and found that board independence reduces debt costs.

A study by Aljughaiman et al. (2022) on American publicly traded firms revealed that companies with female board members tend to experience lower debt costs. Another study by Usman et al. (2019), which used Chinese data, found that having female directors on the board reduces information asymmetry between the firm and capital suppliers. The researchers also discovered that capital supplier's charge a 4% lower interest rate if the board includes at least one female member.

Kamil and Appiah (2022) collected data from Ghana to examine the relationship between gender diversity and debt cost. They found that board gender diversity does not increase debt costs. However, the interaction between gender diversity and firm size can reduce debt costs. Finally, Karavitis et al. (2021) analysed Thomson Reuters's database and found that corporations with female directors receive lower loan spreads. In conclusion, the available literature suggests that gender diversity can help reduce debt costs. Hence, the third hypothesis.

- Third hypothesis: a gender-diverse board of directors can lower FBF's debt costs.

3 Data and methodology

3.1 *Research design and measurements*

Survey research is an advantageous and legitimate approach to collecting data from a large population (Ponto, 2015). Therefore, we considered using a survey research design to collect data from owners of FBFs. In addition, we calculated the logarithm (ln) of family business revenues and assets, IFS, family business age, number of family business employees, owner age, and owner experience to reduce heteroscedasticity, (i.e., stabilise variance) in data. The following are the measurements of the variables.

- *The debt costs (I)* variable is measured as the average interest rate business owners pay for their FBFs' loans.

- *The foreign family director (FF_DIR)* variable measures whether family members living abroad, (i.e., foreign family members) are involved in business decision-making. We assigned a value of one if foreign family members living abroad participate in decision-making for FBFs; otherwise, it is zero.

- *The IFS* variable measures total personal and family savings that can be used to invest in the FBFs.

- *Gender diversity (G_DIVERSITY)* variable is measured as the Blau index (*B_INDEX*), Shannon index (*S_INDEX*), and percentage of females (*P_FEM*).

$$\text{Blau Index} = 1 - \sum_{i=1}^{k} P_i^2$$

In the above Blau model, P_i refers to the percentage of (male/female) directors serving on the board. *K* is the number of different categories in FBFs. In line with Shehata et al.'s (2017) study, we used two categories for males and females. The range of the Blau index values is between 0 (when there is only one category in FBF, i.e., males or females) and 0.5 (when both categories have an equal number of males and females serving on the board). For example, a board with two male directors and one female director has a Blau Index equal to 0.44, suggesting that the FBF board has a high level of gender diversity.

$$\text{Shannon Index} = -\sum_{i=1}^{k} P_i * LN(P_i)$$

In the above Shannon index, P_i refers to the percentage of (male/female) directors serving on the board of directors. *K* is the number of different categories in FBFs. Shannon's index values range between 0 (when there is only one category in the firm, i.e., males or females) and 0.69 (when both categories have an equal number of males and females on the board). We assigned the value of ln(P_i) 0 for FBFs with only male or female directors, as ln(0) equals negative infinity, resulting in a 0 value for the index, indicating a lack of diversity in the board of directors.

The percentage of females serving as FBF's board members (*P_FEM*) is calculated by dividing the total number of females by the total number of board members.

- *Owner gender (O_GEN)* is measured as a dummy variable with the assigned value of one if the FBF owner reports female; otherwise, it is zero.

- *Board size (B_SIZE)* is measured as the number of directors serving on the board.

- *CEO duality (CD)* is measured as a dummy variable with an assigned value of one if the FBF owner serves as the director of the board and CEO; otherwise, it is zero.

- *The family business assets (FB_ASSETS)* variable is measured as the total assets of FBF.

- *The family business sales (FB_SALES)* variable is measured as the net sales revenue of FBF.

- *Family business net profit margin (FB_NPM)* is measured as net income after tax ÷ total sales revenue of FBF.

- *Family business age (FB_AGE)* is measured as the age of FBF (in years).

- *Family business leverage (FB_LEV)* is measured as total debt ÷ total assets of the FBF.

- *The family business employees (FB_EMP)* variable is measured as the number of employees the FBF uses to operate.

- *The family business location (FB_LOC)* variable is measured as a dummy variable, with an assigned value of one if the FBF operates in a city; otherwise, it is zero.

- *Owner age (O_AGE)* is measured as the age of the FBF owner in years.

- *Owner education (O_EDU)* is measured as a categorical variable and assigned a value of 1 for high school or less, 2 for college diploma, 3 for bachelor's degree, 4 for master's degree, and 5 for PhD degree.

- *Owner experience (O_EXP)* is measured as the number of years of experience of the FBF owner.

- *The industry (IND)* variable is measured as a dummy variable with the assigned value of one if the FBF operates in the manufacturing/production industry; otherwise, it is zero.

3.2 Sample and response rate

This research study gathered data from individuals who own FBFs. It is worth noting that around 85% of firms in India operate as family businesses (Dewan, 2021). Given the abstract nature of the population, reaching out to all FBF owners was an insurmountable task. Hence, we strategically chose research participants from specific regions of India, namely Punjab, Haryana, Himachal, Uttarakhand, Utter Pradesh, Rajasthan, and Maharashtra. Our data collection team was diligent in ensuring that the selected participants accurately represented the population, even going as far as excluding non-Indian business owners.

To collect data, we compiled a list of research participants using business directories and referrals from families, friends, and religious organisations. The data collection team, which included the authors and other team members, contacted 850 potential participants and successfully collected surveys from 251 of them. After excluding five non-usable surveys, we received a response rate of 29.53%. In addition, the data collection team collected most of the surveys over the telephone and asked all the research participants for their permission before starting an interview to collect data. We assured all the research participants that their confidentiality would be strictly maintained and did not force any research participant to participate.

According to this study, the average family business assets amount to INR 19,538,902.44, and the average sales revenue is INR 18,467,565.04. Mishra (2021) suggested that any firm with an investment of less than ten crore rupees, (i.e., 100 million rupees) and sales revenue of up to 50 crore rupees, (i.e., 500 million rupees) falls under

the small enterprise category in India. Therefore, this study falls within the small family business category.

4   Econometric models, analysis, and results

4.1   Econometric models

This study takes a unique approach by considering foreign family members as FFDs (*FF_DIR*) and gender diversity as components of board diversity. Building on a previous study by Gill et al. (2016) that highlighted non-resident family members' financial support and decision-making participation in FBFs, we extend this concept to view these members as *FF_DIR*. Our study explores how these directors can increase gender diversity and reduce debt costs, with *FF_DIR* serving as a key explanatory variable in this relationship.

It can be argued that having *FF_DIR* can decrease debt costs by increasing gender diversity and IFS. However, this can lead to endogeneity issues, where the causality between changes in *FF_DIR*, *IFS*, and debt costs cannot be determined. We used a two-stage instrumental variables regression analysis and an ordinary least square (OLS) regression analysis to address this. For example, a decrease in debt cost may be associated with higher retained earnings built using family business assets (*FB_ASSETS*), sales (*FB_SALES*), net profit margin (*FB_NPM*), board size (*B_SIZE*), CEO duality (*CD*), and personal and family savings. Factors such as *FF_DIR*, *FB_ASSETS*, *FB_SALES*, *FB_NPM*, *B_SIZE*, and *CD* can impact gender diversity and IFS. Therefore, we used *FB_ASSETS*, *FB_SALES*, *FB_NPM*, *B_SIZE*, and *CD* as instruments in the two-stage least square regression analysis. The baseline OLS used in this study is as follows:

$$Y_i = \alpha_0 + \alpha_1 FF\_DIR_i + \sum \beta_i X_i + \varepsilon_i \tag{1}$$

$$Y_i = \alpha_0 + \alpha_1 G\_DIVERSITY_i + \sum \beta_i X_i + \varepsilon_i \tag{2}$$

In model (1) of regression, the dependent variables, represented by *Y*, are gender diversity measured through the Blau index (*B_INDEX*), Shannon index (*S_INDEX*), percentage of female (*P_FEM*), *IFS*, and debt costs (*I*). *i* represents FBF, while the control variables (*j*) corresponding to FBF *i* are represented by *X*. The normally distributed disturbance term is represented by ε_i.

In models (2), the dependent variable is represented by debt costs (*I*). In model (1), α_1 measures the magnitude at which *FF_DIR* increases gender diversity and IFS and decreases debt costs. In model (2), α_1 measures the magnitude at which *G_DIVERSITY* (measured as *B_INDEX*, *S_INDEX*, and *P_FEM*) reduces debt costs.

We extended models (1) and (2) by considering a different set of control variables once at a time. In this study, model (1) was used to test the first and second hypotheses, and model (2) was used to test the third hypothesis.

To address endogeneity problems, we utilised a two-stage instrumental variables regression analysis. In the first stage, we regressed *G_DIVERSITY* and *IFS* on *FF_DIR*, *FB_ASSETS*, *FB_SALES*, *FB_NPM*, *B_SIZE*, *CD*, and other control variables. In the second stage, we regressed the change in *I* on the fitted values of *G_DIVERSITY* and *IFS*

obtained from the first stage regression. We employed the following first and second-stage regression models:

First stage regression model:

$$Z_i = \beta_0 + \beta_1 FF\_DIR_i + \beta_2 FB\_ASSETS_i + \beta_3 FB\_SALES_i$$
$$+ \beta_4 FB\_NPM_i + \beta_5 B\_SIZE_i + \beta_6 CD_i + \sum \delta_i X_i + \varepsilon_i \tag{3}$$

Second stage regression model

$$Y_i = \gamma_0 + \gamma_i \bar{Z}_i + \sum \delta_i X_i + \varepsilon_i \tag{4}$$

Equation (3) uses Z_i to refer to *G_DIVERSITY* and *IFS* for the *FBF i*. *FF_DIR*, *FB_ASSETS*, *FB_SALES*, *FB_NPM*, *B_SIZE*, and *CD* refer to FFDs, family business assets, family business sales, family business net profit margin, the board size, and CEO duality associated with FBF *i*. β_1, β_2, β_3, β_4, β_5, and β_6 measure the influence of *FF_DIR*, *FB_ASSETS*, *FB_SALES*, *FB_NPM*, *B_SIZE*, and *CD* on the probability of increasing *G_DIVERSITY* and *IFS*.

In equation (4), Y_i represents the FBF owner's perception of a decrease in *I*, while $\bar{Z}_i$ is the predicted probabilities of *G_DIVERSITY* and *IFS*. γ_1 estimates the effect of *FF_DIR*, *FB_ASSETS*, *FB_SALES*, *FB_NPM*, *B_SIZE*, and *CD* on *I* by increasing *G_DIVERSITY* and *IFS*. We estimated the coefficients of equations (3) and (4) using the OLS method and the expected probabilities of *G_DIVERSITY* and *IFS* obtained from equation (3) were used in equation (4).

4.2   *Descriptive statistics*

Table 1 presents the descriptive statistics and the variable differences between individual FBFs with and without FFDs. According to the t-test results, FBFs with FFDs have significantly higher IFS and pay 3% lower than FBFs without FFDs, which is a significant finding at the 1% level. Therefore, FFDs are beneficial for FBFs in India.

Table 2 provides Pearson correlation analysis showing that *FF_DIR*, *B_INDEX*, *S_INDEX*, *P_FEM*, *IFS*, and *FB_NPM* are negatively and significantly correlated with *I*, and *F_AGE* and *O_EXP* are positively and significantly correlated with *I*, implying that foreign family director, gender diversity, IFS, and family business net profit margin decrease and firm age and owner experience increase debt costs for FBFs in India. Likewise, *F_DIR*, *B_SIZE*, and *FB_NPM* are positively and significantly correlated with *B_INDEX*, and *FB_ASSETS*, *FB_SALES*, and *IND* are negatively and significantly correlated with *B_INDEX*, suggesting that foreign family director, board size, and family business net profit margin increase and family business assets, family business sales, and industry decrease the gender diversity. Similarly, *FF_DIR*, *B_SIZE*, and *FB_NPM* are positively and significantly correlated with *S_INDEX*, and *FB_ASSETS*, *FB_SALES*, and *IND* are negatively and significantly correlated with *S_INDEX*, indicating that foreign family director, board size, and family business net profit margin increase and family business assets, family business sales, and industry decrease the gender diversity. Further, *FF_DIR* and *FB_NPM* are positively and significantly correlated with *P_FEM* and

B_SIZE, *FB_ASSETS*, *FB_SALES*, *FB_LEV*, and *O_EXP* are negatively and significantly correlated with *P_FEM*, suggesting that foreign family director and family business net profit margin increase and board size, family business assets, family business sales, family business leverage, and owner experience decrease the gender diversity.

Table 1 Descriptive statistics

	Mean	SD	Minimum	Median	Maximum	With FF_DIR	Without FF_DIR	T-test difference
I	0.110	0.038	0.045	0.110	0.276	0.097	0.127	−0.03**
FF_DIR	0.56	0.497	0	1	1	-	-	-
B_INDEX	0.242	0.230	0.00	0.320	0.50	0.274	0.200	0.074*
S_INDEX	0.344	0.324	0.00	0.50	0.69	0.389	0.286	0.103*
P_FEM	0.271	0.278	0.00	0.250	1.00	0.324	0.203	0.121**
O_GEN	0.18	0.384	0	0.00	1	0.20	0.15	0.05*
B_SIZE	2.85	1.375	1	2.00	10	2.81	2.77	0.004†
CD	0.77	0.420	0	1	1	0.83	0.70	0.13*
IFS	13.971	1.250	9.21	13.82	16.68	14.11	13.79	0.32*
FB_ASSETS	16.099	1.260	11.16	16.12	19.67	16.05	16.16	−0.11
FB_SALES	15.980	1.356	11.51	16.01	19.34	15.83	16.18	−0.35*
FB_NPM	0.146	0.112	0.010	0.100	0.530	0.161	0.127	0.034*
FB_AGE	2.823	0.613	0.00	3.00	4.11	0.286	0.279	0.007
FB_LEV	0.350	0.216	0.030	0.300	0.890	0.321	0.387	−0.066*
EMP	1.570	1.248	0.00	1.39	6.23	1.69	1.42	0.27†
F_LOC	0.67	0.471	0	1	1	0.67	0.67	0
O_AGE	3.772	0.229	3.00	3.81	4.28	3.78	3.76	0.02
O_EDU	2.74	1.026	1	3	5	2.79	2.67	0.12
O_EXP	2.716	0.546	1.39	2.77	3.93	2.73	2.70	0.03
IND	0.50	0.501	0	0.50	1	0.53	0.46	0.07

Notes: †$p < 0.10$, *$p < 0.05$, and **$p < 0.01$; variables include debt costs (*I*), foreign family director (*FF_DIR*), Blau index (*B_INDEX*), Shannon index (*S_INDEX*), percentage of female in the board (*P_FEM*), owner gender (*O_GEN*), board size (*B_SIZE*), CEO duality (*CD*), internal financing sources (*IFS*), family business assets (*FB_ASSETS*), family business sales (*FM_SALES*), family business net profit margin (*FB_NPM*), family business age (*FB_AGE*), family business leverage (*FB_LEV*), number of employees (*FB_EMP*), family business location (*FB_LOC*), owner age (*O_AGE*), owner education (*O_EDU*), owner experience (*O_EXP*), and industry (*IND*). SD = Standard deviation. The data shown in Table 2 related to family business revenues and assets, internal financing sources, family business age, number of family business employees, owner age, and owner experience is based on natural logarithms (ln).

Table 2   Correlation analysis

		1	2	3	4	5	6	7	8	9	10
1		1									
2	B_INDEX	-0.339**	1								
3	S_INDEX	-0.338**	0.999**	1							
4	P_FEM	-0.348**	0.573**	0.563**	1						
5	FF_DIR	-0.395**	0.161*	0.158*	0.215**	1					
6	O_GEN	0.038	-0.093	-0.089	-0.091	0.071	1				
7	B_SIZE	-0.001	0.183**	0.206**	-0.150*	0.052	-0.075	1			
8	CD	0.025	-0.048	-0.050	0.079	0.145*	0.037	-0.130*	1		
9	IFS	-0.181**	-0.039	-0.038	-0.124	0.129*	0.083	-0.011	-0.080	1	
10	FB_ASSETS	0.086	-0.238**	-0.239**	-0.303**	-0.047	-0.021	-0.004	-0.088	0.706**	1
11	FB_SALES	0.063	-0.147*	-0.151*	-0.293**	-0.129*	-0.025	-0.012	-0.146*	0.646**	0.819**
12	FB_NPM	-0.217**	0.252**	0.250**	0.382**	0.148*	0.154*	0.086	0.191**	-0.221**	-0.377**
13	FB_AGE	0.157*	-0.070	-0.066	-0.115	0.057	-0.065	0.168**	-0.119	0.144*	0.196**
14	FB_LEV	0.048	0.028	0.029	-0.136*	-0.151*	0.015	-0.026	0.008	0.099	0.050
15	FB_EMP	-0.023	-0.003	-0.002	-0.016	0.110	0.011	0.108	0.008	0.619**	0.614**
16	F_LOC	0.034	0.001	-0.002	-0.117	0.008	0.064	0.062	0.115	0.054	0.101
17	O_AGE	-0.022	0.113	0.119	0.021	0.044	0.100	0.247**	-0.068	0.038	0.053
18	O_EDU	-0.048	0.013	0.012	-0.113	0.060	0.096	0.073	0.040	0.232**	0.169**
19	O_EXP	0.177**	-0.061	-0.056	-0.155*	0.020	0.021	0.142*	-0.133*	0.191**	0.239**
20	IND	-0.003	-0.128*	-0.125*	-0.025	0.066	0.021	0.068	-0.039	0.441**	0.511**

		11	12	13	14	15	16	17	18	19	20
11	FB_SALES	1									
12	FB_NPM	-0.453**	1								
13	FB_AGE	0.090	-0.068	1							
14	FB_LEV	0.221**	-0.106	-0.041	1						
15	FB_EMP	0.467**	0.054	0.071	-0.038	1					
16	F_LOC	0.122	0.071	0.033	-0.037	0.051	1				
17	O_AGE	0.027	-0.021	0.637**	0.000	-0.004	0.012	1			
18	O_EDU	0.202**	-0.044	-0.010	0.006	0.127*	0.199**	0.026	1		
19	O_EXP	0.137*	-0.179**	0.717**	-0.028	0.046	-0.016	0.691**	-0.017	1	
20	IND	0.468**	-0.132*	0.071	0.084	0.553**	-0.147*	0.005	0.028	0.064	1

Note: *$p < 0.05$ and **$p < 0.01$.

Table 3   Foreign family director, gender diversity, and debt costs (OLS)[1]

Variables	B_INDEX (1)	S_INDEX (2)	P_FEM (3)	IFS (4)	I (5)	I (6)	I (7)	I (8)
FF_DIR	0.062*	0.084*	0.080*	0.388**	-0.026**	-0.024**	-0.024**	-0.024**
	(2.13)	(2.04)	(2.42)	(3.60)	(-6.07)	(-5.69)	(-5.71)	(-5.63)
IFS	0.027	0.041†	0.021		-0.014**	-0.013**	-0.013**	-0.013**
	(1.58)	(1.69)	(1.06)		(-5.31)	(-5.05)	(-5.02)	(-5.18)
B_INDEX						-0.033**		
						(-3.40)		
S_INDEX							-0.023**	
							(-3.44)	
P_FEM								-0.027**
								(-3.15)
O_GEN	-0.035	-0.047	-0.046	-0.043	0.003	0.002	0.002	0.002
	(-0.98)	(-0.93)	(-1.11)	(-0.31)	(0.63)	(0.42)	(0.43)	(0.41)
B_SIZE	0.022*	0.036*	0.044**	-0.054	0.001	0.001	0.002	-0.001
	(2.07)	(2.47)	(3.70)	(-1.36)	(0.46)	(0.92)	(1.01)	(-0.30)
CD	-0.054	-0.074	-0.027	-0.130	0.011*	0.009†	0.009†	0.010*
	(-1.57)	(-1.54)	(-0.70)	(-1.01)	(2.22)	(1.91)	(1.91)	(2.11)
FB_ASSETS	-0.071**	-0.100**	-0.064*	0.285**	0.002	0.001	0.001	0.001
	(-3.03)	(-3.01)	(-2.44)	(3.26)	(0.72)	(0.05)	(0.05)	(0.23)
FB_SALES	0.029	0.037	0.002	0.218**	-0.001	0.001	0.001	-0.001
	(1.43)	(1.30)	(0.10)	(2.88)	(-0.07)	(0.25)	(0.82)	(-0.05)
FB_NPM	0.339*	0.461*	0.678**	0.001	-0.071**	-0.060**	-0.060*	-0.053*
	(2.27)	(2.19)	(4.00)	(0.02)	(-3.20)	(-2.73)	(-2.75)	(-2.35)

Notes: Dependent variables = B_INDEX, S_INDEX, P_FEM, IFS, and I. †$p < 0.10$, *$p < 0.05$, and **$p < 0.01$; models (1) to (4) were used to calculate the fitted value of B_INDEX, S_INDEX, P_FEM, and IFS.

Table 3　　Foreign family director, gender diversity, and debt costs (OLS)[1] (continued)

Variables	B_INDEX (1)	S_INDEX (2)	P_FEM (3)	IFS (4)	I (5)	I (6)	I (7)	I (8)
FB_AGE	-0.054	-0.077	-0.037	0.000	0.012*	0.010*	0.010*	0.011*
	(-1.60)	(-1.63)	(-0.97)	(0.03)	(2.42)	(2.10)	(2.09)	(2.26)
FB_LEV	0.043	-0.064	-0.139†	0.403	0.008	0.009	0.009	0.004
	(0.64)	(-0.68)	(-1.82)	(1.59)	(0.77)	(0.93)	(0.96)	(0.41)
FB_EMP	0.022	0.030	0.014	0.319**	0.007*	0.007*	0.007**	0.007**
	(1.27)	(1.25)	(0.70)	(5.20)	(2.64)	(2.98)	(2.98)	(2.83)
FB_LOC	-0.009	-0.014	-0.046	-0.080	0.003	0.003	0.003	0.002
	(-0.29)	(-0.32)	(-1.31)	(-0.69)	(0.71)	(0.66)	(0.65)	(0.66)
O_AGE	0.225*	0.319**	0.300**	-0.365	-0.055**	-0.048**	-0.048**	-0.047**
	(2.54)	(2.56)	(2.98)	(-1.09)	(-4.21)	(-3.68)	(-3.67)	(-3.60)
O_EDU	-0.001	-0.003	-0.017	0.125*	0.001	0.001	0.001	0.001
	(-0.11)	(-0.15)	(-1.09)	(2.38)	(0.44)	(0.42)	(0.41)	(0.83)
O_EXP	-0.028	-0.039	-0.079†	0.291†	0.021**	0.020**	0.020**	0.019**
	(-0.68)	(-0.68)	(-1.67)	(1.86)	(3.47)	(3.39)	(3.39)	(3.17)
IND	-0.060†	-0.082†	0.055	-0.051	0.001	-0.002	-0.002	0.002
	(-1.65)	(-1.66)	(1.37)	(-0.38)	(0.03)	(-0.35)	(-0.35)	(0.31)
Constant	-0.187	-0.265	0.251	5.619**	0.376**	0.370**	0.370**	0.383**
	(-0.47)	(-0.47)	(0.55)	(3.83)	(6.38)	(6.42)	(6.42)	(6.61)
N	246	246	246	246	246	246	246	246
F-value	3.95**	4.09**	6.43**	24.81**	8.24**	8.80**	8.82**	8.64**
R²	0.216	0.222	0.310	0.618	0.365	0.396	0.397	0.392

Notes: Dependent variables = B_INDEX, S_INDEX, P_FEM, IFS, and I. †$p < 0.10$, *$p < 0.05$, and **$p < 0.01$; models (1) to (4) were used to calculate the fitted value of B_INDEX, S_INDEX, P_FEM, and IFS.

Table 4   Foreign family director, gender diversity, and debt costs (2SLS)[2]

Variables	I (1)	I (2)	I (3)	I (4)
IFSfit	–0.010*			
	(–2.02)			
B_INDEXfit		–0.152**		
		(–5.72)		
S_INDEXfit			–0.103**	
			(–5.52)	
P_FEMfit				–0.091**
				(–5.05)
O_GEN	0.001	–0.005	–0.004	–0.003
	(0.24)	(–0.85)	(–0.74)	(–0.49)
FB_AGE	0.010†	0.002	0.002	0.006
	(1.70)	(0.34)	(0.39)	(1.14)
FB_LEV	0.018	0.016	0.016	–0.007
	(1.58)	(1.59)	(1.57)	(–0.59)
FB_EMP	0.004	0.002	0.002	–0.001
	(1.15)	(0.95)	(0.87)	(–0.30)
FB_LOC	0.004	0.001	0.001	–0.002
	(0.87)	(0.29)	(0.28)	(–0.42)
O_AGE	–0.062**	–0.003	–0.005	–0.022
	(–4.02)	(–0.20)	(–0.31)	(–1.42)
O_EDU	0.001	–0.001	–0.001	–0.004†
	(0.21)	(–0.60)	(–0.62)	(–1.69)
O_EXP	0.026**	0.009	0.010	0.006
	(3.53)	(1.32)	(1.41)	(0.91)
IND	0.003	–0.013*	–0.012*	–0.001
	(0.44)	(–2.24)	(–2.11)	(–0.25)
Constant	0.364**	0.131**	0.133**	0.198**
	(4.50)	(2.86)	(2.89)	(4.56)
N	246	246	246	246
F-value	2.81*	5.95**	5.71**	5.16**
R^2	0.107	0.202	0.196	0.180

Note: Dependent variable = I; $†p < 0.10$, $*p < 0.05$, and $**p < 0.01$.

4.3   Empirical findings and discussion

The key findings of our empirical analysis, as presented in Table 3, reveal several significant associations. *FF_DIR*, *IFS*, *B_SIZE*, *FB_NPM*, and *O_AGE* are all positively and significantly associated with gender diversity (*G_DIVERSITY*) measured with

B_INDEX, *S_INDEX*, and *P_FEM*. Conversely, *FB_ASSETS*, *FB_LEV*, *O_EXP*, and *IND* variables show a negative and significant association with gender diversity. Furthermore, *FF_DIR*, *FB_ASSETS*, *FB_SALES*, *FB_EMP*, *O_EDU*, and *O_EXP* variables are positively and significantly associated with IFS. Lastly, *FF_DIR*, *IFS*, *G_DIVERSITY*, *FB_NPM*, and *O_AGE* variables are negatively and significantly associated, and *FF_DIR*IFS*, *CD*, *FB_AGE*, *FB_EMP*, and *O_EXP* are positively and significantly associated with *I*.

The coefficients of *FF_DIR* in columns (1) to (4) are positive and significant at the 5% and 1% levels, implying that foreign family director increases gender diversity and IFS in FBFs in India. Similarly, *FF_DIR*, *IFS*, *B_INDEX*, *S_INDEX*, and *P_FEM* coefficients in columns (5) to (8) are negative and significant at the 1% level, suggesting that foreign family director, IFS, and board gender diversity decrease debt costs. Thus, the empirical analysis supports the first, second, and third hypotheses. Besides, the coefficients of *FB_NPM* in columns (5) to (8) are negative and significant at the 1% and 5% levels, indicating that net profit margin decreases debt costs. Further, the coefficients of *O_AGE* in columns (5) to (8) are negative and significant at the 1% level, implying that owner age decreases debt costs for FBFs in India.

The coefficients of *CD* in columns (5) to (8) are positive and significant at the 5% and 10% levels, implying that CEO duality increases debt costs. Similarly, the coefficients of *F_AGE* and *FB_EMP* in columns (5) to (8) are positive and significant at the 5% and 1% levels, suggesting that firm age and the higher number of family business employees increase debt costs. Likewise, the coefficients of *O_EXP* in columns (5) to (8) are positive and significant at the 1% levels, indicating that owners experience increased debt costs for FBFs in India.

Regardless of model specification, our research reveals a significant impact of FFDs on gender diversity, IFS, and debt costs. To ensure the robustness of our findings, we employed a two-stage least square (2SLS) model to mitigate endogeneity issues. Additionally, we used a bootstrapping method to address sampling bias and validate our regression results. Notably, the bootstrapping method yielded results almost identical to those calculated using the OLS method.

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

5.1   Discussion and conclusions

This study investigated the relationship between FFDs, board gender diversity, and debt costs for FBFs in India. Our analysis revealed that having FFDs leads to higher board gender diversity and IFS while decreasing debt costs. The survey analysis provides additional support to the findings of Ghouma et al. (2018), Usman et al. (2019), and Kamil and Appiah (2022), which show that board diversity reduces debt costs. Theoretically, it can be argued that gender diversity among FFDs and board members contributes to lower debt costs for FBFs.

The study reveals various factors influencing gender diversity in FBFs. Net profit margin, board size, and owner age tend to increase gender diversity, while family business assets; leverage, owner experience, and industry tend to decrease it. Furthermore, family business net profit margin and owner age are found to reduce debt

costs. On the other hand, CEO duality, family business age, more family business employees, and owner experience are associated with increased debt costs for FBFs. Therefore, CEO duality and more employees might be harmful to FBFs. These findings could be due to the impact of the ongoing COVID-19 pandemic, which is causing repeated disruptions to the corporate business system in India.

In conclusion, FFDs in a business can increase gender diversity and IFS while decreasing debt costs. As a result, gender diversity and internal financing can lead to a reduction in debt costs. Furthermore, Table 2 illustrates that having FFDs can increase family business net profit margins and reduce leverage for FBFs. Therefore, FBFs should consider having FFDs on their board. Additionally, owner education has been found to enhance IFS, which can lead to decreased debt costs. Thus, FBFs should also consider providing business management training to their owners.

5.2 Limitations and recommendations for future research

It is important to note that this study has certain limitations. For instance, if FFDs are present in a higher number in FBFs, the family business owners' perception of gender diversity and debt costs may vary. Hence, the results of this study may not be generalised to all FBFs that are different from the firms sampled in this study. Additionally, the sample size of this study is small and limited to only seven states of India, namely Punjab, Haryana, Himachal, Uttarakhand, Uttar Pradesh, Maharashtra, and Rajasthan. Therefore, we recommend that future studies should aim for a larger sample size from different countries and states to increase the study's validity. Furthermore, future studies should differentiate between male and female FFDs as it could lead to a mechanical increase in board diversity. Lastly, future studies should also consider the number of foreign male and female directors to understand the study's results comprehensively.

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Notes

1   The lowest tolerance is 0.196, and the highest variance inflation factor (VIF) is 5.10, indicating that multicollinearity is not a severe issue since VIF is very close to Rogerson's (2001) recommendation of lower than 5.

2   The lowest tolerance is 0.328, and the highest VIF is 3.048, indicating that multicollinearity is not a serious issue. Rogerson (2001) recommends a VIF value lower than 5.