How debt maturity reacts to the interactions of internal corporate governance mechanisms

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Abstract: As the two primary internal corporate governance mechanisms, boards of directors and ownership structures are important for disciplining managers through short-term and long-term debt and, thus, debt maturity. The interactions between these mechanisms tend to define which type of debt is the more effective discipline mechanism. Thus, this study aims to define the impacts of interactions between intensive board monitoring and ownership structures on debt maturity for all non-financial firms listed on the Saudi market from 2008 to 2013. The results reveal that board monitoring intensity encourages Saudi listed firms to apply more long-term debt. Both direct ownership by large shareholders and family-held firms as controlling shareholders strengthen the monitoring functions of the board and encourage Saudi listed firms to apply more long-term debt. In contrast, ultimate owners, who hold indirect ownership of firms, tend to distract the board from applying its monitoring functions effectively.

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1   Introduction

The corporate governance literature on debt maturity in emerging markets over the last three decades is dominated by two different lines of research. The first demonstrates that boards of directors, as internal governance mechanisms, have the power to set and manage financing policy (Güner et al., 2006; Harford et al., 2008; Klein, 1998). The second line of research focuses on the role of the ownership structure, another internal governance mechanism, in determining debt maturity (Ben-Nasr et al., 2015; Diaz-Diaz et al., 2016).

Previous studies obtain valuable results regarding the impact of corporate governance on debt maturity, but, to the best of our knowledge, these results do not address the impact of interactions between the two internal governance mechanisms, the board of directors and the ownership structure, on debt maturity. Thus, this study aims to fill this gap by measuring the impact of the interactions between these internal governance mechanisms on debt maturity. Measuring the influence of the interaction between the board of directors and the ownership structure on a firm's debt maturity is essential for understanding how the owners of Saudi listed firms alter their debt to strengthen or weaken the monitoring functions of their boards. Debt maturity can be used by a firm's owners as a tool to either strengthen the monitoring functions of the board to maintain more control or weaken board monitoring to manipulate the firm's resources. Thus, understanding the use of debt maturity by owners of Saudi listed firms to accomplish their monitoring goals is critical. This understanding can serve to more precisely determine their intentions to protect or manipulate a firm's resources.

Many researchers find evidence that board composition impacts a firm's financing choices and that a strong board is associated with more debt and shorter debt maturity (Güner et al., 2006; Harford et al., 2008; Klein, 1998; Sriram, 2018). The underlying intuition is that leverage can reduce discretionary funds, subject managers to the scrutiny of financial markets, and reduce managers' self-serving behaviour through the threat of default.

Although most studies use the composition ratio of outside directors as a measure of board efficiency, this study instead uses the intensive board monitoring (IBM) measure. We apply this measure because it more precisely signifies whether the monitoring, advisory, or both roles of the board can affect debt maturity, which the composition ratio is unable to do (Byun et al., 2013; Faleye et al., 2011). In the Saudi and similar contexts, the monitoring functions of the board monitoring committees should be emphasised over the advisory functions of the board because this market has the characteristics to those of emerging markets (Mansur and Delgado, 2008; Sedik and Williams, 2011). These markets are characterised by high ownership concentrations, underdeveloped external governance mechanisms, and weak regularity systems (Claessens et al., 2000; Faccio and Lang, 2002; La Porta et al., 1999). These characteristics require more emphasis on the monitoring functions of the board to overcome any misuse by managers and large shareholders that might harm shareholders and creditors.

IBM interacts with the ownership structure, and, thus, these interactions affect debt maturity in different ways. First, the direct owners of a firm are expected to strengthen the monitoring functions of the board and encourage the managers to use long-term debt as a monitoring mechanism. Their large ownership stakes in the firm and the low disparity between their cash flows and control rights encourage them to do so. This notion is supported by the findings of Byun et al. (2013), Ben-Nasr et al. (2015), and Khasawneh and Staytieh (2017). Byun et al. (2013) show that the direct ownership of large shareholders strengthens the efficiency of board monitoring intensity in improving the valuation of the firm. Similarly, Ben-Nasr et al. (2015) reveal that the presence of multiple large shareholders (MLS) in French firms tends to prevent the largest shareholder from misusing the firm's resources by applying more short-term debt. Khasawneh and Staytieh (2017) reveal that foreign direct ownership negatively and significantly affects the capital structure, as measured by short-term market leverage. Foreign ownership reduces a company's exposure to leverage through a greater reliance on equity financing to maintain control over the firm.

Second, the ultimate owners, who hold indirect ownership in a firm, may collude with managers and encourage them to use more short-term debt. They tend to do so to reduce the monitoring intensity of the board over managers and facilitate their expropriation of the minority shareholders. The excess control rights of the ultimate owners of a firm relative to their cash-flow rights allow them to engage in low maximising activities that do not harm their own interests but might harm minority shareholders' interests (Boubaker, 2007). The findings of Byun et al. (2013) support this idea, as they reveal that the indirect ownership of the ultimate owners weakens the efficiency of board monitoring intensity in improving the valuation of a firm.

Third, the nature of the ownership structure and, more specifically, family ownership, can affect the impact of IBM on debt maturity. Family controllers tend to care more about a firm's reputation and long-term survival than other owners do, which lessens the agency conflicts between managers and shareholders and between shareholders and

creditors (Anderson et al., 2003; Croci et al., 2011). Thus, family control is expected to strengthen the intensity of board monitoring by forcing managers to apply more long-term debt. This notion is supported by the findings of Diaz-Diaz et al. (2016), who indicate that family-controlled firms have better access to long-term debt even when they exercise control through a pyramid structure.

The objective of this study is to determine the role of the ownership structure in strengthening or weakening the monitoring functions of the board by influencing the firm's debt maturity. Doing so requires a deep analysis of board monitoring intensity and ownership complexity among Saudi listed firms. This study's findings are important owing to the scarcity of research in this field in the Saudi context. Furthermore, the Saudi market is growing, and market regulators are working to attract more investors to increase its depth and width. Therefore, investors must understand the intentions of a Saudi listed firm's owners to either protect or manipulate the firm's resources by altering its debt maturity to either strengthen or weaken the monitoring functions of the board. This study's findings are also important for market regulators to develop market rules and regulations to protect investors from owner misuse. This study can also help researchers understand the mechanisms of the interactions between ownership structures and board monitoring under different ownership categories. These findings fill a gap in the current literature and allow researchers to extend the current analysis to other ownership categories to understand more deeply the intentions of owners toward their firms and the firms' resources.

We therefore analyse panel data for all firms listed on the Saudi Stock Exchange, excluding firms in the financial sector, from 2008 to 2013. All necessary data are collected from the Tadawul and Argaam websites and by contacting Capital Market Authority (CMA) officials. The variables used include IBM, direct ownership, indirect ownership, the nature of the ownership structure, debt maturity, and control variables.

The remainder of the paper is organised as follows. Section 2 covers the background theory and hypothesis. Section 3 is devoted to the data sources and the variables studied. Section 4 presents the results of the empirical analysis. Section 5 summarises and concludes.

2   Background theory and hypothesis

This section is devoted to the background theory and hypothesis and is divided into four subsections. The first subsection covers the impact of IBM on debt maturity, whereas the second, third, and fourth subsections discuss the interactions between IBM and direct ownership, indirect ownership, and the nature of the ownership structure, respectively, and their impacts on debt maturity.

2.1   IBM and debt maturity

The board of directors has the power to set a firm's financing policy by influencing its leverage and debt maturity (Güner et al., 2006; Klein, 1998). The board's influence on leverage and debt maturity is required to mitigate the agency problem between managers and shareholders (Jensen and Meckling, 1976). Leverage controls the self-serving behaviour of managers and enforces managers' passing up value-decreasing decisions to avoid the risk of default (Grossman and Hart, 1980). Similarly, Jensen (1986) suggests

that the fixed leverage payments can control the entrenchment activities of managers by reducing their available free cash flow.

Harford et al. (2008) find that greater director power is associated with higher leverage and lower debt maturity. Their study focuses on a sample of S&P 1,500 firms from 1997 to 2004, and director power is measured as a sub-index based on the percentage of block-holders on the board and whether the chairperson of the board is the CEO. Their findings complement those of other researchers, such as Datta et al. (2005) and Benmelech (2006). Both of these studies show that entrenched managers place more emphasis on long-term debt to support their entrenchment activities and avoid short-term payments of short-term debt, and an effective monitoring mechanism is required to prevent them from doing so. These findings support the notion that the board, as an internal governance mechanism, provides control over the firm's managers by enforcing their use of more short-term debt. However, the board might encourage managers to apply more long-term debt, as it allows greater monitoring of managers through the creditor. Long-term financing is associated with more monitoring of debt-holders by creditors than short-term financing is. This monitoring is required for long-term financing because creditors do not have the flexibility to refuse to refinance debt-holders if a problem arises because of their long relationship (Easterwood and Kadapakkam, 1994). Thus, board members who want to maintain more control over managers tend to encourage them to use more long-term debt. Long-term debt tends to intensify the monitoring of managers because both the board members and creditors provide monitoring.

The Saudi market was upgraded to an emerging market in June 2018 and will join the Morgan Stanley Capital International Emerging Market Index in two phases starting in March 2019. In an emerging market, boards must place more emphasis on their monitoring functions than on their advisory functions to discipline managers more effectively (Byun et al., 2013). Thus, this study presumes that intensive monitoring by the board through the board monitoring committees influences a firm's managers to apply more leverage and more long-term debt. Doing so can provide more intensive monitoring of managers through the board members and creditors. Thus, it is reasonable to propose the following hypotheses:

H(1-a)   IBM and debt maturity have a positive relationship.

H(1-b)   IBM and the level of leverage have a positive relationship.

2.2   IBM, direct ownership and debt maturity

The analysis of the impact of IBM on debt maturity helps to understand how IBM can mitigate the principal-agent problem that arises between managers and shareholders. This problem occurs when the managers of a firm tend to make decisions that fulfil their own interests at the expense of shareholders' interests (Fama, 1980; Fama and Jensen, 1983; Jensen and Meckling, 1976; Myers, 1977). The large cash flows held directly by large shareholders encourage them to maximise their monitoring of the firm's managers and complement the monitoring role of the board (Shleifer and Vishny, 1997). This outcome mostly occurs for firms with non-complex ownership structures dominated by large shareholders who control the firms directly.

Ben-Nasr et al. (2015) show that MLS in French firms with concentrated ownership structures tend to keep the largest shareholders from misusing the firms' resources through the use of more short-term debt over long-term debt. The controlling shareholders can therefore influence the structure of the board of directors by strengthening the intensity of board monitoring to maintain more control over managerial actions. This result is supported by Mishra (2011), who finds that the presence of MLS on the board of a firm allow those shareholders to enforce the use of more short-term debt. According to this perspective, the ownership structure strengthens the positive impact of IBM on short-term debt. However, large shareholders might require managers to use less short-term debt to intensify board monitoring when they have very large ownership stakes in the firm. Large shareholders' access to superior information and the extra monitoring by creditors in the case of long-term debt tend to complement the monitoring functions of the board and discipline managers more effectively.

In the context of Saudi Arabia, the large ownership stakes of large shareholders are expected to encourage them to intensify the monitoring functions of the board and increase their support for monitoring by applying more long-term debt. Therefore, the following hypothesis follows:

H2 Direct ownership by large shareholders strengthens the relationship between IBM and debt maturity.

2.3   IBM, indirect ownership and debt maturity

The deviation between the cash flows and control rights of the ultimate owners that results from their indirect ownership in the firm encourages them to engage in low maximising activities that do not harm their interests but could harm minority shareholders' interests (Boubaker, 2007; Claessens et al., 2000). This outcome mostly occurs for firms with complex ownership structures whose ultimate owners have high deviations between their cash flows and control rights. Such high deviations, or wedges, encourage the ultimate owners to tunnel the firm's resources to achieve their own interests at the expense of minority shareholders' interests through a pyramid structure, cross shareholdings, or dual-class shares (Johnson et al., 2000). The stronger control rights of the ultimate owners relative to their cash-flow rights enable them to influence the structure of the board by appointing their affiliates as board members and dismissing other members (Dahya and McConnell, 2009; Yeh and Woidtke, 2005). They do so to maintain control over the firm and maximise their own interests by weakening the board's monitoring role. Thus, the ultimate owners can misuse the firm's assets or make investment decisions that are harmful to the firm but are valuable to themselves to maximise their interests at the expense of the minorities' interests. As a result, indirect ownership by the ultimate owners is expected to weaken the intensity of board monitoring to reduce the monitoring of their actions. Hence, the following hypothesis is proposed:

H3 Indirect ownership by the ultimate owners weakens the relationship between IBM and debt maturity.

2.4 IBM, nature of ownership and debt maturity

Firms that are controlled by large shareholders might have better access to long-term debt, especially when the controlling shareholder is a family-held firm (Anderson et al., 2003; Croci et al., 2011). Anderson et al. (2003) find that the agency conflict of debt is lower for firms that are controlled by family firms. Family ownership can mitigate creditors' agency conflicts by lessening the underinvestment and overinvestment problems (Anderson et al., 2003). Family ownership is characterised by less diverse investments and a higher concentration of ownership, which increases the family owner's interest in maintaining the reputation of the firm and ensuring its long-term survival (Andres, 2008; Deephouse and Jaskiewicz, 2013). Previous research shows that firms with concentrated ownership structures tend to make more conservative investments than diversified ownership firms do (Faccio et al., 2011). Furthermore, controlling shareholders tend to care about increasing the credibility of the firm's commitment to long-term agreements between shareholders and bondholders. Family-held firms tend to be more committed to these implicit agreements than other firms are as a result of their low incentives to renegotiate agreements with bondholders (Andres, 2008). Thus, family ownership should strengthen the monitoring functions of the board by applying more long-term debt and increasing the positive impact of IBM on debt maturity. The following hypothesis can be proposed:

H4 Family ownership strengthens the relationship between IBM and debt maturity.

3   Data and variables

This section is divided into three subsections. The first defines the data sources, and the second identifies the variables applied in the empirical analysis. The third provides descriptive statistics of the variables studied.

3.1 Data sources

IBM and ownership data are collected from the Argaam and Tadawul databases. We contacted CMA officials to obtain unpublished data. All firms listed on the Saudi Stock Exchange from 2008 to 2013 are included in this study except for firms listed in the financial sector, as their characteristics differ from those of firms in other sectors.

The study period is associated with the mandatory rule applied by the CMA in 2008. This rule requires all listed firms to disclose the names and ownership stakes of any shareholders who hold more than 5% of their shares. This disclosure should enhance and improve the investment environment, support transparency and disclosure standards, and protect investors from illegal acts in the market.

3.2 Variables

This subsection is divided into four subsections in which the definitions of the debt maturity, IBM, ownership structure, and control variables are provided.

3.2.1 Debt maturity variables

The measures applied for debt maturity are the ratio of long-term debt to total debt (*DebtMatureL*) and that of short-term debt to total debt (*DebtMatureS*). We also measure the level of leverage using the ratio of total debt to total debt and equity (*Leverage*), following Demirgüç-Kunt and Maksimovic (1998), Zheng et al. (2012), Diaz-Diaz et al. (2016) and Ben-Nasr et al. (2015).

3.2.2 IBM variables

The board monitoring is considered to be intensive if the majority of board members who serve on the board committees are outside members. Outside members are more effective monitors of a firm's managers and controlling shareholders than inside members are because of their total independence from the firm and its management (Raheja, 2005). In the Saudi context, the audit committee and the nomination and remuneration committee are considered the two principle committees of boards of directors because they are the committees that are effectively applied to all Saudi listed firms by the Corporate Governance (CG) Regulations. These regulations are issued by the CMA and precisely define the roles and responsibilities of these two committees. Moreover, the CG Regulations show that the primary function of the two committees is monitoring, and, thus, the IBM variables that we consider in this study focus on these two committees.

The first variable measures the independence of the board as a whole, following Faleye et al. (2011). We do so by measuring the percentage of outside directors who serve on the audit and nomination and remuneration committees (*Indcomm*). The other two variables measure the independence of the audit and nomination and remuneration committees, following Byun et al. (2013). The first variable measures the ratio of outside directors to total directors on the board committee (*IndAud* and *IndNomandRem*). If this percentage is high, then the independence of the committee increases, and its monitoring role dominates its advisory role and disciplines the controlling shareholders more effectively (Byun et al., 2013; Chen and Zhu, 2006). The other variable is a dummy variable that takes a value of one if the chairman of the board committee is an outside director and a value of zero otherwise (*ChairAud* and *ChairNomandRem*). If this variable equals one, the board is more independent, and its monitoring functions are stronger, reducing the agency conflict between controlling and minority shareholders.

3.2.3 Variables of ownership structure

The first ownership variable measures the direct ownership stakes of large shareholders in non-complex ownership firms (*Direct*). A shareholder is considered large if it holds more than a 5% direct ownership stake in the firm. The 5% threshold is applied because the CMA mandates that all Saudi listed firms disclose the names of owners of more than 5% of the firm's shares, and, thus, 5% is considered a sufficient percentage to control the firm. The other ownership variable measures the disparity between the control and cash-flow rights of the ultimate owners in complex ownership firms (*Disp*). This variable is measured as the difference between the control and cash-flow rights of the ultimate owners (Claessens et al., 2000; Faccio and Lang, 2002; La Porta et al., 1999). For the nature of the ownership structure (*Nature*), we use a dummy variable that takes a value of one if the large shareholder who controls the firm directly is a family firm and a value of zero otherwise, following Diaz-Diaz et al. (2016).

3.2.4 Other variables

We include control variables that may affect debt maturity in the empirical analysis to avoid spurious correlations. These variables are firm size, firm age, and the market-to-book ratio.

The size of the firm (*Size*) can affect its debt maturity. Titman and Wessels (1988) argue that small firms cannot afford the high costs associated with long-term debt. Additionally, small firms are more likely to have asymmetric information than large firms are, which means that the information available to creditors about certain aspects of the firm is inaccurate (Berger et al., 2005). Thus, small firms are more likely to be associated with short-term debt maturities than large firms are. We express firm size as the natural logarithm of a firm's total assets, and it is expected to positively affect a firm's debt maturity (Ben-Nasr et al., 2015).

Previous research finds that the age of a firm (*Age*) impacts debt maturity. According to Ezeoha and Botha (2012), if a firm has existed for a long time, then it has better opportunities to take advantage of the benefits associated with experience and corporate reputation. Additionally, older firms are more likely to have stronger asset bases and, thus, to gain attractive industry reputations and have more experience with macroeconomic issues in the marketplace. In terms of access to debt, Rajan and Winton (1995) argue that older firms can attract more creditors because they have built their reputations and have better understandings of market macroeconomic issues. We express a firm's age as the natural logarithm of one plus the firm's age in years (Diaz-Diaz et al., 2016). This variable is expected to have a positive impact on the debt maturity of a firm.

The market-to-book ratio (*MBratio*) is another variable that can affect debt maturity. It serves as a proxy for the growth opportunities of the firm. It is argued that more growth opportunities available to a firm are associated with greater conflict between shareholders and debt-holders (Myers, 1977). Such conflicts can be controlled by reducing the maturity of the firm's debt. Thus, we expect that a high market-to-book ratio is associated with more short-term debt. This ratio is measured as the market value of equity divided by the book value of equity.

3.3 Descriptive statistics

This subsection is divided into three subsections. The first defines the main indicators of the descriptive statistics of the variables studied, including the debt maturity, IBM, ownership structure, and control variables. The second subsection identifies the correlations between them, and the third covers the differences between the debt maturity, IBM, and ownership structure variables.

3.3.1 Mean-based analysis

The descriptive statistics of the variables studied are summarised in Table 1. The table shows that the means of *DebtMatureL*, *DebtMatureS*, and *Leverage* are 22.89%, 13.83%, and 36.20%, respectively. The percentage of leverage among Saudi listed firms is considered low, as Diaz-Diaz et al. (2016) find that the corresponding percentage for Spanish firms is 55.5%. This low percentage results from the weak regulatory system in the Saudi context that forces Saudi banks to be reluctant to lend to firms. The statistics also show that Saudi firms tend to acquire long-term debt more than short-term debt.

Among IBM variables, the mean ratio of independent directors to total directors (*IndTotal*) is 50.97%. Thus, the boards of Saudi listed firms are dominated by independent directors. The mean ratio of independent directors to total directors on the audit (*IndAud*) and nomination and remuneration committees (*IndNomandRem*) are 45.66% and 47.02%, respectively, and 32.75% of independent directors serve on both committees (*IndComm*). The mean percentages of firms for which an independent director is the chairman of the audit committee (*ChairAud*) or the chairman of the nomination and remuneration committee (*ChairNomandRem*) are 51% and 42%, respectively. Audit committees are more independent than nomination and remuneration committees because the CG board independence rules for audit committees were applied to Saudi listed firms earlier than those for nomination and remuneration committees were. Among ownership data, the mean direct ownership (*Direct*) of the largest shareholders is 21.61%, whereas the disparity between cash-flow and control rights (*Disp*) of the largest ultimate owner ranges from 0% to 36%. Thus, the cash-flow and control rights of the ultimate owners deviate, facilitating the expropriation of minority shareholders. The mean value of the nature of ownership (*Nature*) variable is 27%, indicating that 27% of Saudi listed firms are family controlled. Saudi listed firms tend to be large, with a mean total asset value of 3.5 billion riyals. However, the ages of these firms tend to be small, with a mean value of 2.9 years. The mean of the market-to-book ratio (*MBratio*) is 2.12.

Table 1   Summary statistics for all variables

Variable	Obs	Mean	Std. dev.	Min	Max
DebtMatureL	708	.2288746	.2816205	0	.9921582
DebtMatureS	708	.1382802	.1895688	0	.8352111
Leverage	678	.36194	.2265102	.002236	1.526787
IndTotal	594	.5097168	.2064379	0	1
IndComm	583	.3274884	.1770293	0	1
IndAud	583	.4566243	.3006655	0	1
IndNomandRem	558	.4701904	.3000146	0	1
ChairAud	583	.5128645	.5002637	0	1
ChairNoman~m	558	.4229391	.4944692	0	1
Direct	576	.2162366	.199315	0	.95
Disp	576	.0153351	.0505976	0	.357
Nature	708	.2683616	.4434201	0	1
Size	627	21.52253	1.445866	18.66832	26.5359
Age	708	2.914168	.8597967	0	4.127134
MBRatio	638	2.117834	1.477957	.46	12.2

Notes: This table shows the descriptive statistics of the debt maturity, IBM, and ownership variables for a sample of 119 Saudi listed firms for the period 2008 to 2013. The definitions of the variables are given in Table A1 in the Appendix.

Table 2   Correlations between variables

(obs=500)

	debtma~l	debtma~s	indtotal	indcomm	indaud	indnom~m	chairaud	chairn~m	direct	disp	nature	size	leverage	age	mbratio
debtmaturel	1.0000														
debtmatures	-0.1052	1.0000													
indtotal	-0.0616	-0.0005	1.0000												
indcomm	-0.0722	0.0583	0.6322	1.0000											
indaud	-0.0240	0.1085	0.4590	0.6375	1.0000										
indnomandrem	-0.0427	0.0338	0.4742	0.7213	0.3360	1.0000									
chairaud	-0.0930	0.1692	0.3775	0.4425	0.5964	0.2065	1.0000								
chairoman-m	0.0281	-0.0357	0.3246	0.3915	0.0396	0.5674	0.0304	1.0000							
direct	-0.0794	0.0197	-0.2100	-0.0594	0.0027	-0.0167	-0.0558	0.0622	1.0000						
disp	0.1766	-0.0565	-0.1331	-0.0735	-0.1010	-0.0676	-0.0640	0.0467	-0.3062	1.0000					
nature	-0.0497	0.1689	-0.0766	-0.1668	-0.0054	-0.2447	0.0346	-0.2761	0.1649	-0.2011	1.0000				
size	0.4115	-0.1783	-0.2226	-0.1758	-0.1675	-0.0395	-0.1838	-0.0009	0.2445	0.2733	-0.1720	1.0000			
leverage	0.4095	0.3024	-0.1376	-0.1041	-0.1339	-0.1106	-0.0938	0.0119	0.0557	0.1342	0.0874	0.2409	1.0000		
age	-0.2718	0.0864	0.1157	0.0841	0.0754	0.0386	0.0272	-0.1309	0.1043	-0.3106	0.0582	-0.2653	-0.2143	1.0000	
mbratio	-0.1808	-0.0782	0.0342	0.0874	0.0276	0.0364	0.0544	0.0334	-0.0837	0.1205	-0.1418	0.0902	0.0285	0.0281	1.0000

Notes: This table shows the correlations between debt maturity, IBM, and ownership variables for a sample of 119 Saudi listed firms for the period 2008 to 2013.
The definitions of the variables are presented in Table A1 in the Appendix.

3.3.2 Correlation-based analysis

Table 2 defines the correlations between the variables studied. All of the IBM variables are positively correlated, which supports the findings of Byun et al. (2013). However, the correlations between these variables and the *DebtMatureL* and *Leverage* variables are negative, whereas that between the *DebtMatureS* variable and the IBM variables is positive. The correlation between the direct ownership and disparity variables is negative with a value of –0.30. The correlations between the direct ownership variable and the *DebtMatureL*, *DebtMatureS* and *Leverage* variables are negative, positive, and positive, respectively. Similarly, the correlations between the *Nature* variable and the *DebtMatureL*, *DebtMatureS* and *Leverage* variables are negative, positive, and positive, respectively. The disparity variable has positive, negative, and positive correlations with the *DebtMatureL*, *DebtMatureS* and *Leverage* variables, respectively. All the control variables, including *Size*, *Age* and *MBRatio*, have low correlations with all of the independent variables, including the IBM and ownership variables.

3.3.3 Debt maturity, IBM, and ownership structure

This subsection describes the use of the analysis of variance (ANOVA) technique to assess the potential differences in the scale levels of the dependent variables, *DebtMatureL*, *DebtMatureS* and *Leverage*, according to the nominal levels of the independent variables, which represent IBM and ownership structure. The results in Table 3 show that the majority of the Fisher tests performed for this analysis indicate significant differences between the dependent and independent variables. Based on these results, we conclude that differences in *DebtMatureL*, *DebtMatureS* and *Leverage* can be assessed by the IBM and ownership structure variables.

Table 3   One-way ANOVA analysis

F statistic	DebtMatureL	DebtMatureS	Leverage
IndTotal	1.681 (.005)***	1.622 (.008)***	2.429 (.000)***
IndComm	1.464 (.042)**	1.089 (.336)	1.651 (.011)**
IndAud	4.089 (.000)***	1.227 (.237)	3.166 (.000)***
IndNomandRem	1.950 (.008)***	1.893 (.011)**	3.888 (.000)***
ChairAud	5.073 (.025)**	11.02 (.001)***	3.825 (.051)*
ChairNomandRem	.206 (.966)	.969 (.325)	.002 (.989)
Direct	3.654 (.000)***	3.646 (.000)***	4.534 (.000)***
Disp	4.421 (.000)***	2.358 (.000)***	2.584 (.000)***
Nature	1.923 (.166)	13.504 (.000)***	4.801 (.029)**

Notes: This table shows the one-way ANOVA analysis of debt maturity, IBM, and
ownership variables for a sample of 119 Saudi listed firms for the period 2008 to
2013. The numbers in the table represent F-statistics, and the numbers in brackets
represent significance levels. ***, **, and * indicate significance levels of 1%,
5%, and 10%, respectively. The definitions of the variables are presented in
Table A1 in the Appendix.

4 Empirical analysis

We begin the empirical analysis by applying an F-test to choose between an ordinary least squares (OLS) or panel data approach. The F-test for the joint significance of the fixed effects intercepts assumes under the null hypothesis that all the fixed individual effects are zero. If the alternative hypothesis is accepted, then the fixed effect method is employed, and the panel data method is preferable to the OLS approach.

Second, we test the endogeneity of the explanatory variables to choose between panel data and panel data instrumental variable estimators using the Wu-Hausman test for endogeneity. The Hausman test is also used to choose between fixed and random firm effects. If exogeneity is rejected, we apply the panel two-stage least squares (2SLS) method, whereas we apply panel data estimation as a robust estimator if exogeneity is accepted.

This section includes four subsections. The first subsection analyses the impact of IBM on debt maturity. The impact of the ownership structure on the relationship between IBM and debt maturity is analysed in the other three subsections.

4.1 IBM and debt maturity

This subsection contains three subsections focusing on the analysis of the impact of IBM on debt maturity. The first two analyse the impact of IBM on *DebtMatureL* and *DebtMatureS*, respectively, whereas the third subsection covers the impact of IBM on *Leverage*.

4.1.1 IBM and DebtMatureL

To analyse the impact of IBM on *DebtMatureL* we apply the following regression model:

$$DebtMatureL_{it} = b_0 + b_1\ IBMi_{it} + b_2\ Size_{it} + b_3\ Age_{it} + b_4\ MBRatio_{it} + e_{it}$$

where *IBMi* represents the IBM variables used in this study (i.e., *IndComm*, *IndAud*, *IndNomandRem*, *ChairAud* and *ChairNomandRem*).

The random effects 2SLS method is used to analyse the impact of IBM on *DebtMatureL* in all models, as we detect an endogeneity problem, with the exception of model (4), in which the fixed effects method is employed. Table 4 shows that all IBM variables positively affect *DebtMatureL*, but the impact is insignificant except in the case of *IndComm* and *IndAud*, which have positive and significant impacts at the 1% and 5% levels, respectively. These findings provide some support for hypothesis (1-a) and reveal that higher monitoring intensity by the board leads to the use of more long-term debt. The findings on the impacts of firm size and age on debt maturity are consistent with those of Diaz-Diaz et al. (2016). Firm size positively and significantly affects *DebtMatureL*. Thus, large Saudi firms tend to acquire more long-term debt. In contrast, firm age negatively and significantly affects *DebtMatureL*. This negative impact of firm age is not in line with the findings of other studies, such as that of Ezeoha and Botha (2012), which might result from the young ages of Saudi listed firms. Similarly, the market-to-book ratio (*MBratio*) has a negative and significant impact on *DebtMatureL*. Growth firms, with high market-to-book ratios, tend to rely more on short-term than on long-term debt to

reduce the conflict between shareholders and debt-holders that is associated with growth firms.

Table 4   The impact of IBM on DebtMatureL

DebtMature L	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Constant	−1.450 (.000)***	−1.322 (.001)***	−1.242 (.001)***	−.101 (.836)	−1.159 (.002)***
IndComm	.286 (.006)***				
IndAud		.141 (.021)**			
IndNomandRem			.111 (.114)		
ChairAud				.0117 (.522)	
ChairNomandRem					0.0663 (.226)
MBRatio	−.0625 (.001)***	−.0512 (.006)***	−.0610 (.001)***	−.0109 (.276)	−.0579 (.002)***
Size	.0898 (.000)***	.0835 (.000)***	.0841 (.000)***	.00298 (.907)	.0805 (.000)***
Age	−.0637 (.039)**	−.0586 (.058)*	−.0770 (.009)***	.103 (.051)*	−.0732 (.013)**
Specification tests					
Endogeneity test	5.202 (.0742)*	5.64(.0596)*	4.708(.0950)*	3.927(.140)	5.344(.0691)*
Sargan test	.995 (.318)	.859(.353)	0.397(.528)	-	.857 (.354)
F (114,447)	13.83 (.000)***	14.37 (.000)***	13.63 (.000)***	14.25 (.000)***	13.59 (.000)***
Hausman (RE vs. FE)	2.24 (.692)	3.41 (.492)	.58 (.965)	13.10 (.0108)**	.56 (.967)
Estimation method	Random effects 2SLS	Random effects 2SLS	Random effects 2SLS	Fixed effects	Random effects 2SLS

Notes: This table shows the results of the regression analysis of *DebtMatureL* on the IBM and control variables for a sample of 119 Saudi listed firms for the period 2008 to 2013. The year effect is a dummy variable. The numbers in the table represent t-statistics, and the numbers in brackets represent significance levels. ***, ** and * indicate significance levels of 1%, 5%, and 10%, respectively. The definitions of the variables are presented in Table A1 in the Appendix.

4.1.2 IBM and DebtMatureS

The following model is employed to analyse the impact of IBM on *DebtMatureS*:

$$DebtMatureS_{it} = b_0 + b_1\ IBMi_{it} + b_2\ Size_{it} + b_3\ Age_{it} + b_4\ M-BRatio_{it} + e_{it}$$

The random effects method is considered in analysing the impact of IBM on *DebtMatureS* in all models, as the endogeneity problem is not observed in any of these models.

The results of the analysis presented in Table 5 are mixed, as the impacts of *IndComm*, *IndNomandRem* and *ChairNomandRem* on *DebtMatureS* are negative but

insignificant. The impact of *IndAud* is positive but not significant, and the impact of *IndNomandRem* is positive and significant at the 10% level. The inconsistency of the results may be because the boards of Saudi listed firms enforce the use of short-term debt lightly. Short-term debt, unlike long-term debt, does not provide extra monitoring by creditors that supports the monitoring functions of the board. For this reason, the high monitoring intensity of the boards drives Saudi listed firms to use more long-term debt, and, thus, the control variables have an insignificant impact on *DebtMatureS*.

Table 5 The ipact of IBM on DebtMatureS

DebtMatureS	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Constant	.0755 (.724)	.0624 (.771)	.0904 (.674)	.0424 (.842)	.0885 (.680)
IndComm	−.0353 (.348)				
IndAud		.00678 (.773)			
IndNomandRem			−.0108 (.648)		
ChairAud				.0260 (.050)*	
ChairNomandRem					−.0171 (.210)
MBRatio	−.00564 (.306)	−.00619 (.258)	−.00374 (.505)	−.00634 (.245)	−.0034 (.545)
Size	−.00061 (.949)	−.000235 (.918)	−.00109 (.909)	.00019 (.983)	−.00094 (.921)
Age	.0351 (.070)*	.0322 (.094)*	.0296 (.126)	.0322 (.089)*	.0297 (.124)
Specification tests					
Endogeneity test	.355 (.837)	.614(.735)	.551(.759)	.421(.810)	1.447(.484)
Sargan test	-	-	-	-	-
F (114,447)	12.19 (.000)***	11.74 (.000)***	11.42 (.000)***	11.93 (.000)***	11.46 (.000)***
Hausman (RE vs. FE)	5.02 (.284)	7.36 (.195)	5.07 (.279)	.421 (.810)	5.51 (.238)
Estimation method	Random effects	Random effects	Random effects	Random effects	Random effects

Notes: This table shows the results of the regression analysis of *DebtMatureS* on IBM
and control variables for a sample of 119 Saudi listed firms for the period 2008 to
2013. The year effect is a dummy variable. The numbers in the table represent
t-statistics, and the numbers in brackets represent significance levels. ***, **, and
* indicate significance levels of 1%, 5%, and 10%, respectively. The definitions of
the variables are presented in Table A1 in the Appendix.

4.1.3 IBM and the level of leverage

This subsection analyses the impact of IBM on *Leverage* by applying the following regression:

$$Leverage = a_0 + a_1\ IBMi_{it} + a_2\ Size_{it} + a_3 Age_{it} + a_4\ MBRatio_{it} + e_{it}$$

The endogeneity problem is detected for models 3, 4, and 5, and the 2SLS method is therefore employed for these models, whereas the fixed effects method is employed for the two first models in favour of the random effects method based on the Hausman test.

Table 6   The impact of IBM on leverage

Leverage	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Constant	1.066 (.000)***	1.027 (.000)***	−.146 (.704)	−.0637 (.875)	−.194 (.587)
IndComm	.0626 (.027)**				
IndAud		.0501 (.004)***			
IndNomandRem			.0488 (.243)		
ChairAud				.0564 (.022)**	
ChairNomandRem					.0581 (.102)
MBRatio	.0195 (.000)***	.0204 (.000)***	−.0105 (.516)	−.0042 (.782)	−.0151 (.336)
Size	−.0444 (.001)***	−.0439 (.001)***	.0285 (.109)	.0221 (.244)	.0309 (.063)*
Age	.0619 (.035)**	.0690 (.016)**	−.0386 (.090)*	−.0262 (.258)	−.0368 (.101)
Specification tests					
Endogeneity test	2.547(.279)	.993(.608)	5.514(.0635)*	4.633(.0986)*	4.828(.0894)*
Sargan test	-	-	.176 (.675)	.139 (.709)	.041 (.840)
F (114,447)	34.32 (.000)***	34.34 (.000)***	30.23 (.000)***	34.63 (.000)***	31.25 (.000)***
Hausman (RE vs. FE)	48.260 (.000)***	33.91 (.000)***	1.49 (.829)	5.70 (.222)	1.401 (.845)
Estimation method	Fixed effects	Fixed effects	Random effects 2SLS	Random effects 2SLS	Random effects 2SLS

Notes: This table shows the results of the regression analysis of *Leverage* on IBM and control variables for a sample of 119 Saudi listed firms for the period 2008 to 2013. The year effect is a dummy variable. The numbers in the table represent t-statistics, and the numbers in brackets represent significance levels. ***, ** and * indicate significance levels of 1%, 5%, and 10%, respectively. The definitions of the variables are presented in Table A1 in the Appendix.

Table 6 reveals that all the IBM variables positively affect *Leverage*, but the impact is not significant in all models. The variable related to the independence of the board, *IndComm* and those related to the independence of the audit committee, *IndAud* and *ChairAud*, have positive, significant impacts on leverage at the 5%, 1%, and 5% levels, respectively. The significance of the results supports hypothesis (1-b) and reveals that a higher level of monitoring by the board encourages Saudi listed firms to borrow more. Moreover, these results support our findings regarding long-term debt and show that high amounts of leverage of listed firms tend to enforce greater use of long-term debt (Diamond, 1991). However, the impacts of the variables related to the independence of the nomination and

remuneration committees, *IndNomandRem* and *ChairNomandRem*, are not significant. This result can be attributed to the fact that nomination and remuneration committees were applied to Saudi listed firms in 2010, after the audit committees were applied in 2008, reducing their impact on leverage relative to that of the audit committees. Firm size has a negative and significant impact on leverage at the 1% level in the first two models, whereas the impact is positive and insignificant in the other three models. However, firm age and the market-to-book ratio positively and significantly affect leverage in the first two models but have negative and insignificant effects in the other models. The previous two subsections show that the impacts of control variables on *DebtMatureL* are significant and consistent, whereas their impacts on *DebtMatureS* are inconsistent. Thus, the insignificant and mixed results in this subsection can be attributed to short-term debt.

4.2 IBM, direct ownership and debt maturity

The following regression model is used to analyse the impact of direct ownership on the relationship between IBM and debt maturity, where debt maturity is measured using *DebtMatureL* and *DebtMatureS*:

$$DebtMaturity_{it} = b_0 + b_1\ Direct_{it} + b_2\ IBMi_{it} * Direct_{it} + b_3\ Size_{it} + b_4\ Age_{it} + b_5 MBRatio_{it} + eit$$

where ($IBMi_{it}*Direct_{it}$) is the interaction between each of the IBM variables and the direct ownership variable.

The results in Table 7A show that the impacts of the interactions between *Direct* and *IndComm*, *IndAud* and *IndNomandRem* on *DebtMatureL* are positive and significant at the 5%, 5%, and 1% levels, respectively. These findings support our second hypothesis, which indicates that direct ownership by large shareholders strengthens the positive impact of IBM on debt maturity. Among Saudi listed firms, large shareholders hold large direct ownership stakes that incentivise them to maintain control over managers and support the monitoring functions of the board by applying more long-term debt. In contrast, the impacts of the interactions of *Direct* with *ChairAud* and *ChairNomandRem* on *DebtMatureL* are insignificant. This result might be caused by the nature of these two IBM variables (i.e., *ChairAud* and *ChairNomandRem*). These two variables measure the independence of the chairman of the board committee. If the chairman of the board committee is not entirely independent from the board on which he serves or if he has any kind of relationship with the firm and its managers, the independence of the board committee and the board as a whole might be affected (Bhagat and Black, 1999). Furthermore, this lack of total independence of the chairman of the board committee might weaken the monitoring functions of the board and cause the above results to be insignificant. These findings are supported by the findings in Table 7B, which indicate that the interactions between *Direct* and the IBM variables have positive but insignificant impacts on *DebtMatureS* in all models except model (4), for which the impact is positive and significant at the 5% level. The insignificance of the results proves that, among Saudi listed firms, large shareholders tend to support the monitoring functions of boards by applying more long-term debt.

Firm size has a positive impact on *DebtMatureL*, whereas firm age and the market-to-book ratio both negatively affect *DebtMatureL*. These findings support the results obtained when analysing the impact of IBM on *DebtMatureL*, shown in Table 4.

Similarly, the impacts of the control variables on *DebtMatureS* are insignificant, which supports the findings obtained in the analysis of the impacts of IBM variables on *DebtMatureS*, shown in Table 5.

Table 7   IBM, direct ownership and debt maturity

	A				
DebtMatureL	*Model (1)*	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	−1.334 (.001)***	−1.368 (.000)***	.244 (.653)	.241 (.656)	−1.129 (.002)***
IndComm*Direct	1.360 (.015)**				
IndAud*Direct		.699 (.047)**			
IndNomandRem*Direct			.213 (.089)*		
ChairAud*Direct				−.0121 (.855)	
ChairNomandRem*Direct					.238 (.304)
MBRatio	−.0645 (.000)***	−.0571 (.001)***	−.0118 (.319)	−.0116 (.325)	−.0580 (.001)***
Size	.0903 (.000)***	.0911 (.000)***	−.00042 (.988)	−.00556 (.838)	.0816 (.000)***
Age	−.0506 (.107)	−.0491 (.116)	.0621 (.269)	.106 (.053)*	−.0595 (.052)*
Direct	−.739 (.000)***	−.642 (.001)***	−.711 (.002)***	−.630 (.007)***	−.402 (.015)**
Specification Tests					
Endogeneity test	6.512 (.0385)**	5.201(.0742)*	4.317(.115)	3.032(.219)	5.114(.0775)*
Sargan test	…. (.318)	1.383(.239)	-	-	1.501 (.220)
F (114,447)	12.84 (.000)***	12.69 (.000)***	12.39 (.000)***	13.01 (.000)***	12.34 (.000)***
Hausman (RE vs. FE)	4.91 (.427)	5.78 (.328)	11.76 (.038)**	14.12 (.014)**	2.25 (.814)

Notes: Tables 7A and 7B show the results of the regression analysis of the interactions between IBM and direct ownership for a sample of 119 Saudi listed firms for the period 2008 to 2013. The year effect is a dummy variable. The numbers in the table represent t-statistics, and the numbers in brackets represent significance levels. ***, ** and * indicate significance levels of 1%, 5%, and 10%, respectively. The definitions of the variables are presented in Table A1 in the Appendix.

Table 7 IBM, direct ownership and debt maturity (continued)

	B				
DebtMatureS	*Model (1)*	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	…. (.724)	.188 (.399)	.221 (.325)	.158 (.474)	.230 (.305)
IndComm*Direct	.193 (.202)				
IndAud*Direct		.0625 (.533)			
IndNomandRem*Direct			.0556 (.542)		
ChairAud*Direct				.117 (.015)**	
ChairNomandRem*Direct					.0421 (.387)
MBRatio	−.00052 (.933)	.00018 (.976)	.00013 (.986)	−.00146 (.981)	.00016 (.979)
Size	−.00687 (.493)	−.00638 (.526)	−.00756 (.453)	−.00522 (.599)	−.00799 (.428)
Age	.0277 (.156)	.0289 (.142)	.0263 (.183)	.0303 (.115)	.0265 (.178)
Direct	−.00597 (.943)	−.00208 (.813)	.0241 (.776)	−.0049 (.950)	.0280 (.724)
Specification tests					
Endogeneity test	…. (.837)	1.085(.581)	.952(.621)	2.459(.292)	2.459(.292)
Sargan test	-	-	-	-	-
F (114,447)	10.38 (.000)***	10.56 (.000)***	9.80 (.000)***	9.82 (.000)***	9.82 (.000)***
Hausman (RE vs. FE)	8.64 (.124)	7.68 (.174)	7.86 (.164)	10.76 (.0563)*	8.26 (.142)

Notes: Tables 7A and 7B show the results of the regression analysis of the interactions between IBM and direct ownership for a sample of 119 Saudi listed firms for the period 2008 to 2013. The year effect is a dummy variable. The numbers in the table represent t-statistics, and the numbers in brackets represent significance levels. ***, ** and * indicate significance levels of 1%, 5%, and 10%, respectively. The definitions of the variables are presented in Table A1 in the Appendix.

4.3 IBM, indirect ownership and debt maturity

To analyse the impact of indirect ownership on the relationship between IBM and debt maturity, we use the following regression model:

$$DebtMaturity_{it} = b_0 + b_1\ Disp_{it} + b_2\ IBMi_{it} * Disp_{it} + b_3\ Size_{it} + b_4\ Age_{it} + b_5 MBRatio_{it} + e_{it}$$

where ($IBMi_{it} * Disp_{it}$) is the interaction between each of the IBM variables and the disparity variable.

The results in Tables 8A and 8B indicate that none of the interactions between IBM and disparity has a significant effect on *DebtMatureL* and *DebtMatureS*, respectively. The insignificance of the results could be attributed to the nature of the disparity variable. The ultimate owners, whose cash-flow and control rights differ, tend to misuse firm resources and expropriate minority shareholders. This misuse of the firm resources tends to have a distracting effect on the disciplinary role of the independent board members over the firm's managers and affects their ability to use more long-term debt to maintain control. Similarly, all of the control variables have insignificant impacts on *DebtMatureL* and *DebtMatureS*, which supports the distracting effect of the disparity variable.

Table 8   IBM, indirect ownership and debt maturity

	A				
DebtMatureL	*Model (1)*	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	−.144 (.787)	−.976 (.001)***	−.941 (.000)***	−.989 (.003)***	−1.116 (.001)***
IndComm*Disp	.324 (.840)				
IndAud*Disp		1.301 (.179)			
IndNomandRem*Disp			.525 (.684)		
ChairAud*Disp				−.351 (.197)	
ChairNomandRem*Disp					.425 (.427)
MBRatio	−.0133 (.260)	−.0316 (.000)***	−.0534 (.000)***	−.0567 (.000)***	−.0499 (.000)***
Size	.00313 (.909)	.0615 (.000)***	.0719 (.000)***	.0714 (.000)***	.0775 (.000)***
Age	.117 (.043)**	−.0145 (.587)	−.0631 (.129)	−.0561 (.050)*	−.0596 (.064)*
Disp	1.723 (.069)*	.416 (.454)	−1.820 (.711)	.182 (118)	−.288 (.459)
Specification tests					
Endogeneity test	6.512 (.0385)**	5.954 (.0509)*	6.114 (.047)**	6.772 (.0338)**	5.885 (.0527)*
Sargan test	-	1.030 (.310)	.102 (.749)	1.756 (.185)	.032 (.858)
F (114,447)	13.60 (.000)***	13.66 (.000)***	13.03 (.000)***	13.91 (.000)***	12.95 (.000)***
Hausman (RE vs. FE)	12.42 (.029)**	.47 (.993)	1.07 (.956)	2.34 (.801)	1.04 (.959)

Notes: Tables 8A and 8B show the results of the regression analysis of the interactions between IBM and indirect ownership for a sample of 119 Saudi listed firms for the period 2008 to 2013. The year effect is a dummy variable. The numbers in the table represent t-statistics, and the numbers in brackets represent significance levels. ***, ** and * indicate significance levels of 1%, 5%, and 10%, respectively. The definitions of the variables are presented in Table A1 in the Appendix.

Table 8 IBM, indirect ownership and debt maturity (continued)

DebtMatureS	*Model (1)*	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
			B		
Constant	.178 (.425)	.175 (.429)	.213 (.343)	.192 (.389)	.193 (.387)
IndComm*Disp	.213 (.856)				
IndAud*Disp		.437 (.557)			
IndNomandRem*Disp			.199 (.771)		
ChairAud*Disp				−.147 (.535)	
ChairNomandRem*Disp					−.0983 (.702)
MBRatio	−.00033 (.957)	−.00021 (.974)	−.000187 (.976)	−.000134 (.983)	−.000124 (.984)
Size	−.00554 (.581)	−.00548 (.585)	−.00675 (.502)	−.00615 (.541)	−.00611 (.544)
Age	.0302 (.139)	.0305 (.129)	.0269 (.187)	.0296 (.142)	.0286 (.160)
Disp	−.0867 (.851)	−.0188 (.653)	−.0765 (.858)	.0562 (.869)	.0632 (.858)
Specification tests					
Endogeneity test	.831 (.660)	2.319 (.313)	1.493 (.474)	3.056 (.217)	1.925 (.382)
Sargan test	-	-	-	-	-
F (114,447)	10.51 (.000)***	10.53 (.000)***	9.72 (.000)***	10.53 (.000)***	9.77 (.000)***
Hausman (RE vs. FE)	5.96 (.310)	5.74 (.331)	6.97 (.223)	6.32 (.276)	6.82 (.382)

Notes: Tables 8A and 8B show the results of the regression analysis of the interactions
between IBM and indirect ownership for a sample of 119 Saudi listed firms for the
period 2008 to 2013. The year effect is a dummy variable. The numbers in the
table represent t-statistics, and the numbers in brackets represent significance
levels. ***, ** and * indicate significance levels of 1%, 5%, and 10%,
respectively. The definitions of the variables are presented in Table A1 in the
Appendix.

4.4 IBM, nature of ownership, and debt maturity

To analyse the impact of the nature of ownership on the relationship between IBM and
debt maturity, the following regression model is employed:

$$DebtMaturity_{it} = b_0 + b_1 \, Nature_{it} + b_2 \, IBMi_{it} * Nature_{it} + b_3 \, Size_{it} + b_4 \, Age_{it} + b_5 MBRatio_{it} + e_{it}$$

where ($IBMi_{it}*Nature_{it}$) is the interaction between each of the IBM variables and *Nature*.

Table 9   IBM, nature of ownership and debt maturity

	A				
DebtMatureL	*Model (1)*	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	−1.005 (.010)**	−1.156 (.003)***	−.929 (.020)**	−.136 (.783)	−.955 (.012)**
IndComm*Nature	.729 (.007)***				
IndAud*Nature		.282 (.033)**			
IndNomandRem*Nature			.394 (.000)***		
ChairAud*Nature				.0246 (.470)	
ChairNomandRem*Nature					.186 (.246)
MBRatio	−.0512 (.006)***	−.0537 (.004)***	−.0501 (.010)**	−.0127 (.212)	−.0499 (.008)***
Size	.0734 (.000)***	.0799 (.000)***	.0717 (.000)***	.00544 (.832)	.0724 (.000)***
Age	−.0664 (.034)**	−.0613 (.045)**	−.0793 (.011)**	.104 (.051)*	−.0749 (.014)**
Nature	−.248 (.006)***	−.153 (.025)**	−.172 (.058)*	−.0471 (.329)	−.0767 (.1662)
Specification tests					
Endogeneity test	10.510 (.005)***	6.622 (.0365)**	7.352(.0253) **	4.221(.121)	8.282(.0159) **
Sargan test	.066 (.797)	1.383(.239) ***	.016(.898)	-	1.117 (.290)
F (114,447)	13.42 (.000)***	13.96 (.000)***	13.56 (.000)***	13.98 (.000)***	13.26 (.000)***
Hausman (RE vs. FE)	6.99 (.221)	5.20 (.392)	2.41 (.790)	14.06 (.0152)**	2.09 (.836)

Notes: Tables 9A and 9B show the results of the regression analysis of the interactions between IBM and the nature of ownership for a sample of 119 Saudi listed firms for the period 2008 to 2013. The year effect is a dummy variable. The numbers in the table represent t-statistics, and the numbers in brackets represent significance levels. ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively. The definitions of the variables are presented in Table A1 in the Appendix.

Table 9   IBM, nature of ownership and debt maturity (continued)

			B		
DebtMatureS	*Model (1)*	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	.0828 (.696)	.0739 (.727)	.0945 (.658)	.0846 (.689)	.0931 (.662)
IndComm*Nature	.0425 (.433)				
IndAud*Nature		.00889 (.811)			
IndNomandRem*Nature			.0248 (.600)		
ChairAud*Nature				.0418 (.088)*	
ChairNomandRem					.0147 (.534)
MBRatio	−.00593 (.325)	−.00541 (.325)	−.00312 (.576)	−.00579 (.290)	−.00308 (.581)
Size	−.00118 (.900)	−.00089 (.925)	−.00167 (.861)	−.000129 (.891)	−.00166 (.861)
Age	.0291 (.127)	.0298 (.118)	.0261 (.172)	.0295 (.119)	.0266 (.165)
Nature	.0196 (.528)	.0308 (.298)	.0289 (.341)	.0110 (.689)	.0341 (.184)
Specification tests					
Endogeneity test	1.384 (.506)	.086(.957)	1.076 (.584)	.682 (.711)	3.105 (.211)
Sargan test	-	-	-	-	-
$F_{(111,447)}$	11.64 (.000)***	11.71 (.000)***	11.01 (.000)***	11.65 (.000)***	11.08 (.000)***
Hausman (RE vs. FE)	7.42 (.196)	7.32 (.198)	7.16 (.213)	7.22 (.204)	7.03 (.154)

Notes: Tables 9A and 9B show the results of the regression analysis of the interactions
between IBM and the nature of ownership for a sample of 119 Saudi listed firms
for the period 2008 to 2013. The year effect is a dummy variable. The numbers in
the table represent t-statistics, and the numbers in brackets represent significance
levels. ***, **, and * indicate significance levels of 1%, 5%, and 10%,
respectively. The definitions of the variables are presented in Table A1 in the
Appendix.

The results in Table 9A reveal that the impacts of the interactions between *Nature* and
IndComm, *IndAud*, and *IndNomandRem* on *DebtMatureL* are positive and significant at
the 5%, 5%, and 1% levels, respectively. These findings support our fourth hypothesis,
which states that family ownership strengthens the positive impact of IBM on debt
maturity. Family owners tend to care about the reputation of a firm and its survival as a
result of their high ownership stakes (Andres, 2008; Deephouse and Jaskiewicz, 2013).
Thus, family-held firms tend to maintain control over managers through long-term
agreements between shareholders and bondholders and tend to highly commit to these

agreements owing to their low incentives to renegotiate the agreements with bondholders (Andres, 2008). The impacts of the interactions between *Nature* and *ChairAud* and *ChairNomandRem* on *DebtMatureL* are positive but insignificant. This result, as discussed earlier, can be attributed to the lack of independence of the chairmen of board committees. This lack of independence can lead to personal relationships between the chairmen and managers, which affect the independence of the board committee and the board as a whole (Bhagat and Black, 1999). The findings in Table 9B support the previous findings in Table 9A. The interactions between *Nature* and the IBM variables affect *DebtMatureS* positively but insignificantly in all models except for model (4), in which the impact is positive and significant at the 10% level. The insignificance of these results proves that family-held firms, as controlling shareholders, tend to support the monitoring functions of boards by applying more long-term debt.

Firm size positively and significantly affects *DebtMatureL*, whereas age and the market-to-book ratio both affect *DebtMatureL* negatively and significantly. These findings support the results obtained by analysing the impact of IBM on *DebtMatureL* in Table 4. The impact of the control variables on *DebtMatureS* is insignificant, which supports the findings obtained by analysing the impact of the IBM variables on *DebtMatureS* in Table 5.

5   Conclusions

The results of previous studies show that managers can be disciplined using short-term and long-term debt and, thus, debt maturity. The preferences for these two types of leverage depend on the two primary internal corporate governance mechanisms, the board of directors and the ownership structure. Strong boards that place more emphasis on their monitoring functions tend to prefer long-term to short-term debt as a discipline mechanism. Long-term debt can support and strengthen the monitoring functions of the board through the monitoring of creditors (Easterwood and Kadapakkam, 1994). Similarly, direct owners, who hold large ownership stakes in firms, tend to prefer long-term debt to discipline managers more effectively. Thus, the interactions between these two corporate governance mechanisms seem to encourage firms to emphasise long-term debt over short-term debt. The results of this study support this notion, as the findings reveal that intensive monitoring by the board encourages Saudi listed firms to use more long-term debt. Direct ownership by large shareholders and family-held firms, as controlling shareholders, strengthens the monitoring functions of boards and encourages Saudi listed firms to apply more long-term debt. However, ultimate owners, who hold indirect ownership in these firms, tend to distract boards from applying their monitoring functions effectively.

These findings are important for investors and regulators to understand how the owners of Saudi listed firms alter the debt maturities of their firms to either protect or manipulate firm resources. Specifically, investors can make better investment decisions, and regulators can improve the rules and regulations of the market to provide more protection for investors. These findings can help researchers understand the interactions between ownership structures and board monitoring intensities and the effects of these interactions on debt maturity. Researchers can therefore extend the research in this field and measure the effects of other ownership categories or other measures of board monitoring intensity on debt maturity.

To extend the current findings, we suggest that future research considers the impacts of foreign institutional investments (FII) on IBM and debt maturity. The CMA enacted many changes to liberalise the market and improve its quality. Opening the market to FIIs, which began in June 2015, is one such change that aims to attract more sophisticated investors to the market and improve its liquidity. Thus, studying how the ownership structures of those investors can strengthen or weaken the monitoring functions of the board and affect debt maturity is important to consider in future research.

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References

Anderson, R., Mansi, S. and Reeb, D. (2003) 'Founding family ownership and the agency cost of debt', *Journal of Financial Economics*, Vol. 68, No. 1, pp.263–285.

Andres, A. (2008) 'Large shareholders and firm performance – an empirical examination of founding-family ownership', *Journal of Corporate Finance*, Vol. 14, No. 4, pp.431–445.

Benmelech, E. (2006) *Managerial Entrenchment and Debt Maturity: Theory and Evidence*, Harvard University Working Paper.

Ben-Nasr, H., Boubaker, S. and Rouatbi, W. (2015) 'Ownership structure, control contestability, and corporate debt maturity', *Journal of Corporate Finance*, Vol. 35, pp.265–285.

Berger, A., Espinosa-Vega, M., Frame, S. and Miller, N. (2005) 'Debt maturity, risk, and asymmetric information', *Journal of Finance*, Vol. 60, No. 6, pp.2895–2923.

Bhagat, S. and Black, B. (1999) 'The uncertain relationship between board composition and firm performance', *Business Lawyer*, Vol. 54, No. 3, pp.921–963.

Boubaker, S. (2007) 'Ownership-control discrepancy and firm value: evidence from France', *Multinational Finance Journal*, Vol. 11, Nos. 3–4, pp.211–252.

Byun, H., Lee, J. and Park, K. (2013) 'Ownership structure, intensive board monitoring, and firm value: evidence from Korea', *Asia-Pacific Journal of Financial Studies*, Vol. 42, No. 2, pp.191–227.

Chen, C. and Zhu, S. (2006) 'Ultimate shareholder, government control, and firm performance in China (Working Paper No. 10.2139)', Paper presented at *The Third International Symposium on Corporate Governance Papers*.

Claessens, S., Djankov, S. and Lang, L. (2000) 'The separation of ownership and control in East Asian corporations', *Journal of Financial Economics*, Vol. 58, Nos. 1–2, pp.81–112.

Croci, E., Doukas, J. and Gonenc, H. (2011) 'Family control and financing decisions', *European Financial Management*, Vol. 17, No. 5, pp.860–897.

Dahya, J. and McConnell, J.J. (2009) 'Does board independence matter in companies with a controlling shareholder?', *Journal of Applied Corporate Finance*, Vol. 21, No. 1, pp.67–78.

Datta, S., Iskandar-Datta, M. and Raman, K. (2005) 'Managerial stock ownership and the maturity structure of corporate debt', *Journal of Finance*, Vol. 60, No. 5, pp.2333–2350.

Deephouse, D.L. and Jaskiewicz, P. (2013) 'Do family firms have better reputation than non-family firms? An integration of socioemotional wealth and social identity theories', *Journal of Management Studies*, Vol. 50, No. 3, pp.337–360.

Demirgüç-Kunt, A. and Maksimovic, V. (1998) 'Law, finance, and firm growth', *The Journal of Finance*, Vol. 53, No. 6, pp.2107–2137.

Diamond, D.W. (1991) 'Debt maturity structure and liquidity risk', *Quarterly Journal of Economics*, Vol. 106, No. 3, pp.709–737.

Díaz-Díaz, N.L., García-Teruel, P.J. and Martínez-Solano, P. (2016) 'Debt maturity structure in private firms: does the family control matter?', *Journal of Corporate Finance*, Vol. 37, No. C, pp.393–411.

Easterwood, J.C. and Kadapakkam, P.R. (1994) 'Agency conflicts, issue costs, and debt maturity', *Quarterly Journal of Business and Economics*, Vol. 33, No. 3, pp.69–80.

Ezeoha, A. and Botha, F. (2012) 'Firm age, collateral value, and access to debt financing in an emerging economy: evidence from South Africa', *South African Journal of Economic and Management Sciences*, Vol. 15, No. 1, pp.55–71.

Faccio, M. and Lang, L.H.P. (2002) 'The ultimate ownership of Western European corporations', *Journal of Financial Economics*, Vol. 65, No. 3, pp.365–395.

Faccio, M., Marchica, M.T. and Mura, R. (2011) 'Large shareholder diversification and corporate risk-taking', in *The Review of Financial Studies*, Vol. 24, No. 11, pp.3601–3641.

Faleye, O., Hoitash, R. and Hoitash, U. (2011) 'The costs of intense board monitoring', *Journal of Financial Economics*, Vol. 101, No. 1, pp.160–181.

Fama, E. (1980) 'Agency problems and the theory of the firm', *The Journal of Political Economy*, Vol. 88, No. 2, pp.288–307.

Fama, E.F. and Jensen, M.C. (1983) 'Separation of ownership and control', *Journal of Law and Economics*, Vol. 26, No. 2, pp.301–325.

Grossman, S. and Hart, O. (1980) 'Takeover bids, the free-rider problem, and the theory of the corporation', *The Bell Journal of Economics*, Vol. 11, No. 1, pp.42–64.

Güner, A.B., Malmendier, U. and Tate, G. (2006) *The Impact of Boards with Financial Expertise on Corporate Policies*, Stanford University Working Paper.

Harford, J., Li, K. and Zhao, X. (2008) 'Corporate boards and the leverage and debt maturity choices', *International Journal of Corporate Governance*, Vol. 1, No. 1, pp.3–27.

Jensen, M. and Meckling, W. (1976) 'Theory of the firm: managerial behavior, agency costs and ownership structure', *Journal of Financial Economics*, Vol. 3, No. 4, pp.305–360.

Jensen, M.C. (1986) 'Agency costs of free cash flow, corporate finance and takeovers', *American Economic Review*, Vol. 76, No. 2, pp.323–339.

Johnson, S., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2000) 'Tunnelling', *The American Economic Review*, Vol. 90, No. 2, pp.22–27.

Khasawneh, A.Y. and Staytieh, K.S. (2017) 'Impact of foreign ownership on capital structure and firm value in emerging market: case of Amman Stock Exchange listed firms', *Afro-Asian Journal of Finance and Accounting*, Vol. 7, No. 1, pp.35–64.

Klein, A. (1998) 'Firm performance and board committee structure', *The Journal of Law and Economics*, Vol. 41, No. 1, pp.275–304.

La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (1999) 'Corporate ownership around the world', *The Journal of Finance*, Vol. 54, No. 2, pp.471–517.

Mansur, A. and Delgado, F. (2008) *Stock Market Developments in the Countries of the Gulf Cooperation Council*, Palgrave Macmillan, UK.

Mishra, D. (2011) 'Multiple large shareholders and corporate risk taking: evidence from East Asia', *Corporate Governance: An International Review*, Vol. 19, No. 6, pp.507–528.

Myers, S. (1977) 'Determinants of corporate borrowing', *Journal of Financial Economics*, Vol. 5, No. 2, pp.147–175.

Raheja, C. (2005) 'Determinants of board size and composition: a theory of corporate boards', *Journal of Financial and Quantitative Analysis*, Vol. 40, No. 2, pp.283–306.

Rajan, R. and Winton, A. (1995) 'Covenants and collateral as incentives to monitor', *The Journal of Finance*, Vol. 50, No. 4, pp.1113–1146.

Sedik, T. and Williams, O. (2011) *Global and Regional Spillovers to GCC Equity Markets*, Working Paper No. 11/138, ISSN: 9781455265435/1018-5941 [online] https://www.imf.org.

Shleifer, A. and Vishny, R. (1997) 'A survey of corporate governance', *The Journal of Finance*, Vol. 52, No. 2, pp.737–783.

Sriram, M. (2018) 'Board characteristics and firm performance – a study of S&P BSE Sensex in India', *Afro-Asian Journal of Finance and Accounting*, Vol. 8, No. 3, pp.336–349.

Titman, S. and Wessels, R. (1988) 'The determinants of capital structure choice', *The Journal of Finance*, Vol. 43, No. 1, pp.1–19.

Yeh, Y. and Woidtke, T. (2005) 'Commitment or entrenchment?: controlling shareholders and board composition', *Journal of Banking and Finance*, Vol. 29, No. 7, pp.1857–1885.

Zheng, X., El Ghoul, S., Guedhami, O. and Kwok, C. (2012) 'National culture and corporate debt maturity', *Journal of Banking & Finance*, Vol. 36, No. 2, pp.468–488.

Appendix

Table A1 Definitions of variables

Variable	Description
DebtMatureL	The ratio of long-term debt to total debt
DebtMatureS	The ratio of short-term debt to total debt
Leverage	The total leverage of the firm divided by its total assets
IndTotal	The ratio of independent board directors to the total number of directors in the firm
IndComm	The ratio of independent directors who serve on the audit and nomination and remuneration committees to the total number of directors in the firm
IndAud	The ratio of independent directors to the total number of directors on the audit committee
IndNomandRem	The ratio of independent directors to the total number of directors on the nomination and remuneration committees
ChairAud	A binary variable that takes a value of one if the chairman of the audit committee is an independent director and a value of zero otherwise
ChairNomandRem	A binary variable that takes a value of one if the chairman of the nomination and remuneration committee is an independent director and a value of zero otherwise
Direct	The percentage of cash-flow rights that the large shareholder holds directly in the firm that he controls
Disp	The expropriation of minority shareholders by the ultimate owners through the difference between cash-flow and control rights
Nature	A binary variable that takes a value of one if the Saudi firm is controlled by a family-held firm and a value of zero otherwise
Size	Natural log of the firm's total assets
Age	The natural logarithm of one plus the age of the firm in years
MBRatio	The ratio of the market value of the common stock to the book value of the common stock