Corporate governance in Saudi Arabia: what happens to firm value when the board of directors and ownership structure interact?

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Abstract: The ownership structure can strengthen or weaken the monitoring functions of the board. Therefore, it is intended in this article to analyse how the complexity of the ownership structure affects the relationship between intensive board monitoring and firm value. The study covers all the firms listed in the Saudi stock market, except the firms listed in the banking and insurance sectors, over the period 2008 till 2013. The results of the analysis reveal that the direct ownership of large shareholders in non-complex structures and the joint ownership between the government and family owners and individual investors both complement the monitoring functions of the board. Further the indirect ownership of ultimate owners in complex structures weakens the board monitoring intensity.

Keywords: intensive board monitoring; IBM; agency theory; board of directors; ownership structure; board independence; direct ownership; indirect ownership; joint ownership.

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1 Introduction

Many researchers analyse the impact of intensive board monitoring (IBM), as a measure of board independence, on the valuation of the firm (Holmstrom, 2005; Faleye et al., 2011; Lahlou and Navatte, 2013). The importance of the board results from its role, as an internal governance mechanism, in disciplining the principle-agent agency problem and the principle-principle agency problem. These two problems result from misusing the

firm's resources and harming the valuation of the firm by the firm's managers and controlling shareholders, respectively.

Little attention is paid in previous research to the impact of the ownership structure on the relationship between IBM and firm value (Byun et al., 2013). Therefore, this article intends to verify whether the ownership structure of Saudi listed firms has an impact on the relationship between IBM and firm value. More specifically, the researchers intend to define whether the ownership structure strengthen or weaken the impact of board monitoring intensity on the valuation of the Saudi listed firm. Measuring how the interaction between board of directors and ownership structure influences the valuation of the firm is crucial to understand how owners of Saudi listed firms strengthen or weaken the monitoring functions of the board. Firm's owners either to strengthen the monitoring functions of the board to maintain higher control, or weaken board monitoring to manipulate the firm's resources (Guo and Masulis, 2015; Chung and John, 2017). Therefore, it is very important to understand how firm value is affected by its owners, among Saudi listed firms, to accomplish their monitoring goals. The findings of the paper are important due to scarcity of research in this field in the Saudi context. Besides that, the Saudi market regulator's aim to expand its depth and width through attracting more investors to invest in the market. Therefore, it is essential for investors to understand the intuitions of Saudi listed firm's owners toward either protecting or manipulating the firm's resources through strengthening or to weakening the monitoring functions of the board.

In this article, IBM is applied as a measure of board independence rather than the composition ratio of outside directors in the board. IBM can identify more precisely the role of the outside directors, through focusing on the board monitoring committees, in improving the valuation of the firm. While the composition ratio of outside directors can not signify whether the monitoring role, advisory role, or both roles of the board have an impact on firm value (Adams and Ferreira, 2007; Faleye et al., 2011; Byun et al., 2013). The focus here is on the monitoring role of the board over its advisory role in the Saudi market, which has the characteristics of emerging markets. These markets are characterised by weak regularity systems, low development, uncertainty, and high concentration of ownership (La Porta et al., 2000; Nenova, 2003; Dyck and Zingales, 2004). In these markets, e.g., Saudi market, the external corporate governance mechanisms, such as managerial labour market and market for corporate control are not effective in disciplining the agency problem as the internal governance mechanisms, such as the ownership structure and board of directors. Therefore, the Saudi market requires an emphasis on the monitoring role of the board, which requires higher board independence than its advisory role, to control the agency problem through disciplining the firm's managers and large shareholders from misusing the firm's resources.

Many researchers prove that concentrated ownership dominates the ownership structure of many firms around the world (Demsetz, 1983; Shleifer and Vishny, 1986; La Porta et al., 1999; Claessens et al., 2000). This is also proved to be the case among Saudi listed firms (Umar and Al-Elg, 2004; Alajlan, 2004; Soliman, 2013). Through analysing the ownership structure of Saudi listed firms we draw the attention to the complexity of the ownership structure. Non-complex structures are dominated by large shareholders who control the firm directly. Whereas complex structures, generally called pyramidal structure or cross-shareholdings structure, are dominated by ultimate owners who control the firm indirectly. In complex structures the ultimate owners are encouraged

to maximise their own interests through expropriating the minority shareholders, as a result, of the disparity between their cash-flow and control rights (Johnson et al., 2000).

The joint ownership structure occurs when there is a joint ownership between the controlling government and family owners and controlling individual investors. If such joint ownership takes place, it may lead to collusion between the government representatives and family owners and individual investors, which might harm both of the minorities' interests and valuation of the firm. This kind of collusion is a form of the principle-principle agency problem that may lead to a wealth distribution problem between the large shareholders and minority shareholders. The wealth distribution problem takes place when the government representatives and family owners and individual investors use the inside information they have or their power and collude with each other to expropriate the minority shareholders. The kind of expropriation that might occur could be in the form of sale of assets in favour of controlling shareholders, overpricing of merger and acquisition deals, or any other financial transactions that might harm the minorities' interests (Bae et al., 2002; Baek et al., 2006).

This article analyses a panel data of all the firms listed in the Saudi stock exchange, except the firms in the banking and insurance sectors, during the period 2008 till 2013. All the data required are collected from Tadawul and Argaam websites and through contacting the officials in the capital market authority (CMA).

The variables we apply in this article include the variables of board monitoring intensity, ownership structure, and firm value. For the IBM variables, we apply three measures. The first of these measures defines whether the majority of outside directors serve in both of the principal board committees of Saudi listed firms, which is the audit and nomination and remuneration committees (Faleye et al., 2011). While the other two measures define the percentage of outside directors in the board committee and whether the chairman of the board committee is an outside director (Byun et al., 2013). These measures of IBM can define the degree of board independence among Saudi listed firms and whether the boards in these firms focus more on its monitoring functions over its advisory functions.

For the ownership variables, we define the direct ownership of large shareholders in non-complex firms. Also we trace the ultimate owners along the control chain in complex firms to define their identities, control rights, cash-flow rights, and the disparity between the both through applying the weakest link principle approach (WLP). To the best of our knowledge, number of researchers questioned the validity of Berle and Means view of wildly held firms in the Saudi context through analysing the ownership structure of Saudi listed firms (Umar and Al-Elg, 2004; Alajlan, 2004; Soliman, 2013). But none of them considered the disparity between the cash-flow and control rights of the controlling shareholders through applying the WLP approach. The majority of these studies treated the cash-flow and control rights of controllers as equal, which is not the case in the Saudi context because of the existence of indirect ownership among Saudi listed firms. The ultimate owners, indirect owners, in Saudi listed firms can maintain indirect control over the firm and expropriate the minority shareholders through the use of pyramidal structure. In a pyramidal structure the ultimate owners maintains control through a chain of companies, which lead to a variation between their control and cash-flow rights. Furthermore, the sample understudy in these articles is not strong enough because it covers only a small number of years compared to the large number of years this article

covers. Besides the direct and indirect ownership, we define the firms that have joint ownership between the government and family owners and individual investors. This is the first study, to our knowledge, that defines the amount of such joint ownership in the Saudi context. For the firm's valuation variables, we apply Tobin's Q and market-to-book (M-B) ratio as two measures for the value of Saudi listed firms.

These data can provide a full description of the board of directors, ownership structure, and valuation among Saudi listed firms. Also it can help us to understand better the role of the ownership structure of Saudi listed firms in strengthening or weakening the intensity of board monitoring.

The aim of this article is to answer the following questions:

- Does the ownership structure affect board monitoring intensity of Saudi listed firms and its impact on firm value?
- Does the direct ownership of large shareholders complement the monitoring functions of the board among Saudi listed firms?
- Does the disparity between cash-flow and control rights of ultimate owners substitute the monitoring functions of the board among Saudi listed firms?
- Does the joint ownership between the government and family owners and individual investors has an impact on the monitoring functions of the board among Saudi listed firms?

To analyse the impact of the ownership structure on the relationship between IBM and firm value, we introduce interaction variables between each of the IBM variables and each of the three ownership variables for non-complex, complex and joint ownership firms.

2 Empirical literature review

This section is divided into four subsections; these subsections cover the previous empirical research on the agency theory, board of directors, ownership structure and the relationship between board independence, ownership structure and firm value.

2.1 The agency theory

Berle and Means (1932) view of wildly held firms says that the ownership of capital is not concentrated in the hands of few shareholders, rather, it is spread among them, while managers control the firm. Based on this view, agency theorists, such as Jensen and Meckling (1976), Myers (1977), Fama (1980) and Fama and Jensen (1983), proposed the agency theory. The agency theory defines the relationship between the managers of the firm (the agents) and its shareholders (the principles). In such a relationship, the principles delegate the power of decision making to the agents in hope of maximising and enhancing their wealth. But in some cases the agents might not act for the best interests of principles, instead, they act for the best of their own interest, which lead to the principle-agent agency problem. This problem can take the form of information

asymmetry, moral hazard and adverse selection (Berhold, 1971; Fama, 1980). In information asymmetry, agents tend to have and know some information about the firm that principles do not have an access to (Myers and Majluf, 1984). While moral hazard is generated from the incapability of the principle to accurately assess the quality of services provided by his\her agent. Adverse selection results from that the contract between the principle and agent can not identify accurately the characteristics of goods and services that are defined in this contract. This should make it hard for the principle to assess the quality of these goods and services.

The shareholders, the principles, try to reduce the agency costs that result from the agency conflict between them and the firm's managers (Jensen and Meckling, 1976). Agency costs for shareholders can result from:

a Monitoring by outside board members to control managerial actions and align their interests with the interests of shareholders.

b Bonding by principles, where shareholders pay managers to consider their interests when taking their decisions in the firm and not to harm them (Alagaratnam, 2002). If harm occurs to the principles, they should be compensated by managers.

c Residual loss, which results from the loss of value supported by shareholders where neither monitoring costs nor bonding costs could avoid. Besides these agency costs, the shareholders do not monitor their managers as expected from them (Shleifer and Vishny, 1986).

The main reason for that is the free-rider problem of the firm's shareholders. Shareholders of the firm with low ownership stakes do not provide the required monitoring over their managers because they tend to absorb all the costs of that monitoring activity but reap only minimal benefits comparable to their ownership stake in the firm.

Many researchers, such as Demsetz (1983), Shleifer and Vishny (1986), La Porta et al. (1999) and Claessens et al. (2000), started to question the validity of Berle and Means view of wildly held firms. They prove that the ownership structure of many firms around the world is concentrated in the hands of the controlling shareholders, which contradicts the view of Berle and Means (1932) of dispersed ownership. Also it arises another agency problem, that is, the principle-principle agency problem, which is documented by Claessens et al. (2000). Such problem arises between the controlling shareholders and minority shareholders when controlling shareholders do not monitor managerial actions to protect the interests of minority shareholders; instead, they might collude with the firm's managers to expropriate the minorities and fulfil their own interests. This kind of agency problem is accentuated when there is a deviation between the cash-flow and control rights of the controlling shareholders (La Porta et al., 1999; Claessens et al., 2000). Such deviation can allow the controlling shareholders to generate high benefits and bear only low costs from new investments or decisions taken in the firm (Wolfenzon, 1998). Whereas the minority shareholders will bear most of the costs and generate only minimal benefits.

This theoretical background on the agency theory reveal that both of the firm's managers and controlling shareholders can harm the minority shareholders by misusing the firm's resources. Accordingly, an effective control mechanism is required to control such misuses and to solve both of the agency problems.

2.2 The board of directors

The board of directors, as an internal governance mechanism, can provide the required control over the firm's managers and its controllers to align their interests with the interests of minority shareholders and to overcome the principle-agent and principle-principle agency problems. Guo and Masulis (2015) and Chung and John (2017) find that firms with high board monitoring intensity can discipline their managers more effectively. Fama and Jensen (1983) reveal that the board of directors is a vital internal governance mechanism. Board members are delegated the control over the firm's managers by shareholders to evaluate, hire, fire and set compensations for those managers. The board of directors is also positioned at top of the internal control system in corporate governance (Jensen, 1993).

The two main functions of the board of directors are the monitoring functions and advisory functions (Hillman and Dalziel, 2003). For the monitoring functions, the board members are delegated the role of monitoring and observing the actions of the firm's managers to align their interests with the interests of shareholders. Members of the board evaluate the performance of managers to define whether to rehire them or fire them and to set their compensations. Whereas for the advisory functions, board members use their experience to assist the managers in establishing the strategies and policies of the firm. The trade-off between the monitoring and advisory functions depends on the benefits and costs for each one of them. Emphasise on the monitoring functions of the board is proved to harm firm value in developed markets (Adams and Ferreira, 2007; Faleye et al., 2011; Lahlou and Navatte, 2013). This bad influence results from hindering the advisory functions of the board that is considered important for the firms in developed markets. Hindering these functions leads to the dominance of the monitoring costs over its benefits in such context. Both of Faleye et al. (2011) and Lahlou and Navatte (2013) cover the S&P's 1500 firms and in both studies the value of the firm is affected negatively by higher monitoring by the board. Whereas in emerging markets, emphasise on the monitoring functions of the board is proved to improve firm value (Dahya et al., 2007; Byun et al., 2013). Emerging markets are characterised by weak regularity system and high concentration of ownership that require higher monitoring by the board to reduce the agency problems and control the misuses of the firm's managers and controlling shareholders (Claessens et al., 2000; Faccio and Lang, 2002). In such context, the benefits of board monitoring outweigh its costs. The study of Byun et al. (2013) reveals that the value of Korean listed firms is improved by higher monitoring intensity by the board. The Korean context is an emerging one that requires higher monitoring by the board to overcome the drawbacks of the weak regularity system and high concentration of ownership in such context.

To give more emphasis to the monitoring functions of the board over its advisory functions, the board of directors should be more independent through assigning higher number of outside members to it. The outside members are more independent than the inside members and can provide the required monitoring over the firm's managers and its controlling shareholders (Raheja, 2005). The independence of the board is found by Linck et al. (2008) to increase with firm's complexity, advising benefits, private benefits generated by managers and CEOs duality. While it decreases with monitoring and advising costs, performance of the firm, and the amount of shares held by CEOs and outside directors. These findings prove that higher board independence is required to improve the oversight quality of the board.

2.3 The ownership structure

The ownership structure is proved to be concentrated in many countries around the world (Demsetz, 1983; Shleifer and Vishny, 1986; La Porta et al., 1999; Claessens et al., 2000). The controlling shareholders who control these firms can tunnel the firm's recourses and expropriate the minority shareholders through the use of pyramidal structure, cross-shareholdings or dual-class shares (Johnson et al., 2000). The controlling shareholders maintain control in a pyramidal structure through vertical chain of companies. In cross-ownership structure the controllers preserve control through a horizontal cross-holding of shares. Whereas the controllers can maintain control through the use of dual-class shares with higher voting rights than the regular shares, without the need for multiple companies to keep on control.

Previous research reveals that the most common used mechanism to expropriate the minority shareholders by the controlling shareholders is the pyramidal structure (La Porta et al., 1999; Claessens et al., 2000; Faccio and Lang, 2002). The controlling shareholders can generate high premiums from pyramidal structures through the separation between their cash-flow and control rights. The high control rights they hold in excess of their cash-flow rights allow them to bear all the benefits of new investments and pay only some of the costs. Whereas the minority shareholders bear only a small part of the benefits and handle most of the costs of these new investments. This happens because the controlling shareholders have higher voting rights in excess of their cash flows along the pyramid (Wolfenzon's, 1998).

Both of La Porta et al. (1999) and Claessens et al. (2000) prove that pyramidal structure is the most controlling mechanism used by the controlling shareholders followed by dual-class shares in a worldwide sample and a sample from East Asia, respectively. Whereas the study of Faccio and Lang shows that dual-class shares is the most used mechanism in a sample of West European firm followed by pyramidal structure. In all of these studies the usage of cross-shareholding is limited.

Both studies of Bertrand et al. (2000) and Bigelli and Mengoli (2004) reveal the transfer of wealth from the bottom to the top of the pyramidal structure. The study of Bertrand et al. (2000) shows that firms that belong to an Indian business group benefit more from earning shocks that occur at the bottom of the pyramidal structure than earning shocks that occur at the top. Similarly, the findings of Bigelli and Mengoli (2004) reveal that acquisitions in the context of Italy do not create value to all shareholders and support the tunnelling activity toward the top of the pyramidal structure when the controlling shareholder holds both the acquiring and target firms.

The above results confirm the prevalence of concentrated ownership structure in many countries around the world. This concentration of ownership can affect negatively on the minority shareholder's interests if the controlling shareholders are not prevented from misusing the firm's recourses.

2.4 The relationship between board independence, ownership structure, and firm value

Most of the studies that analyse the interdependence between insider ownership, board independence and firm performance focus on the ownership of the firm's managers (Agrawal and Knoeber, 1996; Barnhart and Rosenstein, 1998; Mishra and Nielsen, 2000; Coles et al., 2008; Cheng et al., 2012). Only few studies focus on the ownership of

outside shareholders rather than the insiders (Denis et al., 1998; Fernández and García, 2007; Lefort and Urzua, 2008; Desender, 2009; Byun et al., 2013; Li et al., 2014; Ararat et al., 2015). In the study of Denis et al. (1998) the researchers reveal that the presence of outside block-holders enforce higher monitoring through the increase in executive's turnover. While the executive's turnover is reduced with higher ownership stake of officers and directors, which is an indication of hindering the monitoring functions of the board. In the study of Byun et al. (2013), the controlling shareholders, who dominate the ownership structure of Korean listed firms, are found to have a great impact on the board of directors, through weakening or strengthening its monitoring functions. Their findings depend on the complexity of the ownership structure. The researchers find that in a non-complex structure the large shareholders, who hold high cash-flow rights directly in the firm, increase the positive impact of board monitoring intensity on the valuation of the firm. Such positive impact is strengthened with the increase in the direct ownership of controlling shareholders. For example, the positive effect of board monitoring intensity on firm value is higher for the firms with high direct ownership for the controlling shareholders by 31.50%. The findings of the researchers reveal that there is a complementary relationship between IBM and the direct ownership of controlling shareholders. While, in a complex ownership structure the ultimate owners, with a high disparity between their cash-flow and control rights, are found to reduce the positive impact of IBM on the valuation of the firm. This reduction increases with the increase in the disparity between the cash-flow and control rights of the ultimate owners. The study of Li et al. (2014) that covers the Chinese companies over the period 2003 till 2008 applies the same method of Byun et al. (2013), which is the interaction between the board independence and ownership concentration and its impact on firm performance. But in their study they do not consider the complexity of the ownership structure. Their findings are in contrast to the findings of Byun et al. (2013) the researchers find that the lower the concentration of ownership the higher the positive impact of board independence on firm performance. The controlling shareholders might have the incentive to divert the firm's resources for their own interest when they have large block holdings in the firm, therefore, reducing their shareholdings in the firm can provide a higher protection for the minority shareholders. The study of Ararat et al. (2015) investigate the moderating effect of controlling shareholders on the relationship between board monitoring and firm value using data from turkey. Their results reveal that the impact of board monitoring on firm value is moderated by the propensity of controlling shareholders to expropriate the firm's resources.

Desender (2009) argues in his theoretical model that less monitoring by the board over the firm's managers is required when the presence of the large shareholders in the firm is high. The large shareholders in the firm have the incentives and the ability to monitor managers through the insider information they have access to in the firm and through their interaction with the firm's managers, which allow them to substitute the monitoring functions of the board. In such situations the board should focus more on the provision of resources rather than monitoring. But in such cases the researcher argues that another agency problem occur between the controlling shareholders and minority shareholders, which requires higher monitoring by the board of directors to discipline the controllers from harming the minorities. Similarly, Fernández and García (2007) find in their study, which is conducted on the Spanish market in the year 2003, that higher concentration of ownership in the hands of large shareholders hinders the monitoring

activities of the audit committee in the firm. In contrast to these findings, Lefort and Urzua (2008) find that among Chilean companies the higher the concentration of ownership and the higher the deviation between the cash-flow and control rights of the controlling shareholders the more outside members are assigned to the board of directors. These findings confirm that controlling shareholders are willing to reduce their self dealing practices and improve the corporate governance practices in the firm through assigning more outside directors to the board.

3 Hypotheses

This section presents the hypotheses that define the impact of direct ownership, indirect ownership, and joint ownership on the relationship between board monitoring intensity and valuation of the firm over three subsections, respectively.

3.1 The interaction between IBM and direct ownership

The large shareholders, who hold a direct ownership in the firm, lean toward maximising the monitoring role over their managers and complement the monitoring role of the board when their cash-flows in the firm are high (Shleifer and Vishny, 1997). The controlling shareholders in this manner can influence the structure of the board of directors through strengthening the intensity of board monitoring to maintain higher control over managerial actions. This mostly occurs in non-complex structures where the disparity between the cash-flow and control rights of the large shareholders tends to be small. According to this perspective, the ownership structure strengthens the relationship between IBM and the value of the firm. On the contrary, the large shareholders tend to weaken the monitoring role of the board over the firm's managers when they have very large ownership in it (Desender, 2009). This occurs because those large shareholders tend to have strong incentives to:

a maintain control over the firm

b monitor managers through their access to superior information in the firm and their ability to discipline those managers through diverse governance mechanisms.

For this, the direct ownership of the large shareholders tends to substitute the intensity of board monitoring over the managers of the firm. But in such cases, further board monitoring is required to control the agency problem that might occur between the large shareholders and small shareholders. Such problem occurs when the former does not consider the interests of the later when taking their decisions in controlling the firm. In the context of Saudi Arabia, the ownership structure is presumed to play a crucial role because most of the listed firms are dominated either by large shareholders or ultimate owners. Based on that, this article determine that the direct ownership of large shareholders strengthen the impact of IBM on firm's value, as a result of their large ownership stakes in the firm. These large ownership stakes leads to higher concerns by the large shareholders about the performance of the firm, which increase their support of the monitoring functions of the board.

H1 The direct ownership of large shareholders strengthens the efficiency of IBM in improving the firm's value.

3.2 The interaction between IBM and indirect ownership

The ultimate owners, who hold an indirect ownership in the firm, tend to maintain control over the firm they own (Grossman and Hart, 1980). The excess control rights they hold in the firm over their cash-flow rights, allows them to engage in low maximising activities that could harm the minority shareholders' interests but not their own interests. Number of researchers, such as Classens et al. (2000) and Boubaker (2007), revealed that firm value is affected negatively by the presence of ultimate owners who have a deviation between their cash-flow and control rights. The high control of the ultimate owners over their firms, allow them to influence the structure of the board to weaken its monitory role and to expropriate the minority shareholders through the pursuance of private benefits of control (Byun et al., 2013). They could do so through their power to appoint and dismiss board members (Dahya and Mcconnell, 2009). The ultimate owners might appoint board members who are affiliated to them to reduce the protection of the board over the minority shareholders. Yeh and Woidtke (2005) revealed that the high disparity between the cash-flow and control rights of the ultimate owners is associated with higher affiliated members assigned to the board. This mostly occurs in complex structures where the disparity between the cash-flow and control rights of the ultimate owners tends to be large. Nevertheless, the negative impact of ultimate owners is expected to be applied even if the board is dominated with outside directors who are not affiliated to the controlling shareholders. This negative effect results from the misuses of ultimate owners that affects negatively on the minority shareholders' interests, such as using the firm's assets as a collateral for personal loans or investing in projects with negative net present value but with high benefits to them. According to this perspective, the indirect ownership of the ultimate owners is expected to weaken the efficiency of IBM in improving the value of the firm.

H2 The indirect ownership of ultimate owners weakens the efficiency of IBM in improving the firm's value.

3.3 The interaction between IBM and joint ownership

A large number of research prove that the governments tend to maintain control over state-owned firms even after several years of it being privatised (Bortolotti and Faccio, 2009; Boubakri et al., 2011). The government, as an individual investor, has the propensity to maintain control over strategic projects to realise political and social goals rather than profit maximisation goals. In such cases, the government tends to expropriate the firm's resources to achieve these goals. In order to do so, the government representatives encourage the managers in the firms in which they maintain a large ownership stake after privatisation, to manipulate the firm's earnings and not to make a full disclosure of the firm's accounting information to hide their tunnelling activities. In the paper of Bin-Nasr et al. (2015), they refer to the term 'political inference hypothesis' to explain the direct influence of the government over the quality of earnings in newly privatised firms. The findings of their research revealed that the ownership of the government is associated with less quality of the earnings of the firm. These findings are supported by the findings of other researchers, such as Wang et al. (2008) and Guedhami et al. (2009). The research work of Wang et al. (2008) revealed that state-owned firms in China tend to assign small auditors more often than the privately owned firms. While in

Guedhami et al. (2009) the findings showed that when the state ownership in the firm is high, the big four auditing companies were less chosen by the firm in order to facilitate the collusion between the government and managers to achieve the government's political and social goals.

As the government maintains its control in privatised firms to pursue political and social goals in strategic projects, the government representatives might also have personal goals that are not aligned with the political and social goals of the government. Similarly, the individual investors or even the family owners might pursue their own interests and tunnel the firm's resources when they have large ownership in the firm they control (La Porta et al., 1999; Classens et al., 2000; Faccio and Lang, 2002). The government representatives and family owners and individual investors, as large shareholders, might seek to engage in joint ownership because it facilitates the collusion between them and helps them to achieve their goals. This can be done intentionally, where the government representatives choose a specific family or an individual investor to engage in a joint ownership by transferring part of its ownership. Or it can happen unintentionally where the family or the individual investor seeks to engage in a joint ownership with the government through acquiring part of its shares.

The political and social goals which the government tries to achieve can take the form of allocating the production facilities in regions that are desirable for reasons more political than economic (Dewenter and Malatesta, 2001; Megginson and Netter, 2001). While for the government representatives, they might have personal goals that are not even aligned with the political and social goals of the government rather more aligned with the personal goals of individual investors and family investors, and tunnelling the firm's resources can help them to achieve these goals. Tunnelling can take the form of sales of assets, overpaid compensations to executives, unprofitable mergers and acquisitions, etc. (Johnson et al., 2000).

In the context of Saudi Arabia, the government has large ownership stakes in Saudi listed firms. These large stakes of ownership should increase the concerns of the government representatives regarding the performance of the firm. Such concerns should encourage them to prevent the family owners and individual investors, whom they have joint ownership with, from taking actions that could harm the minority shareholders and the performance of the firm as well. Based on this, this article determines that the joint ownership between the government and family owners and individual investors should strengthen the impact of IBM on firm's value. Therefore, it's reasonable to propose the following hypothesis:

H3 The joint ownership between the government and family owners and individual investors strengthens the efficiency of IBM in improving the firm's value.

4 Data, variables, and research methodology

This section is divided into two sub-sections. The first sub-section defines the sources of data understudy. While the second subsection provides a full definition of all the variables applied in this article, which include the variables of firm valuation, IBM, ownership structure and control variables.

4.1 Data sources

All the data required regarding the intensity of the board monitoring of Saudi listed firms are provided through Argaam website. While the Saudi stock exchange, Tadawul, website offers all the data required regarding the ownership structure and through contacting the officials in the CMA to provide the unpublished data in Tadawul website. The article covers all the firms listed in the Saudi stock exchange, except the firms in the banking and insurance sectors, during the period 2008 till 2013. The banking and insurance sectors were excluded, as a result, of their characteristics, which is different from the characteristics of the firms in other sectors. The main difference between these sectors covers the measures of financial statement profitability and liquidity assessment (Soliman, 2013). The coverage of the period 2008 till 2013 is associated with the mandatory rule applied by the CMA in 2008 that mandates all listed firms to disclose the names and ownership stakes of their large shareholders who hold more than 5% of the firm's shares. Such disclosure should enhance and improve the investment environment, supports transparency and disclosure standards, and protects investors from illegal acts in the market. We exclude from the sample the large holding foreign firms, who hold more than 5% in the firm, whom we couldn't trace their owners. For example, the Saudi Steel Pipe Company (SSP) had a large direct shareholder with a 16.3% ownership stake in the firm in 2013. This owner is a Korean steel company, which is the Heo Steel Limited Company. We couldn't trace the owners of this firm, so we exclude it from the sample.

4.2 Variables

In this sub-section, the definition of the variables understudy is clarified. This sub-section is divided into four sub-sections where the definition of the variables of firm value, IBM, ownership structure, and control variables are defined over these four sub-sections, respectively.

4.2.1 Variables of firm's valuation

This article applies Tobin's Q as a measure of firm's value. This variable is defined as the ratio of market value of assets to the book value of assets, where the market value of assets is the book value of assets plus the market value of common equity less the sum of the book value of common equity and deferred taxes (if any). An additional measure of firm value is applied based on previous literature; which is market-to-book ratio (Byun et al., 2013; Chen and Zhu, 2006). Market-to-book ratio is an important measure of firm's value because it reflects the assessment of the investors regarding the future abnormal profits of the firm (Meoli et al., 2009).

4.2.2 Variables of IBM

The main functions of the board of directors are the monitoring and advisory functions. The execution of both functions is done through the board committees. The audit committee and the nomination and remuneration committees are the two principle committees of the board of directors in the Saudi context. These two committees are the principal ones because they are the committees that become effective to apply on all Saudi listed firms and which their roles and responsibilities had been defined precisely by

the board of the CMA. The board is considered a monitoring intensive one if the majority of board members who serve in the audit committee and the nomination and remuneration committee are outside members. The outside members are more independent than the inside members and they provide the required monitoring over the firm's managers and controlling shareholders (Raheja, 2005).

To analyse the intensity of board monitoring, this article applies three different measures of IBM. The first variable measures the independence of the board as a whole. One variable is applied to define whether the majority of outside directors serve in both of the principal board committees of Saudi listed firms, which is the audit and nomination and remuneration committees (Faleye et al., 2011). The corporate governance regulations show that the primary function of the two committees is monitoring. Hence, if the majority of outside directors serve in the two committees, then the board is considered as a monitoring intensive one. One variable is used to measure the percentage of outside directors who serve in both committees (Ind-Comm). Another variable is applied to measure the independence of the board as a whole (Ind-Total). The higher the number of independent directors, the more the focus of the board will be on the monitoring functions over advisory functions. This variable is measured as a binary one that takes the value of one if majority of directors are independent, or zero otherwise (Faleye et al., 2011).

Whereas the other two variables measure the independence of the audit and nomination and remuneration board committees. Two variables are applied to measure the independence of the audit committee and the independence of the nomination and remuneration board committee (Byun et al., 2013). The first variable measures the percentage of outside directors to total directors in the board committee. If this percentage is high, the independence of the committee increases and its monitoring role dominates its advisory role, which disciplines the controlling shareholders more effectively (Chen and Zhu, 2006; Byun et al., 2013). Two variables are added to measure the ratio of outside directors in the two committees (*Ind-Aud* and *Ind-Nom&Rem*). While the other variable measures whether the chairman of the board committee is an outside director. If this applies, the board becomes more independent and its monitoring functions strengthen, which reduces the agency conflict between the controlling shareholders and minorities. Two dummy variables are used that take the value of one if the chairman of any of the two board committees is an outside director, or zero otherwise (*Chair-Aud* and *Chair-Nom&Rem*).

4.2.3 Variables of ownership structure

This sub-section provides the definitions for the ownership structure variables. The ownership structure of a company is considered in this article as a non-complex one, if it is controlled directly by a large shareholder with more than 5% ownership stake in the firm. The 5% threshold is applied because the CMA mandates all Saudi listed firms to disclose the names of owners who hold more than 5% of the firm's shares. We apply two variables in this article. The first variable is a binary one that takes the value of one if the firm is with a non-complex structure, or zero otherwise (*non-complex*). While the other variable measures the direct ownership stake of the large shareholder in the firm (*direct*). Whereas, the ownership structure of a sample firm is defined as a complex one if it is

pyramidal, with more than two layers in its chain of control, and if it's controlled by an ultimate owner (Paligorova and Xu, 2012). A binary variable is applied that takes the value of one if the firm is with a complex structure, or zero otherwise (*complex*). Like many other research papers (see for example Classens et al., 2000) ownership is defined based on cash-flow rights, while the definition of control relies on voting rights. The disparity between the control and cash-flow rights is measured by the difference between them. A variable that measures the amount of the disparity between the control rights and cash-flow rights of the ultimate owners is applied (*disp*). A sample firm is considered with a joint ownership structure if a joint ownership occurs between the government and family owners, between the government and individual investors, or between the three parties. A binary variable is used that takes a value of one if a joint ownership generally occurs in the firm, or zero otherwise (*joint*). While the variable (joint%) defines the percentage of joint ownership in the firm.

The large shareholders and the ultimate owners in the firms understudy can be identified as: government, family-held firms, individuals, or financial institution. Four binary variables are used, for each one of the above categories, that takes the value of one if the controlling shareholder belongs to that category, or zero otherwise (*government*, *family*, *individual*, *financial institution*).

4.2.4 Other variables

We add a list of control variables to the empirical analysis that may affect the valuation of the firm, to avoid spurious correlation. These variables are firm size, leverage, ROA, investment opportunities (Invest-Opportune), free cash flows (FCF) and board ownership (Linck et al., 2008; Byun et al., 2013; Faleye et al., 2011). Size of the firm is an important control variable because larger firms tend to be more subject to the regulations of corporate governance than small sized firms and, hence, has better valuation. The size of the firm's total assets is the measurement we apply in this article (Faleye et al., 2011). We apply the natural log of total assets in the analysis to control for the variations in total assets among Saudi listed firms. Leverage is defined as the total leverage of the firm divided by its total assets. It is a control mechanism that the firm can apply to control the overinvestment problem because of the obligations and default risk associated with it (Byun et al., 2013). ROA is defined as the ratio of net income to total assets and it's applied to measure the impact of profitability on the valuation of the firm (Byun et al., 2013). Also ROA helps to define whether the accounting measures and the valuation measures of the firm are aligned. Investment opportunity (Invest-Opportune) is calculated as the ratio of capital expenditures to sales to capture the growth potentials of the firm (Faleye et al., 2011). FCF is measured as operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. This variable defines the private benefits available to managers (Linck et al., 2008). Board ownership (Board-Own) is the proportion of outstanding shares owned by all directors (Faleye et al., 2011). When board members hold a large ownership stake in the firm, their interests are aligned with the shareholder's interest (Raheja, 2005). But in such a case they are not considered as independent, as a result, of their ownership in the firm.

Table 1 provides a full description of the variables understudy.

Table 1 Definition of variables

Variable	*Description*
Tobin's Q	The ratio of market value of assets to the book value of assets, where the market value of assets is the book value of assets plus the market value of common equity less the sum of the book value of common equity and deferred taxes (if any).
Market-to-book ratio	Market value of common stock/book value of common stock.
Ind-Total	Binary variable that takes the value of one if majority of the board directors are independent directors, or zero otherwise.
Ind-Comm	The percentage of outside directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm.
Ind-Aud	The percentage of outside directors to total number of directors in the audit committee.
Ind-Nom&Rem	The percentage of outside directors to total number of directors in the nomination and remuneration committee.
Chair-Aud	Binary variable that takes the value of one if the chairman of the audit committee is an outside director, or zero otherwise.
Chair-Nom&Rem	Binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an outside director, or zero otherwise.
Non-complex	Binary variable that takes the value of one if the firm is controlled directly by a large shareholder, or zero otherwise.
Complex	Binary variable that takes the value of one if the firm is controlled indirectly by an ultimate owner, or zero otherwise.
Joint	Binary variable that takes the value of one if a joint ownership occur between the government and families or individual investors, or zero otherwise.
Direct	The percentage of cash-flow rights that the large shareholder holds directly in the firm he\she controls.
Cash-flow (CF)	This variable measures the cash-flow rights of the ultimate owner through the multiplication of his\her holdings of stocks along the chains of control.
Control rights (C)	This variable defines the voting rights of the ultimate owner through the weakest link of his\her holdings of stocks along the chains of control.
Disp	This variable measures the expropriation of the minorities by the ultimate owners through the difference between the cash-flow and control rights.
Joint%	This variable measures the percentage of joint ownership between the government and family owners or individual investors.
Government	Binary variable that takes the value of one if the large shareholder or the ultimate owner is the government or an institution that is totally held by the government, or zero otherwise.
Family	Binary variable that takes the value of one if the large shareholder or the ultimate owner is a family-held firm, or zero otherwise.
Individual	Binary variable that takes the value of one if the large shareholder or the ultimate owner is an individual, or zero otherwise.
Financial	Binary variable that takes the value of one if the large shareholder or the ultimate owner is a financial company, or zero otherwise.

Table 1 Definition of variables (continued)

Variable	*Description*
Size	Natural log of the firm's total assets.
Leverage	Total leverage of the firm divided by its total assets.
ROA	The ratio of net income to total assets.
Invest-Opportune	The ratio of capital expenditures to sales.
FCF	Operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets.
Board-Own	The proportion of outstanding shares owned directly by all directors.

4.3 Research methodology

A full descriptive statistics is conducted to analyse the data understudy, where the mean values of the IBM measures in regard to complexity of ownership structure and ownership categories are analysed. Also the analysis cover the means of the firm's valuation variables in regard to the complexity of ownership structure.

A detailed empirical analysis is performed to test the research hypotheses. Multivariate tests are conducted to measure the impact of direct ownership, indirect ownership, and joint ownership on the relationship between board monitoring intensity and firm value. To perform these tests, interaction variables between each of the ownership variables and the IBM variables are added to these test. These interaction variables define how the influence of ownership structure on board monitoring intensity affects the value of Saudi listed firms.

5 Descriptive statistics

This section presents the descriptive statistics of the variables understudy in three sub-sections. The first subsection defines the mean values of the IBM measures in regard to the complexity of ownership structure. Whereas the second subsection covers the means of the IBM measures along with the ownership categories. The third sub-section analyses the means of the firm's valuation variables in regard to the complexity of ownership structure.

5.1 Complexity of the ownership structure-based analysis

To define whether the intensity of board monitoring among Saudi listed firms is affected by the complexity of the ownership structure, we divide the whole sample into three sub-samples, where each sub-sample represents an ownership group. The first sub-sample represents the non-complex firms that are dominated by large shareholders who control the firm directly. The second sub-sample represents the complex firms that are dominated by ultimate owners who control the firm indirectly. While the third sub-sample represents the joint ownership firms, in which both of the government and family owners and individual investors hold a large ownership stake in the firm. The results of analysing the means of the variables of board monitoring intensity for the three ownership sub-samples

in Table 2 shows that the means of board monitoring intensity measures are higher for non-complex firms than complex firms and firms with joint ownership structure, except for the measures that are related to the nomination and remuneration committee. Both of the mean of the percentage of outside directors in the nomination and remuneration committee (*Ind-Nom&Rem*) and the mean of the firms in which the chairman of this committee is an outside director (*Chair-Nom&Rem*) are higher in the sub-sample of joint ownership firms compared to the sub-sample of non-complex firms, 52.46% vs. 46.69% and 42.31% vs. 40.58%, respectively. These results indicate that the protection of the shareholders, specifically the minorities, against the misuses of the controlling shareholders is higher in non-complex and joint ownership firms. The low monitoring by the board in complex firms allows the controlling shareholders to extract private benefits for their own interests, through tunnelling the firm's resources, at the expense of the minority shareholders' interests.

Table 2 IBM and the complexity of the ownership structure

	Ind-Comm	*Ind-Aud*	*Ind-Nom&Rem*	*Chair-Aud*	*Chair-Nom&Rem*
Non-complex	33.50%	47.33%	46.69%	54.03%	40.58%
Complex	28.78%	37.71%	41.60%	32.84%	39.34%
Joint	31.24%	40.54%	52.46%	49.99%	42.31%

Notes: The table shows the means for the three variables of IBM for non-complex, complex, and joint ownership firms at the 5% level of control. The analysis is applied on a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Non-complex, is a binary variable that takes the value of one if the firm is controlled directly by large shareholders, or zero otherwise. Complex, is a binary variable that takes the value of one if the firm is controlled indirectly by ultimate owners, or zero otherwise. Joint, is a binary variable that takes the value of one if a joint ownership occurs between the government and family owners and individual investors, or zero otherwise.

5.2 Nature of ownership-based analysis

The results of analysing the means of IBM measures among the nature of ownership, the government, individuals, families, and financial firms, in Table 3 reveal that board monitoring intensity is accentuated among the firms that are controlled by individuals, followed by family-held firms and then the firms that are controlled by the government. The means of the percentage of outside directors in the audit committee (*Ind-Aud*) and the nomination and remuneration committee (*Ind-Nom&Rem*) are 20.67% and 22.81%, respectively, for the firms that are controlled by individuals and 18.40% and 16.72%, respectively, for family-held firms. Besides that the mean percentage of firms in which the chairman of the board committee is an outside director is larger among the

audit committee (*Chair-Aud*) than the nomination and remuneration committee (*Chair-Nom&Rem*). It is 24% vs. 23% for the firms that are controlled by individuals and 22% vs. 12% for family-held firms. These findings reveal that individuals, as controlling shareholders, require higher monitoring by the board than the other controlling shareholders. This is because individuals might have higher incentives to expropriate the other shareholders and they care less about the firm they control than controlling families and the government.

Table 3 IBM and the nature of ownership

	Ind-Comm	*Ind-Aud*	*Ind-Nom&Rem*	*Chair-aud*	*Chair-Nom&Rem*
Government	10.62%	12.52%	16.55%	0.12	0.18
Family	12.68%	18.40%	16.72%	0.22	0.12
Individual	15.32%	20.67%	22.81%	0.24	0.23
Financial	3.82%	4.47%	6.05%	0.05	0.07

Notes: The table shows the means for the three variables of IBM for each category of ownership at the 5% level of control. The analysis is applied on a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Government, is a binary variable that takes the value of one if the large shareholder or the ultimate owner is the government or an institution that is totally held by the government, or zero otherwise. Family, is a binary variable that takes the value of one if the large shareholder or the ultimate owner is a family-held firm, or zero otherwise. Individual, is a binary variable that takes the value of one if the large shareholder or the ultimate owner is an individual, or zero otherwise. Financial, is a binary variable that takes the value of one if the large shareholder or the ultimate owner is a financial company, or zero otherwise.

5.3 Firm valuation-based analysis

To be able to define how the ownership structure affects the relationship between IBM and the valuation of the firm, it is very important to analyse how the three groups of ownership, non-complex, complex and joint, affect firm value. To do this, we analyse the means of Tobin's Q and M-B ratio for each ownership group. Table 4 reveals that the means of the valuation variables are higher for the firms with complex structure than the firms with non-complex and joint ownership structure. The mean of Tobin's Q for complex firms is 1.94 compared to 1.83 for non-complex and joint ownership firms. The highest mean for the M-B ratio is for complex firms with a value of 2.46, followed by the firms with joint ownership with a value of 2.18, and the lowest mean is for non-complex firms with a value of 1.97.

Table 4 Ownership structure and firm valuation

	Tobin's Q	*M-b ratio*
Non-complex	1.83	1.97
Complex	1.94	2.46
Joint	1.83	2.18

Notes: The table shows the means for the two valuation variables for non-complex, complex, and joint ownership firms at the 5% level of control. The analysis is applied on a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Non-complex, is a binary variable that takes the value of one if the firm is controlled directly by a large shareholder, or zero otherwise. Complex, is a binary variable that takes the value of one if the firm is controlled indirectly by an ultimate owner, or zero otherwise. Joint, is a binary variable that takes the value of one if a joint ownership occur between the government and family owners and individual investors, or zero otherwise. Tobin's Q, is measured as the ratio of market value of assets to the book value of assets, where the market value of assets is the book value of assets plus the market value of common equity less the sum of the book value of common equity and deferred taxes (if any). M-B ratio, is the market value of common stock/book value of common stock.

These results show that non-complex firms have the lowest mean of firm value, as a result, of the high direct ownership of large shareholders, which affects negatively on firm value and corporate control. The highest mean of firm valuation is for complex firms, which are considered very profitable. Such high profitability of the firm can cover any misuses of the firm resources, as a results, of the expropriation that might occur by the ultimate owners. For example, Herfy Company generated high profits throughout the years of this study period from 2008 until 2013. During these years, Herfy was indirectly controlled by a family firm named MASIC, through SAVOLA company. The mean of M-B ratio is higher for joint ownership firms compared to non-complex firms. This result from the high revenues these joint ownership firms can generate. Such as SAVOLA Company that has a joint ownership between the government and family owners and individual investors all over the period understudy. Over this period, from 2008 till 2013, the company generated positive revenues, which affected positively on the valuation of the company.

6 Empirical results and analysis

This section is divided into three subsections where the impact of direct ownership, indirect ownership and joint ownership on the relationship between board monitoring intensity and firm value is defined over these three subsections, respectively.

6.1 The interactions between IBM and direct ownership and its impact on firm value

This sub-section analyses the impact of the direct ownership of large shareholders on the relationship between board monitoring intensity and firm value over three sub-sections. We begin the analysis by dividing the sample of firms with direct ownership into two

sub-samples based on the median level of direct ownership in the first two sub-sections. The first sub-section covers the firms with high direct ownership, whereas the second sub-section covers the firms with low direct ownership. The impact of board monitoring intensity on the valuation of the firm is then defined in both sub-sections. Whereas, the third sub-section analyses the interactions between intensive monitoring by the board and direct ownership and the impact of these interactions on firm value.

6.1.1 Estimations conducted on high direct ownership sub-sample

The results for the sub-sample with high direct ownership in Table 5 reveal that IBM has more positive impact on firm valuation. When we measure the firm value by Tobin's Q, the *Ind-Comm* and *Chair-Nom&Rem* variables have a positive significant impact on firm value at the 1% level, while for the rest of the variables, *Ind-Aud*, *Ind-Nom&Rem*, and *Chair-Aud*, the impact is positive and significant at the 5% level. When we apply M-B ratio as a measure of firm valuation we find that *Ind-Comm*, *Ind-Aud*, and *Chair-Aud* variables have a positive and significant impact on firm value at the 1% and 5% level, respectively. While the impact of the variables that are related to the nomination and remuneration committee (*Ind-Nom&Rem* and *Chair-Nom&Rem*) are positive but not significant.

6.1.2 Estimations conducted on low direct ownership sub-sample

The findings of the low direct ownership sub-sample in Table 6 shows that only the *Ind-Comm* and *Ind-Aud* variables have a positive significant impact on firm value, measured by Tobin's Q, at the 1% and 10% level, respectively. While the impact of other variables is positive but insignificant. The *Ind-Comm* variable is the only variable that has a positive and significant impact on firm value, measured by M-B ratio, at the 1% level, while the rest of the variables have a positive but insignificant impact.

Comparing the findings of the sub-sample with high direct ownership with the findings of the sub-sample with low direct ownership support the complementary role of direct ownership on the monitoring functions of the board. These findings also support our first hypothesis, which indicates that the direct ownership of the large shareholders strengthens the impact of IBM on firm's value.

6.1.3 Estimations conducted on the whole sample

After the previous analysis for the high and low direct ownership sub-samples, we apply a multivariate test where the impact of direct ownership on the relationship between board monitoring intensity and firm valuation is defined through an interaction variables. The regression formula we apply as follows:

$$\begin{aligned}\text{Firm value}_{it} = {} & b_0 + b_1\text{Direct}_{it} + b_2\text{IBMI}_{it} * \text{Direct}_{it} + b_3\text{Size}_{it} + b_4\text{Leverage}_{it} \\ & + b_5\text{ROA}_{it} + b_6\text{Invest-opportune}_{it} + b_7\text{FCF}_{it} + b_8\text{Board-own}_{it} + e_{it}\end{aligned}$$

Table 5 The impact of IBM on firm value for the sub-sample with high direct ownership (OLS)

Section (A): Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	–1.12 (0.264)	–0.78 (0.434)	–0.50 (0.616)	–0.84 (0.401)	–0.50 (0.618)
Ind-Comm	3.28 (0.001)***				
Ind-Aud		2.36 (0.019)**			
Ind-Nom&Rem			2.21 (0.028)**		
Chair-Aud				2.25 (0.025)**	
Chair-Nom&Rem					2.62 (0.009)***
Control variables	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.390	0.377	0.361	0.376	0.367
Section (B): M-B ratio					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	–0.99 (0.321)	–0.80 (0.422)	–0.57 (0.568)	–0.89 (0.375)	–0.56 (0.576)
Ind-Comm	2.69 (0.008)***				
Ind-Aud		2.42 (0.016)**			
Ind-Nom&Rem			1.28 (0.201)		
Chair-Aud				2.55 (0.012)**	
Chair-Nom&Rem					1.22 (0.225)
Control variables	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.249	0.245	0.231	0.247	0.230

Notes: This table shows the impact of IBM on firm value by applying the OLS approach for the sub-sample of high direct ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Direct, is the percentage of cash-flow rights that the large shareholder holds directly in the firm he\she controls. The set of control variables include Size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 6 The impact of IBM on firm value for the sub-sample with low direct ownership (OLS)

Section (A): Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	–2.55 (0.011)	–2.18 (0.030)	–1.50 (0.134)	–1.92 (0.056)	–1.25 (0.213)
Ind-Comm	2.91 (0.004)***				
Ind-Aud		1.82 (0.071)*			
Ind-Nom&Rem			1.03 (0.302)		
Chair-Aud				1.22 (0.223)	
Chair-Nom&Rem					–0.85 (0.399)
Control variables	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.423	0.411	0.405	0.406	0.404
Section (B): M-B ratio					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	–2.42 (0.016)	–1.76 (0.079)	–1.56 (0.121)	–1.61 (0.108)	–1.25 (0.211)
Ind-Comm	2.79 (0.006)***				
Ind-Aud		0.99 (0.321)			
Ind-Nom&Rem			1.39 (0.165)		
Chair-Aud				0.63 (0.529)	
Chair-Nom&Rem					0.48 (0.632)
Control variables	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.289	0.269	0.270	0.268	0.264

Notes: This table shows the impact of IBM on firm value by applying the OLS approach for the sub-sample of low direct ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the Audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Direct, is the percentage of cash-flow rights that the large shareholder holds directly in the firm he\she controls. The set of control variables include Size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 7 IBM, direct ownership, and firm value (OLS)

Section (A): Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	1.62 (0.106)	1.72 (0.085)	1.85 (0.065)	1.52 (0.129)	1.86 (0.064)
Direct	–2.16 (0.032)**	–2.15 (0.032)**	–1.42 (0.157)	–1.06 (0.291)	–0.93 (0.357)
Ind-Comm * Direct	2.68 (0.008)***				
Ind-Aud * Direct		2.82 (0.005)***			
Ind-Nom&Rem * Direct			1.51 (0.131)		
Chair-Aud * Direct				1.81 (0.071)*	
Chair-Nom&Rem * Direct					1.09 (0.279)
Size	1.50 (0.134)	1.45 (0.147)	1.24 (0.214)	1.62 (0.105)	1.29 (0.199)
Leverage	–2.45 (0.015)**	–2.28 (0.023)**	–2.33 (0.021)**	–2.59 (0.010)***	–2.51 (0.013)**
ROA	6.57 (0.000)***	6.60 (0.000)***	6.14 (0.000)***	6.09 (0.000)***	6.03 (0.000)***
Invest-opportune	–0.24 (0.811)	0.03 (0.978)	–0.22 (0.827)	–0.28 (0.776)	–0.33 (0.741)
FCF	–2.71 (0.007)***	–2.51 (0.012)**	–2.69 (0.007)***	–2.61 (0.009)***	–2.70 (0.007)***
Board-own	–1.93 (0.054)*	–2.34 (0.020)**	–1.62 (0.107)	–1.38 (0.169)	–1.65 (0.099)*
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.365	0.366	0.348	0.359	0.346

Notes: This table shows the regression analysis of the interaction between IBM and direct ownership by applying the OLS approach for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Direct, is the percentage of cash-flow rights the large shareholder holds directly in the firm he\she controls. Ind-Comm * direct, Ind-Aud * direct, Ind-Nom&Rem * direct, Chair-Aud * direct, and Chair-Nom&Rem * direct measures the interaction between the Ind-Comm, Ind-Aud, Ind-Nom&Rem, Chair-Aud and Chair-Nom&Rem variables and the Direct ownership variable, respectively. The set of control variables include: size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 7 IBM, direct ownership, and firm value (OLS) (continued)

Section (B): M-B ratio					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	0.46 (0.642)	1.56 (0.576)	0.66 (0.512)	0.28 (0.782)	0.62 (0.536)
Direct	–2.81 (0.005)***	–3.21 (0.001)***	–1.80 (0.073)*	–1.90 (0.058)*	–1.20 (0.232)
Ind-Comm * Direct	2.94 (0.004)***				
Ind-Aud * Direct		3.62 (0.000)***			
Ind-Nom&Rem * Direct			1.38 (0.168)		
Chair-Aud * direct				2.40 (0.017)**	
Chair-Nom&Rem * Direct					0.30 (0.765)
Size	2.00 (0.046)**	1.96 (0.050)**	1.80 (0.072)*	2.23 (0.026)	1.88 (0.061)
Leverage	0.098 (0.328)	1.27 (0.204)	1.03 (0.305)	0.88 (0.377)	0.94 (0.346)
ROA	4.05 (0.000)***	4.15 (0.000)***	3.59 (0.000)***	3.47 (0.001)***	3.38 (0.001)***
Invest-opportune	–0.92 (0.360)	–0.57 (0.570)	–1.00 (0.318)	–0.99 (0.323)	–1.04 (0.300)
FCF	–1.33 (0.184)	–1.17 (0.244)	–1.48 (0.138)	–1.27 (0.204)	–1.59 (0.113)
Board-own	–1.00 (0.316)	–1.61 (0.108)	–0.74 (0.462)	–0.36 (0.715)	–0.61 (0.542)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.256	0.264	0.243	0.251	0.239

Notes: This table shows the regression analysis of the interaction between IBM and direct ownership by applying the OLS approach for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Direct, is the percentage of cash-flow rights the large shareholder holds directly in the firm he\she controls. Ind-Comm * direct, Ind-Aud * direct, Ind-Nom&Rem * direct, Chair-Aud * direct, and Chair-Nom&Rem * direct measures the interaction between the Ind-Comm, Ind-Aud, Ind-Nom&Rem, Chair-Aud and Chair-Nom&Rem variables and the Direct ownership variable, respectively. The set of control variables include: size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

The results in sections (A) and (B) in Table 7 show that the impact of the interactions between the direct ownership and the *Ind-Comm* and *Ind-Aud* variables on firm value, measured by Tobin's Q and M-B ratio, is positive and significant at the 1% level. While the impact of the interaction between the direct variable and the *Chair-Aud* variable on firm value is positive and significant at the 10% level when Tobin's Q is applied, and it is positive and significant at the 5% level when M-B ratio is applied as a measure of firm valuation. These findings support our first hypothesis, which indicates that the direct ownership of the large shareholders complements the monitoring functions of the board over the firm's managers.

The impact of the interactions between the direct variable and the *Ind-Nom&Rem* and *Chair-Nom&Rem* variables on firm value is positive but not significant. The board of the CMA set up of the nomination and remuneration committee and defines its duties and responsibilities and mandates all Saudi listed firms to apply this committee in 2010, not from the beginning of the study period in 2008, which might be the cause for the insignificance of the results. Some of the members of this committee, who were considered as independent before 2010, might not be truly independent because of their relationship with the firm's owners or its managers (Bhagat and Black, 1999). This lack of independence can be more prevailed when the board monitoring intensity variables that are related to the nomination and remuneration committee, *Ind-Nom&Rem* and *Chair-Nom&Rem*, interact with the direct ownership variable.

The direct variable in all of the five models has a negative impact on firm value. When Tobin's Q is applied as a measure of firm value, this negative impact is significant at the 5% level only in the first two models, where the *Ind-Comm* and *Ind-Aud* variables are applied. While when M-B ratio is applied, the negative impact of the direct variable on firm value is significant at the 1% level in the first two models, where the *Ind-Comm* and *Ind-Aud* variables are applied, and it's significant at the 10% level in models (3) and (4), where the *Ind-Nom&Rem* and *Chair-Aud* variables are applied. The negative impact, as found by Byun et al. (2013), results from the high direct ownership holdings of the large shareholders, which affects negatively on corporate control and the value of the firm. These findings are supported by the findings of Castaneda (2006). In his theoretical model, Castaneda reveals that the large owners tend to have fear of losing their control over the firm, which encourage them to choose low risk and low productive projects and to avoid corporate control.

6.2 *The interactions between IBM and indirect ownership and its impact on firm value*

The impact of indirect ownership on the relationship between board monitoring intensity and firm valuation is defined through a multivariate test that includes an interaction variables between IBM and the disparity between cash-flow and control rights of the ultimate owners (Disp):

$$\begin{aligned}\text{Firm value}_{it} = {} & b_0 + b_1\text{Disp} + b_2\text{IBMI}_{it} * \text{Disp} + b_3\text{Size}_{it} + b_4\text{Leverage}_{it} \\ & + b_5\text{ROA}_{it} + b_6\text{Invest-opportune}_{it} + b_7\text{FCF}_{it} + b_8\text{Board-own}_{it} + e_{it}\end{aligned}$$

The results in section (A) in Table 8 reveal that the interactions between the *Ind-Nom&Rem* and *Chair-Nom&Rem* variables and the disparity variable have a negative and significant impact on Tobin's Q at the 1% level and 10% level, respectively. While the impact of the interaction with the *Ind-Comm* variable is negative but not significant. The interactions between the *Ind-Aud* and the *Chair-Aud* variables and the disparity variable have a positive insignificant impact on Tobin's Q. The reason behind such findings is that the nomination and remuneration committee become mandatory to apply by the board of the CMA on all Saudi listed firms in 2010. This makes the adjustment of Saudi listed firm to this committee weaker that their adjustment to the audit committee that become mandatory to apply since the beginning of the study period, in 2008. Based on that, the bad influence of the disparity between the cash-flow and control rights of the ultimate owners is more prevailed in this committee than the audit committee. These findings support our second hypothesis, which indicates that the disparity values between the cash-flow and control rights of the ultimate owners weaken the efficiency of board monitoring intensity. In section (B), the interaction between the *Ind-Comm* variable and the disparity variable has a negative and significant impact at the 10% level on firm valuation, measured by M-B ratio. While this negative impact becomes insignificant when the *Ind-Aud*, *Ind-Nom&Rem*, and *Chair-Nom&Rem* variables are applied as measures of board monitoring intensity. These results also support the second hypothesis and prove that the ultimate owners tend to misuse the firm resources and expropriate the minority shareholders when they have a deviation between their cash-flow and control rights. The above findings are supported by the findings of previous research, such as Baek et al. (2006) and Bigelli and Mengoli (2004), which prove the existence of tunnelling for the firm's resources by the ultimate owners at the expense of the minority shareholders.

The disparity variable has a positive insignificant impact on firm value, measured by Tobin's Q, in all the models except in two models (3) and (5), where the IBM variables are related to the nomination and remuneration committee (*Ind-Nom&Rem* and *Chair-Nom&Rem*). In these two models the impact of the disparity variable on Tobin's Q is positive and significant at the 1% and 10% level, respectively. Similarly, the impact of the disparity variable on M-B ratio is positive and significant at the 5% level in all models, except for model (4), where the impact is positive but insignificant. This positive impact on firm value results from the high profitability generated by the firms that are controlled by ultimate owners. Such high profits can cover the bad influence on firm value that results from the expropriation of the firm's resources by the ultimate owners. The positive impact of the disparity variable on firm value is also proved by the inconsistency of the significance of the impact of the interaction variables on firm value. The impact of the interactions between the disparity variable and the IBM variables on Tobin's Q are negative and significant, negative but insignificant, or positive but insignificant. Similarly, the impact of the interaction variables on M-B ratio is negative and significant, negative but insignificant, or positive and significant in the fourth model where the *Chair-Aud* variable is applied. This variation in the results confirms the coverage of the high profitability of the firm to the tunnelling activities taken by the ultimate owners and their expropriation of the firm's resources.

Table 8 IBM, indirect ownership, and firm value

Section (A): Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	–1.12 (0.273)	–1.43 (0.166)	–1.22 (0.234)	–1.46 (0.157)	–2.37 (0.027)
Disp	1.70 (0.102)	1.02 (0.318)	3.03 (0.006)***	1.20 (0.242)	1.97 (0.060)*
Ind-Comm * Disp	–1.10 (0.280)				
Ind-Aud * Disp		0.03 (0.974)			
Ind-Nom&Rem * Disp			–2.92 (0.008)***		
Chair-Aud * Disp				0.36 (0.721)	
Chair-Nom&Rem * Disp					–1.74 (0.096)*
Size	1.68 (0.106)	1.95 (0.062)*	1.41 (0.171)	1.95 (0.062)*	2.80 (0.010)***
Leverage	–1.78 (0.088)*	–1.60 (0.123)	–1.91 (0.068)*	–1.52 (0.140)	–1.03 (0.315)
ROA	6.28 (0.000)***	6.13 (0.000)***	7.27 (0.000)***	5.38 (0.000)***	5.65 (0.000)***
Invest-opportune	0.78 (0.443)	0.56 (0.580)	1.27 (0.216)	0.43 (0.674)	–0.18 (0.859)
FCF	–6.08 (0.000)***	–5.88 (0.000)***	–5.91 (0.000)***	–4.97 (0.000)***	–3.37 (0.00)***
Board-own	1.89 (0.071)*	1.90 (0.070)*	1.05 (0.304)	1.75 (0.093)*	2.39 (0.026)**
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.891	0.886	0.919	0.886	0.902

Notes: This table shows the regression analysis of the interaction between IBM and the disparity between the cash-flow and control rights of the ultimate shareholders for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the Audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Disp, measures the expropriation of the minorities by the ultimate owners through the difference between their cash-flow and control rights. Ind-Comm * disp, Ind-Aud * disp, Ind-Nom&Rem * disp, Chair-Aud * disp, and Chair-Nom&Rem * disp measures the interaction between the Ind-Comm, Ind-Aud, Ind-Nom&Rem, Chair-Aud and Chair-Nom&Rem variables and the disparity ownership variable, respectively. The set of control variables include: size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 8 IBM, indirect ownership, and firm value (continued)

Section (B): M-B ratio					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	–0.39 (0.698)	–0.80 (0.434)	0.03 (0.978)	–2.07 (0.049)	–0.59 (0.562)
Disp	2.60 (0.015)**	2.06 (0.050)**	2.60 (0.016)**	1.18 (0.250)	2.23 (0.036)**
Ind-Comm * Disp	–1.72 (0.098)*				
Ind-Aud * Disp		–0.78 (0.441)			
Ind-Nom&Rem * Disp			–1.56 (0.132)		
Chair-Aud * Disp				3.08 (0.005)***	
Chair-Nom&Rem * Disp					–1.32 (0.200)
Size	0.72 (0.480)	1.10 (0.280)	–0.13 (0.894)	2.35 (0.027)**	0.72 (0.476)
Leverage	0.04 (0.966)	0.10 (0.9919)	0.43 (0.674)	0.87 (0.391)	0.84 (0.409)
ROA	0.94 (0.357)	0.91 (0.374)	1.10 (0.282)	–0.41 (0.686)	0.54 (0.591)
Invest-opportune	0.30 (0.763)	0.08 (0.940)	0.96 (0.345)	–1.00 (0.327)	0.12 (0.904)
FCF	–3.38 (0.002)***	–3.10 (0.005)***	–3.62 (0.001)***	–1.67 (0.107)	–2.17 (0.040)**
Board-own	2.54 (0.018)**	2.60 (0.015)**	1.95 (0.063)*	2.02 (0.054)*	2.87 (0.009)***
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.467	0.419	0.444	0.568	0.429

Notes: This table shows the regression analysis of the interaction between IBM and the disparity between the cash-flow and control rights of the ultimate shareholders for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the Audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Disp, measures the expropriation of the minorities by the ultimate owners through the difference between their cash-flow and control rights. Ind-Comm * disp, Ind-Aud * disp, Ind-Nom&Rem * disp, Chair-Aud * disp, and Chair-Nom&Rem * disp measures the interaction between the Ind-Comm, Ind-Aud, Ind-Nom&Rem, Chair-Aud and Chair-Nom&Rem variables and the disparity ownership variable, respectively. The set of control variables include: size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 9 IBM, joint ownership, and firm value

Section (A): Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	–1.74 (0.086)	–0.92 (0.362)	–0.78 (0.436)	–0.29 (0.770)	–0.62 (0.538)
Joint%	3.01 (0.004)***	4.22 (0.000)***	3.13 (0.002)***	3.53 (0.001)***	4.59 (0.000)***
Ind-Comm * Joint%	2.04 (0.044)**				
Ind-Aud * Joint%		0.72 (0.471)			
Ind-Nom&Rem * Joint%			2.12 (0.037)**		
Chair-Aud * Joint%				0.97 (0.337)	
Chair-Nom&Rem * Joint%					1.95 (0.055)*
Size	1.61 (0.111)	0.83 (0.412)	1.37 (0.173)	0.84 (0.404)	1.18 (0.241)
Leverage	0.18 (0.858)	–0.06 (0.950)	–0.24 (0.809)	0.06 (0.953)	–0.43 (0.665)
ROA	4.62 (0.000)***	4.20 (0.000)***	4.71 (0.000)***	4.17 (0.000)***	4.49 (0.000)***
Invest-opportune	1.44 (0.155)	1.15 (0.254)	1.23 (0.221)	1.10 (0.276)	1.12 (0.267)
FCF	–1.95 (0.055)*	–2.13 (0.037)**	–1.96 (0.054)*	–2.15 (0.035)**	–2.15 (0.035)**
Board-own	–2.67 (0.009)***	–3.85 (0.000)***	–2.84 (0.006)***	–3.39 (0.001)***	–3.08 (0.003)***
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.623	0.605	0.625	0.607	0.622

Notes: This table shows the regression analysis of the interaction between IBM and joint ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Joint%, is the percentage of joint ownership between the government and family owners and individual investors. Ind-Comm * Joint%, Ind-Aud * Joint%, Ind-Nom&Rem * Joint%, Chair-Aud * Joint%, and Chair-Nom&Rem * Joint% measures the interaction between the Ind-Comm, Ind-Aud, Ind-Nom&Rem, Chair-Aud and Chair-Nom&Rem variables and the joint ownership variable, respectively. The set of control variables include: size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 9 IBM, joint ownership, and firm value (continued)

	Section (B): M-B ratio				
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
(Constant)	–2.58 (0.012)	–2.05 (0.044)	–0.32 (0.751)	–0.27 (0.788)	–0.47 (0.640)
Joint%	3.48 (0.001)***	4.56 (0.000)***	3.90 (0.000)***	3.23 (0.002)***	4.98 (0.000)***
Ind-Comm * Joint%	1.75 (0.085)*				
Ind-Aud * Joint%		0.77 (0.447)			
Ind-Nom&Rem * Joint%			1.26 (0.213)		
Chair-Aud * Joint%				2.12 (0.037)**	
Chair-Nom&Rem * Joint%					2.21 (0.030)**
Size	2.34 (0.022)***	1.80 (0.076)*	2.02 (0.047)**	2.04 (0.045)**	2.24 (0.028)***
Leverage	–0.17 (0.868)	–0.35 (0.724)	–0.57 (0.571)	–0.00 (0.999)	–0.85 (0.401)
ROA	5.25 (0.000)***	4.94 (0.000)***	5.11 (0.000)***	5.05 (0.000)***	5.33 (0.000)***
Invest-opportune	1.84 (0.070)*	1.58 (0.117)	1.70 (0.094)*	1.45 (0.152)	1.60 (0.113)
FCF	–3.14 (0.002)***	–3.29 (0.002)***	–3.17 (0.002)***	–3.39 (0.001)***	–3.31 (0.001)***
Board-own	–3.55 (0.001)***	–4.66 (0.000)***	–4.00 (0.000)***	–3.72 (0.000)***	–3.93 (0.000)***
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.779	0.771	0.777	0.783	0.786

Notes: This table shows the regression analysis of the interaction between IBM and joint ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Joint%, is the percentage of joint ownership between the government and family owners and individual investors. Ind-Comm * Joint%, Ind-Aud * Joint%, Ind-Nom&Rem * Joint%, Chair-Aud * Joint%, and Chair-Nom&Rem * Joint% measures the interaction between the Ind-Comm, Ind-Aud, Ind-Nom&Rem, Chair-Aud and Chair-Nom&Rem variables and the joint ownership variable, respectively. The set of control variables include: size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

6.3 The interactions between IBM and joint ownership and its impact on firm value

To analyse the impact of joint ownership on the relationship between board monitoring intensity and firm valuation, we apply the following regression model that includes an interaction variable between IBM and joint ownership:

$$\text{Firm value}_{it} = b_0 + b_1\text{Joint\%} + b_2\text{IBMI}_{it} * \text{Joint\%} + b_3\text{Size}_{it} + b_4\text{Leverage}_{it} + b_5\text{ROA}_{it} + b_6\text{Invest-opportune}_{it} + b_7\text{FCF}_{it} + b_8\text{Board-own}_{it} + e_{it}$$

The results of the analysis in Table 9 reveal that the interactions between the joint ownership between the government and family owners and individual investors and IBM have a positive impact on firm value. When Tobin's Q is applied in section (A), the impact of the interactions between the *Ind-Comm*, *Ind-Nom&Rem*, and *Chair-Nom&Rem* variables and the joint ownership variable on firm value is positive and significant at the 5% level, 5% level, and 10% level, respectively. While the interactions with the other two variables, *Ind-Aud* and *Chair-Aud*, are positive but insignificant. For the M-B ratio in section (B), the interactions with the *Ind-Comm*, *Chair-Aud* and *Chair-Nom&Rem* variables are the ones that have positive significant impact on firm value at the 10% level, 5% level, and 5% level, respectively, while the interactions with the other two variables, *Ind-Aud* and *Ind-Nom&Rem*, are positive but insignificant. These findings support our third hypothesis, which states that the joint ownership strengthens and complements the impact of board monitoring intensity on firm value. This happens when the government representatives discipline the individuals or family owners, whom they have joint ownership with them, and prevent them from harming the minority shareholders. They do so through complementing the monitoring functions of the board and strengthen it. Another reason behind such findings could be that the joint ownership between the government and family owners and individual investors does not influence any of them to pursue their own interest at the expense of the other shareholders. A third reason might be that the joint ownership values among Saudi listed firms are not large enough to allow the parties, whom they have joint ownership, to monitor effectively the firm's managers. As a result, those parties tend to strengthen the board monitoring functions over the managers of the firm. These values of joint ownership, which are not too large, could be the reason behind the variations in the significance of the results.

These findings are supported by the positive and significant impact of the joint ownership variable on firm value, measured by Tobin's Q and M-B ratio, at the 1% level. This positive significant impact supports the view that the joint ownership between the government and family owners and individual investors improves the value of the firm. The high revenues generated in these firms with joint ownership influences the high valuation of the firm.

7 Identification

Many research papers prove the endogenous nature of the board monitoring and ownership structure variables when analysing their impact on the valuation of the firm (Holmstron, 2005; Faleye et al., 2011; Lahlou and Navatte, 2013; Byun et al., 2013; etc.). When endogeneity is proved instrumental variables estimations are applied to resolve the correlation between the error term and one or more than one independent variable. This problem of correlation can be the cause of measurement error of endogenous variable, the omission of some variables that are correlated between the dependent variable and the endogenous variable or the dependent variable and the endogenous variable are simultaneously determined. For these reasons, we conduct an endogeneity test to choose the consistent method for estimations. In our analysis we consider the Durbin-Wu-Hausman test for endogeneity. When endogeneity is not rejected, instrumental variable method is applied. The two-stage least squares method (2SLS) is employed in case of homosceadasticity, whereas, we apply the generalised method of moments method (GMM) when heteroscedasticity is detected. Breush Pagan test is conducted to test heteroscedasticity.

We start the analysis by testing the endogeneity of the IBM variables in both sub-samples of high and low direct ownership. The results in Table 10 prove the endogenous nature of the IBM variables in the high direct ownership sub-sample which require applying the 2SLS method. Whereas these variables prove to be exogenous, in most cases, under the sub-sample of low direct ownership in Table 11. To determine the impact of IBM on firm value under the sub-sample of high direct ownership by applying the 2SLS method, we need to consider instrumental variables in the analysis. The instrumental variables considered are the Indtotal1 variable and lagged variables for each endogenous variable. Over-identification tests and Sargan test are employed to verify if instruments are well identified and the problem of endogeneity is resolved or not. According to Table 10 we conclude that all estimated models are well identified, the endogeneity problem is resolved, and the impact of IBM on firm value is positive and significant, including the impact of Ind-Nom&Rem and Chair-Nom&Rem variables on M-B ratio that was insignificant under the OLS approach. To refine estimations, as we have a large number of firms, heteroscedasticity test was considered. The rejection of homoscedasticity for all models, lead us to re-estimate models by the GMM method and use the Hans J-test to check if instruments are valid. For all models, the statistics are not significant at 5% level which means that all instruments are valid.

For the sub-sample with low direct ownership the exogenous nature of the IBM variables does not allow to apply the 2SLS approach to estimate the impact of IBM on firm value, except model (4) in panel 1 and models (1) and (3) in panel 2 of Table 11 where GMM method have been applied. Whereas the least square dummy variable model (LSDV) have been used to the other models to re-estimate the impact of IBM on firm value. The results in Table 11 support our results in Table 6 and prove that the higher the ownership stakes in the hands of large shareholders, the stronger the positive impact of IBM on the valuation of the firm.

Table 10 The impact of IBM on firm value for the sub-sample with high direct ownership (2SLS)

	Section (A) Tobin's Q				
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	–0.213 (0.534)	0.609 (0.245)	0.922 (0.099)*	0.416 (0.396)	0.953 (0.086)*
Ind-Comm	1.265 (0.004)***				
Ind-Aud		0.919 (0.000)***			
Ind-Nom&Rem			0.793 (0.017)**		
Chair-Aud				0.573 (0.000)***	
Chair-Nom&Rem					0.844 (0.006)***
Control variables	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Specification tests					
Endogeneity test	4.498 (0.033)**	7.656 (0.005)***	6.428 (0.011)**	8.374 (0.003)***	7.610 (0.005)***
Over-identification	124.31 (0.000)***	126.582 (0.000)***	106.246 (0.000)***	114.861 (0.000)***	31.213 (0.000)***
Sargan test	0.034 (0.854)	0.779 (0.377)	0.987 (0.320)	0.139 (0.709)	0.474 (0.491)
Heteroscedasticity	28.49 (0.0276)**	39.962 (0.015)**	41.76 (0.009)***	40.207 (0.014)**	38.903 (0.020)**
Hansen J-test	0.0785 (0.779)	1.247 (0.264)	2.334 (0.126)	0.145 (0.702)	0.701 (0.402)
N obs.	237	237	237	237	237

Notes: This table shows the impact of IBM on firm value by applying the 2SLS approach for the sub-sample of high direct ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. The set of control variables include size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 10 The impact of IBM on firm value for the sub-sample with high direct ownership (2SLS) (continued)

	Section (B) M-B ratio				
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	0.589 (0.373)	0.403 (0.560)	0.952 (0.204)	0.274 (0.720)	0.991 (0.215)
Ind-Comn	1.966 (0.012)**				
Ind-Aud		1.318 (0.000)***			
Ind-Nom&Rem			0.904 (0.093)*		
Chair-Aud				0.732 (0.001)***	
Chair-Nom&Rem					1.154 (0.027)**
Control variables	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Specification tests					
Endogeneity test	4.115 (0.0425)**	5.316 (0.0211)**	4.900 (0.0269)***	5.017 (0.025)**	8.630 (0.003)***
Over-identification	124.31 (0.000)***	126.582 (0.000)***	106.246 (0.000)***	114.861 (0.000)***	31.213 (0.000)***
Sargan test	0.032 (0.858)	0.530 (0.466)	1.725 (0.189)	0.267 (0.601)	0.320 (0.571)
Heteroscedasticity	50.44 (0.000)***	45.706 (0.000)***	50.143 (0.000)***	48.77 (0.001)***	49.498 (0.001)***
Hansen J-test	0.0105 (0.918)	0.760 (0.383)	2.864 (0.090)*	0.269 (0.603)	0.338 (0.560)
N obs.	237	237	237	237	237

Notes: This table shows the impact of IBM on firm value by applying the 2SLS approach for the sub-sample of high direct ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comn, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. The set of control variables include size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 11 The impact of IBM on firm value for the sub-sample with low direct ownership (GMM) and (LSDV)

Section (A) Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	1.004 (0.005)***	0.815 (0.152)	0.842 (0.138)	1.562 (0.000)***	0.914 (0.133)
Ind-Comm	0.809 (0.078)*				
Ind-Aud		0.497 (0.018)**			
Ind-Nom&Rem			0.531 (0.030)**		
Chair-Aud				0.072 (0.649)	
Chair-Nom&Rem					0.151 (0.216)
Control variables	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Specification tests					
Endogeneity test	2.311 (0.128)	0.343 (0.558)	2.066 (0.150)	6.202 (0.012)**	0.738 (0.390)
Over-identification				116.913 (0.000)***	
Sargan test				1.110 (0.292)	
Heteroscedasticity				37.065 (0.003)***	
Hansen J-test				1.055 (0.304)	
N obs.	225	225	225	225	225

Notes: This table shows the impact of IBM on firm value by applying the GMM approach on model (4) in panel 1 and models (1) and (3) in panel 2, whereas the LSDV approach is applied on the other models, for the sub-sample of low direct ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Direct, is the percentage of cash-flow rights that the large shareholder holds directly in the firm he\she controls. The set of control variables include size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 11 The impact of IBM on firm value for the sub-sample with low direct ownership (GMM) and (LSDV) (continued)

	Section (B) M-B ratio				
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	3.885 (0.000)***	2.967 (0.008)***	3.980 (0.000)***	3.050 (0.008)***	3.041 (0.006)***
Ind-Comm	–0.563 (0.271)				
Ind-Aud		0.489 (0.051)*			
Ind-Nom&Rem			–0.661 (0.174)		
Chair-Aud				0.080 (0.648)	
Chair-Nom&Rem					0.413 (0.025)***
Control variables	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Specification tests					
Endogeneity test	7.443 (0.006)***	0.331 (0.565)	5.837 (0.015)**	0.287 (0.592)	1.313 (0.390)
Over-identification	143.404 (0.000)***		93.915 (0.000)***		
Sargan test	0.875 (0.349)		1.589 (0.207)		
Heteroscedasticity	58.464 (0.000)***		57.90 (0.000)***		
Hansen J-test	1.119 (0.290)		1.865 (0.172)		
N obs.	225	225	225	225	225

Notes: This table shows the impact of IBM on firm value by applying the GMM approach on model (4) in panel 1 and models (1) and (3) in panel 2, whereas the LSDV approach is applied on the other models, for the sub-sample of low direct ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Direct, is the percentage of cash-flow rights that the large shareholder holds directly in the firm he\she controls. The set of control variables include size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 12 IBM, direct ownership, and firm value (2SLS)

Section (A) Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	0.0922 (0.693)	0.396 (0.702)	0.720 (0.500)	0.133 (0.603)	0.755 (0.486)
Direct	–1.08 (0.001)***	–0.744 (0.010)**	–0.679 (0.032)**	–0.408 (0.079)*	–0.382 (0.096)*
Ind-Comm * direct	3.06 (0.002)***				
Ind-Aud * direct		1.388 (0.002)***			
Ind-Nom&Rem * direct			1.104 (0.086)*		
Chair-Aud * direct				0.583 (0.030)**	
Chair-Nom&Rem * direct					0.488 (0.094)*
Size	0.134 (0.001)***	0.120 (0.003)***	0.106 (0.012)**	0.133 (0.002)***	0.107 (0.012)**
ROA	4.96 (0.000)***	4.933 (0.000)***	4.995 (0.000)***	4.694 (0.000)***	4.880 (0.000)***
FCF	–3.53 (0.005)***	–3.44 (0.008)***	–3.66 (0.006)***	–3.51 (0.007)***	–3.67 (0.006)***
Leverage	–0.709 (0.001)***	–0.703 (0.001)***	–0.723 (0.001)***	–0.773 (0.000)***	–0.784 (0.000)***
Invest-opportune	–0.037 (0.550)	–0.014 (0.823)	–0.042 (0.552)	–0.0439 (0.493)	–3.285 (0.019)**
Board-own	–0.584 (0.010)**	–0.663 (0.006)***	–0.513 (0.032)**	–0.416 (0.068)*	–0.061 (0.416)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	No	Yes	Yes	Yes	Yes
Specification tests					
Endogeneity	0.272 (0.602)	2.584 (0.107)	0.015 (0.903)	2.367 (0.439)	0.598 (0.439)
Heteroscedasticity	81.03 (0.000)***	76.88 (0.000)***	67.71 (0.000)***	70.41 (0.000)***	67.12 (0.000)***
R-squared	0.403	0.404	0.397	0.401	0.396
N obs	479	479	462	479	462

Notes: This table shows the regression analysis of the interaction between IBM and direct ownership by applying the 2SLS approach for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Direct, is the percentage of cash-flow rights the large shareholder holds directly in the firm he\she controls. Ind-Comm * direct, Ind-Aud * direct, Ind-Nom&Rem * direct, Chair-Aud * direct, and Chair-Nom&Rem * direct measures the interaction between the Ind-Comm, Ind-Aud, Ind-Nom&Rem, Chair-Aud and Chair-Nom&Rem variables and the direct ownership variable, respectively. The set of control variables include: size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 12 IBM, direct ownership, and firm value (2SLS) (continued)

	Section (B) M-B ratio				
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Constant	–1.863 (0.268)	–1.758 (0.293)	–1.441 (0.312)	–2.253 (0.205)	–1.507 (0.401)
Direct	–2.15 (0.000)***	–1.93 (0.000)***	–1.323 (0.013)**	–1.13 (0.005)***	–0.814 (0.038)*
Ind-Comm * direct	4.974 (0.000)***				
Ind-Aud * direct		2.851 (0.000)***			
Ind-Nom&Rem * direct			1.373 (0.111)		
Chair-Aud * direct				1.112 (0.005)***	
Chair-Nom&Rem * direct					0.260 (0.555)
Size	0.244 (0.001)***	0.240 (0.001)***	0.228 (0.001)***	0.266 (0.001)***	0.234 (0.003)***
ROA	3.499 (0.031)**	3.493 (0.032)**	3.403 (0.000)***	3.020 (0.070)*	3.208 (0.065)*
FCF	–2.873 (0.204)	–2.803 (0.215)	–3.292 (0.005)***	–2.955 (0.198)	–3.453 (0.157)
Leverage	0.155 (0.634)	0.238 (0.460)	0.167 (0.651)	0.114 (0.725)	0.125 (0.714)
Invest-opportune	–0.191 (0.027)**	–0.146 (0.085)*	–0.216 (0.201)	–0.208 (0.017)**	–0.229 (0.013)**
Board-own	–0.369 (0.362)	–0.612 (0.147)	–0.281 (0.475)	–0.122 (0.205)	–0.262 (0.561)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
Specification tests					
Endogeneity	0.013 (0.910)	1.388 (0.238)	1.081 (0.298)	0.682 (0.408)	1.662 (0.197)
Heteroscedasticity	158.6 (0.000)***	147.4 (0.000)***	134.1 (0.000)***	138.7 (0.000)***	142.2 (0.000)***
R-squared	0.262	0.271	0.269	0.26	0.254
N obs.	474	474	474	474	457

Notes: This table shows the regression analysis of the interaction between IBM and direct ownership by applying the 2SLS approach for a sample of 119 Saudi listed firms over six years from 2008 till 2013. The total number of yearly observations understudy is 714. Ind-Comm, is the percentage of independent directors who serve in the audit and the nomination and remuneration committees to the total number of directors in the firm. Ind-Aud, is the percentage of independent directors to total number of directors in the audit committee. Ind-Nom&Rem, is the percentage of independent directors to total number of directors in the nomination and remuneration committee. Chair-Aud, is a binary variable that takes the value of one if the chairman of the audit committee is an independent director, or zero otherwise. Chair-Nom&Rem, is a binary variable that takes the value of one if the chairman of the nomination and remuneration committee is an independent director, or zero otherwise. Direct, is the percentage of cash-flow rights the large shareholder holds directly in the firm he\she controls. Ind-Comm * direct, Ind-Aud * direct, Ind-Nom&Rem * direct, Chair-Aud * direct, and Chair-Nom&Rem * direct measures the interaction between the Ind-Comm, Ind-Aud, Ind-Nom&Rem, Chair-Aud and Chair-Nom&Rem variables and the direct ownership variable, respectively. The set of control variables include: size, is the natural log of the firm's total assets. Leverage, is the total leverage of the firm divided by its total assets. ROA, is the ratio of net income to total assets. Invest-Opportune, is the ratio of capital expenditures to sales. FCF, is the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock/total assets. Board-Own%, is the proportion of outstanding shares owned directly by all directors. Year and industry effect are dummy variables. The numbers in the table represents the t-statistics values and the numbers in brackets represent the significance level. ***, **, and *indicate a significance level of 1%, 5%, and 10%, respectively.

Table 13 This table shows the endogeneity and heteroscedasticity tests for the interaction variables between IBM and indirect ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013

Section (A) Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Specification tests					
Endogeneity	1.094 (0.295)	1.603 (0.209)	0.349 (0.554)	3.092 (0.0787)*	0.329 (0.566)
Heteroscedasticity	88.92 (0.000)***	87.29 (0.000)***	81.90 (0.000)***	24.95 (0.003)***	78.76 (0.000)***
R-squared	0.407	0.405	0.407	0.461	0.408
N obs.	479	479	462	398	462
Section (B) M-B ratio					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Specification tests					
Endogeneity		0.319 (0.572)	0.676 (0.411)	0.157 (0.692)	1.105 (0.293)
Heteroscedasticity	137.7 (0.000)***	138.6 (0.000)***	126.4 (0.000)***	130.7 (0.000)***	127.89 (0.000)***
R-squared	0.246	0.257	0.261	0.279	0.265
N obs.	474	474	457	474	457

Notes: * 10% level of significance, ** 5% level of significance, *** 1% level of significance.

After that, the endogeneity of IBM variables is tested under the whole sub-sample of direct ownership by assuming that the problem can be caused by the interaction variables between IBM variables and the direct ownership variable. The results in Table 12 show that all estimated models reject the endogeneity problem but the heteroscedastity problem can not be rejected because of heterogeneity of firms in our sample, therefore, weighted least squares regression is considered. According to the results of Table 12, we obtain a negative and significant estimated coefficient of the variable direct in all models for both dependent variables, Tobin's Q and MB-ratio, which is consistent with the findings of Table 7. Another important result concern the interaction variables where we obtain a positive and significant effect on firm value when we consider the variable Tobin's Q as a dependent variable. While we obtain same results as in Table 7 when M-B ratio is employed as a dependent variable. Most of control variables obtain similar results to those obtained in Table 7, but some of these variables become more significant. Such as the impact of size variable on firm value that become positive and significant compared to its positive insignificant impact in Table 7. Also, industry and time effects have a significant impact on the valuation of the firm. These results reveal that the direct ownership of large shareholders strengthen the positive impact of IBM on firm value, which is consistent with our results in Table 7 and the results of other research such as Byun et al. (2013).

Tables 13 and 14 are devoted to the endogeneity tests of the IBM variables under the indirect ownership and joint ownership sub-samples, respectively. This is done through assuming that the cause of the problem is the interaction between the IBM variables and

the indirect ownership and joint ownership variables, respectively. The results in both tables reject the endogeneity for all models. Therefore, we will rely on the findings in Tables 8 and 9 that analyse the impact of interactions between IBM and indirect ownership and joint ownership, respectively, on firm value.

Table 14 This table shows the endogeneity and heteroscedasticity tests for the interaction variables between IBM and joint ownership for a sample of 119 Saudi listed firms over six years from 2008 till 2013

Section (A) Tobin's Q					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Specification tests					
Endogeneity	0.003 (0.960)	1.218 (0.269)	0.080 (0.777)	1.136 (0.286)	0.103 (0.748)
Heteroscedasticity	86.26 (0.000)***	68.77 (0.000)***	65.53 (0.000)***	75.12 (0.000)***	64.30 (0.000)***
R-squared	0.389	0.395	0.398	0.397	0.396
N obs.	479	479	462	479	462
Section (B) M-B ratio					
	Model (1)	*Model (2)*	*Model (3)*	*Model (4)*	*Model (5)*
Specification tests					
Endogeneity	0.593 (0.441)	1.527 (0.216)	0.344 (0.557)	0.137 (0.711)	1.536 (0.215)
Heteroscedasticity	122.82 (0.000)***	137.7 (0.000)***	129.8 (0.000)***	113.9 (0.000)***	130.8 (0.000)***
R-squared	0.248	0.249	0.254	0.249	0.252
N obs.	474	474	457	474	457

Notes: * 10% level of significance, ** 5% level of significance, *** 1% level of significance.

8 Conclusions

The ownership structure is proved by previous research to has an impact on the monitoring functions of the board (Faleye et al., 2011; Byun et al., 2013). The large shareholders and the ultimate owners, who control the ownership structure of many firms around the world including the firms listed in the Saudi market, can strengthen or weaken the impact of board monitoring intensity on the valuation of the firm.

This article is conducted on all Saudi listed firms, except the firms listed in the banking and insurance sectors, over the period 2008 till 2013 to measure how the complexity of the ownership structure affects the effectiveness of board monitoring intensity.

The findings of the research reveal that the large shareholders in non-complex ownership firms tends to complement the monitoring functions of the board and strengthen the positive impact of IBM on firm value. While the ultimate owners in complex ownership firms tends to generate private benefits of control at the expense of the minority shareholders through weakening the monitoring functions of the board.

The joint ownership between the government and family owners and individual investors strengthens the impact of board monitoring intensity on firm value. This results from preventing the family owners and individual investors by the government from misusing the firm's resources.

All the above findings should provide a better understanding for the officials in the Saudi market regarding the role that the ownership structure plays in strengthening or weakening the relationship between IBM and firm value. Such findings should increase the confidence of the investors in the Saudi stock market because the investors can understand better the incentives of the controlling shareholders in the firms they invest in, which can prevent them from being expropriated by those controllers and increase their confidence in the Saudi market. The findings are also of an importance to the market regulators to, be able to, develop the market rules and regulations to protect the investors from the misuses of owners. For researchers, the paper can help them to realise how the interaction between ownership structure and board monitoring works in the Saudi context under different ownership categories. These findings should fill the gap in the current literature and assess researchers to conduct research in this field considering other ownership categories to understand more deeply the intuitions of owners toward the firm and its resources.

It is advised for coming research to analyse deeply the role of the new corporate law in enhancing and improving the monitoring functions of the board and its role in preventing the misuses of the controlling shareholders. The Saudi Arabia's council of ministers had approved in the 9th of November, 2015 the new company's law 1437H/2015G. This new law is applied in May, 2016 to overcome the drawbacks of previous corporate law. One of the rules of the new law prohibits any executive member in the firm to combine between his executive position and the position of the chairman of the board of directors. Such rule and other rules in the new law should improve the effectiveness of the board of directors, and more specifically its monitoring functions. This kind of analysis is considered an extension to our work in this article and can provide a better outlook to the role of the board of directors under the new corporate law.

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