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Examining the association between Board characteristics, ownership structure and performance: the case of companies listed on the Egyptian Stock Exchange

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Abstract

Purpose

This research investigates the association between board characteristics, ownership structure and firm performance. Board size and role duality are used to express board characteristics while managerial, governmental, institutional and concentrated ownership are used to express ownership structure.

Design/methodology/approach

The sample consisted of the most active listed companies from 2008 to 2011 after excluding financial institutions such as banks, investment funds, investment and financial services companies and insurance companies due to their peculiar activities and regulations. Regression analysis is employed to test research hypotheses in addition regression analysis assumptions are examined. The dependent variable is measured through ROA, Tobin's Q, ROE and market-to-book value ratio.

Findings

The results report that board size, governmental ownership and performance are positively related. Moreover, the result reports a significant negative relationship between role duality and firm performance. This means that companies with large boards and large governmental ownership outperform companies with small boards and small governmental ownership. In addition, role duality seems to have

negative influence on firm performance. Moreover, it seems that managerial ownership fails to link shareholders and management interest. Finally, institutional investors and large investors do not use their voting rights properly to monitor the management and enhance firm performance.

Research limitations

This study suffers from some limitations. First, this study focuses only on board size and role duality as board characteristics while the relationship between board independence and performance is not examined in this research. Second, this study tackles endogeneity problem through using lagged dependent variable. However, it is suggested that future research may use different methods such as 2SLS or generalized method of moments. Third, this study, similar to most of the literature, assumes a linear association between performance and ownership structure while the relation may take a U-shaped relationship.

Practical Implications

Based on the results of this study, several recommendations to policy makers and investors could be offered. Policy makers and regulators may benefit from the results of this study to enhance the monitoring role of board of directors and ownership. Furthermore, the results of this study assists the investors to understand the association between corporate governance and firm performance.

Originality/value

The current study fills some gaps in the literature through examining the interaction between board characteristics and ownership structure and their influence on firm performance for a relatively large sample of Egyptian listed companies over 4 years from 2008 to 2011. The study provides an evidence from one of the emerging economies; Egypt.

Keywords:

Firm performance, corporate governance, board size, duality, ownership structure

دراسة واختبار العلاقة بين خصائص مجلس الإدارة وهيكل الملكية وأداء الشركات: حالة الشركات المدرجة في سوق الأوراق المالية المصرية

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ملخص البحث

يهدف هذا البحث إلى اختبار العلاقة بين خصائص مجلس الإدارة، هيكل الملكية وأداء الشركات. تم استخدام حجم مجلس الإدارة وثنائية الأدوار للتعبير عن خصائص مجلس الإدارة كما استخدمت الملكية الحكومية، الملكية الإدارية، الملكية المؤسسية وتركز الملكية للتعبير عن هيكل الملكية.

منهجية البحث

تتكون عينة الدراسة من الشركات الأكثر نشاطًا المدرجة في سوق الأوراق المالية المصرية خلال الفترة من 2008 إلى2011، وذلك بعد استبعاد المؤسسات المالية مثل البنوك، صناديق الاستثمار، شركات الاستثمار والخدمات المالية وشركات التأمين بسبب طبيعة أنشطتها والقوانين المنظمة لها. تم استخدام تحليل الانحدار لاختبار فروض البحث. أيضًا يتم اختبار افتراضات تحليل الانحدار. تم قياس المتغير التابع من خلال العائد على الأصول، مؤشر توبين كيو، العائد على الملكية ونسبة القيمة السوقية إلى القيمة الدفترية.

نتائج البحث

تشير نتائج البحث إلى وجود علاقة موجبة ذات معنوية إحصائية بين حجم مجلس الإدارة، الملكية الحكومية وأداء الشركات. كما تشير النتائج إلى وجود علاقة عكسية ذات معنوية إحصائية بين ثنائية الأدوار وأداء الشركات. وهذا يعني أن الشركات ذات مجلس الإدارة كبير الحجم وذات الملكية الحكومية المرتفعة تقدم أداءً متميزًا مقارنة بالشركات ذات مجلس الإدارة صغير الحجم وذات الملكية الحكومية المنخفضة. بالإضافة إلى ذلك، يبدو أن لثنائية الأدوار تأثيرًا سلبيًا على أداء الشركات. علاوة على ذلك، يبدو أن الملكية الإدارية قد فشلت في الربط بين مصالح المساهمين ومصلحة الإدارة. وأخيرًا، فإن المستثمر المؤسسى

وكبار المستثمرين لا يستخدما حقهما في التصويت بشكل صحيح لمراقبة الإدارة والعمل على تعزيز أداء الشركات.

حدود البحث

يوجد عدد من القيود على نتائج هذا البحث. أولًا، تركز هذه الدراسة فقط على حجم مجلس الإدارة وثنائية الأدوار في حين أن العلاقة بين استقلال مجلس الإدارة وأداء الشركات لم يتم دراستها في هذا البحث نظرًا لعدم توفر البيانات. ثانيًا، تتناول هذه الدراسة مشكلة المتغيرات الداخلية من خلال استخدام متغير تابع ذو فترة إبطاء زمنى. لذا يقترح الباحث أن تستخدم البحوث المستقبلية أساليب مختلفة مثل طريقة المربعات الصغرى ثنائية الخطوات أو الطريقة العامة للعزوم. ثالثًا، تفترض هذه الدراسة، على غرار معظم الأدبيات في حوكمة الشركات، وجود علاقة خطية بين أداء الشركات وهيكل الملكية إلا أن العلاقة بين أداء الشركات وهيكل الملكية قد تكون علاقة غير خطية.

مقترحات البحث

تقدم هذه الدراسة عدد من المقترحات التى قد تفيد كل من واضعي السياسات والمستثمرين. قد يستفيد واضعى السياسات والمنظمين من نتائج هذه الدراسة للعمل على تحسين الدور الرقابي لمجلس الإدارة والملكية. علاوة على ذلك، قد تساعد نتائج هذه الدراسة المستثمرين على فهم العلاقة بين حوكمة الشركات والأداء المالى والسوقى لها.

المساهمة العلمية

تحاول الدراسة الحالية تناول بعض الفجوات البحثية في أدبيات حوكمة الشركات من خلال دراسة التفاعل بين خصائص مجلس الإدارة وهيكل الملكية وتأثيرها على أداء الشركات لعينة كبيرة نسبيا من الشركات المدرجة في سوق الأوراق المصرية خلال فترة زمنية قدرها 4 سنوات من 2008 إلى2011. وعلى وجه الخصوص، تحاول الدراسة تقديم دليل تجريبى من أحد الاقتصاديات النامية، مصر.

كلمات البحث

أداء الشركات، حوكمة الشركات، حجم مجلس الإدارة، ثنائية الأدوار، هيكل الملكية

1- Introduction

The association between different corporate governance and firm performance is the focus of a multidisciplinary research for more than two decades (Aljifri and Moustafa, 2007; Pham et al., 2011). Departure between ownership and control creates disconvergence of interest between shareholders and managers which may negatively influence firm performance. Agency theory predicts that ownership structure and board of directors may reduce agency cost and converge shareholders' and managers' interest (Agrawal and Knoeber, 1996; Al-Saidi and Al-Shammari, 2015; Jensen and Meckling, 1976). For example, managerial ownership may encourage managers to enhance firm performance since any harm to shareholders' wealth will also affect managers' wealth. In addition, large shareholders and institutional investors may use voting rights to discipline the management and exercise an important monitoring role which in turn may enhance firm performance (Shleifer and Vishny, 1997). Furthermore, board of directors characteristics; namely board size, role duality and board independence, may influence performance (Guest, 2009; Jensen, 1993). Several empirical studies argue that companies with well-functioning corporate governance mechanisms seem to have better performance compared to companies with less effective mechanisms (Aljifri and Moustafa, 2007; Conheady et al., 2015; Ghazali, 2010).

Guest (2009) argues that the association between board of directors characteristics and performance is expected to according to firm characteristics and from one country to another. This claim supports the need to examine this relationship in different contexts due to differences in regulatory, economic and institutional systems.

Although a number of studies examines the determinants of firm performance, most of them focus on developed countries and Asian region (Agrawal and Knoeber, 1996; Arosa et al., 2010; Brown and Caylor, 2006; Chen et al., 2003; Christensen et al., 2003; Conheady et al., 2015; Demsetz and Villalonga, 2001; Ghazali, 2010; Guest, 2009; Han et al., 2004; Lei and Song 2012; Zhao, 2003). However, little attention has been devoted to emerging economies such as Egypt.

Egypt has taken serious steps to adopt a privatization program in the beginning of 1990s. However, like other countries that have the same experience like China, the government still holds a significant ownership stake in privatized companies and this ownership may bring some political factors that may influence firm performance since social objectives still have some influence on management actions(Alipour, 2013; Sun et al., 2002). However, Sun et al. (2002) argue that the effect of governmental ownership on firm performance is unclear and therefore more investigation is needed to examine such relationship. In addition, the market for companies control in emerging economies may not play a significant monitoring role. Therefore, the influence of ownership structure and board of directors on performance need more investigation in emerging economies such as Egypt.

Due to international recognition of the importance of corporate governance, the Minister of Foreign Trade issued ministerial decree No.675 of 2003 that established the Egyptian Institute of Directors (EIoD) to issue the Egyptian code of corporate governance and to support director's professional capabilities (ROSC, 2004). Therefore, the first guidance of corporate governance was released in October

2005 to be applicable to listed companies only. The guidance aims to identify essential procedures that support optimal equilibrium between the interests of management, shareholders and stakeholders (EIoD, 2005). A second code of corporate governance was released in October 2006 to be applied in public sector enterprises regardless whether they are listed on the Egyptian exchange or not. The guidance aims to enhance corporate governance practices of public sector enterprises and hence enhance their economic performance and support the success of the privatization program (EIoD, 2006).

The aim of this research is examining the association between internal corporate governance and corporate performance in the Egyptian context. In other words, the focus is examining whether the variation in ownership structure and board characteristics can explain the variation in firm performance (Kapopoulos and Lazaretou, 2007). This research aims to answer the following research questions:

RQ1: Is there a relationship between board of directors characteristics (board size and role duality) and performance?

RQ2: Is there a relationship between ownership structure (managerial, governmental, institutional and concentrated ownership) and performance?

The objective of this research is to extend accounting literature and provide an investigation to the association between corporate governance and corporate performance. The research objective is to identify theoretically and empirically the potential effect of board size, role duality and ownership patterns on the performance of listed Egyptian companies during 2008 to 2011. This study contributes to the literature through enhancing our understanding of this relationship in emerging economies since ownership patterns and board of

directors characteristics may vary in emerging economies compared to developed economies. Providing an empirical evidence from the emerging economies is important since most of the available evidence is based on Anglo/American contexts (Kapopoulos and Lazaretou, 2007).

This research is organized as follows. Section 2 is devoted to present literature review and the development of research hypotheses while section 3 discussed research methodology. Section 4 presents results and discussion and finally section 5 is devoted to the conclusion, recommendations and limitations.

2- Literature review and hypotheses development

This section presents the review of previous literature and the development of research hypotheses.

2-1- Literature review

Examining the association between corporate governance and corporate performance is an area of multidisciplinary research between accounting and finance (Agrawal and Knoeber, 1996; Aljifri and Moustafa, 2007; Arosa et al., 2010). Modern corporations are characterised by ownership diffusion and a separation between ownership and management (Rose, 2005). This phenomenon is explained by agency theory or the theory of ownership structure (Jensen and Meckling, 1976). Therefore, agency theory underpins accounting research that examined this association (Al Farooque et al., 2007; Alipour, 2013; Arouri et al., 2014; Ma et al., 2010; Rose, 2005).

Based on agency theory, a corporation is a nexus of contractual relationship between a principle and an agent. The main objective of the principle is wealth maximization therefore the

performance of the agent should be monitored and assessed (Alipour, 2013). In addition, the agents may have opportunistic behaviour so they may prefer to maximize their own interest even on the account of shareholders (Weir et al., 2002). This conflict of interest leads to an increase in the cost of monitoring and bonding managers' behaviour. In addition, this conflict of interest is fuelled by information asymmetry and moral hazard since the shareholders cannot determine whether satisfactory performance is due to manager's effort not (Conheady et al., 2015; Rose, 2005). It is argued that several mechanisms such as ownership structure and board of directors may mitigate agency cost and positively influence firm performance (Al-Saidi and Al-Shammari, 2015; Pham et al., 2011).

Regarding the effect of ownership structure on corporate performance, several studies examined the influence of ownership identity, such as governmental ownership, on firm performance (Alipour, 2013; Aljifri and Moustafa, 2007; Desoky and Moustafa, 2013; Ghazali, 2010; Han et al., 2004; Mollah et al., 2012). Investigating the association between ownership structure and firm performance is an important issue to countries which transit to privatization since studying the impact of government ownership will reflect political intervention by the government (Sun et al., 2002). Those studies argue that political influence is highlighted through the power a government can exercise through its ownership. However, those studies find mixed results. For example, Zhao (2003) examines the impact of governmental ownership on firm performance of Chinese companies during 1997 to 1999. The study reports a non-significant association between governmental ownership and corporate performance. Aljifri and Moustafa (2007) investigate the

association between governmental ownership and performance in 51 listed companies in United Arab Emirates (UAE) in 2004. The study finds a significant positive association between governmental ownership and firm performance. Furthermore, Alipour (2013) examines the relationship between governmental ownership and corporate performance of corporations listed on Tehran stock exchange through 2005 until 2009. The result shows a significant negative association between governmental ownership and firm performance.

Regarding managerial ownership, it is claimed theoretically that managerial ownership may converge the interest of both managers (agent) and shareholders (principle) and reduce agency cost hence improve performance (Jensen and Meckling (1976). Empirical research examines extensively the impact of ownership structure on corporate performance (Arosa et al., 2010). Several studies examine the impact of managerial ownership on firm performance (Ghazali, 2010; Han et al., 2004; Henry, 2008; Moustafa 2005). These studies use agency theory to explain how managerial ownership may link the interest of managers and shareholders. Mustafa (2005) examines difference in performance between owner-controlled and manager-controlled companies in UAE during the period 1998-2002. The sample consists of 24 owner-controlled and 25 manager-controlled companies. In contrast to the expectation of agency theory, the main conclusion of this study reports that managers-controlled firms have a lower performance compared to owner-controlled firms. In China, Han et al., (2004) examine the impact of managerial ownership on firm performance of 490 listed companies in 2000. The study finds that managerial ownership and corporate performance are positively

related. In Malaysia, Ghazali (2010) examines the effect of managerial ownership on firm performance of 87 companies listed on Bursa Malaysia in 2001. The study reports a non-significant association between the variables under investigation.

Regarding institutional ownership, Shleifer and Vishny (1997) claim that institutional ownership may positively influence firm performance. Several studies aim to investigate this claim (Alipour, 2013; Henry, 2008; Pham et al., 2011; Zhao, 2003). In Australia, Henry (2008) examines the effect of adoption of Australian code of corporate governance on firm value during the period 1992 to 2002. The result shows a significant positive association between institutional ownership and firm value. Pham et al. (2011) examine the influence of institutional ownership on firm performance of 136 companies during 1994 to 2003. This study extends the literature by using economic value added to measure performance. The result finds no association between the two variables, supporting the existence of endogeneity problem. In addition, the effect of legal ownership on performance has received the attention of few previous studies. Legal ownership refers to the ownership by private companies. Both Zhao (2003) and Alipour (2013) find a positive relationship between legal ownership and corporate performance in Iran and china respectively.

With respect to board of directors, several studies highlight the significant role of board of directors in shaping corporate's strategies (Guest, 2010). Board of directors is a monitoring mechanism of management actions on behalf of shareholders (Donaldson and Davis, 1991). Board of directors has an advising function to the chief executive officer (CEO) and has a significant responsibility to monitor

and discipline top management (Guest, 2010). Jensen (1993, p.862) highlights the monitoring role of the board. He states that:

> "The problems with corporate internal control systems start with the board of directors. The board, at the apex of the internal control system, has the final responsibility for the functioning of the firm. Most importantly, it sets the rules of the game for the CEO. The job of the board is to hire, fire, and compensate the CEO, and to provide high-level counsel".

In addition, Jensen (1993) indicates that board characteristics such as board culture, board and managers ownership, board size, CEO role duality are key factors for a well-performing corporate governance mechanism. Moreover, the board has a significant motivating role to encourage top management to align their interest with that of shareholders through designing compensation plans to induce managers to work for the best interest of shareholders (Han et al., 2004). Based on these theoretical arguments, accounting research investigates the association between board characteristics and performance. Board characteristics include board size (Ghazali, 2010; Guest, 2009; Han et al., 2004; Henry, 2008; Mollah et al., 2012; Zhao, 2003), role duality (Ghazali, 2010; Weir and Laing, 2000; Weir et al., 2002), board independence (Han et al., 2004; Henry, 2008; Pham et al., 2011; Weir et al., 2002). For example, Yermack (1996) investigates the influence of board size on performance of 452 U.S. industrial companies during 1984 to 1991. The result finds a significant negative association between the two variables. In contrast, in Australia, Christensen et al. (2010) find that board size and

performance are positively related using a sample of listed publically corporation in 2004. This result supports the prediction of stewardship theory. Furthermore, in UK, Guest (2009) examines the association between board size and performance during 1981 and 2002. The result finds a nonlinear association between the two variables. In respect to role duality, Weir et al. (2002) examine the association between role duality and firm performance large British corporations. The result reports a nonsignificant relationship between role duality and performance. On the contrary, Zhao (2003) finds a negative relationship between role duality and firm performance in support to the prediction of agency theory. More interestingly, Christensen et al. (2010) find a significant positive association between duality and performance and this result render support to stewardship theory.

Recently, few studies investigate the influence of characteristics of the board and ownership structure on performance in the Egyptian context. Desoky and Mousa (2013) examine the association between ownership concentration, ownership structure and performance of the 99 most active listed companies in 2009. The results show that ownership concentration and performance are positively related only when performance is measured by accounting-based measures. In addition, the result documents a significant impact of fund ownership on performance. In the same vein, Emile et al. (2014) investigate the impact of corporate governance on the performance of the 30 most active listed companies during 2004 to 2010. Corporate governance includes board size, role duality and board independence. The study shows a nonsignificant association between corporate governance and performance. It seems that the study fails to account for endogeneity problem which in turn affect the

validity of the results. Recently, Shahwan (2015) examines the impact of the quality of corporate governance practices on performance of 86 listed Egyptian companies in 2008. The study constructs a corporate governance index consists of 15 item and covers four main corporate governance components; namely disclosure and transparency, board of directors' characteristics, shareholders' rights and investor relationships and ownership and control structure. The results show no association between corporate governance quality and performance as measured by Tobin's Q.

Reviewing the previous studies indicates some gaps in the literature. First, most of the studies that examine the determinants of firm performance give more attention to developed economies such as US, UK, Australia and the Asian region with little attention is directed to developing economies (Al Farooque et al., 2007). Therefore, the results obtained from studies performed in developed economies may not be generalized to emerging economies due to differences in business environment, development of stock markets and investors protection regulations. Second, the effect of governmental ownership on firm performance needs more investigation to identify the political influence of government on performance. Governmental ownership has not been examined in most of the previous literature -except the Chinese market- because governmental ownership is not common in developed economies. Third, most of the previous literature, including the literature in the Egyptian context, focuses on the impact of corporate governance or ownership structure on performance and very few studies examine the effect of both board of directors characteristics and ownership structure simultaneously. Fourth, studies that examine the Egyptian context employ a small sample (Emile et

al., 2014) or employ cross-sectional analysis (Desoky and Mousa, 2013; Shahwan, 2015) and focus on accounting measures of performance (Desoky and Mousa, 2013; Emile et al., 2014) while little attention is given to market-based measures of performance (Shahwan, 2015). Finally, except for Desoky and Mousa (2013), literature based on the Egyptian context fails to address properly the problem of endogeneity. The current study aims to fill these gaps in the previous literature by examining the interaction between board characteristics, and ownership structure and performance for a relatively large sample of Egyptian listed companies over 4 years from 2008 to 2011.

2-2- Hypotheses development

2-2-1- Board size

Board of directors is a key mechanism of corporate governance (Bai et al., 2004; Christensen et al., 2010). Accounting research highlights board size as a mechanism to mitigate agency problems (Aljifri and Moustafa, 2007) and can be used as a measure of board effectiveness in performing its monitoring function (Shin-Ping and Tsung-Hsien, 2009). A distinction can be made between two different points of view to explain the potential association between board size and performance.

Based on the resource dependence theory, large boards combine a variety of skills, experience and specialized knowledge in board meetings (Ghazali, 2010) hence large boards can be connected easily to business environment, professional networks and secure more resources (Shin-Ping and Tsung-Hsien, 2009). In addition, Guest (2009) and Mollah et al. (2012) argue that large boards secure the existence of more outsider non-executive directors who may support

and enhance decision-making policies in order to protect their reputation as professional directors.

On contrast, several arguments support the positive impact of small boards on firm performance. For example, small boards are characterised by better decisions coordination and effectiveness since large boards may permit the dominance of CEO on the board and may suffer from less effective decisions (Jensen, 1993). Small boards support sharing of responsibilities, effective communications and securing consensus in the board (Lipton and Lorsch, 1992) therefore small boards charge their responsibilities more efficiently (Jensen, 1993). In addition, small boards may not suffer from diffusion of responsibilities (Mollah et al., 2012), social loafing (Pham et al., 2011) and free riding (Arouri et al., 2014; Lipton and Lorsch, 1992) because members of small boards are unable to hide their poor contribution in monitoring activities. Therefore, small boards are more effective in monitoring firm performance (Pham et al., 2011). Jensen (1993) proposes that board of directors should be between 7 to 8 members since the advantages associated with increasing board size are outweighed by the disadvantages of increasing problems.

Empirical research regarding the association between board size and performance is inconclusive. Zhao (2003), Haniffa and Hudaib (2006), Isshaq et al. (2009) and Shin-Ping and Tsung-Hsien (2009) find a significant relationship between board size and performance while Pamburia et al. (2015) find a significant negative association. Han et al. (2004), Aljifri and Moustafa (2007), Ghazali (2010), Pham et al. (2011) and Mollah et al. (2012) find a nonsignificant relationship between board size and performance. Moreover, Guest (2009) documents a nonlinear relationship between

the two variables. According to this discussion, the following alternative hypothesis could be formulated:

H_1: There is a significant positive association between board size and firm performance.

2-2-2- Role Duality

Role duality occurs if one person combines both CEO and chairman of the board position simultaneously (Weir and Laing, 2000). In other words, one person combines decision making and decision control in one hand (Jensen, 1993). In this case, the board reflects duality of leadership. Two conflicting points of view may explain the association between role duality and firm performance; one point of view considers role duality to be harmful to firm performance while the other point of view considers role duality beneficial to firm performance.

On one hand, based on agency theory and the opportunistic behaviour of managers, several studies support the separation between CEO and chairman position for several reasons. The separation between the two positions ensures a balance of power and authority in the board of directors (Ghazali, 2010), supports the board's role in monitoring management (Fama and Jensen, 1983) and deters CEO maximizing self-interest (Arouri et al., 2014). In addition, the separation between the two roles increases board independence and eliminates a main source of conflict in the board (Arouri et al., 2014) and assists the board to promptly respond to any management failure (Jensen, 1993). Finally, the separation between CEO and chairman position is a grantee that the board works to maximize shareholders interest (Weir and Liang, 2000).

On the other hand, role duality may provide some advantages to board of directors. Based on stewardship theory, role duality may offer a deep understanding and knowledge about the operations of the corporation since the CEO will know every detail of day-to-day operations (Weir et al., 2002). In addition, duality may lead to better performance through providing uniformity of decision in the hand of the CEO who is responsible for establishing corporate's strategy with minimum intervention from other members on the board (Donaldson and Davis, 1991). Moreover, role duality removes uncertainty regarding the party who has the power, authority and responsibility for strategic decisions (Donaldson and Davis, 1991). Consequently, role duality may have a positive impact on performance.

Empirical results report mixed result for the relationship between role duality and performance. Zhao (2003) and Haniffa and Hudaib (2006) document a significant negative association between role duality and performance while Weir and Laing (2000), Han et al. (2004), Henry (2008) and Weir et al. (2002) find nonsignificant relationship between the two variables. More interestingly, Christensen et al. (2010) report a positive association between role duality and performance. According to those arguments, the following alternative hypothesis is formulated:

H_2: There is a significant negative association between role duality and firm performance.

2-2-3- Managerial ownership

Jensen and Meckling (1976) and Jensen (1993) argue that managerial ownership may assist in reducing agency conflict between shareholders and managers because managers have a greater incentive to maximize shareholders wealth. This claim is known as alignment or

convergence of interest hypothesis (Ghazali, 2010; Rose, 2005; Shin-Ping and Tsung-Hsien, 2009). In this case, the interest of both shareholders and managers are aligned and hence the probability of opportunistic behaviour is diminished (2000; Weir et al., 2002). The main idea that stock-based compensation scheme makes the managers as a residual claimant and encourages them to seek any opportunity to enhance firm performance (Rose, 2005; Shin-Ping and Tsung-Hsien, 2009). On contrast, due to information asymmetry and moral hazard, managers may pursue self-serving goals and work on maximizing their interest disregarding shareholders' wealth maximization (Weir et al., 2002). This argument is known as entrenchment or conflict of interest hypothesis which refers to a negative relationship between managerial ownership and performance (Shin-Ping and Tsung-Hsien, 2009). This happens when managers have a minor stake of corporate shares. Therefore, the manager is willing to secure favourable employment condition and consuming perquisites which in turn may negatively impact firm performance (Rose, 2005).

Empirical research provides inconclusive results. Consistent with the expectation of alignment of interest hypothesis, Zhao (2003), Han et al. (2004) and Lozano et al. (2015) find a significant positive association between managerial ownership and firm performance. However, consistent with the prediction of conflict of interest hypothesis, Moustafa (2005), Haniffa and Hudaib (2006) find a significant negative association between the two variables. In addition, Weir et al. (2002) and Henry (2008) document a U-shaped relationship between managerial ownership and performance. According to these discussions, the following alternative hypothesis is constructed:

H_3: There is a significant positive association between managerial ownership and firm performance.

2-2-4- Governmental ownership

In corporate governance literature, there is no clear indication whether governmental ownership may lead to better or poor performance (Alipour, 2013). Governmental ownership may negatively influence firm performance. First, the government may give higher priority to social and political objectives than maximizing profitability and shareholders' value (Alipour, 2013; Aljifri and Moustafa, 2007). Second, government owned companies might have governance system which is different from that of private companies (Aljifri and Moustafa, 2007). Third, Han et al. (2004) argue that the political influence of government is reflected through the large stake of shares owned by the government. Political aspects may have significant influence in hiring top management and hence the government may give less attention to the experience and qualification of top management (Alipour, 2013).

In contrast, government ownership may positively affect firm performance. First, the government may keep a close eye on state-owned companies and monitor their performance and support them when needed to justify the importance of the privatization program. Second, Al-Saidi and Al-Shammari (2015) argue that government-owned companies might work in monopoly or receive governmental support which may give those companies advantages to improve their performance. Third, government-owned companies may enjoy great support in securing finance from a variety of financial intermediaries and face less pressure from the government which allow the managers

to select accounting methods that boost firm performance (Aljifri and Moustafa, 2007).

Empirical evidence documents mixed results. Han et al. (2004), Aljifri and Moustafa (2007) and Ghazali (2010) find a significant positive relationship between governmental ownership and performance. On the contrary, Shin-Ping and Tsung-Hsien (2009), Mollah et al. (2012) and Alipour (2013) report a significant negative association between the two variables while Sun et al. (2002), Yu (2013) and Lozano et al. (2015) document a nonlinear association between governmental ownership and performance. Based on this discussion, the next alternative non-directive hypothesis is constructed:

H_4: There is a significant association between governmental ownership and firm performance.

2-2-5- Institutional ownership

Alipour (2013, p.1144) defines institutional investors as "companies and organizations that choose investments with more returns and profitability, for these investors like to increase their wealth by investing on good projects". Institutional investors encompass a wide range of financial intermediaries such as banks, pension funds, mutual funds who are independent from top management and can enforce management to protect their investment (Pham et al., 2011). Institutional investors may reduce other investors needs of monitoring since they can transfer information to other shareholders (Alipour, 2013). Pound (1988) provides three hypotheses regarding the association between institutional ownership and performance; namely the efficient monitoring, the strategic alignment and the conflict of interest hypothesis. The efficient monitoring

hypothesis expects that institutional investors may have positive impact on performance because they are well-informed and have more experience so they can use their voting rights effectively to monitor top management (Shleifer and Vishny, 1986). In addition, institutional investors are well-equipped with the required resources to monitor the management (Alipour, 2013). Pham et al. (2011) and Arouri et al. (2014) argue that institutional investors reduce interest disconvergence between shareholders and managers, reduce monitoring and agency cost and reduce management incentives for any opportunistic behaviour which consequently improve firm performance.

In contrast, according to the conflict of interest hypothesis, some institutional investors may have conflict of interest with other shareholders so they vote in favour of the management (Pound, 1983). In addition, institutional investors may have some strategic alliances with top management and vote in favour of their side to protect their strategic interest. Therefore, institutional ownership and performance are negatively associated. Extending this analysis, Bhide (1994) argues that institutional ownership and firm performance may have a nonlinear relationship and therefore at a certain point of ownership a trade-off between the desire of institutional investors for short-term profitability and the merits of monitoring top management may occur.

Evidence for the association between institutional ownership and performance is inconclusive. Henry (2008), Alipour (2013) and Desoky and Mousa (2013) report a significant positive association between institutional ownership and performance while Zhao (2003), Al Farooque et al. (2007), Shin-Ping and Tsung-Hsien (2009) and Mollah et al. (2012) document a significant negative association

between the two variables. Moreover, Aljifri and Moustafa (2007), Pham et al. (2011) and Al-Saidi and Al-Shammari (2015) find a nonlinear association between institutional ownership and performance. According to this discussion, the following alternative hypothesis is formulated:

H_5: There is a significant positive association between institutional ownership and firm performance.

2-2-6- Concentrated ownership

Concentrated ownership occurs when a large proportion of company stocks is owned by a few number of shareholders (Weir and Laing, 2000). This also occurs in a case of a legal (corporate) ownership which refers to investment by private incorporated firm in another firm. This situation creates interest disconvergence between large shareholders and minority shareholders or agent-agent conflict of interest (Shleifer and Vishny, 1997). In this case, large shareholders will have the power to monitor the performance of top management and enforce managers to take actions that maximize firm value since the potential cost of inefficient decision will deteriorate their investment (Weir and Laing, 2000). In addition, large shareholders have the power to appoint more non-executive directors in the board therefore they may support board independence (Weir and Laing, 2000). Consequently, concentrated ownership and firm performance are positively related.

On the other hand, large ownership may create a serious conflict of interest between two types of principles (Shleifer and Vishny, 1997). Those principles are controlling and minority shareholders Therefore, controlling shareholders may enforce the management to maximize their benefits disregarding minority

shareholders' benefits. The reasons for concentrated ownership may not be just achieving profit or higher return on investment but may be extended to achieve control over these owned companies (Shin-Ping and Tsung-Hsien, 2009). Therefore, legal ownership and performance are negatively associated.

Empirical results show mixed results. Zhao (2003), Christensen et al. (2010), Desoky and Mousa (2013) find a significant positive association between concentrated ownership and firm performance while Haniffa and Hudaib (2006), Shin-Ping and Tsung-Hsien (2009) and Lozano et al. (2015) report a significant negative relationship between the examined variables. Moreover, Weir and Laing (2000) and Lei and Song (2012) document a nonsignificant relationship between concentrated ownership and firm performance. Based on this discussion, the following non-directional alternative hypothesis is formulated:

H_6: There is a significant association between concentrated ownership and firm performance.

3- Methodology

3-1- Population and sample

This study examines the relationship between board characteristics, ownership structure and performance of Egyptian listed companies from 2008 to 2011. Consistent with Desoky and Mousa (2013) and Emile et al. (2014), the most active 50 companies are selected to be the sample under examination. The market capitalization of listed companies on the Egyptian stock exchange in 2011 is 294 billion pounds while market capitalization for companies included in the sample is about 157 billion pounds. In other words,

companies included in the sample represent 53% of total market capitalization (Egyptian Stock Exchange, 2011). Financial institutions such as insurance companies, investment and financial services companies, investment funds and banks are excluded from the sample due to their peculiar activities and regulations. This makes the sample includes only companies in manufacturing and non-manufacturing sectors and covers a time span of 4 years. Consequently, 159 observations are included in the analysis.

3-2- Measurement of the dependent variable

Reviewing the literature indicates that accounting-based measures (such as return on assets (ROA) and market-based measures (such as Tobin's Q) are commonly used as proxies for firm performance (Alipour, 2013; Isshaq, 2009; Sun et al., 2002; Yu, 2013; Zhao, 2003). Tobin's Q is a market-oriented measure of firm performance (Al-Saidi and Al-Shammari, 2015; Christensen et al., 2010). Tobin's Q reflects the estimation of company's intangible assets such as goodwill, opportunities of growth and company competitive advantages (Rose, 2005). Moreover, Tobin's Q reflects market expectation about future earnings (Arouri et al., 2014) and it is a stable proxy for firm value (Ang and Ding, 2006). Tobin's Q reflects firm future growth which is linked corporate governance (Han et al., 2004). Furthermore, Tobin's Q may reflect the degree of convergence between shareholders and management interest (Weir et al., 2002). As an indicator of a company's future value, higher value of Tobin's Q means better appreciation of firm value (Weir et al., 2002) and the company is well-functioning and value is added to the firm over years while low value of Tobin's Q refers to decreasing in value over time (Alipour, 2013; Haniffa and Hudaib, 2006). However, Tobin's Q

depends on the market efficient hypothesis (Han et al., 2004) which may not be a valid hypothesis in developing markets. Consistent with Chung and Pruitt (1994) and as followed by Agrawal and Knoeber (1996), Weir et al. (2002), Chen et al. (2003), Haniffa and Hudaib (2006), Henry (2008), Arouri et al. (2014) and Conheady et al., 2015, Tobin's Q is measured as the total of market value of company' equity plus the book value of debt divided by book value of assets.

Return on assets (ROA) is an accounting-oriented backward measure of firm performance that focuses on management stewardship and widely used as a proxy of firm performance (Christensen et al., 2010) since maximizing return is a universal objective of firms (Ma et al., 2010). ROA is a measure of management efficiency in asset utilization (Aljifri and Moustafa, 2007)) and reflects the ability of company's assets to generate earnings. Therefore, it is used by investors in their investment decisions (Arosa et al., 2010). ROA reflects the effects of management policies on firm performance (Cochran and Wood, 1994). However, ROA has some disadvantages. For example, ROA is influenced by conditions out of the control of the management. ROA is affected by different accounting treatments and therefore ROA is a noisy measure of performance (Pham et al., 2011). Following Zhao (2003), return on assets is calculated as net income divided by total assets.

Since each financial performance measure has its own pros and cons. Considering the absence of any preference for one measure over the other coupled with the lack of any theoretical basis to select between the two measures (Cochran and Wood, 1994; Al-Saidi and Al-Shammari, 2015), this study employs the two measures of financial firm performance as dependent variables; return on assets (ROA) and

Tobin's Q (TQ). This is consistent with a number of accounting research such as Zhao (2003), Alipour, (2013), Yu (2013) and Al-Saidi and Al-Shammari (2015). Using two measures of firm performance assists in checking the results robustness (Haniffa and Hudaib, 2006). In addition, the study employs another two proxies; namely return on equity (ROE) (Alipour, 2013; Mollah et al., 2012; Moustafa, 2005) and market-to-book value ratio (MTB) (Arouri et al., 2014; Sun et al., 2002) to check the robustness of the results.

3-3- Measurement of the independent variables

This study employs pooled regression analysis to investigate the association between board characteristics, ownership structure and firm performance. Using pooled regression assists in increasing the efficiency of the econometric model, degrees of freedom and reducing any potential multicollinearity among the independents variables (Baltagi, 2005). The regression model includes the following independent variables: board size (BS), role duality (DUAL), managerial ownership (MO), governmental ownership (GO), institutional ownership (IO) and concentrated ownership (CO).

Following the previous literature, the independent variables are measured as follows. Board size is measured as the number of directors on the board (Al-Saidi and Al-Shammari , 2015; Christensen et al., 2010; Ghazali, 2010; Han et al., 2004; Isshaq et al., 2009). Role duality is measured by a dummy variable equal to one in case of chairman of the board is the CEO and zero otherwise (Christensen et al., 2010; Han et al., 2004). Managerial ownership is measured by the percentage of shares owned by management (Isshaq et al., 2009; Yu, 2013; Zhao, 2003) while governmental ownership is measured by the percentage of share owned by the government (Alipour, 2013; Desoky

and Mousa, 2013; Sun et al., 2002). Institutional ownership is measured by the percentage of shares owned by institutional investors such as banks, investment funds and insurance companies (Alipour, 2013; Aljifri and Moustafa, 2007; Desoky and Mousa, 2013) and concentrated ownership is measured by the percentage of shares above 5% owned by individual investors or private companies (Alipour, 2013; Desoky and Mousa, 2013; Sun et al., 2002; Zhao, 2003).

3-4- Regression Model

This study employs a fixed effect regression model to control for omitted variables (Ang and Ding, 2006; Chen et al., 2003; Henry, 2008; Pham et al., 2008) and to mitigate the problem of endogeneity (Bai et al., 2004). According to Sun et al. (2002), two types of omitted variables could be identified; namely individual time-invariant variables and period individual-invariant variables.

Individual time-invariant variables refer to variables that vary among cross-sectional units but stay constant for a given cross-sectional unit overtime such as company location and management culture. In contrast, period individual-invariant variables refer to variables that are constant for all cross-sectional units at a certain point of time but they change overtime such as, for example, economic conditions which affect all the companies in the same industry in the same way but may change from year to year. Consequently, to account for period individual-invariant variables, the regression model includes a dummy variable (YEAR) to capture the effect of changes in economic condition on the association between board characteristics, ownership structure and firm performance (Bauwhede, 2009; Mollah et al., 2004).

In addition, to account for individual time-invariant variables, the regression model includes a dummy variable (INDUST) to capture the effect of industry characteristics (Alipour, 2013; Haniffa and Hudaib, 2006; Ma et al., 2010; Sun et al., 2002). Including such variables in the regression model assists in controlling for unobserved variables that may influence the association between dependent variables and independent variables. The study employs a dummy variable to distinguish between manufacturing and non-manufacturing companies instead of using a dummy variable for each company due to the fear of losing too much degrees of freedom and ending up with meaningless statistical inference (Gujarati, 2011).

Moreover, Cochran and Wood (1994) argue that the comparison of financial performance across companies requires the consideration of company's capital structure and risk differences. High leverage companies face a high agency cost and may receive unfavourable borrowing conditions (Christensen et al., 2010). In addition, large firms are politically sensitive and have a large number of shareholders therefore the monitoring cost is increasing (Christensen et al., 2010). Consequently, two controlling variables are included in the regression model since firm size (SIZE) and leverage (LEV) may affect financial performance (Desoky and Mousa, 2013; Ma et al., 2010). The least-squares dummy variable (LSDV) regression model used in this study is (Eq.1) (Gujarati and Porter, 2009):

$$PERF_{it} = \alpha_0 + b_1BS_{it} + b_2DUAL_{it} + b_3MO_{it} + b_4GO_{it} + b_5IO_{it} + b_6CO_{it} + b_7YEAR_{it} + b_8INDUSTit + b_9SIZE_{it} + b_{10}LEV_{it} + e_{it} \quad \text{(Eq.1)}$$

where:

PERF : Firm performance as measured by ROA, ROE, Tobin's Q (TQ) or market-to-book value ratio (MTB).

BS : Number of directors on the board.

DUAL : Dummy variable equal to one in case of chairman of the board is the CEO and zero otherwise.

MO : Percentage of shares owned by management.

GO : Percentage of share owned by the government.

IO : Percentage of shares owned by banks, investment funds, investment and financial services companies and insurance companies.

CO : Percentage of shares above 5% owned by individual investors or private companies.

YEAR : Dummy variable equal to one for the years 2010 and 2011 and zero for the years 2008 and 2009.

INDUST : Dummy variable equal to one if the company is a manufacturing company and zero if the company is a non-manufacturing company.

SIZE : Total book value of assets.

LEV : Percentage of total debts to total assets.

e_{it} : Error term

Regression assumptions of linearity, normality, heteroscedasticity, multicolinearity, and autocorrelation are checked to examine the validity of the results. Linearity and heteroscedasticity assumptions are checked through regression plots such as P-P plots and residual plots. In addition, normality of errors assumption is checked through the histogram of standardized residual. Multicolinearity assumption is checked through correlation among independent variables and variance inflation factor (VIF). It is suggested that multicolinearity will not cause severe implications to

regression analysis if correlation coefficient among independent variables does not exceed 0.8 and VIF does not exceeds the value of 10 (Field, 2005). Autocorrelation is checked through Durbin–Watson test. The test statistic lies between 0 and 4 with a value of 2 indicating uncorrelated residuals (Field, 2005).

4- Results and discussion

4-1- Descriptive statistics

Table (1-A and 1-B) provide descriptive statistics about the dependent (firm performance) and independent variables (board characteristics and ownership structure). Regarding firm performance, the mean ROA is 6.93% with a minimum -10% and a maximum 34% while the average Tobin's Q is 0.99 with a minimum 0.0013 and a maximum 5. In addition, alternative measures of firm performance, the mean ROE is 14.71% with a minimum -29% and a maximum 91% while the average market-to-book value ratio is 2.3 with a minimum 0.0032 and a maximum 17.

Regarding the independent variables, the average board size is 10 members with a minimum of 4 and a maximum of 23 members. This average is slightly above the recommended board size of 8 members suggested by Jensen (1993). The average managerial ownership is 7.31% with a minimum of zero and a maximum of 66%. This small managerial ownership stake may suggest diminutive influence of managerial ownership on firm performance since this non-significant stake may not align the interest of both shareholders and management. In the same vein, the average institutional ownership is 7.96% with a minimum of zero and a maximum of 82%. This non-significant stake may highlight that institutional investors may have less incentive to monitor management performance.

Governmental ownership has a mean of 15.21%, minimum of zero and a maximum of 95%. This means that the Egyptian government holds a significant stake in listed companies and may provide support to those companies and monitor their performance. Finally, the concentrated ownership has a mean of 24.64% with a minimum of zero and a maximum of 87.67%. Regarding role duality, 65% of the companies included in the sample have role duality while 35% only have non-role duality. Regarding control variables, leverage has a mean of 40.60% while the minimum and maximum are 0.08% and 90% respectively. The average firm size is 7,768,239 thousand pounds and the minimum and maximum are 49,724 and 59,300,500 thousand pounds respectively. Finally, 54% of companies in the sample belong to non-manufacturing industries while 46% of them belong to manufacturing industries.

Table 1-A: Descriptive statistics of dependent and continuous independent and control variables

	Mean	Median	SD	Min	Max	Skew	Kurtosis
ROA	6.93	5.1	8.154	-10	34	1.258	2.257
TQ	0.99	0.82	0.748	0.0013	5	1.522	3.71
ROE	14.71	10.4	17.928	-29	91	1.356	2.684
MTB	2.3	1.51	2.641	0.0032	17	2.881	9.913
BS	10.4	10	3.873	4	23	1.061	1.408
MO	7.31	0.1	15.535	0	66	2.513	5.597
GO	15.21	0.32	25.329	0	95	1.697	1.782
IO	7.96	2.25	12.207	0	82	2.657	10.031
CO	24.6435	20.3	23.9817	0	87.67	0.587	-0.868
LEV	0.406	0.3814	0.23247	0.0008	0.9	0.221	-1.158
SIZE	7768239	1657521	14394121	49724	59300500	2.483	5.099

Table 1-B: Descriptive statistics of discrete variables

Duality	Frequency	Percent	Industry	Frequency	Percent
Non Role Duality	56	35	Non-Manufacturing	86	54
Role Duality	103	65	Manufacturing	73	46
Total	159	100.0	Total	159	100.0

4-2- Correlation analysis

Correlation matrix (Table 2) reports preliminary evidence about the association between dependent and independent variables. In addition, it is a diagnostic tool to check multicollinearity among independent variables. Table (2) reports a significant positive relationship between board size, institutional ownership and accounting-based measures of performance. In addition, the result documents a significant positive relationship between governmental ownership and performance as measured by both accounting-based and market-based measures. Furthermore, the result shows a non-significant association between managerial ownership and performance while the relationship between concentrated ownership and firm performance (Tobin's Q) is negative.

As a diagnostic tool of multicollinearity, the highest correlation among the independent variables is between governmental ownership and concentrated ownership ($r = -.483$, $p < 0.001$). This correlation coefficient does not exceed the cut-off point of 0.8 suggested by Field (2005). Therefore, it could be concluded that multicollinearity has no severe complications to regression analysis. The correlation matrix includes also the correlation coefficients between performance and lagged performance variables. This will be discussed in section 4-5-8 as a possible solution to endogeneity problem.

Table 2: Correlation matrix among independent variables

Correlations																
		TQ	ROE	ROA	MTB	BS	MO	GO	IO	CO	LEV	SIZE	Lag ROE	Lag ROA	Lag TQ	Lag MTB
TQ	Pearson Correlation	1														
	Sig. (2-tailed)															
	N	159														
ROE	Pearson Correlation	.352**	1													
	Sig. (2-tailed)	.000														
	N	159	159													
ROA	Pearson Correlation	.387**	.759**	1												
	Sig. (2-tailed)	.000	.000													
	N	159	159	159												
MTB	Pearson Correlation	.651**	.507**	.157*	1											
	Sig. (2-tailed)	.000	.000	.048												
	N	159	159	159	159											
BS	Pearson Correlation	.027	.202*	.382**	-.078	1										
	Sig. (2-tailed)	.734	.011	.000	.328											
	N	159	159	159	159	159										
MO	Pearson Correlation	-.058	.027	-.045	.049	-.143	1									
	Sig. (2-tailed)	.469	.737	.570	.542	.072										
	N	159	159	159	159	159	159									
GV	Pearson Correlation	.213**	.260**	.241**	.212**	.185*	-.269**	1								
	Sig. (2-tailed)	.007	.001	.002	.007	.020	.001									
	N	159	159	159	159	159	159	159								
IO	Pearson Correlation	.100	.042	.194*	-.095	.307**	-.206**	.105	1							
	Sig. (2-tailed)	.212	.599	.014	.232	.000	.009	.189								
	N	159	159	159	159	159	159	159	159							
CO	Pearson Correlation	-.169*	-.052	-.091	-.115	-.060	-.180*	-.483**	-.257**	1						
	Sig. (2-tailed)	.033	.517	.254	.150	.451	.023	.000	.001							
	N	159	159	159	159	159	159	159	159	159						

LEV	Pearson Correlation	-.102	.307**	-.131	.459**	-.203*	.227**	-.049	-.289**	.205**	1					
	Sig. (2-tailed)	.200	.000	.100	.000	.010	.004	.544	.000	.010						
	N	159	159	159	159	159	159	159	159	159	159					
SIZE	Pearson Correlation	-.193*	.022	-.091	.044	-.019	.200*	-.098	-.119	.134	.351**	1				
	Sig. (2-tailed)	.015	.784	.252	.585	.816	.012	.220	.134	.092	.000					
	N	159	159	159	159	159	159	159	159	159	159	159				
Lagged ROE	Pearson Correlation	.349**	.719**	.485**	.516**	.216**	.041	.238**	-.036	.096	.370**	.083	1			
	Sig. (2-tailed)	.000	.000	.000	.000	.006	.611	.003	.651	.229	.000	.298				
	N	159	159	159	159	159	159	159	159	159	159	159	159			
Lagged ROA	Pearson Correlation	.333**	.549**	.705**	.156*	.378**	-.001	.213**	.132	.056	-.056	-.051	.732**	1		
	Sig. (2-tailed)	.000	.000	.000	.049	.000	.985	.007	.098	.484	.481	.520	.000			
	N	159	159	159	159	159	159	159	159	159	159	159	159	159		
Lagged TQ	Pearson Correlation	.515**	.368**	.345**	.410**	.132	-.105	.143	.086	.064	-.006	-.155	.397**	.421**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.098	.188	.073	.283	.425	.936	.052	.000	.000		
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	
Lagged MTB	Pearson Correlation	.423**	.486**	.166*	.734**	-.025	.011	.225**	-.084	-.008	.383**	.059	.514**	.177*	.654**	1
	Sig. (2-tailed)	.000	.000	.038	.000	.758	.894	.004	.293	.919	.000	.462	.000	.026	.000	
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

4-3- Checking regression assumptions

Based on regression plots (Appendix 1), the residual plots show a linear relationship between linear relationship between outcome variable and regressors therefore linearity assumption is not seriously violated since non-linear patters are not observed. In addition, residual plots report no funnel patterns which support that heteroscedasticity is not a serious problem to regression analysis. In addition, the histogram of residual and P-P plots show no significant violation to normality assumption. Furthermore, VIF value for all the regressors are below the value of 10 (Table 3 and 4), the highest VIF is 1.914 for concentrated ownership and hence multicolinearity is not a problem to regression analysis. Finally, Durbin–Watson test statistics (Table 3 and 4) vary between 1.822 and 2.083 which is very close to the cut-off point of 2 indicating the absence of residual autocorrelation. Therefore, it could be concluded that regression assumptions are reasonably satisfied hence the reported results are valid for generalization.

4-4- Regression analysis

Table (3) and (4) report the outputs of regression analysis for the association between board characteristics, ownership structure and firm performance.

Table (3): Regression analysis outputs – dependent variable ROA and Tobin's Q

	ROA				Tobin's Q			
	B	t	Sig	VIF	B	t	Sig	VIF
(Constant)	-3.078	-1.196	.234		1.324	5.272	.000	
BS	.600	3.583	.000***	1.227	.002	.097	.923	1.227
DUAL	1.824	1.400	.164	1.137	-.081	-.635	.526	1.137
MO	.068	1.432	.154	1.568	.003	.667	.506	1.568
GO	.073	2.389	.018**	1.761	.006	2.095	.038**	1.761
IO	.075	1.358	.176	1.329	.002	.448	.655	1.329
CO	.049	1.440	.152	1.914	.000	-.085	.933	1.914
INDUST	1.923	1.522	.130	1.164	-.309	-2.507	.013**	1.164
YEAR	-1.609	-1.355	.177	1.034	-.209	-1.804	.073*	1.034
LEV	-1.718	-.562	.575	1.474	-.261	-.874	.384	1.474
SIZE	-2.72E-08	-.610	.543	1.203	-9.59E-09	-2.203	.029**	1.203
Adjusted R Square	0.185				0.078			
F	4.592				2.333			
Sig.	.000				.014			
Durbin-Watson	2.208				1.918			

*** significant at the 0.01 level (2-tailed).
** significant at the 0.05 level (2-tailed).
* significant at the 0.10 level (2-tailed).

Table (4): Regression analysis outputs – dependent variable ROE and market-to-book value ratio

	ROE				market-to-book value ratio			
	B	t	Sig	VIF	B	t	Sig	VIF
(Constant)	-11.128	-2.011	.046		1.428	1.864	.064	
BS	.980	2.722	.007***	1.227	.027	.550	.583	1.227
DUAL	1.034	.369	.713	1.137	-.777	-2.002	.047**	1.137
MO	.095	.932	.353	1.568	-.005	-.368	.714	1.568
GO	.181	2.740	.007***	1.761	.018	1.979	.050**	1.761
IO	.121	1.020	.310	1.329	-.006	-.390	.697	1.329
CO	.059	.810	.419	1.914	-.017	-1.642	.103	1.914
INDUST	1.790	.659	.511	1.164	-.961	-2.555	.012**	1.164
YEAR	-6.118	-2.397	.018**	1.034	-.814	-2.304	.023**	1.034
LEV	29.910	4.550	.000***	1.474	5.738	6.304	.000***	1.474
SIZE	-1.08E-07	-1.122	.264	1.203	−2.35e-08	-1.767	.079***	1.203
Adjusted R Square	.221				.312			
F	5.480				8.151			
Sig.	.000				.000			
Durbin-Watson	1.942				2.053			

***. significant at the 0.01 level (2-tailed).
**. significant at the 0.05 level (2-tailed).
*. significant at the 0.10 level (2-tailed).

4-4-1- Board size

The result indicates a significant positive association between board size and performance as measured by ROA and ROE ($p < 0.01$). This means that companies with large boards outperform companies with small boards hence H_1 is supported. This result indicates that large boards encompass a wide range of knowledge, skills and experience including professional background and accounting experience. This supports the board's role in formulating and implementing companies' strategies, making informed judgements which consequently enhance firm performance. This result also supports the claim of stewardship theory that managers work for the best interest of shareholders since large boards may provide better monitoring compared to small boards. However, this result challenges Jensen's claim (1993) that large board negatively influences firm performance. This result is consistent with that of Zhao (2003), Haniffa and Hudaib (2006), Henry (2008), Isshaq et al. (2009) and Shin-Ping and Tsung-Hsien (2009). However, it contradicts with the result of Yermack (1996) and Guest (2009) who show that board size and performance are negatively related. Emile et al. (2014) find no association between board size and performance in the Egyptian context.

4-4-2- Role Duality

The result reports a significant negative relationship between role duality and performance based on market-to-book value ratio ($p < 0.05$). This means that the market perceives role duality as a threat to firm performance since companies with no role duality have better performance compared to companies with role duality and hence H_2 is accepted. In line with the expectation of agency theory, this result supports the separation between CEO and chairman of the board position since this separation may hinder the dominance of CEO on the board and may prevent CEO from pursuing self-interest maximization. In addition, this separation may support the effective monitoring role of the board on top management. This result is consistent with that of Zhao (2003). However; it contradicts with that of Weir and Laing (2000), Weir et al. (2002), Han et al. (2004), Henry (2008), Ghazali (2010) and Emile et al. (2014) who show that role duality and performance are non-significantly related.

4-4-3- Managerial ownership

The result indicates a non-significant association between managerial ownership and performance ($p > 0.10$). This means that managerial ownership has no influence on firm performance and though H3 is not supported. This result may be justified on the ground that management in Egyptian companies owned a small stake of stocks or may be stock-based compensation scheme is not a common practice in Egypt. Consequently, the link between shareholders and management interest is very weak. Chen et al. (2003) argue that the alignment between shareholders' and management's interest occur only at high levels of managerial ownership and this is not the case of Egypt. This result is consistent with the result of Weir and Laing (2000), Ghazali (2010) and Pham et al. (2011) who find a non-significant association between managerial ownership and firm performance. However, the result is contradicted with that of Chen et al. (2003), Zhao (2003) and Han et al. (2004) who document a positive association between the two variables while Weir et al. (2002), Henry (2008) and Shin-Ping and Tsung-Hsien (2009) find a U-shaped association between the two variables.

4-4-4- Governmental ownership

The result reports a significant positive relationship between governmental ownership and firm performance ($p < 0.05$). This means that firms with higher

governmental ownership outperform companies with lower governmental ownership hence H_4 is accepted. This result confirms that government keeps a close eye on its investment and plays an effective role in monitoring and disciplining management. In addition, firms with higher governmental ownership may receive the support of the government so they may obtain finance at favourable conditions and stay safe from aggressive competition. In the Egyptian context, the Accountability State Authority (ASA) should audit the financial statements of any company if the governmental ownership is 25% or more. The ASA performs operational auditing and checks management efficiency in using their resources. This is a possible reason to motivate the management to enhance firm performance if they work under the scrutiny of ASA. This result is consistent with that of Han et al. (2004), Ang and Ding (2006), Aljifri and Moustafa (2007), Ghazali (2010) and Al-Saidi and Al-Shammari (2015). However, the result is inconsistent with that of Shin-Ping and Tsung-Hsien (2009), Mollah et al. (2012) and Alipour (2013) who find that governmental ownership and performance are negatively associated.

4-4-5- Institutional ownership

The result indicates a non-significant relationship between institutional ownership and performance ($p > 0.10$). This result highlights that institutional ownership has no effect on firm performance therefore H5 is not supported. This result indicates that institutional investors do not use their voting rights properly and they are less active in monitoring top management. In addition, institutional investors and other investors may depend on each other in monitoring management activities or may be a conflict of interest between institutional investors and other investors exists and so institutional investors refrain from exercising effective monitoring role. According to Shin-Ping and Tsung-Hsien (2009), institutional investors refrain from performing their monitoring duties because they acquire information directly from the company through their identity as active shareholders or maybe they receive some privilege from other activities in the company. Therefore, efficient monitoring hypothesis is not supported in the Egyptian context. This result is consistent with that of Aljifri and Moustafa (2007), Al-Saidi and Al-Shammari (2015) and Shahwan (2015). However, this result is contradicted with that of Henry (2008), Alipour (2013) and Desoky and Mousa (2013) who find a positive relationship between institutional

ownership and firm performance while Zhao (2003) and Al Farooque et al. (2007) document a negative association between the two variables.

4-5-6- Concentrated ownership

The result reports a non-significant relationship between concentrated ownership and performance ($p > 0.10$). This means that large shareholders have no influence on performance hence H_6 is not supported. This result may reflect that large investors are unaware about their important role in monitoring and disciplining top management. This result is consistent with the result of Weir and Liang (2000), Weir et al. (2002), Lei and Song (2012), Al-Saidi and Al-Shammari (2015) and Shahwan (2015). However, this result is conflicted with that of Shin-Ping and Tsung-Hsien (2009) and Alipour (2013) who find a negative association between institutional ownership and performance while Kapopoulos and Lazaretou (2007) and Christensen et al. (2010) show that the two variables are a positively related.

4-5-7- Control Variables

The result confirms that leverage positively influence firm performance as measured by ROA and MTB. In addition, the result documents a significant negative association between firm size, industry and firm performance as measured by market-based performance measures. This means that small size firms, firms with high leverage and firms belong to non-manufacturing industries companies outperform large size firms, firms with low leverage and firms belong to manufacturing industries. In addition, the companies performance in 2008 and 2009 is better that that of 2010 and 2010 this may reflect the effect of the Egyptian revolution in 2011.

4-5-8- Endogeneity Problem

More caution in corporate governance literature has been given to the problem of endogeneity (Demsetz and Villalonga, 2001; Eisenberg et al., 1998). Endogeneity refers to the reverse association between dependent variable and independent variables and the correlation between error term and the independent variables due to omitted variables (Sun et al., 2002). The main assumption of this literature that corporate governance and ownership structure influence firm performance (Rose, 2005). In other words, the impact runs from corporate governance and ownership structure to performance therefore corporate governance, ownership structure and firm performance could be considered endogenous variables (Demsetz and

Villalonga, 2001; Eisenberg et al., 1998; Pham et al., 2011). Consequently, caution should be exercised in estimating this relationship since performance can affect corporate governance and ownership structure.

One solution to this problem is employing instrumental variables analysis which requires the use of instrument variables that is correlated with a given independent variable (ownership structure) and uncorrelated with the dependent variable (firm performance) (Rose, 2005). Then, a two steps least square regression (2SLS) is employed. However, Wintoki (2007) argues that this will not be an easy task. Another solution to endogeneity problem is using a lagged dependent variable (Haniffa and Hudaib, 2006; Pham et al., 2011; Weir et al., 2002; Yermack, 1996) or lagged independent variable (Conheady et al., 2015). Due to the nature of the data used in this study, a lagged dependent variable (firm performance) is employed as an independent variable. Four lagged performance variables (LAGROA, LAGTQ, LAGROE and LAGMTB) are included in Eq.1 as independent variables. The regression results are reported in Table 5 and 6.

The result (Tables 5 and 6) confirms a positive association between board size and performance (ROA and ROE) and a negative association between concentrated ownership and firm performance (market-to-book value ratio). Furthermore, the results report a non-significant association between role duality, governmental ownership, institutional ownership, managerial ownership and performance. However, this result should be interpreted with caution due to significant association between performance and lagged performance. The correlation (Table 2) between ROA and lagged ROA is 0.705, the correlation between Tobin's Q and lagged Tobin's Q is 0.515, the correlation between ROE and lagged ROE is 0.791. Finally, the correlation between market-to-book value ratio and lagged market-to-book value ratio is 0.734. Therefore, it is suggested that future research could address endogeneity problem via the use of 2SLS.

Table (5): Regression outputs – lagged performance variables: lagged ROA and lagged Tobin's Q

	ROA				Tobin's Q			
	B	t	Sig	VIF	B	t	Sig	VIF
(Constant)	3.423	1.546	.124		1.498	6.756	.000	
BS	.367	2.654	.009***	1.273	-.008	-.525	.601	1.242
Dual	.652	.612	.541	1.155	-.012	-.105	.917	1.158
MO	-.023	-.576	.566	1.680	7.81E-05	.019	.985	1.590
GO	.006	.240	.811	1.925	.002	.844	.400	1.857
IO	.025	.557	.578	1.350	-.001	-.305	.761	1.349
CO	-.023	-.802	.424	2.082	-.004	-1.270	.206	1.958
INDUST	1.498	1.459	.147	1.167	-.270	-2.479	.014**	1.174
Year	-.449	-.461	.645	1.053	-.154	-1.504	.135	1.046
LEV	-1.771	-.714	.476	1.474	-.305	-1.167	.245	1.475
SIZE	-5.72E-09	-.158	.875	1.208	-4.14E-09	-1.060	.291	1.256
LAGROA	4.768	8.824	.000***	1.274				
LAGTQ					.359	6.610	.000***	1.153
Adjusted R Square	.464				.292			
F	13.421				6.889			
Sig.	.000[b]				.000[b]			
Durbin-Watson	2.083				1.822			

*** significant at the 0.01 level (2-tailed).
** significant at the 0.05 level (2-tailed).
* significant at the 0.10 level (2-tailed).

Table (6): Regression outputs – lagged performance variables: lagged ROE and lagged market-to-book value ratio

	ROE				market-to-book value ratio			
	B	t	Sig	VIF	B	t	Sig	VIF
(Constant)	6.148	1.206	.230		2.691	3.890	.000	
BS	.539	1.760	.080*	1.268	.010	.239	.811	1.233
DUAL	-.275	-.117	.907	1.143	-.564	-1.653	.101	1.155
MO	-.061	-.697	.487	1.649	-.010	-.837	.404	1.574
GO	.034	.579	.564	1.954	.005	.613	.541	1.862
IO	.048	.484	.629	1.340	-.015	-1.066	.288	1.338
CO	-.066	-1.050	.295	2.038	-.023	-2.555	.012**	1.920
INDUST	1.634	.720	.473	1.164	-.901	-2.732	.007	1.169
YEAR	-3.556	-1.649	.101	1.057	-.711	-2.295	.023**	1.039
LEV	14.126	2.421	.017**	1.661	3.261	3.746	.000***	1.775
SIZE	-5.50E-08	-.684	.495	1.211	-4.67E-09	-.393	.695	1.267
LAGROE	10.268	8.053	.000***	1.447				
LAGMTB		1.206	.230	1.268	1.231	6.896	.000***	1.233
Adjusted R Square	.456				.481			
F	13.027				14.204			
Sig.	.000[b]				.000[b]			
Durbin-Watson	1.841				1.912			

***.significant at the 0.01 level (2-tailed).
**. significant at the 0.05 level (2-tailed).
*. significant at the 0.10 level (2-tailed).

5- Conclusion, recommendations and limitations

This research examines the relationship between board characteristics, ownership structure and performance. Board characteristics include board size and role duality while ownership structure includes managerial ownership, governmental ownership, institutional ownership and concentrated ownership. The sample consisted of the 50 most active companies listed on the Egyptian stock exchange from 2008 to 2011. Financial institutions such as banks, investment funds, investment and financial services companies and insurance companies were excluded due to their peculiar activities and regulation. Regression analysis results report a significant positive relationship between board size, governmental ownership and performance. In addition, the results report a significant negative relationship between role duality and performance. This means that companies with large boards, large governmental ownership and companies with no role duality outperform companies with small boards, small governmental ownership and companies with role duality. It seems that large boards combine a variety of experience, knowledge and professional background which support the monitoring function of the board and positively enhanced firm performance. In addition, the government keep close eyes to its investment. The ASA performs a significant monitoring function regarding firm performance and sheds light on operational problems that companies may encounter therefore tackling those problems may enhance firm performance. Furthermore, role duality is a major threat to firm performance. Combining the power of both the CEO and board chairman in one hand may disable the monitoring function of the board of directors and negatively influence firm performance. Moreover, it seems managerial ownership fails to link shareholders' and management's interest is very weak and the assumption of alignment of interest needs more investigation in the Egyptian context. Finally, institutional investors and concentrated ownership do not use their voting rights properly to monitor the management and enhance firm performance.

This study may offer several implications to policy makers and investors. Policy makers and regulators may benefit from the results of this study and work on improving the monitoring role of board of directors and ownership. Furthermore, the results of this study may assist the investors to appreciate the relationship between corporate governance and performance. Therefore, investors can rationalize their

investment decisions. Based on these findings, several recommendations could be presented to policy makers:

1- The Egyptian stock exchange and the Egyptian Financial Supervisory Authority (EFSA) should encourage listed companies with small boards to increase the size of the board of directors through the inclusion of directors with distinguish professional experience and knowledge.

2- The Egyptian stock exchange and the EFSA should encourage listed companies to separate the position of the CEO and board chairman since role duality is a deter to firm performance.

3- The government should support the monitoring role of ASA due to positive implications on firm performance.

4- The Egyptian stock exchange and the EFSA should foster the advantages of stock-based compensation scheme and encourage listed companies to use this scheme in linking the interest of both management and shareholders and enhance firm performance.

5- The Egyptian stock exchange and EFSA should encourage institutional and large investors to use their voting rights to discipline companies' management and effectively monitor management's decisions.

This study suffers from some limitations. First, this study focuses only on board size and role duality as board characteristics while the influence of board independence on performance was not examined due to data unavailability. Second, this study tackles endogeneity problem through using lagged dependent variable. However, it is suggested that future research may use different methods such as 2SLS or generalized method of moments. Third, this study, similar to most of the literature, assumes a linear association between performance and ownership structure. However, the relation may take a U-shaped relationship. Future research may address this point. Fourth, this study focuses on the most active 50 listed companies so it is better that future research expands the sample to include more listed companies. Fifth, future research may address the association between the existence of risk committee and performance.

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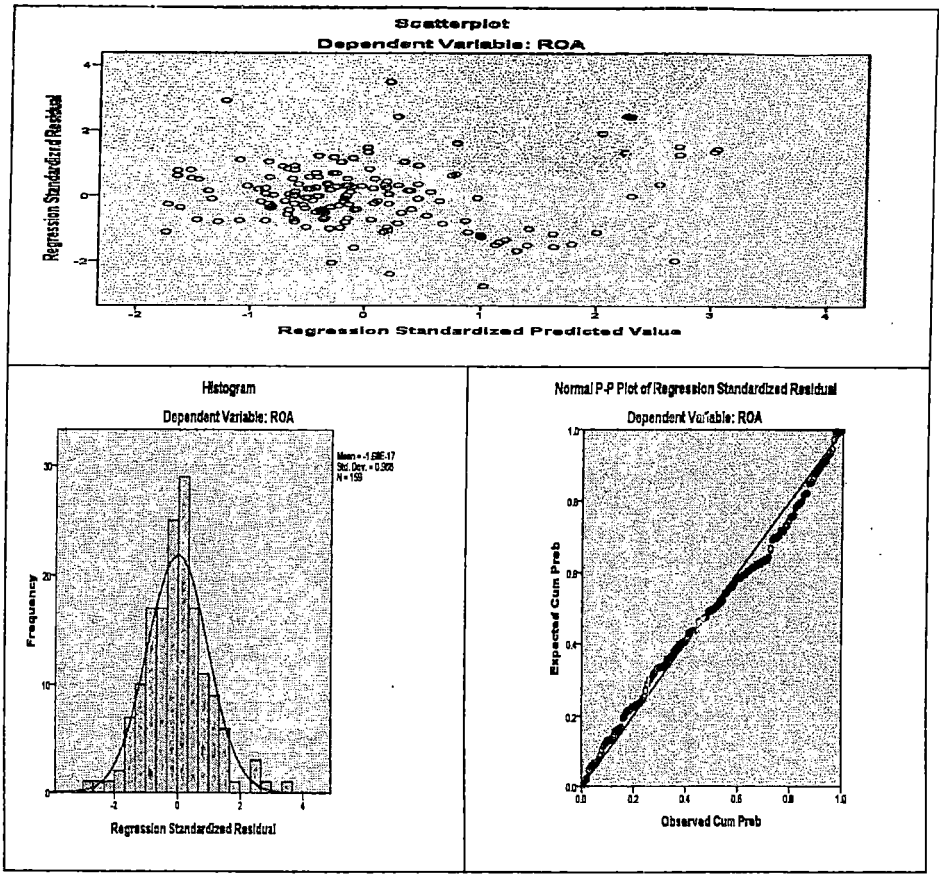
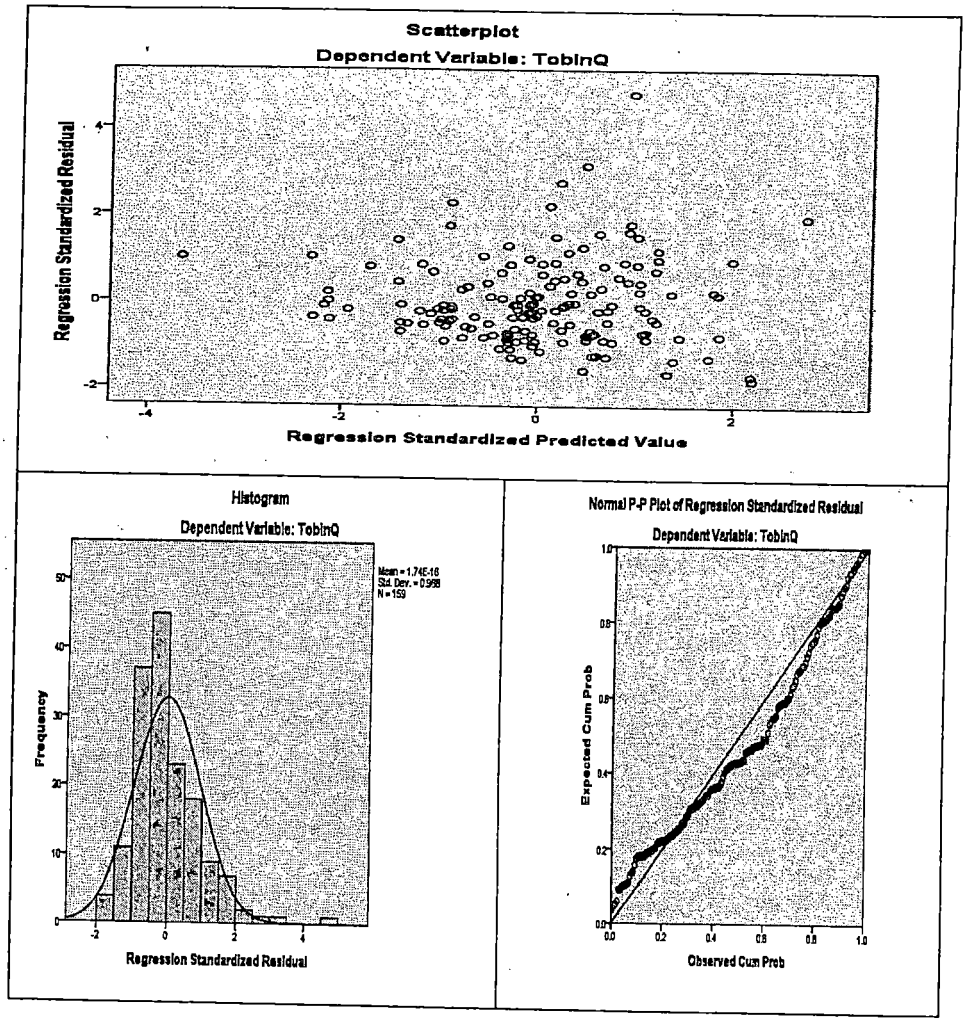
Appendix (1): Regression Residual Graphs

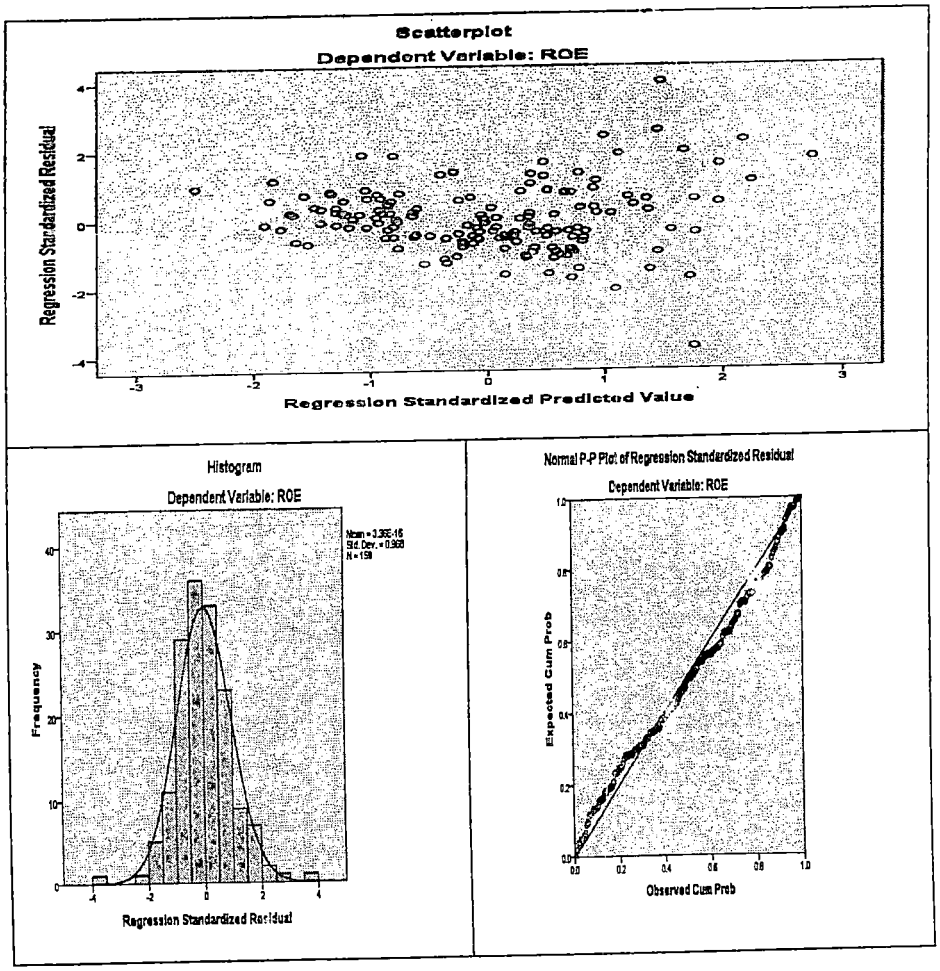
1- Dependent variable: ROA



2- Dependent variable: Tobin's Q



3- Dependent variable: ROE



4- Dependent variable: market-to-book Value ratio