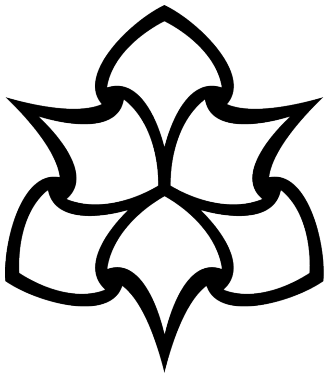

Corporate Finance Practices and Corporate Governance Effect on Firm Performance and Information Leakage in Saudi Arabia

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Dedication

First and foremost, this thesis and endeavour is dedicated with deep love to my parents, to the soul of my father who passed away fifteen years ago, as well as my beloved mother whose wishes to see me happy all the time. It is to them that I owe all of the moments of my life and I appreciate all of their care, inspiration, support and effort.

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In the name of Allah, the Most Compassionate, the Most Merciful

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From the bottom of my heart, I send special thanks to my wife Afrah, who was beside me throughout my long PhD journey. Without her support and inspiration, I would not have been able to focus and work for such a long time on my thesis. I thank my little sons, Zyad and Moaiad, who spread joy and happiness in my life, for their patience with their busy father.

Declaration

I declare that no material contained in the thesis has been used in any other submission for another academic award.

Presentations related to this thesis were undertaken at different conferences:

- Corporate finance practices and performance: evidence from Saudi Arabia, at the RIBM Doctoral Symposium – March 2014 – Business School, MMU, UK.
- The corporate governance effect on information leakage and performance: evidence from Saudi Arabia, at the British Accounting and Finance Association (BAFA) – Doctoral Conference – March 2015 – University of Manchester, UK.
- The corporate governance effect on information leakage and performance: evidence from Saudi Arabia, at the British Accounting and Finance Association (BAFA) – Doctoral and Annual Conference – March 2016 – University of Bath, UK.

Abstract

The major aim of this thesis is to investigate corporate finance practices, as well as the effect of corporate governance mechanisms on firm performance and information leakage in Saudi Arabia. Saudi Arabia is a major state among developing and Middle Eastern countries, characterised by certain economic and financial differences in contrast with other advanced and developing countries. Little consensus exists with regard to the means through which firms should come to corporate financial decisions. Therefore, a scant number of studies have conducted comprehensive surveys into corporate finance practices, covering capital budgeting, cost of capital, capital structure and dividends. These studies have indicated that firm practices are not always in accordance with academic rules and theories. Regardless of such evidence, no research has been undertaken to explore the discrepancy between financial theories developed in western markets and the corporate financial practices of Saudi firms. Therefore, as far as I am aware, this thesis is the first study seeking to fill this literature gap, providing a contribution to the literature in the form of a comprehensive investigation of corporate finance decision making in Saudi Arabia. To execute this investigation, a draft survey was devised and distributed to the CFOs of all Saudi listed firms. Analysis of the responses indicated that popular techniques were IRR and NPV, for capital budgeting and earnings yield assessments of equity costs. The Zakat rate is the tax rate utilised by 94.2% of Saudi firms, with support present for the pecking-order theory and the trade-off theory. Furthermore, Saudi firms have a long-term target pay-out ratio, while strong support is indicated for the bird in hand theory and signalling mechanism. Moreover, one of the major issues relating to the Saudi market has been the emergence of insider trading and information leakage. Additionally, in 2006 the Saudi stock market crashed, producing a negative influence on investor confidence. Subsequently, Saudi Arabia's Capital Market Authority

(CMA) issued corporate governance regulations; in 2009, the CMA began enforcing these regulations on all Saudi listed firms, as a means of enhancing market transparency and credibility. Despite the significance of these regulations, no existing research has assessed the effect of these regulations on the information leakage phenomenon, or the impact of regulations on firm performance post-2009. Therefore, to the best of my knowledge, this is the first study investigating the effect of these governance mechanisms on information leakage, in addition to firm performance for the post-2009 period. To undertake this examination, information leakage was identified on the basis of cumulative abnormal returns (CARs), prior to quarterly and annual earnings announcements. Three models were utilised to calculate abnormal returns, namely the constant mean return model, market adjusted model and market model. Three measures were applied for firm performance: return on assets (ROA); return on equity (ROE), alongside Tobin's Q. Additionally, for the regression analysis, the System Generalized Methods of Moments (GMM) was adopted as a control for autocorrelation, heteroscedasticity, heterogeneity and endogeneity. The findings indicated that significant information leakage and CARs was present prior to the official quarterly and annual earnings announcements. Besides, the information leakage level before quarterly earnings announcements for the period 2006-2008 were greater than for 2009-2014. Additionally, the results indicated the negative effect of ownership concentration, government ownership and board subcommittees' presence on firm performance. Institutional ownership, director ownership, managerial ownership, board size and audit committee size were positively correlated to firm performance. Moreover, the results confirmed that ownership concentration, board size and frequency of board meetings have a positive influence effect on information leakage, whereas institutional ownership, director ownership, board subcommittees' presence and audit committee size all have a negative impact on information leakage.

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Chapter 1: Introduction

1.1 Background and Motivation

This research presents the outcomes of an examination of corporate finance practices, alongside the impact of corporate governance on firm performance and information leakage in Saudi Arabia. Saudi Arabia is a major country in the developing and Islamic world, while also being an important country in the Middle East. Saudi Arabia represents a different and unique context compared with other countries. Moreover, the relationship between corporate governance, firm financial performance and information leakage has been a fundamental concern in corporate governance research. This study is the first to comprehensively investigate corporate finance practices, in addition to the impact of corporate governance components on firm information leakage in Saudi Arabia. Furthermore, this is the first investigation examining the effect of corporate governance components on firm performance for the period following the corporate governance codes becoming obligatory for all listed firms in the Saudi market.

A specific emphasis has been placed on investigating the optimal corporate finance decisions that firms should formulate and implement. Although corporate finance theories have been subjected to empirical testing, little consensus exists in terms of the way in which firms should decide on corporate financial decisions. Very few studies have provided a comprehensive survey into corporate finance practices covering an array of areas of corporate finance practice, for example capital budgeting, capital costs, capital structure and dividend. One of the few studies that has is the ground-breaking investigation by Graham and Harvey (2001), providing a comprehensive survey of corporate finance practices in the U.S. market. Graham and Harvey (2001) hoped:

> “that researchers will use our results to develop new theories and potentially modify or abandon existing views. We also hope that practitioners will learn from our analysis by noting how other firms operate and by identifying areas where academic recommendations have not been fully implemented” (p.188).

Furthermore, Graham and Harvey's (2001) research indicated that the financial decision-making process of firms is not inevitably in line with academic rules and theories, a proposition that stimulated other researchers to replicate the survey in other contexts and countries. Adopting similar surveys to Graham and Harvey (2001), Anand (2002) revealed the corporate finance practices of Indian firms, while Brounen et al. (2004) studied the corporate finance practices of European firms. Furthermore, Maquieira et al. (2012) implemented the same survey in order to examine corporate finance practices in South America. All of the survey outcomes indicated that little understanding exists of the relationship between the theory and practice behind corporate financial decision-making, with results suggesting that firms’ financial decision-making processes are not always in accordance with academic theories and explanations.

Nevertheless, regardless of such evidence, few investigations have focused on listed companies in developed countries, for example the USA European countries, South American countries or India. Furthermore, restricted research has been conducted on developing countries, particularly in the Middle East. Specifically, no research has been dedicated to corporate financial decision making practices in the Saudi Arabian market, despite Saudi Arabia representing a distinctive business and financial system and environment, compared with, for example, India the USA or European countries. Therefore, this PhD thesis seeks to contribute to filling this literature gap, through a comprehensive investigation of corporate finance decision making practices, in order to determine whether theories

and polices extracted from the western market are aligned with the decisions and practices of financial managers in Saudi Arabia.

Saudi Arabia has a distinctive environment and characteristics, compared with other countries. One such unique characteristic is the absence of a tax system, meaning that there is no individual or corporation taxed on their salary or investment earnings. A tax system is essential in the majority of countries, while also being associated with several theories and tenets of corporate finance. For example, the tax effect theory proposes that shareholders do not prefer to receive dividends, if the tax on dividends is higher than the tax on the capital gains, because the firms can invest the difference in other investments (Brennan, 1970). Additionally, Saudi Arabia is characterised by the bond market still being at a nascent stage compared with other countries, while the financial system is dominated by Islamic finance. The provision of Islamic financing services and products is not reliant upon the interest rate, as well as being distinct from the popular financing methods offered in other countries. This has resulted in Saudi firms adjusting their policies and practices, in order to deal with these differences. As mentioned, Saudi Arabia is a major country in the Islamic and Arab world, the sole Arab country in the G20 and is positioned as one of the largest oil producing countries internationally. Moreover, Saudi Arabia is one of the largest economies and stock markets in the Gulf region, comprising 47% of Arab Gulf States' GDP (Ali, 2013). Globally, Saudi GDP is the 19th largest (Ali, 2013).

Although Mutairi et al. (2009) undertook survey-based research into the corporate finance practices of Kuwaiti firms, which are based in the Gulf Region, the results cannot be considered transferrable to the Saudi market and firm context, as a result of the substantial differences between the Kuwaiti and Saudi Arabian economies, business environments and regulations. Brounen et al.'s (2004) research indicated the differences between the corporate finance practices of

European countries, regardless of certain similarities in their economic environments. Additionally, Dahel and Laabas (1998) confirmed several discrepancies between the GCC stock markets. As noted, Saudi Arabia is the Gulf region's largest economy and stock market, with 47% of Arab Gulf States' GDP (DeAngelis, 2011). Therefore, the Kuwaiti economy is evidently much smaller compared with the Saudi economy (Ali, 2013). Besides, Saudi Arabia is the sole Arab country in the G20, while also being one of the world's largest oil producing countries. Thus, it is crucial for this research to determine the corporate finance practices in Saudi Arabia.

Furthermore, the financial crises and scandals occurring in developed countries during the last decade have drawn greater attention to corporate governance at both the local and international level, with a focus on the need to increase transparency and protect all shareholders' rights (Kirkpatrick, 2009). Moreover, in 2006 there was the Saudi stock market crash, which prompted by the loss of investor confidence. Resultantly, Saudi Arabia's Capital Market Authority (CMA) initiated reform and development of the market by issuing corporate governance regulations to interested parties, as a means of enhancing market transparency, credibility and accountability (Samba Financial Group, 2009). A major issue within the Saudi market was the emergence of activities such as insider trading, alongside information leakage in the market prior to a firm's public announcement. Alzahrani and Gregoriou (2010) undertook research into the Saudi market that indicated there was a significant amount of asymmetrical information present before the official earnings announcement date, confirming that private acquisition of information had occurred.

In an efficient market, all shareholders would simultaneously obtain all information and announcements concerning the listed firms. However, in reality certain investors can acquire crucial, leaked information relating to the firm prior to

the information's public release (Brunnermeier 2005). Consequently, transparency in the market and firms' announcements is a principal aspect of efficient corporate governance regulations, because shareholders and investors in financial markets anticipate receiving precise and complete firm disclosures, thus enabling them to make appropriate decisions based on a basic assessment of a firm (Heggen and Gannon, 2008; Tsai, 2014). The OECD (2004) proposed that efficient corporate governance regulations should result in greater reliability and transparency concerning firms' disclosures, which should help to preserve stockholders' interests. Therefore, the important objectives of corporate governance include protecting financial disclosures, alongside encouraging firms to generate a transparent environment through control and monitoring systems (Koh et al., 2007).

The Saudi Corporate Governance Regulations (CGRs), which were legislated for in 2006, aim to enhance the responsibility and transparency of both Saudi firms and the overall market. Initially, the CGRs were released solely as a guideline, although from 2009, the CGRs became obligatory for all Saudi listed firms. The Saudi Capital Market Law prohibited the leaking of inside information for insider trading, deeming it an illegal act (CMA 2009). Nevertheless, the Saudi authorities need to continuously assess the situation, as a means of examining the extent of information leakage in the market and to assess the efficiency of the existing CGRs in terms of diminishing the degree of information leakage. Despite there being several studies exploring the relationship between corporate governance mechanisms and information leakage, no evidence or research to date has considered whether or not such corporate governance mechanisms have affected and diminished the degree of information leakage in the Saudi market. Consequently, this research provides a valuable contribution, being the first research to investigate the relationship between corporate governance mechanisms and information leakage in such a context. Additionally, Klapper and Love (2004)

proposed that optimal corporate governance has a positive impact on firm performance, as it can be perceived as an obligation that firms are obliged to adhere to, in order to undertake the necessary procedures for effective capital investment. Moreover, Morey et al. (2009) indicated that effective corporate governance will maximise investors' wealth in emerging markets. Even though few studies examined the relationship between CGRs and performance in the Saudi market such as the study of Al-Matari et al. (2012) and Ezzine (2011), these studies have several limitations and did not cover the period from 2009 when the CGRs became mandatory on all Saudi listed firms. Therefore, this thesis also seeks to investigate the effect of existing corporate governance regulations on Saudi firms' performance, being the first study investigating the relationship between CGRs and firm performance prior to and after 2009, when the CGRs began to become obligatory for all Saudi listed firms.

1.2 Initial Methodological Considerations

As a means of investigating corporate finance practices in Saudi Arabia, this research devised a draft survey that is similar to that developed by Anand (2002). However, certain modifications were introduced in order to make the questionnaire more relevant to the Saudi market. Moreover, the research adopted one question from Graham and Harvey's (2001) survey concerning capital structure practices. The draft survey concerns the practices of cost of capital, capital budgeting, capital structure and dividend. As the chief financial officers (CFOs) play an essential role in shaping Saudi companies' financial decisions, the sample included all CFOs of Saudi listed firms until the end of May 2015, totalling 165 listed firms. 52 completed responses were obtained, providing a response rate of almost 31.51%. The survey results indicated interesting outcomes. For example, IRR and NPV are popular capital budgeting techniques, with earnings yield being a common approach for

assessing equity costs. Additionally, the Zakat rate is the tax rate adopted by 94.2% of the Saudi listed firms. The outcomes of capital structure questions provide clear evidence in terms of the pecking-order theory and the trade-off theory. Saudi firms have a long-term pay-out ratio, while strong support exists for the bird-in-the-hand theory and signalling mechanism. The results showed also that the corporate finance practices of Saudi firms are not always the same as Kuwaiti firms.

In addition, in order to examine the impact of Saudi CGRs on firm performance and information leakage, this thesis utilised a sample that included all Saudi listed firms up until the end of 2014. By that time, there were 163 listed firms. The research was based on two types of data, namely the firms from every sector and non-financial firms, as well as two time period, between 2006 and 2014 and from 2009 to 2014. The years between 2006 and 2014 enabled the research to investigate the firms prior to and following the period when CGRs became obligatory for all firms. Additionally, the period between 2009 and 2014 saw an increased in listed firms in the Saudi market. Furthermore, the research undertook a comprehensive literature review, in order to build the research hypotheses for the anticipated relationship between the corporate governance variables, firm performance and information leakage. As a means of testing these hypotheses, the research adopted the multivariate regression model, examining the effect of corporate governance components on firm financial performance and information leakage. The balanced panel data was applied, permitting the research to utilise time series and cross-sectional data. An array of statistical tests have to be conducted in order to confirm the presence of the ordinary least square (OLS) assumptions, enabling a determination of whether any of these assumptions have been violated. The statistical tests concluded that the research models are influenced by the problem of serial correlation, heteroscedasticity and endogeneity. Consequently, the simple OLS are not valid and are inappropriate for this research,

because biased and unreliable results will be obtained. Therefore, the Generalized Methods of Moments (GMM) estimator is adopted, because it is designed specifically for data comprising of endogeneity variables, unobserved heterogeneity, heteroscedasticity and autocorrelation between individuals.

1.3 Research Aims

This thesis aims to reveal the corporate finance and governance decisions of Saudi firms and to what extent the governance decisions affect the firm performance and information leakage.

1.4 Research Objectives

To achieve the research aims, the research set the following objectives:

- To reveal the corporate finance decisions of Saudi Arabian firms.
- To examine the effects of corporate governance decisions of Saudi Arabian firms on their performance.
- To determine the extent of information leakage in the Saudi Stock Exchange market.
- To investigate the effects of corporate governance decisions of Saudi Arabian firms on their information leakage.

1.5 Research Questions

Based on the defined major objectives of this thesis, the main thesis questions that the research seeks to answer are:

- What are the corporate finance practices of Saudi firms?
- To what extent do CGRs affect firms' performances in Saudi Arabia?
- To what degree is information leakage extant within the Saudi Stock Exchange?

- To what degree does corporate governance impact upon information leakage in Saudi Arabia?

1.6 Research Contributions

Saudi Arabia is the major country in the Middle East and the Islamic world, and the sole Arab country in the G20. Moreover, it has a different financial system and business environment compared to the west and other developing countries for example it is characterised by the absence of tax systems, an undeveloped bond market, and intensive Islamic financial products and services. Therefore, the research findings will provide valuable contributions to the researchers, practitioners, and participants. The research contributions to the various literatures and academicians, practitioners, and firms can be summarised as follows:

- This research is the first study that conducts a comprehensive investigation into the corporate financial decisions and practices that includes capital budgeting, cost of capital, capital structure, and dividend practices in Saudi firms. Therefore, this research offers a valuable contribution to the literatures by showing the gap between the theories and models that were developed in western world and the corporate financial practices in a country which greatly differs from western and developing countries. It is hoped that the thesis findings will be used by investigators to evaluate, develop, or modify the current corporate financial theories and models. In addition, firms can use the findings to compare their practices with other firms' practices which may enhance their financial decisions. Besides, the research will provide to the Saudi business schools how Saudi firms utilise and practice the corporate finance theories and models that are taught at the school.
- From 2009, the CMA started to make several governance codes obligatory for all Saudi listed firms in an attempt to improve the firm and the market. This

research is the first study that examines the effect of Saudi corporate governance mechanisms on firm performance in the period before and after the year 2009. In addition, according to my current knowledge, it is the first study that investigates the effect of institutional ownership, government ownership, and managerial ownership on firm performance in the Saudi market. In addition, this study will provide to literatures new findings determining the relationship between corporate governance mechanisms and firm performance which were analysed by applying the dynamic model, the System GMM model, three measures of firm performance, two types of data, and the context of Saudi Arabia that consists of several differences in comparison to other developed and developing countries. In addition, as this research covers the period before and after governance codes became obligatory for Saudi's listed firms. Therefore, the findings would help the CMA to assess and review the market reform and improve the current governance mechanisms.

- This research is the first study that investigates the extent and presence of information leakage incidents and cumulative abnormal returns prior to the quarterly and annual earnings announcements during the period before and after 2009. Therefore, the findings of this research would provide the Saudi CMA with the necessary evidence and proof of the effect of their market reform and the application of CGRs on the market and firm transparency as well as the level of information leakage before and after 2009.

- This research is the first study that examines the influence of corporate governance components on information leakage in the Saudi market. Examining the relationship between corporate governance mechanisms and firm information leakage is fairly limited in the literatures; therefore, this research would significantly contribute to researchers' knowledge, especially since this research adopted two types of data to compare the results and applied the

System GMM model to control autocorrelation, heteroscedasticity, heterogeneity, and endogeneity. This enabled the research to provide valid and accurate results. In addition, the findings provided the firms with a greater understanding of which corporate governance mechanisms are likely to reduce the level of information leakage and which ones have a positive influence on the level of information leakage. Besides, this findings will enable the CMA to assess the current market reform and lead the CMA to reform, change, or improve the current codes which show a positive or non-significant influence on the firm information leakage and information asymmetry.

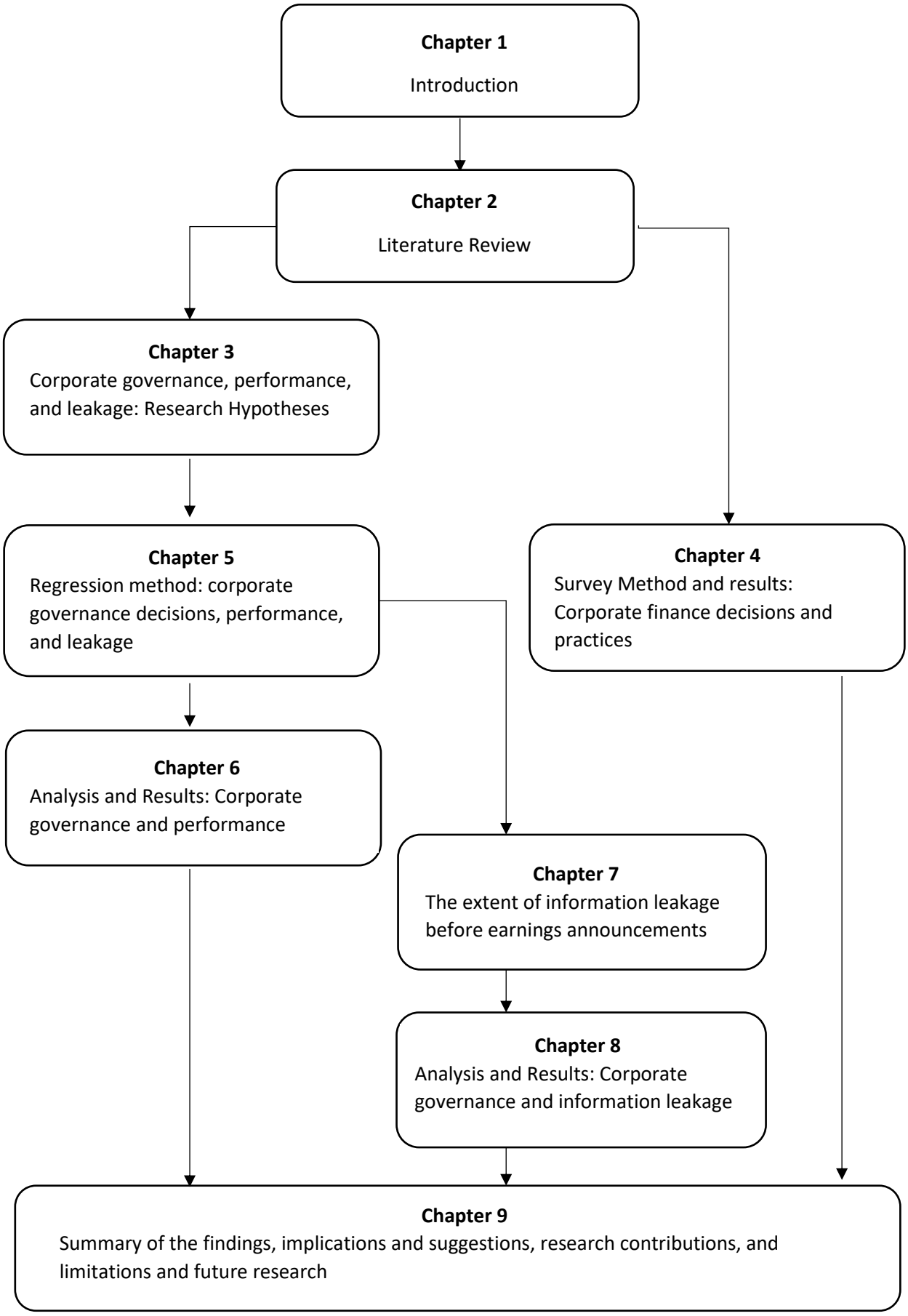
1.7 Thesis Structure

This thesis is structured into nine chapters, investigating corporate finance practices and the impact of corporate governance mechanisms on Saudi Arabian firms' performance and information leakage prior to earnings announcements. **Chapter 1** discusses the research background and motivations, as well as introducing the research objectives and questions. Furthermore, it presents the thesis' major research contributions and the organisation of the thesis. **Chapter 2** presents the literature review and theoretical background for the major areas of corporate finance, including capital budgeting, cost of capital, capital structure and dividends. Following this, it reviews previous survey studies pertaining to corporate finance practices. Additionally, the chapter provides an assessment of the literature concerning corporate governance mechanisms, market efficiency and transparency, as well as information leakage and insider trading. **Chapter 3** evaluates and reviews the literature and prior empirical studies pertinent to investigating the anticipated relationship between each corporate governance component, firm performance and information leakage. Subsequently, a research hypothesis is constructed for each relationship. The chapter is divided into two main

sections. The first concerns the research hypotheses relating to the board of directors' characteristics, while the second part presents the research hypotheses for ownership structure characteristics. **Chapter 4** outlines the research methodology for exploring corporate finance practices in Saudi Arabia. It presents the survey design, sample identification and the methods utilised to deliver and receive the responses. This chapter also provides an interpretation and discussion of the survey results. **Chapter 5** explains the research methodology for determining the association between corporate governance components, firm performance and information leakage, prior to official earnings announcements. The discussion illustrates the assumptions based on the Ordinary Least Squares (OLS) model and the Generalized Methods of Moments (GMM) estimator. Subsequently, the sample and variables are outlined, with the descriptive statistics outlined pertaining to the independent and control variables, which are utilised to perform the regression analysis of the relationship between corporate governance, performance and information leakage. **Chapter 6** initially discusses the dependent and control variables, alongside the regression analysis adopted for selecting the model for determining the impact of corporate governance components on firm performance. Subsequently, a justification is provided for the selection of the System GMM model. Finally, chapter 6 illustrates and discusses the regression results and results. **Chapter 7** investigates the degree of information leakage in the Saudi exchange market, prior to official earnings announcements. An explanation is offered for the event study methodology, the sample and the models adopted to calculate the cumulative abnormal returns (CARs). Lastly, an explication of the event study analysis outcomes is presented. **Chapter 8** investigates the effect of CGRs on information leakage prior to annual public earnings announcements. The dependent variables and control variables are demonstrated for this relationship, with a discussion of the regression analysis and the model selected to comprehend the

relationship. Finally, the chapter presents and reveals the regression results for the association between the corporate governance and information leakage. **Chapter 9** summarises the research findings and explains the suggested implications from the findings. Finally, it illustrated the research limitations and the suggested subjects for future studies. Table 1-1 shows the research structure and the relationship between the research chapters.

Table 1-1: Research structure and the relationship between the research chapters



Chapter 2:

Literature Review

2.1 Introduction

The previous chapter discussed the overall structure of this thesis, comprising the research background and motivations, study aims and objectives, research questions, in addition to the thesis structure. As explained previously, the fundamental goal and objective of this research is to investigate corporate finance practices, and to assess the effect of CGRs on firm performance and information leakage in Saudi Arabia. Consequently, this chapter's purpose is to present a review of the literature and theoretical background associated with the main subjects of corporate finance, namely capital structure, capital costs, capital budgeting and dividends, while also reviewing the previous survey studies focusing on corporate finance practices. Additionally, the chapter reviews the literatures and theories pertinent to corporate governance mechanisms and their effects, market efficiency and information leakage. The chapter is structured as follows: Section 2.2 assesses the theories, literature and previous survey research concerning corporate finance practice. Section 2.3 presents the basic information and theoretical background relating to corporate governance components, analysing the literature to determine its significance. Section 2.4 reviews the literature associated with the subject of market efficiency and transparency, as well as information leakage. 2.5 provides a conclusion for the chapter.

2.2 Corporate Finance Practices

Corporate finance is concerned with the efficiency of financial methods and techniques that are adopted by company managers, in order to fulfil the objectives of that company (Watson, 2016). The sub-sections below provide an appraisal of the literature focusing on the theoretical background of corporate finance, in addition to previous surveys of corporate finance practices.

2.2.1 Theoretical Background

Corporate finance covers several topics and themes focusing on firms' financial decisions. Following the seminal survey research of Graham and Harvey (2001), as well as later survey investigations by Anand (2002), Brounen et al. (2004) and Maquieira et al. (2012), this research concentrates on the four principal areas of corporate finance, namely the capital structure, cost of capital, capital budgeting and dividends.

2.2.1.1 Capital Structure

Capital structure includes equity and debt that are used by firms to finance their projects. The financial manager can decide to issue more debt than equity or can alter the mix by issuing more equity than debt. The aim of financial managers is to choose the proportion of equity and debt that maximises the firm's value (Ross et al., 2002). Many theories discuss the optimal financial policy and capital structure for firms. Modigliani and Miller (1958) developed the leading theory in this area.

The irrelevance theory put forward by Modigliani and Miller (1958) claims that, in a perfect capital market, no connection exists between financial policy and a firm's value. Given that a perfect capital market is questionable, it has led researchers to focus more on factors that may affect capital structure and the influence of the level of leverage on a firm's performance. After almost 50 years, Cole (2013; p 780) stated that 'the seemingly simple question as to how firms should

best finance their fixed assets remains a contentious issue'. Two competing theories, static trade-off theory and pecking-order theory, have been employed extensively by researchers to explain capital structure decisions.

The static trade-off theory relies on an optimal capital structure and describes the optimal capital structure as the exchange between the cost of debt, such as bankruptcy and agency costs, and the advantages of debt including interest tax deductions (Brigham and Houston, 2004). When a firm increases its debt it will benefit from interest tax deductions resulting from the debt because the income derived from equity financing is subject to corporate tax; but, alternatively, by increasing the firm's debt the firm will risk financial distress and incur costs associated with this risk.

The pecking-order theory also investigates capital structure behaviour by focusing on the cost of information asymmetry and signalling impact. Myers and Majluf (1984) showed that when firms want to finance their projects they follow a hierarchy of financial steps. First, they attempt to find internal resources (retained earnings) because this type of financing does not have information asymmetry costs, as the management controls more information for the firm than new shareholders do. When internal recourse is unavailable, the firm can finance its project using debt because it is less sensitive to information issues. Finally, when all previous recourses are exhausted, the firm can release new shares to new shareholders but this choice can prove more costly because of the information asymmetry risk between the management and new shareholders (Myers and Majluf, 1984). The pecking-order theory does not rely on optimal capital structure in the same manner as the trade-off theory because there is no trade-off between the cost and the benefit of debt.

Moreover, some other literatures focus on other determinants of capital structure such as the agency cost theory. Jensen and Meckling (1976) outlined that

agency cost remains a significant factor affecting a firm's capital structure because of the discrepancy that may exist between stock and debt holders. According to the agency cost theory, the optimal structure of capital decreases the cost of the discrepancy between these groups.

2.2.1.2 Cost of Capital

Pratt and Grabowski (2008; p3) defined the cost of capital as "the expected rate of return that the market participants require in order to attract funds to a particular investment" and, in economic terms, the "cost of forgoing the next best alternative investment". The cost of capital relays on the market value rather than the book value and on the investment itself not the investor. Firms invest new funds if they can afford the required rate of return, which can be earned if investors use the same funds in alternative investments at specific risk. Firms estimate the cost of equity capital by using celebrated models such as Sharpe's (1964) capital asset pricing model, Ross's (1976) arbitrage pricing model, and the Fama-French (1995) three factor model.

The capital asset pricing model (CAPM) was developed by Sharpe (1964) and Lintner (1965). For over 30 years, financial researchers have preferred the CAPM as the favoured model to calculate the cost of capital (Pratt and Grabowski, 2008). The CAPM assumes that there is a positive linear relation between the predicted return of a security and its beta which compares the risk of the security to the market as a whole, so the cost of capital can be anticipated depending on the project beta and the market risk premium (Ross et al., 2002). The CAPM received support in the early studies of Black, Jensen and Scholes (1972), Fama and MacBeth (1973), and Blume and Friend (1973). However, the CAPM and the accuracy of beta as the only measure for risk, were put under scrutiny by many scholars during the 1980s. Banz (1981) suggested in his study that the CAPM is

misspecified. The study investigated NYSE firms over a forty years period and concluded that small stocks gain higher returns than the returns anticipated by the CAPM. Basu (1977) studied 753 firms on the NYSE and found that stocks with high price-earnings ratios had higher returns than anticipated by beta, and stocks with low P/E ratios had lower returns than anticipated by beta. Despite these criticisms, the CAPM is still the model favoured in business schools.

There are other models that draw upon multiple factors as opposed to the single factor CAPM uses, such as the arbitrage pricing model (APM) and Fama and French's three factor models. The APM was developed by Ross (1976) and in this model the cost of capital depends on the sensitiveness of an investment to different risk factors. The limitation of arbitrage pricing theory is that it does not assign particular risk factors but most researchers have observed the macroeconomic risk factors such as inflation risk, interest rate risk, business environment risk, and yield spread (Pratt and Grabowski, 2008).

The studies of Fama and French (1992, 1993 and 1996) announced the end of beta as the only factor for estimating the cost of capital and, instead, they developed the three factor model. Fama and French (1992) found that the cost of equity anticipated by the CAPM for high beta was higher than the actual returns and for low beta was lower than the actual returns. Furthermore, they found that the cost of equity anticipated by the CAPM for high book/market value was very low comparative to the actual return and for low book/market value was very high comparative to the actual return. Therefore, Fama and French added value and size factors to the market risk factor of the CAPM to create the three factor model as value and small cap securities typically exceed market performance.

In addition, there is the weighted average cost of capital (WACC) model, which is used by financial managers to estimate the overall cost of capital of a firm. The WACC model is particularly suitable for projects chosen in capital budgeting to

see if the project is worthwhile and will maximise the firm's wealth. The WACC model estimates the cost of capital by taking into consideration the proportional weight of each type of capital structure.

2.2.1.3 Capital Budgeting

Capital budgeting is defined as the method of analysing and choosing long- term investment asset or assets anticipated offering value returns over more than one year (Peterson and Fabozzi, 2002). Firms are in constant need to analyse and evaluate new opportunities and investments so capital budgeting is a continuous practice in most firms. Capital budgeting is an important element of the financial decision process because it affects the success of a firm and its growth outlook. When a firm decides to analyse proposed projects it must define the cash flow that each project expects to provide and, evaluate the uncertainty that comes with future cash flows. The main techniques used in evaluating the projects are the payback period, internal rate of return, profitability index and net present value.

The net present value (NPV) and payback period are the most frequently used techniques but, historically, the payback period was the first technique chosen and was defined as the period of time required on the project to return the invested funds from the project cash flow (Brigham and Ehrhardt, 2011). Payback period and accounting rate of return are popular non-discounted cash flow methods used in evaluating projects (Ross et al., 2002). The payback period is an easy tool and the decisions are based on which project has the shorter payback period regardless of which one is better value. However, the payback period techniques have received some criticism, for example, their disregard of the time effect of cash flows, doesn't look at cash flows beyond the payback period and, finally, it focuses only on the recovery period without incorporating information on investor wealth (Brigham and Ehrhardt, 2011). Therefore, the discounted payback period has been suggested.

This is the period of time that the discounted future cash flows of a project needs to return the original fund (Peterson and Fabozzi, 2002). The cash flows are discounted by the cost of capital at commencement to take into account the time value and uncertainty that comes with future cash flows.

One of the leading techniques in capital budgeting is the net present value. Financial literature indicates that the net present value (NPV) is the best technique for analysing fund investment projects and is defined as the difference between the investment value and cost or the variance between the current value of the expected cash flows of the project and its initial outflow (Bennouna et al., 2010). To maximise the wealth of shareholders, a firm should invest in projects that offer positive NPV and reject those offering negative NPV because positive NPV offers sufficient returns to cover the required return of the project. The distinction of the NPV technique is that it covers all future additional cash flows, considering the timing value of cash flows and differentiating between projects that have different cash flow risks (Peterson and Fabozzi, 2002).

Another technique is internal rate of return (IRR) or the discounted cash flow rate of return. The IRR technique is widely employed in analysing future cash flows and is defined as the discount rate that causes the net present value to be equal to zero (Brealey et al., 2011). Financial literature deems net present value as superior to IRR, but in practice firms, particularly large firms, favour the use of the IRR technique because it is simpler and requires no specified cost of capital (Cheng et. al., 1994). Firms maximise the wealth of shareholders by accepting projects whose IRR is greater than the cost of capital. A problem can occur with the IRR technique when a project has abnormal cash flows that produce multiply possible IRR solutions and lead to confusion in making financial decisions. To remedy this problem, the modified internal rate of return (MIRR) is suggested. MIRR is the return

on the project supposing a specific return on the reinvestment of cash flows (Peterson and Fabozzi, 2002).

Finally, the profitability index (PI) technique is used to analyse investment. PI is “the ratio of the present value of future expected cash flows after initial investment divided by the amount of the initial investment” (Ross et al., 2002). PI shows the amount of profit that each one pound can create so the investment maximises the firm’s wealth when the PI is greater than one. Firms do not utilize all capital budgeting techniques and, according to the survey conducted by Graham and Harvey (2001) on 392 U.S. firms, the most frequently used technique was either IRR or NPV and the least used technique was PI.

2.2.1.4 Dividend

The study conducted by Miller and Modigliani (1961) concerning optimal dividend policy showed that, in a perfect market, the dividend policy does not influence the value of a firm. They indicated that preferring one specific dividend policy over another is irrelevant for a firm’s shareholders. To increase the firm’s and shareholder wealth, a firm should focus on valuable investments. M&M believed that dividend policy has no effect on firms’ value because shareholders can make a homemade dividend by selling some shares equivalent to the value of cash that the firm could pay. However, Miller and Modigliani’s (1961) theory does not hold up in real world financial markets. As a result, several other theories explaining dividend policies have put forward. These include bird in the hand theory, tax effect theory, signalling effect theory and agency cost theory.

Graham and Dodd (2009), Lintner (1962) and Gordon (1963) supported the bird in the hand theory which indicates that the required returns on capital decrease when cash dividends are increased because, in this situation of uncertainty and asymmetric information, investors favour receiving dividends over retained

earnings. This is because cash received from dividends is lower risk than cash received from future cash flows and the cost of capital is positively related to risk. Therefore, dividend payments lead to an increase in a firm's value as the lower cost of capital enhances the firm's performance. The theory demonstrates that when firms want to maximise the price of their stock, the firms set a high level of payout ratio to reflect investors' preferences (Baker and Powell, 1999).

Signal or asymmetric information theory states that managers, as insiders, use the modification of the dividend payout ratio as a signal of the delivery of good information about the firm to investors as outsiders (Denis et al., 1994). The theory was developed by Bhattacharya (1979) and Miller and Rock (1985), and it shows that because managers usually have more accurate information about a firm than external investors, especially about its expected investments and future cash flows, managers increase the dividends ratio to send a good signal to investors about the firm's future cash flows and profits in order to increase the demand for firm stock and thereby affecting the value and wealth of the firm.

Agency cost theory, which is suggested by Jensen and Meckling (1976) and Jensen (1986), relies on the assumption that manager interests are not always in line with shareholder interests and as a result, shareholders may use dividend policy as a way to control managers' decisions. As it is difficult for shareholders to monitor every manager's performance and decisions, which may not be in line with shareholder interests, shareholders prefer to use external parties such as a debtor as a controller by setting a high dividend payout ratio to prompt managers to use external financing. In addition, the tax effect theory indicates that shareholders prefer firms that do not send any cash dividends to shareholders if the tax on profits less than the tax on dividends because firms can use the difference for future investments (Brennan, 1970). The tax effect theory is not applicable to the Saudi

Arabian market because there is no tax on cash dividends so this theory is not relevant to this research.

2.2.2 Survey Studies on Corporate Finance Practices

Most of the studies on financial decision practices have focused on a specific financial decision practice, such as capital structure, capital budgeting or dividends policy, while few researchers have performed comprehensive surveys on corporate financial practices. Most studies were conducted on listed firms in advanced countries such as the U.S. and the United Kingdom, while other studies focused on cross-country financial decision practices such as in Europe and Latin countries. There are few surveys conducted on developing markets, especially the Middle East, and, no comprehensive surveys about corporate finance practices has yet been conducted with regards to Saudi Arabia.

Few researchers conduct comprehensive surveys that involve a variety of aspects of corporate finance practices and in the literatures there are four comprehensive surveys which are the study of Graham and Harvey (2001), Anand (2002), Brounen, Jong and Koedijk (2004), and Maquieira, Preve and Sarria-Allende (2012).The most well-known survey of corporate finance practice is the survey completed by Graham and Harvey (2001) on a cross section of large publicly listed U.S. firms. The survey was about capital structure, capital budgeting and cost of capital practices, and the sample included 329 responses from financial officers a with response rate of 9%. The results indicated that financial practices differ based on a firm's size and managers used mainly the academic techniques of NPV and CAPM but were less likely to follow capital determinants and theories when deciding on capital structure.

In addition, Anand (2002) investigated corporate financial practices of a cross section of Indian firms. The sample included 81 responses from private and public

firms with a response rate of 15.43%. The survey focused on capital budgeting, cost of capital, dividends policy and capital structure practices. Thus the survey of Anand (2002) is more comprehensive survey compared with the other three surveys as it covers the four main topics of corporate finance. Therefore, this research used survey questions similar to the survey of Anand (2002) because this comprehensive survey would be able to give clear answer to the research question. The results of Anand (2002) showed that a firm's size has an important influence on corporate finance practice and firms use the basic techniques that are taught in business schools such as CAPM and NPV techniques in regards to the cost of capital and capital budgeting and they follow the pecking-order theory for capital structure decisions. Brounen, Jong and Koedijk (2004) used Graham and Harvey's (2001) questions to perform a survey about corporate finance practices in Europe. The sample was selected from the UK, France, Germany and the Netherlands and included 131 firms with a response rate of 5%. They indicated that the static trade-off theory found some acceptance by managers and the gap between theories and practice appeared to be the same in the U.S. and Europe.

Additionally, Maquieira, Preve and Sarria-Allende (2012) studied corporate finance practice in Latin America. The survey used the questions devised by Graham and Harvey (2001) with some modifications to reflect the differences of the Latin American market. The questions were about capital structure, capital budgeting and the cost of capital practices in Argentina, Ecuador, Peru, Uruguay, Chile, Colombia and Venezuela. The sample included 290 responses from a small percentage of public firms. The results showed that the major difference, compared with U.S. firms, was in the practice of cost of capital because most firms do not use financial techniques to evaluate the cost of capital but simply rely on shareholders request.

Furthermore, Mutairi et al. (2009) conducted a survey study about corporate finance practices in Kuwaiti-listed firms and they concluded that not all corporate finance practices in Kuwait are consistent with what is taught in business schools. For example, Kuwaiti firms have widely used the IRR technique, despite its limitations and the CAMP model despite the WACC model is more popular. Furthermore, firms do not have any specific preferences about financing types as is the case in the United States. However, even though this study was conducted in Kuwait, which is in the Gulf Region, it cannot represent the status of the Saudi market and firms due to the substantial differences between Kuwaiti and Saudi Arabian economies, business environments and regulations. Saudi Arabia is the largest economy and stock market in the Gulf region with 47% of Arab Gulf States' GDP so the Kuwaiti economy is deemed relatively small compared with the Saudi economy (Ali, 2013). What is more, Saudi Arabia is the sole Arab country in the G20 and one of the largest oil producing countries in the world. The study of Brounen et al. (2004) showed the differences of corporate finance practices between European countries despite the similarities of economic environments in these countries. In addition, the study of Dahel and Laabas (1998) confirmed some differences in the GCC stock markets. Therefore, it is important for this research to reveal corporate finance practices in Saudi Arabia which represent the largest economy in the GCC and the Middle East and having 25% of the Arab countries' GDP (DeAngelis, 2011). Saudi Arabia is also characterised by the absence of income tax.

Further studies focus only on one specific issue of corporate finance practice such as capital structure or cost of capital. Beattie, Goodacre and Thomson (2006) performed a survey about capital structure decisions in the UK. The sample included 198 responses from UK listed firms. The results suggested that country's institutional differences have an important influence on financial decisions. They showed that financial managers' decisions do not fully adhere to the major theories.

Additionally, managers do not agree with the balance trade-off theory between interest tax shields and bankruptcy and do not agree with the assumption that issuing new shares sends a bad signal to the market.

Bancel and Mittoo (2004) conducted a survey on firms from sixteen European countries to investigate the gap between the theory and practice of capital structure in Europe. The sample contained 87 responses with a response rate of 12% and it indicated that the determinants of capital structure are similar in the U.S. and Europe. The survey showed that chief financial officers gave weak preference to agency cost theory and pecking-order theory. In addition, Fan and So (2000), examined the capital structure decisions of Hong Kong firms. They conducted a survey of firms from the Hong Kong Exchange Market and the sample included 259 responses with a response rate of 46.17%. The survey's results showed support for the pecking-order theory more than optimal capital structure and the signaling effect did not play a role in managers' financial decisions.

For capital budgeting, Gitman and Forrester (1977) conducted a survey of U.S. public firms. The sample comprised 103 firms' responses and showed that firms apply many techniques presented in financial theories. Most firms prefer firstly the IRR and secondly the payback period technique. The study entitled 'The Theory-Practice Gap in Capital Budgeting' by Arnold and Hatzopoulos (2000) investigated 296 UK firms and received 96 responses making a response rate of 32.4%. The survey confirmed that the majority of UK firms used the financial techniques stated in textbooks. Additionally, Kester and others (1999) conducted a survey about capital budgeting practice in the Asia-Pacific region, that is, Australia, Singapore, Indonesia, Philippines, Hong Kong and Malaysia. The sample comprised of 226 firms from the various stock markets with a response rate of 16.3%. The results indicated that the analysis techniques used in the Asia-Pacific region in general are

similar to those used in the U.S. and Europe. The study showed that firms prefer NPV and IRR than non-DCF techniques for selecting investments.

Hermes, Smid and Yao (2007) compared the capital budgeting practices of the Netherlands and China to examine the differences between developed and undeveloped countries. The survey was sent to listed and unlisted firms and the sample comprised 87 responses (45 from Chinese firms and 42 from Dutch firms) with a response rate of 15% for the Chinese firms and 17% for Dutch firms. The results found that, on average, Dutch financial managers apply advanced capital budgeting techniques more than Chinese financial managers do.

Some other surveys focus on the practice of cost of capital. Gitman and Mercurio (1982) surveyed the cost of capital practices of U.S. firms. The sample contained 177 leading industrial firms from the Fortune 1000 list. The study confirmed that there is a significant gap between the theory and practice of the cost of capital and firms' practice does not reflect the implications of financial theory. Black and others (2002) performed a survey in New Zealand to investigate the practice of the cost of capital and capital budgeting in New Zealand in comparison to the U.S. The sample included 26 responses from listed firms with a response rate of 19%. The results showed that the differences in financial decision practices reflect variations in size and between countries. Truong, Partington, and Peat (2008) examined the cost of capital and capital budgeting practice in Australia. The sample comprised 87 responses from stock market firms with a response rate of 24.4%. The popular techniques in Australian firms are NPV and IRR for capital budgeting and the WACC model and the CAPM for cost of capital.

Some studies have investigated dividend policy and practice. Brav and others (2005) examined the dividend policies of 384 firms, 256 firms listed on the NYSE market and 128 private firms. They concluded that financial managers gave weak support to signalling, agency and clientele theories and believed that tax shield

benefits are not an important factor. Dhanani (2005), examined how dividend policy theories are significant for UK firms. The sample included 164 responses with a response rate of 16.4%. The results confirmed that managers support signalling theories and ownership structure more than agency cost theory and that a firm's characteristics have an influence on dividend policy. Chazi, Boubakri and Zanella (2011) surveyed listed UAE firms about their dividend policy practices. The sample comprised of 36 responses from firms listed on the Abu Dhabi and Dubai stock markets with a response rate of 34.6%. They confirmed that owner structure plays an important role in setting dividend policy and managers gave weak support to signalling theory.

From the above, it is clear that there are few comprehensive studies investigating the gap between theory and practice in corporate finance. Most previous studies were focused on the U.S., Europe, Australia, India and China and, to the researcher's knowledge, no survey has been conducted on Saudi Arabian firms, despite the unique economic environment of Saudi Arabia compared to other countries.

2.3 Corporate Governance

Two main perspectives and theories underpin explanations of the nature of the relationship between firm management and shareholders, namely agency theory and stewardship theory. Firm's corporate governance mechanisms are often constructed on the basis of agency theory. Additionally, corporate governance mechanisms concern the firm's board of directors, board committees and the ownership structure.

2.3.1 Agency Theory

Agency theory is the overwhelmingly predominant theoretical perspective studied in corporate governance literatures (Daily, et al., 2003). The separation between corporate ownership and corporate control leads to the creation of an agency relationship between the shareholders and the executives so the executives work as an agent to represent the principals, i.e. the shareholders (Bagley, 1999). In fact, the debate regarding the separation between ownership and control of a corporation began with the famous economist Adam Smith. Smith (1776) who stated that “the directors of such firms, however, being the managers rather of other people’s money than of their own, it cannot well be expected that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own”. This separation between ownership and control was discussed by Berle and Means (1932) in which they referenced the United States. However, the agency issue was first examined in Ross (1973), while Jensen and Meckling (1976) being the first works which gave detailed theoretical presentations regarding agency theory. Jensen and Meckling (1976) defined the agency relationship as an agreement between one or more individuals, the principals, with another individual, the agent, to conduct services and make decisions on their behalf. The principals may believe that the agent will not always work in line with their interests, therefore, in this situation, the principals will set in place proper incentives to encourage agents to act in the best interests of the principals, including payment of monitoring costs to minimise agent acts which are not aligned with the interests of the principals (Jensen and Meckling, 1976). Therefore, conflict of goals between the principals and agents is one of the major assumptions of agency theory (Solomon, 2013).

One clear characteristic of listed firms is the widespread between ownership and control amongst shareholders and managers, so shareholders may believe that

the agents are only interested in their own gains over the interests of the shareholders (Anderson, et al., 2007). This belief creates a conflict of interest between the owners (shareholders) and the agent (executive directors). Executive directors may work in their own interests rather than the interest of shareholders, by setting high bonus rates or unreasonably high salaries for themselves (Bebchuk and Fried, 2003). Additionally, executive directors may take advantage of valuable internal information which could require shareholders to pay monitoring costs in order to observe the executives (Jensen and Meckling, 1976).

In addition to the conflict between shareholders and executives, there could be a difference in the interests of larger shareholders acting as agent and the interests of the smaller shareholders as principals (Armour, et al., 2009). Large shareholders have far more influence on the management decisions of their firms than do small shareholders, so if their interests differ from those of the small shareholders, it could lead to a situation where a firm targets its benefit towards the larger shareholders. Research taken from developing markets showed that large shareholders may exploit firm resources for their benefit at the expense of the smaller shareholders (Chalevas, 2011). Therefore, firms require a governing mechanism which determines the firms' resources and which could essentially diffuse and resolve any conflict of interest amongst the myriad participants within a firm (Daily, et al., 2003). Corporate governance suggests different mechanisms which can reduce agency problems and the conflict of interest between shareholders and firm management. These measures can include splitting the role of chairman and chief executive and presenting independent non-executive directors to sit on the board (Donald and Davies, 1994; Solomon, 2013).

In Saudi Arabia, the agency problem for listed firms may come from the conflict of interest between shareholders and managers due to the separation between ownership and control. In addition, even though the Saudi authorities have

made reforms to improve the market, Saudi listed firms have substantial concentration of ownership which is dominated by government and family ownership (Al-Harkan, 2005; Al-Nodel and Hussainey, 2010; Soliman, 2013). This concentration of ownership may lead to the expropriation of small shareholder interests by larger controlling shareholders thereby increasing the conflict of interest between large and small shareholders (Soliman, 2013). Therefore, expected agency problems within Saudi firms and their potential effect on commercial transparency and performance make the agency theory a significant factor in the context of Saudi Arabia.

2.3.2. Stewardship Theory

Stewardship theory has its origin in psychology and sociology and was positioned for investigators to research situations in which managers, acting as stewards are encouraged to work in the best interests of shareholders (Davis, et al., 1997). Stewardship theory is perceived by researchers as a complementary contrast to the agency theory and while agency theory sees executives as a self-interested and pragmatic, stewardship theory views executives' interest as being aligned with the interests of the shareholders (Daily, et al., 2003). This is not because the stewardship theory views executives as unselfish individuals, but because stewardship theory recognised that there are managers who believe they are acting for the interests of shareholders as well as also serving their own self-interests (Lane, et al., 1998). Under this theory, executives are seen as stewards of a firm who will seek to maximize the wealth of shareholders even though there is some conflict of interest, but will not allow this conflict to affect the executives' task.

The diversity of a firm's owners, all with different goals, may create an unclear vision for the firm, so the group who can work together in the best interests of the

owners, are the firm's managers, who can create an efficient way to increase benefits for all the owners. This is due to managers having access to explicit and accurate insider information regarding the firm and the business arena which qualifies them to make correct decisions in order to maximise the value of the firm (Nicholson and Kiel, 2007). Based on stewardship theory, the assumption is that the board of directors will not work as a monitor or controller of the CEO's activities; instead they will work as an assistant and consultant board for the CEO (Albrecht, et al., 2004). Whilst agency theory emphasises the importance of role separation between the CEO and chairman of the board to ensure the efficient monitoring of the CEO by the board, stewardship theory posits that managers acting as both CEO and chairman of the board simultaneously may be the most suitable way for managing firms as long as the executives are trusted by the shareholders (Siebels and Knyphausen-Aufseb, 2012).

However, this trust-based relationship between shareholders and executives depends on the stewardship theory which may not represent the intentions of all managers. Those managers who have different skills and intentions may not adhere to the stewardship theory of a more constant and even long-term growth and performance cycle; rather they may prefer the option of high profit, short term performance benefits and salaries. Additionally, combining the management roles of the CEO and chairman based on the stewardship theory will lead to managers having the ability to control more of the internal firm information which in turn increases the problematic issue of information asymmetry and decreases the transparency within the firm environment (Cheung, et al., 2010). Moreover, the trust relationship between owners and executives under the stewardship theory may tempt executives to take advantage of a firm's resources and information for their own benefit, thereby deceiving owners as to the true condition of the firm (Albrecht et al., 2004). Davis et al. (1997) stated that empirical studies have attempted to

confirm either the stewardship or agency theory as the singular method for corporate governance when based on the assumption that all executives are either agents or stewards. However, the outcome of these empirical studies concluded with varying outcomes, indicating the need for the re-interpretation of both stewardship and agency theories regarding the relationship between the principals and management.

In Saudi Arabia, the current corporate governance regulations which were enacted in 2006 in order to reform the market are based on agency theory assumptions. For example, Articles 12c and 12d of the regulations state that “the majority of the members of the Board of Directors shall be non-executive members” and “it is prohibited to conjoin the position of the Chairman of the Board of Directors with any other executive position in the firm, such as the Chief Executive Officer (CEO) or the managing director or the general manager” (CMA, 2011). The aim of the regulations and market reforms in the Saudi market is to strengthen the function of the firm boards which monitor and supervise the executives’ activities in order to ensure the benefits and wealth is targeted towards the owners. In addition, these regulations seek to build the accountability and transparency for the business environment within Saudi firms and with the market.

2.3.3 Corporate Governance Overview

One clear feature of listed firms and corporations is the widespread ownership and control amongst the different participants. Monks and Minow (2001: p6) defined a corporation as “a mechanism established to allow different parties to contribute capital, expertise, and labour, for the maximum benefit of all of them”. Shareholders share the profits and benefits of the firm without any management responsibility, and on the managerial side, the directors actively operate the firm without bearing any of the financial risk. Under the agency theory, if the shareholders do not see the agent and executives working in line with their interests, they will put in place

incentive mechanisms and pay additional oversight costs to encourage the agent to better oversee the activities of the corporation in order to ensure compliance with the interests of the shareholders (Jensen and Meckling, 1976). Agency relationships may lead to a conflict of interest between shareholders and executives and also between large and small shareholders. Therefore, the corporate governance system works as “ex ante command-and-control approach, constraining the authority of managers and inculcating more direct shareholder oversight of managerial conduct early on” (Talley and Johnsen, 2004: p2).

Corporate governance is seen as a mechanism which is useful to minimize agency issues between different participants within a firm (Shleifer and Vishny, 1997; Aguilera and Jackson, 2003). Corporate governance is seen as being in the public interest because of the significance of its role regarding the development and growth of corporations and financial markets, especially after the events of the most recent financial crisis. That crisis which overran the financial markets and most national economies led to the banking crash and subsequent worldwide recession and has made corporate governance a hot topic on the public agendas of most nations. The failure of corporate governance, resulting in weak internal control and monitoring systems and the lack of independent directors on firm boards, was investigated and identified by academics and practitioners as one of the reasons for the breakdown of firms and the global financial crisis (Solomon, 2013).

In fact, there is no consensus on the exact definition and meaning of corporate governance as it includes numerous mechanisms and rules that vary from country to country and depend on the corporate model which has been applied by that country’s lawmakers. For example, countries which follow the Anglo-Saxon corporate model would concentrate on the shareholders rights and interests for their corporate governance definitions whilst countries which follow the European-Japanese model would concentrate on stakeholders’ interests for definition in their

corporate governance. One of the earliest and most famous definitions was presented by the Cadbury Report (1992) which defined corporate governance as "the system by which firms are directed and controlled" (Cadbury, 1992: p14). Moreover, Gregory (2001: p2) defined corporate governance as "it refers to that blend of law, regulation, and appropriate voluntary private-sector practices which enables the corporation to attract financial and human capital, perform efficiently, and thereby perpetuate itself by generating long-term economic value for its shareholders, while respecting the interests of stakeholders and society as a whole". Monks and Minow (2001: p1) however, defined corporate governance as the "relationship among various participants in determining the direction and performance of corporations. The primary participants are (1) the shareholders, (2) the management and (3) the board of directors".

Corporate governance mechanisms can be divided into two main categories being external and internal mechanisms. The external corporate governance mechanisms contain the rules for controlling matters such as takeovers and market regulations (Easterbook and Fishel, 1996; Cremers and Nair, 2005). The internal corporate governance mechanisms comprise the rules governing ownership and board structure and deals with such matters as CEO duality and the percentage of independents directors (Weir, et al., 2002; Cremers and Nair, 2005). The Organisation for Economic Co-operation and Development (OECD, 2004: p 11) indicated that "good corporate governance should provide proper incentives for the board and management to pursue objectives that are in the interests of the firm and its shareholders and should facilitate effective monitoring". Thus the efficient internal corporate governance mechanisms should solve any conflict of interest between participants and assist both executives and the board of directors in fulfilling their obligations, thereby attaining better firm performance. Klapper and Love (2004) indicated that optimal corporate governance has a positive effect on the

performance of a firm and it can be seen as an obligation to which firms need to adhere in order to carry out the necessary procedures to effectively invest capital. Furthermore, Morey et al. (2009) stated that effective corporate governance will maximise investors' wealth in emerging markets.

Good internal corporate governance should enhance the transparency and accountability of the corporate environment as it should set out an effective internal control and monitoring process. The main aims of corporate governance include safeguarding financial reporting and supporting corporations to create value by offering accountability and monitoring systems (Koh et al., 2007). Therefore safeguarding financial reporting will help to decrease the asymmetry of information between executives, shareholders and other investors as the financial report is one of the main sources of information that is used by investors to evaluate the performance of both firm executives and the firm itself. Asymmetrical information therefore prevents shareholders and investors from making precise and correct decisions or effectively monitoring managers. The OECD (2004) stated that effective corporate governance mechanisms should lead to accuracy and transparency in firm announcements in order to protect shareholders' interests.

2.3.4 Board of Directors, Subcommittees, and Ownership Structure

A board of directors is at the heart of internal corporate governance mechanisms and governance effectiveness. Aguilera (2005: p1) defined a board of directors as "the internal governing mechanism that shapes firm governance, given their direct access to the two other axes in the corporate governance triangle: managers and shareholders (owners)". A board of directors is the link between the shareholders, who offer the capital and who are dispersed around the world, and the managers, a group of individuals who employ the capital and operate the firm. The board also provides the balance between the conflict of interest between the managers and

shareholders to ensure that the firm works towards the long term interests of the shareholders (Monks and Minow, 2011).

The board has diverse duties such as overseeing the hiring and/or firing of the CEO, standing in for the interests of the firm shareholders, offering advice to and consultations with, the highest level of managers, monitoring of managerial activities and firm performance and confirming their approval of important decisions (Fama and Jensen, 1983; Zahra and Pearce II, 1989). Because of the assumptions of agency theory and the separation between ownership and control, shareholders depend on the board of directors to represent their interests by monitoring and controlling the firm executives' actions and decisions. OECD (2004) stated that "board members should act on a fully informed basis, in good faith, with due diligence and care, and in the best interest of the firm and the shareholders" and "should have access to accurate, relevant and timely information". Aguilera (2005) indicated that a board of directors can be criticised for a firm's failure and can also be seen as a significant mechanism for improving corporate governance practices.

There are two models of board, a unitary board and a two tier board. The unitary board contains executive and non-executive directors and this model is popular in countries that follow the Anglo-Saxon corporate governance model (i.e. Saudi Arabia). The two tier board includes two different boards which are the management board which is comprised purely of executives who deal with the day to day operational issues, and the supervisory board which comprises the non-executive directors and deals only with strategic firm decisions (Solomon, 2013). There are various different types of directors who sit on a board: executive directors who work also as executive managers in the firm, the chief executive officer (the CEO), non-executive directors who do not work in managerial positions, but who have a connection with the firm, and finally the independent director who does not hold any position in or have any relationship with, the firm (Tricker, 2012).

The independent director of the board has been identified as a significant aspect of the corporate governance mechanisms (Monks and Minow, 2011). There is increasing interest in academic literature regarding the role of independent board members and their effect on building good corporate governance. To date, there is no consensus in the literature as to whether independent directors improve the board roles and shareholders wealth (Monks and Minow, 2011; Solomon, 2013). Clarke (2007) stated that independent board members can enhance the effectiveness of corporate governance by monitoring related party transactions to see whether there is a conflict of interest, thereby protecting the rights of small shareholders by acting as a “brain trust or consultant” and forcing the board to apply the external standards and regulations which increases their level of compliance.

In addition, almost all listed firm internal corporate governance regulations around the world require the board of directors to form three standing subcommittees; the audit committee, the remuneration committee and the nomination committee (Tricker, 2012). Research shows that a relationship between the activities of these subcommittees and the value of the firm exists (Chhaochharia and Grinstein, 2007). The board subcommittees are a method by which shareholders can lessen any agency issues and enhance the internal control processes by monitoring the acts and decisions of the firm executives (Harrison, 1987; Klein, 1998). The audit committee is comprised mainly of independent directors and is the link between the external auditor and the firm’s board which reviews the financial reports and assesses the efficiency of the internal audit system (Tricker, 2012). It is one of the most significant corporate governance techniques by which shareholders can constrain any opportunistic explorations or detours from the agreed path by managers (Gendron and Bédard, 2006). The remuneration committee also includes mainly independent directors who are responsible for setting the policies for the remuneration packages of the board members, especially

executives and senior members of management (Tricker, 2012). This committee will assist shareholders to minimise the influence of executives when setting firms' remuneration packages to prevent executives using these packages to take advantage of shareholders and to steer profits away from the shareholders' and towards the executives. The committee therefore ensures the activities of the executives are in line with the firm's objectives. Due to the financial scandals that surfaced in the United States, at the start of the new century, market regulators deemed the remuneration committee to be an essential part of any firm making significant business decisions (Vafeas, 2003). Finally, the nomination committee is again created mainly from independent members who are responsible for recommending changes to board members and providing a check and balance mechanism in order to reduce the influence of dominant board members (especially CEOs) who would prefer to add their favoured candidates to a firm's board (Tricker, 2012).

Ownership structure is considered to be a crucial component of corporate governance mechanisms, as it provides the structure for corporate governance regulation in every country (Darko et al., 2016). Large shareholders and a high degree of ownership concentration can provide an effective controller and monitoring tool with regard to management activities, thus diminishing the agency problem, otherwise large shareholders may dominate the firm's decision making, exploiting the firm's resources for their own advantage at the expense of smaller shareholders (Darko et al., 2016). Additionally, Donnelly and Mulcahy (2008) have indicated that institutional ownership can diminish the agency issue, because institutions have greater professionalism, therefore they can more easily and effectively monitor management actions and decisions. Furthermore, the higher directors can help to resolve the agency issue if they become shareholders, because their interests would be in greater alignment with the other shareholders'

interests (Hussainey and Al-Najjar, 2012). Nevertheless, as explained in the research hypotheses chapter, no consensus exists in the literature with regard to the effect of ownership structure on firm performance and information leakage.

2.4 Information Leakage and Market Efficiency

The information leakage in the stock market is a sign for the weaknesses of the market efficiency and transparency. The leaked information would increases the problem of information asymmetry between the firm and investors and this leaked information would be used by few investors for insider trading. The following sections review the literatures about the market efficiency and transparency and information leakage.

2.4.1 The Market Efficiency and Transparency

The efficiency of the market decrees that share prices should be instantly and totally available and reflect all pertinent information (Blake, 2000). This means that stock prices should represent the results of all the available information about a firm. The term “efficient” first appeared in the pioneering and influential study of Fama (1965). Fama (1970a: p383) defined the efficiency of the market as “a market in which prices always fully reflect all available information is called efficient”. In addition, Fama (1970b: p76) wrote that “an "efficient" market is defined as a market where there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants. In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which,

as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value". Based on this meaning, stock price changes should be unanticipated and an investor should not have any opportunity to gain abnormal returns. If the stock price change can be anticipated, the market is not sufficiently efficient and the stock prices do not reflect all available information. Thus, in an efficient market, the movement of stock prices would be based on the release of new information about the firm.

Fama (1970a) classified the Efficient Market Hypothesis ("EMH") into three sets which are termed the weak form, semi strong form, and strong form. The weak form set of the EMH suggests that the share price fully reflects the historical information and return on shares but has no influence on future returns, resulting in knowledgeable investors being unable to anticipate the future movements of the stock (Blake, 2000). Based on this form of the EMH, investors should not be able to gain abnormally high returns by depending solely on the analysis of the share price historical data. The semi strong form set of the EMH indicates that the share price reflects not only the historical data of the shares, but also includes current information available within the public domain thereby allowing share prices to be swiftly adjusted to reflect the impact of the new public information (Black, 2000). Therefore, the release of any new public information about the firm such as "stock splits, announcements of financial reports by firms, new security issues" (Fama, 1970a) would influence the movement of the stock price. This would result in investors being unable to earn consistently high abnormal returns through the release of the public information. The strong form set of the EMH would show a stock price which would reflect all information relating to the firm, both public and private including historical data, and an investor would not be able to acquire any additional benefits or earning above average returns (Blake, 2000).

Efficiency in the market is a significant aspect for all investors which can build a healthy environment for competitors and protects the rights of all investors. Despite this, the Efficient Market Hypothesis has received criticism when alternative evidence has been measured against the hypothesis. Jensen (1978: p95) stated that “we seem to be entering a stage where widely scattered and as yet incohesive evidence is arising which seems to be inconsistent with the theory” and “it is evidence which we will not be able to ignore”. Shleifer (2000: p2) reported that “in the last twenty years, both the theoretical foundations of the EMH and the empirical evidence purporting to support it have been challenged”. For example, the influence of a small firm was proved to work against the general context of the EMH. Banz (1981) studied the long term returns of U.S. stocks and concluded with that those firms with small caps resorted to offering higher returns more often than those firms with larger caps. Thus, there was a long term, clear trend that continued to distort the general context of EMH. In addition, the calendar effect indicates that share returns can be regularly higher or lower on specific days of the week, in the month or in a specific month of the year. These implied profit opportunities proved market inefficiency and stood against the semi strong form of the EMH. Cross (1973) investigated U.S. stocks from 1953 to 1970 and found that the raise rate on Friday was significantly higher than the raise rate on Monday. Rozeff and Kinney (1976) researched the shares in the U.S. from 1904 to 1974 and reported that an average return was 3.48% in January, contrasting with 0.42% in other months.

In addition, Jaffe (1974) stated that some researchers investigating insiders, such as firm’s officers, directors, and large shareholders, concluded that the insiders, by collecting insider information, could predict the price movement of shares up to six months prior to the trading date. Blake (2000) pointed out that the insider activities were taking advantage of both lawful and unlawful insider trading and was proof against the strong form of the EMH. Executives and board directors,

being able to access sensitive, significant and private information regarding their firm established the ability (in the absence of any transparency within the business environment), to use this insider information to gain abnormally high returns on the stock market. Wong (2002) stated that the majority of prior studies regarding insider trading concentrated on the U.S. financial markets and these studies confirmed the ability of insiders to earning abnormally high profits. This research rejected the strong form of the EMH, as the strong form asserts that stock prices reflect both insider and public information. Therefore, investors in the financial markets, even in the developed markets such as the U.S., may have the chance to use insider and private information to gain an advantage over other investors to profit from abnormally high returns.

2.4.2 Information Leakage and Trading

Market transparency and firm announcements are the main features of effective corporate governance practices and the role of financial markets as investors in these markets is to seek out accurate, complete, and timely announcements of firms' information so they can make correct decisions regarding the essential value of a firm (Heggen and Gannon, 2008; Tsai, 2014). The OECD (2003a: p 35) stated that "without access to regular, timely, reliable and comparable information, investors will not be able to evaluate corporate prospects and make informed investment and voting decisions" and "this will result in a higher cost of capital and a poorer allocation of resources". Additionally OECD stated that, "good systemic disclosure generates confidence in market integrity" and "as a result, capital flowing to equity and debt markets will fully and fairly reflect the underlying value of the national economy" (OECD, 2003b: p36). Thus, the effects of asymmetrical information and transparency not only influence investors and firms individually, but

can also influence the ability of whole countries to attract capital investment and investors.

The strong form of the EMH specifies that all public and inside information related to a firm are completely reflected in the stock prices (Fama, 1965). In addition, in a perfect market, all types of investors would instantly and simultaneously receive all information relevant to the value of the shares, however in reality, some firms and market participants including directors, executives and their analysts can receive leaked indications of significant stock information before it is released to the public (Brunnermeier, 2005). Betzer and Theissen (2009) indicated that weak transparency and ineffective protective regulations in the financial markets may extend information asymmetries between firms, insider information and investors. Heidle and Li (2005) stated that some stock markets modified their stock quotes before a firm's announcement as they were advised by analysts who had relationships with the trading department within the firm. Additionally, prior to the publication of literature for investors, those who obtain inside information before it is made public, display their ability to gain the abnormally high returns by acting on their expectations of the public announcements (Tsai, 2014). However, these events disprove the strong form of the EMH. The results show that information leakage is a significant event when a firm's announcements such as annual reports, takeover information and acquisition notifications are received by some investors in the market before it is officially announced to the public.

Mac (2002) showed two types of information leakages in the market, the first one containing trading which relied on insider information, happening mostly with small investors, and the second type includes the leaking of special communications made between firms and their analysts, and this is the focal point for analysts. In addition, Brunnermeier (2005) reported that investors who trade via insider

information leakage display three specific features. Firstly, they trade depending on the inside information two times, once before and once after the official announcement. Secondly, they may take the decision to “unwind partially” after the official public announcement as they expect that “the market will overreact” to the announcement and thirdly, their trading before the announcement makes it difficult for other investors in the market to“learn from the past price movement” (Brunnermeier, 2005: p4). Moreover, some firms leak insider information to their analysts about the weak earnings before the public announcement, allowing these analysts and their customer to sell their shares before the fall in price (Mac, 2002), returning to repurchase their shares at the lower price after the public earnings announcement (Brunnermeier, 2005).

Although in the market it is impossible to detect all insider trading activities, especially those which are motivated by possession of the information leakage, the influence of these trades can be observed by investigating share price movements directly before the public announcement takes place (Keown and Pinkerton, 1981). The fact that some investors have the ability to obtain insider information thereby benefitting before other investors and the public provides evidence of the ethical problem of fairness which leads to increased wealth for well-connected investors not because of their efforts, but because of their close relationship with analysts and firm insiders (Mac, 2002). In addition, the study of Brunnermeier (2005) showed that the issue of information leakage and insider trading made stock prices less informative in the long term, and less efficient, both prior to or after, a firm’s public announcements, even if there is short run on earnings before the announcement.

Authorities in different countries set regulations and sanctions to reduce the phenomenon of information leakage and insider trading. For example, the U.S. Securities and Exchange Commission (SEC) stated that “because insider trading undermines investor confidence in the fairness and integrity of the securities

markets, the SEC has treated the detection and prosecution of insider trading violations as one of its enforcement priorities" (SEC, 2001). Besides, the United Kingdom Financial Services and Markets Act 2000 indicates that "market abuse" "is where an insider deals, or attempts to deal, in a qualifying investment or related investment on the basis of inside information relating to the investment in question" (FSMA, 2000). In Saudi Arabia, Alzahrani and Gregoriou (2010) carried out a study on the Saudi Stock Exchange market which indicated that there was a significant level of asymmetrical information present before the official earnings announcement date, confirming that the private acquisition of information had taken place. Even though, there is no empirical study investigate the effect of corporate governance components on information leakage in context of Islamic, and Middle East countries therefore this research is the first research that examines the relationship between the corporate governance and information leakage in these contexts and Saudi Arabia. The Saudi Capital Market Law stated that "any person who obtains, through family, business or contractual relationship, inside information" "is prohibited from directly or indirectly trading in the Security related to such information, or to disclose such information to another person" (CMA, 2009). Reducing insider information leakage is an important step to minimise insider trading activities. There is also a need to continually assess the leakage of information within the market to evaluate the efficiency of the current corporate mechanisms and market regulations to reduce the information leakage.

2.5 Conclusion

This chapter has reviewed and assessed the theoretical background and existing literatures pertinent to the research focus. Firstly, it presented the theoretical context and crucial theories concerning the major areas of corporate finance, which are capital structure, capital expenditure, capital budgeting and dividends. The section

on capital structure discussed the irrelevance theory, static trade-off theory and pecking-order theory. Additionally, an array of methods and techniques were presented in relation to capital expenditure, namely the CAPM model, APM model, Fama and French's three factor model, as well as WACC model. The section on capital budgeting illustrated the significant techniques for evaluating projects, which are the payback period, IRR, PI and NPV methods. The dividend section explained Miller and Modigliani's theory, the bird-in-the-hand theory, signalling effect theory and agency cost theory. Secondly, the chapter appraised the previous survey-based research on corporate finance practice, which has been conducted in both developed and developing countries. The review illustrated that scant few comprehensive surveys have been performed in developing countries, particularly in the Middle East, while there has also been no comprehensive survey yet conducted in relation to Saudi Arabia. This indicates the importance of this research and its contributions to understanding. Table 2-1 provides the main theories and models from the literatures related to the corporate finance and shows how these relate to the research draft survey and questions. Thirdly, the section on corporate governance discussed agency theory and stewardship theory, which are the two major theories explaining the form of relationship between firm management and shareholders. It was revealed that corporate governance elements are constructed based on the principles and philosophy behind agency theory. Subsequently, the chapter explained the components of corporate governance, board of directors, subcommittees and ownership structure, reviewing the literature in terms of the anticipated effect on firm performance and transparency. Fourthly, the final section described the concept of market efficiency, in addition to the relationship between information and the stock market, investigating the central significance of protecting the rights of all investors. Furthermore, the section discussed information leakage and the impact of corporate governance on firm transparency. It was determined

that this research is the first study investigating the relationship between corporate governance and information leakage in the Islamic, Middle Easter, Arabic and Saudi Arabian context. Following this discussion, the upcoming chapter reviews the literature concerning the relationship between corporate governance components, firm performance and information leakage, with relevant research hypotheses devised.

Table 2-1: The connection between the literatures review of corporate finance and the research survey questions

Corporate Finance topics	Theories and models presented in the literatures review	Survey Questions
Capital budgeting	The net present value (NPV) (Brigham and Ehrhardt, 2011). Payback period and accounting rate of return (Ross et al., 2002). Internal rate of return (IRR) (Cheng et. al., 1994). The profitability index (PI) (Ross et al., 2002).	Q1 & Q2
Cost of capital	The capital asset pricing model (CAPM) (Sharpe, 1964). The arbitrage pricing model (APM) (Ross, 1976). The three factor model (Fama and French, 1992, 1993 and 1996). The weighted average cost of capital model (WACC).	Q3, Q4, Q5, & Q6
Capital structure	The irrelevance theory (Modigliani and Miller, 1958). The static trade-off theory (Brigham and Houston, 2004). The pecking-order theory (Myers and Majluf, 1984).	Q7 & Q8
Dividend	Miller and Modigliani theory (Miller and Modigliani, 1961). The bird in the hand theory (Lintner, 1962) and (Gordon, 1963). Signal or asymmetric information theory (Bhattacharya, 1979) and (Miller and Rock, 1985). Agency cost theory (Jensen and Meckling, 1976) and (Jensen, 1986).	Q9

Chapter 3:

Corporate Governance Effect on Firm Performance and Information leakage: Research Hypotheses

3.1 Introduction

The previous chapter discussed the literature review and theoretical context of corporate finance, reviewing the existing survey-based research into corporate finance practices. A review was also undertaken of the literature and theories focused on corporate governance mechanisms and their effects, market efficiency and information leakage. This chapter will critique the literatures relevant to exploring the anticipated relationship between corporate governance components, firm performance and information leakage. Following this comprehensive review of the research, the research hypothesis is devised in relation to the association between each component of corporate governance, firm performance and information leakage. The corporate governance components include the ownership structure, as well as the directors' board aspects. The directors' board issues concern the board size, board independence, board meetings, CEO duality, audit size, audit meetings and board subcommittees. Ownership structure pertains to issues of ownership concentration, government ownership, institutional ownership, directors' ownership and managerial ownership. Thus, the chapter is organised as follows: Section 3.2 shows the research hypotheses discussion for the relationship between the board of directors' components and firm performance and information leakage. Section 3.3 presents the research hypotheses discussion for the association between ownership structure and firm performance and information leakage. 3.4 is the conclusion

3.2 The Board of Directors and Firm Performance and Information Leakage

The board of directors is a signifcant aspects in the corporate governance system and the composition, structure, and quality of the board of directors can influence firms' performance and information asymmetry (Goodstein et al. 1994; Fooladi 2012; Ajina et al. 2013; Elbadry et al. 2015; Khansalar et al. 2015). Corporate governance literature has investigated different characteristics of the board of directors that may have an effect on the board's efficiency and effectiveness on monitoring firms for the benefit of the shareholders. The research studied and reviewed selected characteristics based on their importance, information availability and relationship to the Saudi corporate governance regulations and codes. These characteristics include the board size, the percentage of independent directors, the number of board meetings, CEO duality, and the availability of audit, nomination, and remuneration committees, as well as the audit committee's size and frequency of meetings.

3.2.1 Board Size

The board's size is defined as "the number of directors serving on the board" (Elbadry et al. 2015). Various literature has studied the board size and its effects on the performance of firms but the studies are still indecisive and offer inconsistent outcomes (Kumar and Singh 2012; Al-Matari et al. 2012). In the context of the agency theory, Jensen stated that a smaller board size is connected with the board's efficiency in monitoring firms (Jensen 1993). Based on the agency theory assumption, a large board of directors encourages the dominance of firms' leaders by creating coalitions and disagreement between group interests (Ajina et al. 2013). Additionally, bad communication between directors encourages and facilitates insider manipulations driving to decrease the quality of announced information to the public and increase the problem of information asymmetry (Ajina et al. 2013).

Lakhal (2005) stated that a smaller-sized board helps directors to extensively monitor the firms' inside activities to confirm the transparency and quality of firms' announcements disclosure. Lipton and Lorsch (1992) indicated that when the board size is raised, it may lead the board being less efficient in monitoring the firm's activity and any advantages gained from extra board members will be substituted by the cost of delayed decision-making. Therefore, it is suggested a positive relationship between the board size and information leakage and information asymmetry (Lakhal 2005; Lipton and Lorsch 1992). In addition, directors of large boards cause a bad coordination and cooperation environment between members, which wastes time in making important decisions. Thus their expertise will stay unutilised which creates a bad influence on the firms' performance (Lin 2011; Dharmadasa et al. 2015). Moreover, a negative effect on performance will come from high expenditure on boards' compensation, bonuses, tickets, hotels and other allowances (Vafeas 1999a).

Zabri et al. (2016) examined the top 100 public listed firms in Bursa, Malaysia and they found a significant negative relationship between the board size and return on investment (ROA) as a performance proxy. Rodríguez-Fernández (2015) studied 47 European companies that were included in the EUROSTOXX50 Index in 2012 to find the link between board size and ROA, ROE, and Tobin's Q as a performance measure. The study concluded with a strong and negative link between variables. In addition, Mamatzakis and Bermpei (2015) researched 23 listed investment banks in the US from 2000 till 2012 and found a significant negative relationship between board size and performance, which is in line with the agency cost hypothesis. De Andres et al. (2005) focused on 450 non-financial firms from ten countries in North America and Western Europe to test the role of the board size on firms' value especially on the equity market-to-book ratio and Tobin's Q. Their study reported a significant negative relationship. Mashayekhi and Bazaz (2008) used 240 non-

financial firms listed on the Iranian Stock Market between 2005 and 2006 to examine the influence of board size on EPS, ROA, and ROE as performance variables. Their analysis revealed a strong negative association between size and performance. Hussainey and Al-Najjar (2012) investigated 130 non-financial firms in worldwide context from 2003 to 2009 and they concluded that there was a nonlinear relationship between the board size and the corporate governance ratings.

On the other hand, depending on the resource dependent theory, a large board has a good effect on the firms' performance and information leakage. Goodstein et al. (1994), Fauzi and Locke (2012) and Ujunwa (2012) indicated that additional directors on the board will bring more expertise, ideas, suggestions and help offering critical resources and good investment opportunities to firms. In the end, this improves firms' performance and benefits shareholders. Elbadry et al. (2015) pointed out that boards with more directors are more likely to assign more independent directors to the board and independent directors are more effective in observing the actions of top management. This is expected to increase the firms' transparency and decrease the problem of information asymmetry. Anderson et al. (2004) discussed that, overall, a large-sized board offers more monitoring processes on the financial and accounting activities of a firm, which leads the firm to have a better transparency environment. Based on this argument, more directors on the board increase the firms' performance and decrease the problem of information asymmetry. Moreover, Jiraporn et al. (2009), Ajina et al. (2013) and Ntim and Soobaroyen (2013) explained that large boards will give the firm the ability to form efficient and high quality board committees helping the board in the decision-making process. They will also make firms able to present different stakeholders on the board, which will build good relationships and communication between firms and stakeholders. Even though several studies confirmed the negative relationship

between board size and firms' performance, some research found a positive or no relationship between size and performance.

Yasser et al. (2011) studied 30 firms listed on the Pakistani market and found a positive relation between the board size and ROE. Coles et al. (2008) examined 8165 firms in the US from 1992 to 2005 to find the relationship between the board size and Tobin's Q as a performance measure and the results indicated a positive relation. Kyereboah-Coleman (2007) evaluated 103 companies collected from the stock exchanges of Ghana, Nigeria, Kenya, and South Africa during five years from 1997 to 2001 and the study showed that large board size had a positive influence on the firms' value with ROA and Tobin's Q (Kyereboah-Coleman 2007). Besides, Ajina et al. (2013) investigated a sample included 160 companies listed in the French market during 2008 to 2010 to reveal the association between the corporate governance and information asymmetry. The empirical study reports that the board size has a negative effect on the adverse selection and information asymmetry (Ajina et al. 2013). In addition, Haniffa and Hudaib (2006) studied the effect of board size on ROA and Tobin's Q in 347 firms listed on the Kuala Lumpur Stock Exchange between 1996 and 2000. The research reported mixed results, which are a positive effect on ROA and a negative effect on Tobin's Q.

However, Zhang (2012) investigated 1165 non-financial firms in the Shanghai stock exchange from 2004 to 2008 and found no relationship between the board size and performance and information leakage. Besides, The study of Connelly and Limpaphayom (2004) on 24 life insurance firms in Thailand and the study of Beiner et al. (2004) on 165 non-financial public listed firms in the Swiss market showed that no significant relationship is available between the board size and the firms' performance. Besides, Darko et al. (2016) analysed 20 companies publicly listed on the Ghana Stock Exchange over five years from 2008 to 2012 and the article concluded that there is no significant relationship between the board size

and the companies' performance (Darko et al. 2016). Furthermore, Huang et al. (2012) examined 156 illegal insider trading cases in 78 listed companies in the Taiwan's market to find the relation between the illegal insider trading and corporate governance components. Their empirical research reports that board size is not significantly related to illegal insider trading.

The Corporate Governance Regulation (CGR) in Saudi Arabia does not encourage firms to increase or decrease the board size and it only states that the "number shall not be less than three and not more than eleven" (CMA 2010: p21). In fact, the literature showed very limited studies on the relationship between the board size and information leakage and no study has yet been performed on the Islamic or Middle Eastern regions. Therefore, the research gives a valued contribution to literature internationally, especially for studies in the context of the developing, Middle Eastern, and Saudi Arabian markets. For the relationship between board size and performance, Al-Matari et al. (2012) examined 135 non-financial firms listed on the Saudi Stock Market at the end of 2010 and found an insignificant negative relationship between board size and Tobin's Q. Ghabayen (2012) researched 102 non-financial companies listed on the Saudi Stock Exchange in 2011 to find the link between board size and performance. The study reported that there is no significant link between the board size and ROA (Ghabayen 2012).

The studies of Al-Matari et al. (2012) and Ghabayen (2012) have several limitations. First, they used small samples covering a short period with a one-year observation. The small sample size can undermine the assumption of generalisability of their outcomes which make their results questionable (Ritchie and Lewis 2003). Moreover, sampling errors are decreased when the sample size is increased so the larger the sample size, the fewer the errors of the sample. Also, the estimations derived from the results of a large sample would be more reliable and representative compared to a small sample size (Sobel and Shiraev 2015).

Second, as this research uses balanced panel data, the study of Al-Matari et al. (2012) and Ghabayen (2012) applied unbalanced data. The balanced panel data is associated with a higher degree of freedom and a low level of collinearity (Ntim, Opong & Danbolt 2012). Finally, they used only one proxy and measure for assessing the firms' performance. In contrast, this research offers panel data with large samples and long periods with a nine-year period that cover the period before and after enforcing the Saudi corporate governance regulation (CGR) on listed firms. It also offers two types of data, with and without financial firms, and three measures of performance and information leakage. Using large and long panel data confirms that the outcomes are more likely to be protected from bias, which may come from specific time periods under examination. It also allows researchers to apply useful ways for controlling endogeneity (Guest 2009). In addition, this research applies the System generalised method of moments (GMM) method to control for heteroscedasticity, heterogeneity, and endogeneity. Therefore, this research provides a valuable contribution to literature especially for research in the context of the developing, Islamic, Middle Eastern and Saudi market. Based on the previous literature reviews, most research showed a negative relationship between board size and firms' performance and suggested a positive relationship between board size and information leakage (Jensen 1993; Lakhal 2005; Rodríguez-Fernández 2015; Zabri et al. 2016) . Therefore, the following hypothesises are formed to be empirically tested.

H1a: There is a significant and positive relationship between board size and firm information leakage.

H1b: There is a significant and negative relationship between board size and firm financial performance.

3.2.2 Board Independence

The Capital Market Authority (CMA) in Saudi Arabia stated that the independent director is one who represents the complete independence and the CMA presents situations that violate such independence (CMA 2010). These situations are members who:

- “hold five per cent or more of the issued shares of the company or any of its group
- a representative of a legal person that holds five per cent or more of the issued shares of the company or any of its group
- has been a senior executive of the company or of any other company within that company’s group during the preceding two years
- is a first-degree relative of any board member of the company or of any other company within that company’s group
- is a first-degree relative of any of senior executives of the company or of any other company within that company’s group
- is a board member of any company within the group of the company which he is nominated to be a member of its board
- has been an employee with an affiliate of the company or an affiliate of any company of its group during the preceding two years such as external auditors or main suppliers
- has a controlling interest in any such party during the preceding two years”

(CMA 2010: p5).

According to the agency theory, managers work on their interests and benefits at the cost of firms’ shareholders because of the split between ownership and control (Jensen and Meckling 1976). The interests of shareholders would be saved in these firms by increasing the number of independent directors to the board (Rhoades *et al.* 2000; Ramdani and Witteloostuijn 2010). Independent directors are

an efficient monitoring tool in firms to direct managers' activities in the shareholders' interest (Elbadry *et al.* 2015). Independent members come with different and new skills, knowledge, contact and experience which will enhance the board's decisions and performance (Ntim & Soobaroyen 2013; Abdullah 2004). As independent directors are an effective system to monitor how the board works, this will develop the firms' transparency by directing the board to follow and comply to the accurate processes in producing disclosure information (Chen and Jaggi 2000). Kanagaretnam et al. (2007) investigated 1170 quarterly earnings announcements on the U.S. Stock Market and found a significant negative relationship between the boards' independence and information asymmetry. Elbadry et al. (2015) examined 324 non-financial listed firms in the UK to test the relationship between board independence and information asymmetry and they concluded that there was a significant negative link between the variables. In terms of firms' performance.

Dehaene et al. (2001) researched 122 Belgian firms and found a significant and positive relationship between the boards' independence and ROE as a performance measure. Lefort and Urzua (2008) analysed the panel data of 160 Chilean non-financial firms from 2000 to 2003 and concluded that an increase in the percentage of independent directors has a positive influence on firms' Tobin's Q. Liu et al. (2015) studied 16999 firms in the years from 1999 to 2012 on the Shanghai and Shenzhen Stock Exchange and revealed a significant and positive relationship between the boards' independence and ROA and ROE. Yasser et al. (2011) studied 30 firms listed in Pakistan during the 2008 and 2009 markets and found a positive relation between the boards' independence and ROE and the net profit margin as a performance measure. Kyereboah-Coleman (2007) examined 103 firms combined from the stock exchanges of Ghana, Nigeria, Kenya, and South Africa during five years from 1997 to 2001 and the study showed that the boards' independence had

a positive effect on the firms' value with ROA and Tobin's Q (Kyereboah-Coleman 2007).

On the other hand, Goodstein et al. (1994) stated that independent members increase diversity on the board which may create conflict in making decisions because they have different conceptions which, at the end, slow down the decision-making on the board. Fernandes (2008) examined data from the Portuguese Stock Market to find the link between firm performance and board structure, especially concerning the independent directors. The results indicated that the independent directors played a weak role in monitoring firms and firms with more independent directors had higher wages than firms with fewer independent directors (Fernandes 2008). The study also showed that firms with no independent directors had fewer agency problems and the interests of managers were likely to be in line with the interest of the shareholders (Fernandes 2008). In addition, Agrawal et al. (1996) analysed approximately 400 firms in the U.S. market in 1987 to test the relationship between the boards' independence and their performance. They reported that there is a negative relationship between the board size and Tobin's Q (Agrawal et al. 1996). Darko et al. (2016) evaluated 20 companies listed on the Ghana Stock Exchange during five years from 2008 to 2012 and the research reported that there is a significant negative association between the number of independent directors on the board and the firms' performance measured by ROA, ROE and Tobin's Q (Darko et al. 2016).

However, Zabri et al. (2016) studied the top 100 listed companies on the Malaysian Stock market to find a connection between the boards' independence and performance. They showed that no relationship is available between board independence and ROA and ROE (Zabri et al. 2016). Zhang (2012) evaluated 1165 non-financial companies on the Chinese Stock Market between the years 2004 and 2008 and he pointed out that no relationship is available between the boards'

independence and information leakage and ROA, ROE and Tobin's Q as a performance measure. Moreover, Huang et al. (2012) examined 156 illegal insider trading cases in 78 listed companies in the Taiwan's market to reveal the link between the illegal insider trading and corporate governance components. Their empirical study shows that board independence is not significantly associated with illegal insider trading.

The Articles 12c and 12e of the Saudi CGRs, which are related to board independence, have become mandatory to all firms from 2009. These Articles stated that "the majority of the members of the Board of Directors shall be non-executive members" and "the independent members of the Board of Directors shall not be less than two members, or one-third of the members, whichever is greater" (CMA 2010: p21). In addition, Article 13c said that "a sufficient number of the non-executive members of the Board of Directors shall be appointed in committees that are concerned with activities that might involve a conflict of interest" (CMA 2010: p22). Therefore, the Saudi Corporate Governance Regulations believe that board independence has a negative influence on information leakage and a positive influence on firms' performance. In fact, literature has revealed very limited studies on the relationship between board independence and information leakage and no study has yet been conducted on the Arabic, or Middle Eastern regions. For the relationship between board independence and performance, Al-Matari et al. (2012) examined 135 non-financial public companies in the Saudi Market at the end of 2010 and found an insignificant positive link between board independence and Tobin's Q. Ghabayen (2012) investigated 102 non-financial firms listed on the Saudi Stock Market at the end of 2011 to test the relationship between board independent and performance. The research concluded that there is a significant negative relation between board independence and ROA (Ghabayen 2012).

In addition, Ezzine (2011) studied 96 Saudi industrial listed firms from 2006 to 2008 and showed that no relationship existed between board independence and firms' share performance. The studies of Al-Matari et al. (2012), Ezzine (2011), and Ghabayen (2012) have several limitations. First, they used small samples covering a short period with one or three years' observation. As discussed in detailes in the previous section (see section 3.2.1), a small sample size can undermine the assumption of generalisability and increase sampling errors and bias. Second, their study applied unbalanced data and one measure for assessing the firms' performance. In contrast, this research uses panel data with large samples and long periods of time with a nine-year period that cover the period before and after enforcing the Saudi CGRs on listed firms and it also offers two types of data, with and without financial firms, and three measures of information leakage and performance. In addition, this research applies the System GMM method that can control for heteroscedasticity, heterogeneity, and endogeneity. Therefore, this research provides a valuable contribution to literature worldwide and especially for the research in the context of the developing, Islamic, Middle Eastern and Saudi market. Depending on the above review and following the assumptions of the agency theory and the recommendations of the Saudi corporate governance regulations, the following hypothesises would be empirically tested.

H2a: There is a significant and negative relationship between board independence and firm information leakage.

H2b: There is a significant and positive relationship between board independence and firm financial performance.

3.2.3 CEO Duality

CEO duality is the status that makes the chief executive officer (CEO) work as the board chairman at the same firm and at the same time. Relying on the agency

theory, when one person has two top roles in the firm simultaneously, the problem of interests between managers and shareholders will emerge as this type of power leads the plans, objectives, and strategies of firms and boards to be in line with the self-interest of top managers (Jensen and Meckling 1976; Fama and Jensen 1983). If the role of the board chairman and CEO is split, this will offer an efficient system and environment to monitor managers' activities and performance and prevent the firm from being dominated by one person (Rechner and Dalton 1991). Jensen (1993) stated that the absence of the separation role between the CEO and board chairman will weaken the monitoring tasks of the board. Moreover, it gives the CEO the ability to direct board meetings, choose closed board members and set the subjects that are discussed in board meetings (Haniffa and Cooke 2002). In addition, as the separation role enhances the monitoring process in firms, an effective monitoring system will minimise the benefits gained from inside information, which develops firms' transparency and the quality of information disclosed (Forker 1992). CEO duality was proved by literature to decrease the information level of firms' disclosure, which will worsen the problem of information asymmetry and transparency (Cai et al. 2006).

Tang (2016) investigated 82 public U.S. firms in the computer industry from 1994 to 2001 and the results reported that CEO duality had a negative influence on total shareholder return (TSR) as a performance measure. Besides, Duru et al. (2016) used 950 firms with 6848 observations in the U.S. from 1997 to 2011 to test CEO duality and performance. They stated that CEO duality has a significant negative influence on ROA, ROE and return on sale (ROS) (Duru et al. 2016). Kyereboah-Coleman (2007) evaluated 103 companies collected from the stock exchanges of Ghana, Nigeria, Kenya and South Africa during five years from 1997 to 2001 and the research stated that CEO duality had a negative influence on the firms' value with ROA and Tobin's Q (Kyereboah-Coleman 2007). Dahya et al.

(1996) explored 76 firms in the UK market from 1989 to the end of 1992 to find the influence of CEO duality on financial performance. The results indicated that the market showed a positive response when firms moved from CEO duality to a separate role, and the position between the CEO and the chairman showed an improved performance in these firms (Dahya et al. 1996). In addition, Hearn (2011) observed the West African markets and analysed 37 listed firms from 2002 to 2009. The research showed that the separation roles of CEO and chairman reduces information asymmetry and has a good influence on firms' value (Hearn 2011).

In addition, Feng et al. (2005) examined 224 real estate investment trusts (REIT) in the U.S. during 1999 and 2000 to find the link between the board structure and the effectiveness of a monitoring system and its influence on performance. Their study indicated that the board structure, such as the separate roles of the CEO and the chairman is an important function in an efficient monitoring system and causes better financial performance (Feng et al. 2005). Cai et al. (2006) investigated UK firms from 1999 to 2003 to study the relationship between corporate governance and information efficiency. Their outcomes showed that separating the top roles between the CEO and the chairman develops the process of disclosing information to investors and the public, which will minimise the opportunity of insider information trading (Cai et al. 2006). In addition, Donnelly and Mulcahy (2008) used 51 public listed firms in the Irish market in June 2002 to empirically test the link between corporate governance and firms' quality disclosure. The research reported that firms with a non-executive chairman provided more voluntary disclosures compared with other firms, which minimises the issue of information asymmetry and enhances firms' transparency (Donnelly and Mulcahy 2008).

In contrast, depending on the stewardship theory, top management is trustworthy and its interest would be in line with shareholders' interests (Donaldson and Davis 1991). Therefore, the CEO will work to maximise shareholders' wealth

and the CEO duality gives top executives the ability to be focused, flexible and effective in running firms in a challenging and changing business environment (Donaldson and Davis 1991; Finkelstein and D'Aveni 1994). Lam and Lee (2008) examined 128 public firms in the Hong Kong market in 2003 to find the link between CEO duality and ROA, ROE, return on capital and market-to-book value of equity. The research indicated that neither the agency nor the stewardship theory would interpret the relationship by itself, as the results showed that CEO duality has a positive influence on non-family firms and non-duality has a positive effect on firms controlled by families (Lam and Lee 2008). In addition, Donaldson and Davis (1991) studied 321 firms in the U.S. market from 1985 to 1987 to find if the empirical results support the agency or stewardship theories. Their study indicated that the firms' performance by ROE is superior in the availability of CEO duality (Donaldson and Davis 1991).

The study of Haniffa and Cooke (2002) covered 167 firms publicly listed on the Kuala Lumpur Stock Exchange (KLSE) at the end of December 1995. The study explored the relationship between the corporate governance components and the quality of firms' disclosure and it concluded that the extent of splitting the role between the chairperson and CEO had a high significant negative influence on the quality of firms' information disclosure (Haniffa and Cooke 2002). This evidence disproves the agency theory assumptions, which states the importance of assigning a non-executive chairman to enhance the monitoring role of the board on executives' activities. Al-Janadi et al. (2013) examined 87 companies on the Saudi Stock Exchange during 2006 and 2007 to find the relationship between corporate governance components and voluntary disclosure. The empirical research reported that separating the position of CEO and chairman had a significant negative relationship with voluntary announcements, as firms with CEO duality announced more information than firms with a split position. This improves the firms'

transparency (Al-Janadi et al. 2013). Besides, Huang et al. (2012) investigated 156 illegal insider trading cases in 78 listed firms in the Taiwan's stock market to find the association between the illegal insider trading and corporate governance mechanisms. Their study shows that firms with CEO duality are more likely to have less chance of illegal insider trading.

However, Wan and Ong (2005) analysed 212 responses and 299 directors from listed firms in Singapore and there was no relationship between the CEO duality and board performance. Abdullah (2004) empirically researched public firms listed in the Kuala Lumpur Stock Exchange during the years 1994 to 1996 and the study showed no relationship between the CEO duality and ROA, ROE, earnings per share (EPS) and profit margin. In addition, Zhang (2012) tested 1165 non-financial companies on the Chinese Stock Market for the period 2004 to 2008. The results indicated that there was no relationship between CEO duality and ROA, ROE and Tobin's Q and also the CEO duality has no effect on information leakage (Zhang 2012). Ajina et al. (2013) examined a sample containing 160 firms listed on the Paris Stock Exchange from 2008 to 2010 to study the link between corporate governance and information asymmetry. The research found no significant connection between CEO duality and the adverse selection or information asymmetry (Ajina et al. 2013). Yasser et al. (2011) studied 30 firms listed in the Pakistani market during 2008 and 2009 and found no significant relationship between CEO duality and ROE and the net profit margin.

The Article 12d of the CGRs in Saudi recommends that "it is prohibited to conjoin the position of the Chairman of the Board of Directors with any other executive position in the company, such as the Chief Executive Officer (CEO) or the managing director or the general manager" (CMA 2010: p22). Therefore, the Regulations assume that the separate position of CEO and chairman has a good effect on a firm in general and on the performance and information leakage

specifically. Actually, literature has reported very limited studies on the relationship between CEO duality and information leakage, and no study has yet been conducted on the Islamic, Arabic or Middle East regions. In terms of performance, Al-Matari et al. (2012) investigated 135 non-financial firms listed on the Saudi Stock Exchange at the end of 2010 and the study showed no significant relationship between CEO duality and Tobin's Q. Ezzine (2011) analysed 96 industrial companies listed in the Saudi market from 2006 to 2008 and the results reported that there is a significant negative link between CEO duality and firms' share performance.

As discussed in detailes in the previous sections (see sections 3.2.1 and 3.2.2), the studies of Al-Matari et al. (2012) and Ezzine (2011) have several limitations. In contrast, this research uses panel data with large samples, long periods, two types of data, three measures of information leakage and performance, and the System GMM method to control for heteroscedasticity, heterogeneity, and endogeneity. Therefore, this research provides a valuable contribution to literature especially for research in the context of the developing, Islamic, Middle Eastern and Saudi regions. According to previous literature checks and following the assumptions of the agency theory and the suggestions provided by the Saudi corporate governance regulations, the next hypothesises can be empirically tested:

H3a: There is a significant and positive relationship between CEO duality and firm information leakage.

H3b: There is a significant and negative relationship between CEO duality and firm financial performance.

3.2.4 Board Meetings

The frequency of board meetings provides a signal to the level of board activities and productivity (Brick and Chidambaran 2010). The active board will be more

efficient in monitoring top executives' activities to be aligned with shareholders' objectives and interests which reduce the agency problems (Elbadry et al. 2015). Kanagaretnam et al. (2007) argued that the frequency of board meetings helps the board to conduct monitoring processes more closely with the top executives. In addition, regular meetings of the board improve the level of communication and the efficiency of the board and the published meeting reports to the public bring more confidence to investors and shareholders, decreasing the information asymmetry problems and enhancing firms' transparency (Ajina et al. 2013). Moreover, minimising the agency problems and increasing the shareholders' confidence will improve firms' performance and trading volume and decrease shares' volatility (Schwartz-Ziv and Weisbach 2013; Elbadry et al. 2015). Lipton and Lorsch (1992) argued that increased board meeting frequency is more likely to cause higher performance. Liang et al. (2013) used panel data contained within 50 banks in the Chinese market from 2003 to 2010 to examine the relationship between the board characteristics and firms' performance. The research indicated that the number of board meetings has a significant positive influence on banks' performance (Liang et al. 2013).

Karamanou and Vafeas (2005) explored 275 non-financial and non-utilities firms in the U.S. market which included 1274 observations between 1995 and 2000. Their study showed that the number of board meetings developed the firms' earnings forecasts, which enhances the firms' decision-making processes (Karamanou and Vafeas 2005). In addition, Brick and Chidambaran (2010) explored 5228 observations of firms in the U.S. market over six years from 1999 to 2005 to test the link between board monitoring activities and firms' value. The article stated that the board activities measured by the log of the number of the board meetings, positively affected the firms' value (Brick and Chidambaran 2010). Kanagaretnam et al. (2007) analysed 1170 quarterly earnings announcements listed on the U.S.

Stock Market to find the link between the quality of corporate governance and information asymmetry, measured by bid-asked spreads around quarterly earnings announcements. The study indicated that the frequency of board meetings improved the transparency environment in firms and had a significant negative relationship on information asymmetry (Kanagaretnam et al. 2007).

Moreover, Elbadry et al. (2015) studied 324 non-financial listed companies in the UK market to find the influence of the corporate governance mechanisms on the information asymmetry of firms. Their study indicated that the number of board meetings had a significant negative relationship to the asymmetric information which means that the higher the number of board meetings, the lower the level of information asymmetry (Elbadry et al. 2015). Ajina et al. (2013) researched data that included 160 companies listed on the Paris Stock Market from the period 2008 to 2010 to find the relationship between the corporate governance components and the information asymmetry problem. The research showed that there is a negative significant relationship between the number of board meetings and the adverse information asymmetry (Ajina et al. 2013). Xie et al. (2003) explored 282 listed firms from the S&P 500 index during the years 1992, 1994, and 1996 to find the relationship between the board of directors and preventing earnings management. The study stated that there is a relationship between the number of board meetings and the lower level of earnings management, which implies that board activity and productivity help members to perform their monitoring roles, enhance the firms' transparency and reduce the issue of information asymmetry (Xie et al. 2003).

On the other hand, the theory of stewardship implies that top management in firms is honest and works in line with shareholders' benefits and interests (Donaldson and Davis 1991). Therefore, the board of directors does not need to increase its meetings to improve monitoring effectiveness as top management is trustworthy. Furthermore, there are different expenditures and costs that emerged

with an increase in board meetings, such as preparing times and expenses, travel costs and directors' fees and compensation for attending meetings (Vafeas 1999b). All of these costs will have a negative influence on financial reports and reduce the firms' profitability and performance. Christensen et al. (2015) examined 660 Australian listed firms from 2000 to 2005 and the authors showed that the relationship between the board meetings and firms' performance was significantly negative. The possible interpretation for this result is that the weak performance of firms is usually followed by extensive board meetings to solve the issues and improve firms' operations (Christensen et al. 2015). Vafeas (1999a) investigated 307 companies in the U.S. market from 1990 to 1994 to find the relationship between the frequency of board meetings and performance. He concluded that the annual number of board meetings negatively related to the firms' value but this negativity disappeared when previous share performance was added to the model, indicating that operating performance increases after years of abnormal meetings' frequency (Vafeas 1999b).

However, Jackling and Johl (2009) studied 180 top listed non-financial firms on the Bombay Stock Exchange (BSE) during 2005 and 2006. The study showed that the relationship between the frequency of board meetings was not significantly related to the firms' performance measured by ROA and Tobin's Q (Jackling and Johl 2009). Mehdi (2007) examined 24 listed companies on the Tunisian Stock Market during the years 2000 to 2005 to find the link between corporate governance and performance. The article indicated that there is no relationship between the number of board meetings and firms' economic performance (Mehdi 2007). The author stated that the possible interpretation for this result is that mostly the decisions of board members are affected when there is a case of acquisition or a change in the CEO and the performance relies more on the daily management of activities and operations (Mehdi 2007).

The Article 16-2 of CGRs in Saudi said that “the Board shall convene its ordinary meetings regularly upon a request by the Chairman. The Chairman shall call the Board for an unforeseen meeting upon a written request by two of its members” (CMA 2010: p25). Thus, the authority of Saudi Arabia does not recommend or impose any specific number of board meetings and it depends on the inside procedure of each firm. In fact, the literature shows very limited studies on the relationship between the frequency of board meetings and the information leakage and no study uses the cumulative abnormal returns before earnings announcements as an information leakage measure to find the relationship between the frequency of board meetings and information leakage. Moreover, no study has yet been conducted on the developing countries especially the Islamic, Arabic, or Middle Eastern regions. In terms of performance, no study has been published about the effect of the number of board meetings on the performance of the Saudi listed firms. Furthermore, this study applies panel data with large samples, long periods, two types of data, three measures of information leakage and performance, and the System GMM method to control for heteroscedasticity, heterogeneity, and endogeneity. Therefore, this research provides a valuable contribution to the literature especially for research in the context of the developing, Islamic, Middle Eastern and Saudi market. Referring to the previous literature review and following the assumptions of the agency theory, the next hypothesises can be empirically tested.

H4a: There is a significant and negative relationship between the number of board meetings and firm information leakage.

H4b: There is a significant and positive relationship between the number of board meetings and firm financial performance.

3.2.5 Board Subcommittees

The board subcommittee is one of the most important corporate governance mechanisms that support board activities. Kesner (1988) argued that most significant board decisions are generated and made at subcommittee level, influencing firms' plans and strategies. The Saudi CGR states that the board of directors should create a number of subcommittees to improve the effectiveness of its decisions and performance (CMA 2010). Based on the agency theory, the conflict of interests between shareholders and top executives can be mitigated by creating board committees and the main role of these committees is to work as a close independent monitor for the top executives' activities. This is to ensure that they work in the best interests of shareholders to maximise their wealth and the firms' performance (Klein 1998).

The main role of committees in monitoring companies' operations and activities is to ensure the transparency and accuracy of the quality of all companies' announcements and disclosures to reduce the issue of information asymmetry (Al-Janadi et al. 2013). The Saudi CGR indicates that the audit committee is responsible for monitoring the effectiveness of the procedures and reports of the internal audit system in the firm, as well as the work of external auditors, and the quarterly and annual financial reports before they can be confirmed by the board of directors (CMA 2010). In addition, the Saudi CGR said that one of the main roles of the nomination and remuneration committee is to ensure that there is no conflict of interest among the board members (CMA 2010).

Zhang (2012) evaluated 1165 non-financial firms listed on the Chinese Stock Market during the years 2004 to 2008 to find the effects of board subcommittees on performance and information leakage. The study showed that the audit, nomination and remuneration committees had a positive effect on the firms' ROA, ROE and Tobin's Q ratios (Zhang 2012). Moreover, these committees also had a negative

influence on information leakage which indicated that board subcommittees help firms to increase transparency and reduce the problem of information asymmetry between insider firms and investors (Zhang 2012). Karamanou and Vafeas (2005) examined 275 firms listed in the U.S. market between the year 1995 and 2000 to find the connection between the audit committee and management earnings forecasts. The study showed that the existence of the audit committee was related positively to the effectiveness of the corporate governance and the accuracy of earnings forecast which eventually improves the firms' performance and reduce the issue of information leakage and information asymmetry (Karamanou and Vafeas 2005). Anderson and Bizjak (2003) explored companies on the New York Stock Exchange during 1985 to 1995 to study the effect of the remuneration committee on executive excessive payments. The study indicated that the presence of the remuneration committee had a positive effect on the corporate governance quality and control over executives which leads to better performance and transparency (Anderson and Bizjak 2003).

Vafeas (1999c) evaluated 606 large companies listed in the U.S. market during 1994 to study the association between the presence of the nomination committee and corporate governance. The article indicated that the formation of the nomination committee positively influenced the independence and quality of the board of directors which enhances the firms' performance and transparency (Vafeas 1999c). Klein (1998) studied 486 companies from the S&P 500 in the U.S. market and the research showed that the board subcommittees had a positive influence on the firms' performance. (McMullen 1996) explored 69 companies from the U.S. market between 1984 and 1988 to study the effect of the presence of the audit committee and firms' transparency. The study reported that the presence of the audit committee was positively related to the accuracy and reliability of the companies' financial reporting which reduces the information asymmetry problem

(McMullen 1996). Kaczmarek et al. (2012) assessed UK companies from 1999 to 2008 to study the influence of the nomination committee on the board of directors. The research showed that the existence of the nomination committee had a positive influence on the board effectiveness and diversity (Kaczmarek et al. 2012). In addition, Ruigrok et al. (2006) studied 210 Swiss listed firms during 2001 to 2003 and the study revealed that the presence of the nomination committee positively affected the independence of the board of directors which enhances the firms' performance and monitoring system.

On the other hand, creating board subcommittees will add more costs to firms in the same manner as the costs of the board that are stated by Vafeas (1999a), such as travelling expenses, compensation, fees and meetings arranging costs and these costs may affect negatively the firms' profitability and performance. Besides, Dalton et al. (1998) argued that most of the important decisions made by firms are not established and conducted at board subcommittee level but rather they are conducted by the board of directors itself. Hearn (2011) explored the West African stock markets and examined 37 listed companies from 2002 to 2009. The study reported that creating audit and remuneration committees in firms to monitor executives' activities is unnecessary and may lead to an increase in the level of the information asymmetry and cause a bad effect on firms' value and transparency (Hearn 2011). The possible explanation for this result is that West African investors believe that the board committees work as a committee controlled by executives rather than a committee established as a monitoring mechanism (Hearn 2011). Forker (1992) examined 182 companies in the UK market during the year 1987 and 1988 to find the relationship between the corporate governance components and the quality of firms' financial disclosures. The author found that the presence of the audit committee had a weak relationship with the quality of information disclosed in firms' financial statement, which means that this study does not confirm the positive

effect of an audit committee on firms' transparency (Forker 1992). Furthermore, Christensen et al. (2015) investigated 660 Australian public companies during 2000 to 2005 and the study reported that there was no significant association between the audit committee and firms' performance measured by Tobin's Q.

The Article 14a of Saudi CGRs has to be applied, from the year 2009, by all listed companies and it states that "the Board of Directors shall set up a committee to be named the "Audit Committee" (CMA 2010). Article 15a is a compulsory code for all listed firms and says that "the Board of Directors shall set up a committee to be named "Nomination and Remuneration Committee" (CMA 2010: p25). In fact, the literature shows limited studies on the relationship between the presence of board subcommittees and the information leakage and no study uses the cumulative abnormal returns before earnings announcements as an information leakage measure, to discover the relationship between the presence of subcommittees and information leakage. Moreover, no study has yet been conducted on the developing countries especially the Islamic, Arabic, or Middle Eastern region. In the context of performance, no study has been published about the effect of the presence of subcommittees on the performance of the Saudi listed firms. Therefore, this research provides a valuable contribution to the literature worldwide and especially for research in the context of the developing, Islamic, Arabic and Saudi market. As the Saudi CGR sets and specifies only certain mandatory committees to be established by all firms, which are the audit, nomination, and remuneration committees, these committees would be the scope of this research to assess the effect of the presence of these subcommittees on information leakage and performance in Saudi Arabia. Regarding the above literature review and following the assumptions of the agency theory the next hypothesises can be empirically tested:

H5a: There is a significant and negative relationship between the presence of board subcommittees and firm information leakage.

H5b: There is a significant and positive relationship between the presence of board subcommittees and firm financial performance.

3.2.6 Audit Committee Size

The audit committee size is deemed a related mechanism to help the audit committee perform its tasks (Cadbury-Committee 1992). Kalbers and Fogarty (1993) argued that committees with a high number of members would have more knowledge and confidence in making decisions and more organisational conditions compared with committees with fewer members so a large size has a positive influence on performance. Anderson et al. (2004) stated that, in general, large numbers give the opportunity to conduct more monitoring tasks on the financial and accounting processes of the companies, which encourages the companies to have better transparency and increase the quality of financial reports.

Xie et al. (2003) investigated 282 listed companies in the U.S. from the S&P 500 index in 1992, 1994, and 1996 to study the link between the size of audit committees and the level of earnings management. The research showed that there is a significant and negative association between the audit committee size and the level of earnings management, which indicates that increased members within audit committees helps audit committees conduct their monitoring tasks (Xie et al. 2003). Bryce et al. (2015) studied 200 firms listed on the Australian Securities Exchange between 2003 and 2008 with 1200 observations to find the relationship between the audit committee size and accounting quality. The research reported that firms with a high number of audit committee members were more likely to have high accounting quality and less earnings management so more committee members give the firms the ability to monitor the accounting practices (Bryce et al. 2015). Al-

abbas (2009) investigated the joint stock firms in Saudi Arabia during 2005, 2006, and 2007 and he found that the number of members in the audit committee had a significant negative relation with the abnormal accruals which showed the importance of audit committee size on improving the transparency and the quality of financial reporting of firms.

Besides, Inaam and Khamoussi (2016) used the meta-analysis method to study 58 previous pieces of literature about audit committee characteristics. The meta-analysis showed that the size of the audit committee had a significant negative relationship with earnings management (Inaam and Khamoussi 2016). Kyereboah-Coleman (2007) assessed 103 firms combined from the stock markets of Ghana, Nigeria, Kenya, and South Africa over five years from 1997 to 2001 to find the relationship between corporate governance and performance. The research concluded that the audit committee size had a positive influence on ROA and Tobin's Q as a performance measure (Kyereboah-Coleman 2007). Afza and Nazir (2014) investigated 127 companies in Pakistan throughout 2011 to study the association between the audit quality and firm value. The study revealed that there is a significant positive association between the audit committee size and the firms' value measured by ROA and Tobin's Q (Afza and Nazir 2014).

On the other hand, Mir and Seboui (2008) indicated that audit committees with a high number of members may cause ineffective governance and a large committee size with frequent meetings would add more costs and expenses to firms' budgets which affects their profitability and performance. Lin et al. (2008) argued that large-sized audit committees would reduce the cooperation between members. In addition, they stated that high numbers of members in the audit committee may produce unnecessary discussions and delays in making decision. Therefore, an increased number of audit committee members would have a negative influence on

firms' performance and provide a weak response on critical issues such as monitoring firms' management and transparency.

Karamanou and Vafeas (2005) investigated 275 companies listed on the U.S. Stock Market during the years 1995 to 2000 to study the relationship between the audit committee size and management earnings forecasts. The research reported that the number of audit committee members was linked negatively to the quality of the corporate governance and the accuracy of the earnings forecast (Karamanou and Vafeas 2005). Hamdan et al. (2013) examined 50 industrial Jordanian companies listed on the Amman Stock Market over six years from 2004 to 2009 to study the influence of audit committee characteristics on earnings quality. The research revealed that the size of the audit committee is inversely related to the earnings quality so it is not appropriate to increase the numbers of members of the audit committee in terms of performance (Hamdan et al. 2013). However, Darko et al. (2016) analysed 20 companies publicly listed on the Ghana Stock Exchange over five years from 2008 to 2012 to test the influence of corporate governance on performance. The article concluded that there is no significant relationship between the audit committee size and companies' performance (Darko et al. 2016).

The Article 14a of the Saudi CGR mentions the number of members in the audit committee, stating that "its members shall not be less than three, including a specialist in financial and accounting matters" (CMA 2010: p24). Article 14a become mandatory for all Saudi listed firms from the beginning of 2009 (CMA 2010). Therefore, the Saudi CGR sets only the minimum number for a committee and does not encourage Saudi firms to increase the number of committee members. Thus, the appropriate number of audit committee members is dependent on the system and procedures that are approved by the board of each firm. In fact, the literature shows limited studies on the relationship between the size of audit committees and information leakage and no study uses the cumulative abnormal returns before

earnings announcements as an information leakage measure, to find the relationship between the size of audit committee meetings and information leakage. Moreover, no study has yet been conducted on the developing countries especially in the Arabic or Middle Eastern regions.

With regard to performance, Al-Matari et al. (2012) explored 135 non-financial companies listed on the Saudi Stock Market at the end of 2010 and the study indicated that the audit committee size had a significant negative influence on the companies' performance measured by Tobin's Q. Ghabayen (2012) studied 102 non-financial companies listed on the Saudi Stock Market at the end of 2011 to test the relationship between board characteristics and performance. The study reported that there is no association between the audit committee size and performance measured by ROA (Ghabayen 2012). The studies of Al-Matari et al. (2012) and Ghabayen (2012) have several limitations and discussed in detailes in the previous sections (see sections 3.2.1 and 3.2.2). In contrast, , this researcm implements panel data with large samples, long periods, two types of data, three measures of information leakage and performance, and the System GMM method to control for heteroscedasticity, heterogeneity, and endogeneity. Therefore, this research provides a new valuable contribution to literature worldwide and especially for research in the context of the developing, Islamic, and Middle Eastern market. Referring to the previous literature reviews, the next hypothesises can be empirically tested:

H6a: There is a significant and negative relationship between audit committee size and firm information leakage.

H6b: There is a significant and positive relationship between audit committee size and firm financial performance.

3.2.7 Audit Committee Meetings

The number of audit committee meetings is applied by previous literature to evaluate and test the audit committee's effectiveness and its meetings (Xie et al. 2003; Darko et al. 2016). Brick and Chidambaran (2010) argued that a high number of audit committee meetings is essential to exchange critical information between the audit committee members and managers. Furthermore, the frequency of audit committee meetings is a significant signal that reveals the activities of the audit committee on conducting a monitoring role (Lin et al. 2006). Thus, firms with fewer audit committee meetings would be less active and not able to efficiently monitor top management to reduce the agency problem between management and shareholders (Menon and Williams 1994). Karamanou and Vafeas (2005) stated that an audit committee that meets more than others gives its members more opportunities to perform their monitoring responsibilities and it is more likely to have more efficient control on the transparency, accuracy and quality of financial information and announcements that are released to investors. Menon and Williams (1994) indicated that creating an audit committee does not always means that the board of directors depends on the audit committee to improve the board monitoring role and strength. In fact there are some signals that confirm the dependency on an audit committee for the monitoring system and one of these signals is the frequency of meetings of the audit committee.

Hamdan et al. (2013) investigated 50 industrial Jordanian firms listed on the Amman Stock Exchange over six years from 2004 to 2009 to study the influence of audit committee meetings on earnings quality. The study showed that the number of audit committee meetings improved the earnings quality which indicates that the frequency of audit committee meetings helps the committee to be more active in a monitoring role (Hamdan et al. 2013). Beasley et al. (2000) analysed U.S companies over 11 years between 1987 and 1997 and the articles indicated that audit committees in companies charging for fraudulent financial disclosure had a lower

number of committee meetings compared with non-fraudulent companies which is associated with high frequency audit committee meetings (Beasley et al. 2000). Farber (2005) assessed 87 companies on the U.S. Stock Market during the period 1982 to 2000 to study the importance of the corporate governance. The study indicated that companies who participated in fraudulent activities by manipulating their financial statements had characteristically less frequent audit committee meetings. This shows the importance of the frequency of audit committee meetings in decreasing the information leakage phenomenon. Xie et al. (2003) explored 282 listed firms from the S&P 500 index during 1992, 1994, and 1996 to find the relationship between the corporate governance and preventing earnings management. The study stated that there is a relationship between the frequency of audit committee meetings and the lower level of earnings management, which indicates that a higher frequency of audit committee meetings helps members to conduct their monitoring tasks (Xie et al. 2003).

Bryce et al. (2015) analysed 200 companies listed on the Australian Securities Exchange during the years 2003 and 2008 with 1200 observations to study the link between the frequency of audit committee meetings and accounting quality. The study indicated that the number of audit committee meetings had a significantly negative effect on the level of earnings management, which enhances the accounting quality of companies. Thus the higher frequency of audit committee meetings helps firms to monitor effectively the accounting processes and decrease the problem of information asymmetry to enhance transparency (Bryce et al. 2015). Inaam and Khamoussi (2016) applied the meta-analysis approach to evaluate 58 prior studies about audit committee characteristics. The meta-analysis reported that the number of audit committee meetings had a significant negative association with earnings management (Inaam and Khamoussi 2016). Moreover, Elbadry et al. (2015) investigated 324 non-financial listed firms in the UK market to reveal the

effect of the corporate governance mechanisms on the information asymmetry of firms. Their research reports that the number of audit committee meetings had a significant negative association with the asymmetric information (Elbadry et al. 2015). Anderson et al. (2004) examined 252 firms with 1052 observations listed in the U.S. market during the period 1993 to 1998 to study the relation between audit committee meetings and the cost of debt. The research reported that the frequency of audit committee meetings had a significant negative relation with the yield spreads, indicating that a firm with a better performance causes lower yield spreads (Anderson et al. 2004).

Menon and Williams (1994) explored 200 listed firms in the U.S. market during 1986 and 1987 to find the relationship between the audit committee and the monitoring role. The study reported that audit committees with a high number of meetings were likely to have independent directors and represent the shareholders to set an effective monitoring mechanism to control executives (Menon and Williams 1994). In the end, this will enhance the firms' performance and reduce the issue of information leakage. Hoque et al. (2013) investigated 118 limited firms listed on the stock market of Australia during 1999 and 2007 to find the relationship between the frequency of board subcommittees' meetings and performance. The study reported that the number of audit meetings had a significant positive effect on the performance of firms especially on the ROE and ROA ratios (Hoque et al. 2013). Kyereboah-Coleman (2007) evaluated 103 companies collected from the stock exchanges of Ghana, Nigeria, Kenya, and South Africa during five years from 1997 to 2001 to study the connection between corporate governance and performance. The study indicated that the frequency of audit committee meetings had a positive effect on ROA and Tobin's Q as a performance measure (Kyereboah-Coleman 2007).

On the other hand, the monitoring of the frequency of audit committee meetings only gives information about the number of meetings not about the efforts, achievements, and valuable decisions that are made during these meetings (Menon and Williams 1994). Bradbury (1990) stated that boards of directors often establish audit committees for the purpose of appearance to the public rather than to develop the monitoring and control of top executives for the benefits of shareholders. Ben Barka and Legendre (2016) investigated 43 firms with 215 observations listed in the French market between 2002 and 2006 to find the association between the frequency of meetings of audit committees and performance. The study showed that the frequency of meetings of audit committees had a significant negative influence on the firms' performance measured by ROA and ROE ratios (Ben Barka and Legendre 2016). Darko et al. (2016) evaluated 20 companies listed on the Ghana Stock Exchange during five years from 2008 to 2012 to check the effect of corporate governance on performance. The research reported that there is a significant negative association between the frequency of audit committee meetings and performance measured by ROA and ROE and this may be because of the high cost and expenses associated with extensive audit committee meetings (Darko et al. 2016). However, Afza and Nazir (2014) examined 127 firms in Pakistan during 2011 and the study showed that there is no significant relation between the number of audit committee meetings and the firms' value measured by ROA and Tobin's Q (Afza and Nazir 2014).

The CGR in Saudi Arabia does not set any recommendations regarding the appropriate audit committee meetings that should be conducted every year and the Saudi CGR only indiates that "the Board shall approve the by-laws of all committees of the Board, including, inter alia, the Audit Committee, Nomination and Remuneration Committee" (CMA 2010:p22). Thus, the appropriate number of audit committee meetings is based on the system and procedures that are approved by

the board of each firm. In fact, the literature shows limited studies on the relationship between the frequency of audit committee meetings and the information leakage and no study uses the cumulative abnormal returns before earnings announcements as an information leakage measure, to find the relationship between the frequency of audit committee meetings and information leakage. Moreover, no study has yet been conducted on the developing countries especially the Islamic, Arabic, or Middle Eastern regions. In the context of performance, Al-Matari et al. (2012) examined 135 non-financial firms listed on the Saudi Stock Market at the end of 2010 and the study reported an insignificant positive relationship between the frequency of audit committee meetings and Tobin's Q.

The study of Al-Matari et al. (2012) has several limitations and discussed in detailes in the previous sections (see sections 3.2.1 and 3.2.2). In contrast, , this study uses panel data with large samples, long periods, two types of data, three measures of information leakage and performance, and the System GMM method to control for heteroscedasticity, heterogeneity, and endogeneity. Therefore, this research provides a valuable contribution to the literature worldwide and especially for research in the context of the developing, Islamic, Middle Eastern and Saudi market. Based on the above discussion, we expect that the frequency of audit committee meetings has a negative relationship with information leakage and a positive relationship with performance. Thus, the next hypothesises can be empirically tested:

H7a: There is a significant and negative relationship between the number of audit committee meetings and firm information leakage.

H7b: There is a significant and positive relationship between the number of audit committee meetings and firm financial performance.

3.3 The Ownership Structure and Firm Performance and Information Leakage

He and Rui (2014) indicated that the strict governance structure would decrease the insider trading activities and the unethical incidents and acts, something which will also lead to minimising the information asymmetry in the market. The ownership structure is an important factor in corporate governance as it is able to form the corporate governance system in every country (Darko et al., 2016). Whilst the effect of ownership structures on the performance, transparency and information leakage of firms is discussed in the literatures, the outcomes of these studies nevertheless reveal different and contrary results. Fauzi and Locke (2012) indicate that most studies pertaining to ownership structure were conducted in developed countries such as the U.S and the U.K., and as each country has diverse contexts that are characterised by distinct legal, institutional, and business environments, the ownership structure has different influences based on these diverse contexts. Baydoun et al. (2013) stated that even though several studies have investigated the effect of ownership structure, these studies have recommended the effects in different directions because the studied environments were various, and in addition, the new studies reveal that the sampled firms did not represent the worldwide markets as they mostly concerned the Anglo-Saxon markets (Reyna et al., 2012). Moreover, Mangena et al. (2012) investigated the effect of the political and economic environment on the relationship between the board and both ownership structure and the firm's performance, and ultimately indicated that these environments have a strong influence on the relationship between corporate governance and performance. In addition, the research of Varcholova and Beslerova (2013) showed that the influence of ownership structure on firms and their performances is significant in Eastern European firms - in contrast to the more developed countries. These studies show clear evidence of the strong effect of a country's context on corporate governance studies; this confirms the importance of

this research, which will investigate the corporate governance in Saudi Arabia that has a distinct environment compared to either Western or emerging countries. The ownership structure includes concentration ownership, institutional ownership, government ownership, director ownership, and managerial ownership.

3.3.1 Ownership Concentration

Ownership concentration and the block-holders are identified as the level of ownership of shareholders who own at least 5% of the firm's issued shares (Konijn et al. 2011). Furthermore, the ownership concentration can provide a good regulatory system for controlling managers (Reyna et al., 2012). Darko et al. (2016) reported that the large shareholders are anticipated to have strong control and encouragement for observing and monitoring the management activities so that they will reduce the agency issue that exists between management and shareholders. However, if there is unsuitable concentration in the ownership, the large shareholders may dominate the firm's leadership and use the resources for their benefit, against the interests of small shareholders (Darko et al., 2016). Zhuang (1999) stated that concentration ownership and the prevalence of large shareholders in firms results in negative influences on transparency which in turn increases the information asymmetry. Large shareholders are not likely to support the procedure of developing and increasing the firm's transparency or disclosure quality, as this type of improvement will decrease their ability to control the firm (Zhuang, 1999).

Empirical studies into the effect of ownership structures have shown mixed results. Mehdi (2007) investigated twenty-four firms listed on the Tunisian shares market, between 2000 and 2005, in order to study the relationship between corporate governance and performance. The study showed that ownership concentration and block-holders had a significantly negative influence on economic

performance (Mehdi, 2007). This result indicates that block-holders in Tunisia may use the firms' resources for their benefit, thus causing a negative influence on the performance. In addition, Mura (2007) studied unbalanced panel data comprising 673 firms from the UK's market during 1991-2001 by applying the GMM model. The author found that the block-holders' ownership has a significantly negative influence on the firms' performances (Mura, 2007). Moreover, Fauzi and Locke (2012) investigated the New Zealand firms in the stock market during the period 2007-2011, a sample comprising seventy-nine firms. They stated that concentration ownership shows a significantly negative association with the performance measured by ROA and Tobin's Q, and therefore high levels of concentration ownership will lower the performance (Fauzi and Locke, 2012).

Regarding the effect on the information leakage, Lakhal (2005) investigated 207 firms from the SBF 250's index in the French stock market during the period 1998-2001. The author found that the managers in firms with high levels of concentration ownership were less likely to offer greater voluntary disclosures of earnings which indicates that the higher the concentration ownership the lower the firms' transparency (Lakhal, 2005). Ntim and Soobaroyen (2013) examined seventy-five South African listed companies from 2003 to 2009 to identify the connection between the ownership structure and the level of transparency and information disclosures. Their results showed that the block-holders' ownership had a significantly negative association with the level of transparency and information disclosures. Furthermore, Samaha et al. (2012) examined one hundred listed firms on the Egyptian Stock Exchange during 2009. They showed that the level of concentration ownership had a significantly negative influence on the level of corporate voluntary disclosures, and therefore the outcomes indicate that block-holder ownership deceases the firms' transparency and increases the information asymmetry (Samaha et al., 2012).Moreover, Byun et al. (2011) investigated 1067

companies during the period 2001-2004 to identify the relationship between ownership concentration and information asymmetry. They reported that the ownership concentration is related significantly positively with the increase in the level of information asymmetry measured by the increase in the amount of informed trading (Byun et al., 2011).

On the other hand, Reyna et al. (2012) studied ninety companies in the Mexican stock market from 2005 to 2009. The author found a positively significant relationship between the concentration of ownership and the companies' performance, as identified by Tobin's Q and the industry-adjusted Q (Reyna et al., 2012). In addition, Darko et al. (2016) examined twenty firms listed on the Ghanaian Stock Exchange from 2008 to 2012 in order to study the effect of corporate governance on performance. The research revealed that firms with higher ownership concentration had a better performance - especially in ROA and Tobin's Q - compared with firms that had lower ownership concentration (Darko et al., 2016). Furthermore, Boussaada and Karmani (2015) examined thirty-eight banks from the MENA region during the period from 2004 to 2011. The researchers' findings showed that there is a significant and positive relationship between the level of large shareholders in banks and the firms' performances as measured by ROA and ROE (Boussaada and Karmani, 2015). Bos and Donker (2004) analysed 194 voluntary accounting modifications from 1990 to 1998 in the Netherlands' market. The study found that the level of large shareholders decreased the opportunistic acts of executives trying to manipulate the accounting figures (Bos and Donker, 2004).

However, He and Rui (2014) studied 17,320 transactions in the Chinese market from 2007 to 2011 to identify the effect of ownership structures on insider trading and information leakage as measured by the cumulative abnormal returns (CARs). The research showed that there is a convex relationship between ownership concentrations and both the information leakage and insider trading. In

addition, Mangena et al. (2012) analysed 352 financial reports from the Zimbabwe Stock Exchange during the period 2000-2005 in order to discover the effect of ownership structure on firms' performances as measured by ROA and Tobin's Q. They showed that the level of ownership concentration is not related to the firms' performances. Moreover, Zhang (2012) assessed 1165 non-financial companies in the Chinese stock market for the period 2004 to 2008. The results demonstrated that there was no relationship existing between the ownership concentration and ROA, ROE, or Tobin's Q, whilst also showing that ownership concentration had no influence on the information leakage (Zhang, 2012).

The Article 45(a1) of the Listing Rule of the Saudi stock market states that a shareholder has to disclose his ownership and notify the Capital Market Authority (CMA) if he is "becoming the owner of, or interested in, 5% or more of any class of voting shares or convertible debt instrument of the issuer" (CMA, 2004, p. 36). This Article indicates that the Capital Market Authority in Saudi Arabia believes that large shareholders have a special influence on both the firm and the market more than small shareholders do; thus, they require them to disclose their level of ownership to the public so as to improve the market's transparency. In fact, the literatures show limited research has been undertaken on the relationship between ownership concentration and information leakage using the cumulative abnormal returns before earnings announcements, as an information leakage measure. Moreover, no study has yet been conducted in Saudi Arabia, or even in the Arabic or Middle Eastern region. For the association between ownership concentration and performance in Saudi Arabia, Boussaada and Karmani (2015) examined thirty-eight banks from the MENA region - including Saudi Arabia - during the period from 2004 to 2011, and utilised ROA and ROE for performance assessment. Nevertheless, this study has several limitations. Firstly, the research focuses only on one industry - banking - and therefore does not represent the whole market and cannot generalise

the findings of other companies. Secondly, the researchers used a small sample of thirty-eight banks and, as the previous discussion (section 3.2.1) alluded to, the small sample size can undermine the assumption of generalisability and increase sampling errors and biases. In contrast, this study applies panel data with large samples, long periods, two types of data, three measures of information leakage and performance, and the System GMM method to control for heteroscedasticity, heterogeneity, and endogeneity. Therefore, this research provides new and valuable contributions to the literatures worldwide, and especially for research in the context of the developing, Islamic, and Middle Eastern regions. Referring to the previous literature reviews, the following hypothesises can be empirically tested:

H8a: There is a significant and positive relationship between ownership concentration and firm information leakage.

H8b: There is a significant and negative relationship between ownership concentration and firm financial performances.

3.3.2 Institutional Ownership

As the board of directors plays an important role in monitoring the management to best serve shareholders' interests and to minimise the agency problem and information asymmetry between the management and shareholders, the institutional shareholders can also play this role. The institutional ownership is seen as a special ownership compared to other types of ownership because the institutional shareholders can easily monitor the management activities. This owes to the fact that they are more professional and can therefore assess the management's reports and decisions (Donnelly and Mulcahy, 2008).Moreover, large institutional shareholders have incentives to monitor the managements' activities and prevent their potentially self-serving and opportunistic behaviours that are not in line with the shareholders' interests (Bos and Donker, 2004). Moreover,

the institutional shareholders have the financial knowhow to understand deeply the changes in the financial reports (Bos and Donker, 2004). On the contrary, there is a conflict of interest and the agency problem may occur between the institutional shareholders and the firm because the institutional shareholders might have a business relationship with the firm, and therefore their monitoring role and their ability to detect self-serving and opportunistic behaviours could be weakened (Mehdi, 2007). Overall, the empirical literatures concerning the influence of institutional ownership report mixed results.

Hussainey and Al-Najjar (2012) examined 130 non-financial firms worldwide from 2003 to 2009 demonstrating that institutional ownership is the main governance factor that influences the corporate governance rating. Zhang (2012) tested 1165 non-financial companies on the Chinese stock market during the period 2004-2008. The results showed that the institutional ownership had a significantly positive influence on the firms' ROA, ROE, and Tobin's Q ratio (Zhang, 2012). Meanwhile, Henry (2008) examined 177 large listed companies on the Australian Stock Exchange from 1992 to 2002. The author showed that there is a significant and positive association between institutional ownership and the company's performance as measured by Tobin's Q ratios (Henry, 2008). Regarding the influence on the firms' transparency, Lakhal (2005) examined 207 companies from SBF 250's index of the French stock market, covering the period from 1998 to 2001. The research reported that the managers in companies with high levels of institutional ownership are more likely to release voluntary earnings disclosures, and this implies that the level of institutional ownership has a positive effect on the companies' transparency and would thus decrease information asymmetry (Lakhal, 2005).Furthermore, Tsai (2014) examined 2751 earnings announcements on the Taiwanese stock market during the period from 2005 to 2010 in order to study the incidents of trading based on inside information. The research showed that the

investors' trading based on inside information is restricted through the availability of high concentrations of ownership by foreign institutions, and therefore the institutions either take essential roles in lowering the agency and information asymmetry problems, or they focus on buying shares of companies who do not have transparency issues (Tsai, 2014).

On the other hand, Mehdi (2007) explored twenty-four listed firms on the Tunisian stock market between 2000 and 2005 to examine the relationship between corporate governance and performance. The author stated that the increasing institutional ownership has had a negative effect on the economic performance of firms with the q measure, and this outcome implies that high institutional ownership may weaken the effectiveness of firms' operations, in turn resulting in weak performances (Mehdi, 2007). In addition, Ntim and Soobaroyen (2013) studied seventy-five South African listed firms during the period 2003-2009 in order to discover the association between their ownership structures and the levels of transparency and information disclosure. The research outcomes reported that the level of institutional ownership has a significantly negative correlation with the level of transparency and information announcements. Moreover, Cai et al. (2006) studied nonfinancial UK companies outside the FTSE 350 from 1999 to 2003 in order to study the relationship between corporate governance and information efficiency. Their results demonstrated that in the presence of high institutional ownership, there exists a high chance of share trades based on inside information (Cai et al., 2006). Moreover, Elbadry et al. (2015) investigated 324 non-financial listed firms in the UK market to reveal the effect of the corporate governance mechanisms on the information asymmetry of firms. Their research reports that the institutional ownership had a significant positive association with the asymmetric information (Elbadry et al. 2015).

However, Zhang (2012) tested 1165 non-financial companies on the Chinese stock market during the period 2004-2008. The study concluded that institutional ownership has a weak effect on information leakage as the variables provided mixed results with negative and no relationships existing (Zhang, 2012). Additionally, Byun et al. (2011) investigated 1067 companies during the period 2001-2004 to identify the relationship between institutional ownership and information asymmetry, ultimately reporting that institutional ownership is not related to information asymmetry (Byun et al., 2011). In addition, Donnelly and Mulcahy (2008) investigated fifty-one listed companies on the Irish stock market in the year 2002 to study empirically the association between their ownership structures and the levels of transparency and voluntary information disclosure. The authors indicated that institutional ownership has no effect on the level of information disclosures, and will therefore not decrease the prevalence of information asymmetry or enhance firms' transparency (Donnelly and Mulcahy, 2008).

The Article 6(D) of the Saudi CGRs states that the institutional shareholders "shall disclose in their annual reports their voting policies, actual voting, and ways of dealing with any material conflict of interests that may affect the practice of the fundamental rights in relation to their investments" (CMA, 2010, p. 10). This Article adds specific responsibilities to institutional shareholders in order to improve the corporate governance environments in Saudi Arabia, as well as to increase the level of transparency. Indeed, the literatures present limited studies on the association between institutional ownership and information leakage that uses the cumulative abnormal returns before earnings announcements, as an information leakage measure. Moreover, as mentioned earlier, no study has yet been conducted in Saudi Arabia or even in the wider Arabic or Middle Eastern region. In addition, no research has been conduct so far on the relationship between institutional ownership and performance. Therefore, this research presents valuable contributions to the

existing literature by offering the first study concerned with the effect of institutional ownership on information leakage and performance. Referring to the previous literature reviews' argument that supports the good influence of institutional ownership and also by following the evidence of Hussainey and Al-Najjar (2012), Zhang (2012), Lakhal (2005), and Tsai (2014), the following hypothesises can be empirically tested:

H9a: There is a significant and negative relationship between institutional ownership and firm information leakage.

H9b: There is a significant and positive relationship between institutional ownership and firm financial performances.

3.3.3 Government Ownership

Public and listed companies are distinguished by the ownership spread between shareholders but also the separation between the ownership and management. Therefore, this firm structure will cause an agency issue between the interests of shareholders and managers. Several listed firms in Saudi Arabia have high concentrations of ownership by family or government shareholders, and the prevalence of government ownership in some firms is as high as 74.3% of the issued shares. There is an argument in the literatures regarding the effect of government ownership on firms; the main objectives of governments owning shares in the market may be not to gain profits and economic goals but rather to have political influence and control (Darko et al., 2016). Therefore, the ownership benefits of government will be used for the advantage of politicians and bureaucrats, as well as seeing the government's ownership weakening the firms' performances by setting bureaucratic regulations and management (Tran et al., 2014). The study of Borisova et al. (2012) in the European Union market found that government ownership is related to the decrease in governance quality. In contrast, government ownership

can minimise the issue of information asymmetry caused by the incomplete disclosures and information pertaining to the value of the firm (Darko et al., 2016).Moreover, it is argued that high government ownership will provide large support to firms, especially where the government can offer substantial financial subsidy to a firm for its future investments and growth (Tran et al., 2014).

Empirically, Mrad and Hallara (2012) studied thirty-one companies in the French market between 1987 and 2009. The authors showed that the level of government ownership is related significantly and positively with the company's performance, as identified by ROE, ROA, and Tobin's Q (Mrad and Hallara, 2012). Besides, Ghazali (2010) examined the data of eight-seven non-financial firms listed on the Malaysian stock market in 2001. The author reported that the government ownership there is positively related to the firms' performances, as measured by Tobin's Q (Ghazali, 2010). Similarly, Ntim and Soobaroyen (2013) analysed seventy-five companies in the South African market during the period 2003-2009 in order to reveal the relationship between their ownership structure and the levels of transparency and information announced voluntarily. The research results indicated that there is a significantly positive relationship between the level of government ownership and the level of transparency and information announcements (Ntim and Soobaroyen, 2013).Furthermore, Zhang (2012) assessed 1165 non-financial companies in the Chinese stock market during the period 2004-2008. The study showed that government ownership has a significantly negative effect on information leakage (Zhang, 2012). In addition, He and Rui (2014) analysed 17,320 transactions in the Chinese stock market during the period from 2007 to 2011 in order to examine the influence of ownership structure on firms' information leakage, as measured by the cumulative abnormal returns (CARs). The authors indicated that the high level of government ownership decreases the information leakage

incidents and the CARs, which therefore shows a significantly negative effect (He and Rui, 2014).

On the other hand, Darko et al. (2016) examined twenty companies listed on the Ghanaian Stock Exchange for five years from 2008 to 2012 in order to identify the influence of corporate governance on their performance. The study asserted that government ownership had a negative but insignificant effect on the Tobin's Q, and therefore there is no relationship between government ownership and firms' performances (Darko et al., 2016). Meanwhile, Cheung et al. (2010) studied panel data contained in Vietnamese companies during the period from 2004 to 2012. They reported that government ownership has a significantly negative effect on the companies' profitability through using ROA and ROE and labour productivity (Cheung et al., 2010). Chen et al. (2005) analysed 145 companies' yearly observations on the Chinese stock market from 2000-2001. The researchers reported that there is a negative and significant association between government ownership and company performance, as identified by ROA (Chen et al., 2005). In addition, Boussaada and Karmani (2015) examined thirty-eight banks from the MENA region during the period from 2004 to 2011. The investigators found that there is a significant and negative relationship between the levels of state ownership in banks and the firms' performances, as measured by ROA and ROE (Boussaada and Karmani, 2015).Furthermore, Al-Janadi et al. (2013) studied eight-seven firms on the Saudi stock market from 2006 to 2007 in order to examine the relationship between corporate governance components and voluntary disclosure. The study revealed that government ownership had a significantly negative effect on the quality of firms' reports and disclosures, an observation which indicates the importance of reducing the government's ownership so as to enhance the firms' transparency and performances (Al-Janadi et al., 2013). However, Zhang (2012) evaluated 1165 non-financial companies on the Chinese stock market for the period

2004-2008. The results indicated that there is no relationship between government ownership and ROA, ROE, or Tobin's Q (Zhang, 2012).

Indeed, the literatures report limited studies concerned with the association between government ownership and information leakage, through using the cumulative abnormal returns before earnings announcements, as an information leakage measure. Moreover, no study has yet been conducted in Saudi Arabia, or even in the wider Arabic or Middle Eastern region. In addition, there has been no research yet conducted on the relationship between government ownership and performance. Therefore, this research presents valuable contributions to the existing literature by offering the first study of the effect of government ownership on information leakage and performance. Referring to the previous literature reviews and arguments that support the negative effect of government ownership and interventions, as well as following the evidence of Darko et al. (2016), Cheung et al. (2010), Boussaada and Karmani (2015), Chen et al. (2005), and Al-Janadi et al. (2013), the following hypothesises can be empirically tested:

H10a: There is a significant and positive relationship between government ownership and firm information leakage.

H10b: There is a significant and negative relationship between government ownership and firm financial performances.

3.3.4 Director Ownership

Incentive theory indicates that the directors who own shareholders in the firm have large incentives to increase the firm's performance, and therefore the agency cost would be reduced because the differences in the interests between shareholders and directors would be minimised (Mehdi, 2007). The directors with high levels of ownership would gain the benefits of the firm's profits and growth, but in addition they would suffer the consequences of bad decisions and actions that may have

reduced the firm's value and performance (Hussainey and Al-Najjar, 2012). Hussainey and Al-Najjar (2012) examined 130 nonfinancial firms worldwide from 2003 to 2009, indicating that director ownership negatively influences the corporate governance rating, and so director ownership is used as a substitute for the internal corporate governance mechanism to control the management and lower the agency issue. However, it is argued that increasing the directors' ownership may cause a lowering of market firm monitoring (Mehdi, 2007). Jackson et al. (2008) argued that even when the directors' ownership is found to improve the firm performance, there is evidence that the firm's value drops when the level of director ownership is at a high level owing to the phenomenon of management entrenchment. Overall, therefore, the literatures present mixed empirical results of the relationship between directors' ownership and firms' transparency and performances.

Rose et al. (2013) conducted a survey of seventy-two board directors, finding that there is an interactive influence between director ownership and the transparency of their decisions. The directors who own shares are more likely to prevent management activities via manipulating the earnings reports when the transparency is high (Rose et al., 2013). Furthermore, Ju and Zhao (2014) investigated 1124 fund-year observations between 2002 and 2004 from the CRSP/COMPUSTAT database, observing that the boards' independent directors are more likely to lower the fund discounts when they have high levels of ownership. This result indicates that when the independent directors have high levels of ownership, they work efficiently in their monitoring roles (Ju and Zhao, 2014). In addition, Florackis et al. (2009) used 1010 nonfinancial firms from the UK market to investigate the effect of director ownership on the firms' performances. The research showed that the effect of director ownership on the performance, as identified by Tobin's Q, is supported only when the level of ownership is below 15% (Florackis et al., 2009). Moreover, Amer et al. (2014) analysed fifty listed firms on the Egyptian

stock market during 2004 to 2012. They argued that the research results indicate that the levels of director ownership are positively connected with the firms' performances, as identified by ROE, but it is not significantly so (Amer et al., 2014). Likewise, Cosh et al. (2006) studied 363 takeovers in the UK's market during 1986-1996. The research reported that director ownership has a significantly positive influence on the long-run stock returns, but a weak influence on operating performance (Cosh et al., 2006). Furthermore, Farrer and Ramsay (1998) researched 180 listed firms on the Australian stock market, with the study showing that there is an association existing between the directors' ownership and the firms' performances, however, this relationship is influenced by different factors - such as the measurement of performance and ownership, and firms' sizes.

On the other hand, Vafeas (1999b) examined 307 firms in the U.S. market during the period from 1990 to 1994, arguing that the study's results show that the level of director ownership has a significant and inverse relation with the boards' activities (Vafeas, 1999b). Meanwhile, Reyna et al. (2012) investigated ninety Mexican firms during 2005-2009. They reported that the ownership of board directors has a negatively significant relationship with the firms' performance, as measured by Tobin's Q and the industry-adjusted Q. Similarly, Mura (2007) investigated unbalanced panel data contained in 673 companies from the UK's market during the period from 1991 to 2001 by utilising the GMM model. The researcher found that the directors' ownership, especially with the executive directors, has a cubic relationship with the firms' performances (Mura 2007). In addition, Leung and Horwitz (2004) analysed 376 listed firms on the Hong Kong stock market during the year 1996 in order to identify the relationship between directors' ownership and transparency. The research reported that the level of direct ownership has a negatively significant influence on the firm's transparency, especially regarding voluntary segment disclosures (Leung and Horwitz,

2004).Moreover, Fidrmuc et al. (2006) investigated the transactions in the UK's market from 1991 to 1998 in order to ascertain if the market reaction and abnormal returns depends on the ownership structure. The study found that the directors' ownership has a strong and positive influence on the abnormal returns (Fidrmuc et al., 2006).

However, Henry (2008) investigated 177 large listed firms on the Australian Stock Exchange from 1992 to 2002. The author argued that there is a weak relationship between the directors' ownership and the firms' performances, as measured by Tobin's Q (Henry, 2008). In addition, Mehdi (2007) assessed twenty-four listed firms on the Tunisian stock market between 2000 and 2005 in order to examine the relationship between corporate governance and performance. The author reported that director ownership was not related to the economic performance, and that this result is therefore not in line with the argument that the directors' ownership is a good incentive for them to reduce the agency issue between directors and shareholders, or to enhance directors' and firms' performances (Mehdi, 2007). Additionally, Ghazali (2010) examined the data of eighty-seven nonfinancial firms listed on the Malaysian stock market in 2001. The author reported that director ownership is not associated with the firms' performances, as measured by Tobin's Q (Ghazali, 2010).Similarly, Cai et al. (2006) analysed nonfinancial British firms from outside the FTSE 350 from 1999 to 2003 in order to study the association between corporate governance and information efficiency in the stock markets. The results showed that there is a weak and significant association between the directors' ownership and the share trades based on inside information (Cai et al., 2006). Moreover, Samaha et al. (2012) investigated one hundred companies listed on the Egyptian Stock Exchange in 2009, revealing that there is a weak relationship between the level of directors' ownership and voluntary corporate disclosures; thus, the results indicate that the directors'

ownership has no effect on the firms' transparency or information asymmetry (Samaha et al., 2012).

The Article 45(a-3) of the Listing Rule of the Saudi stock market states that shareholders have to disclose their ownership and notify the Capital Market Authority (CMA) if he is "a director or senior executive of the issuer becoming the owner of, or interested in, any rights in the shares or convertible debt instruments of that issuer" (CMA, 2004, p. 36). In fact, the literatures demonstrate limited empirical researches on the relationship between director ownership and information leakage, using the cumulative abnormal returns before earnings announcements, as an information leakage measure. Moreover, no study has yet been conducted in Saudi Arabia, or even in the wider Arabic or Middle Eastern region. In addition, no research yet exists concerning the relationship between director ownership and performance. Therefore, this research offers valuable contributions to the existing literature by presenting the first study on the effect of government ownership on information leakage and performance. Based on the argument that director ownership decreases the agency issue and leads the interests of directors to match the shareholders' interests in increasing their wealth, it is expected that director ownership has positive influences on performance. Moreover, several firms on the Saudi stock market are mainly dominated by families who would prefer to maintain strong control on the firm. The previous empirical studies also demonstrate that director ownership has a negative influence on a firm's transparency, therefore it is expected that director ownership has positive effects on information leakage and information asymmetry. Referring to the previous literature reviews and arguments, and following the evidence of Vafeas (1999b), Cosh et al. (2006), Amer et al. (2014), Leung and Horwitz (2004), and Fidrmuc et al. (2006), the following hypothesises can be empirically tested:

H11a: There is a significant and positive relationship between director ownership and firm information leakage.

H11b: There is a significant and positive relationship between director ownership and firm financial performances.

3.3.5 Managerial Ownership

Managerial ownership is defined as the shares that are owned by the managers in the firm (Mueller and Spitz-Oener, 2006). Jensen and Meckling (1976) argued that managerial ownership causes the objectives and interests of stockholders and executives to match one another, which would decrease the agency cost and improve the company's performance and value. In addition, Jensen and Meckling (1976) argued that when managerial ownership is low, the shareholders need to increase the monitoring aspects of the management's activities. Based on this argument, when the level of managerial ownership is high, the level of shareholders monitoring would be low, which may, in turn, lower the frequency of voluntary disclosures (Donnelly and Mulcahy, 2008). Additionally, this lower level of shareholders monitoring may lead the management to increase their insider trading, opportunistic conduct, and/or information leakage. Overall, the empirical literatures present mixed outcomes regarding the effect of managerial ownership on firms' transparency and performances.

Mehdi (2007) investigated twenty-four listed firms on the Tunisian shares market between 2000 and 2005 in order to study the relationship between corporate governance and performance. The study showed that when managerial ownership was raised the marginal q and performance also rose, and this supports the hypothesis which stated that increased managerial ownership in firms would reduce conflicts of interest and agency issues (Mehdi, 2007). Additionally, Mehran (1995) examined 153 manufacturing firms in the U.S. market from 1973 to 1983 in order to

study the relationship between managers' ownership and firms' performances. He concluded that the percentage of shares owned by managers has a positive effect on firms' performances, as measured by Tobin's Q and ROA (Mehran, 1995).Moreover, Cosh et al. (2006) studied 363 takeovers within the UK's market from 1986-1996. The research indicated that CEO ownership has a significantly positive influence on the long-run stock returns and operating performances (Cosh et al., 2006). Similarly, Daraghma and Alsinawi (2010) analysed twenty-eight listed firms on the Palestine stock market between 2005 and 2008. The research reported that management ownership has positively significant effects on firms' performances (Daraghma and Alsinawi, 2010). Likewise, Mueller and Spitz-Oener (2006) investigated the unbalanced data of 356 firms in the German service sector from 1977 to 2000. The research showed that managerial ownership increases firms' performances (Mueller and Spitz-Oener, 2006). Moreover, Fauzi and Locke (2012) studied New Zealand firms on the stock market from 2007 to 2011, using a sample of seventy-nine companies. The article revealed that managerial ownership has a significant and positive relationship with performance, as measured by ROA and Tobin's Q, and thus high levels of managerial ownership increases performance (Fauzi and Locke, 2012). In addition, Mangena et al. (2012) assessed 352 financial reports from the Zimbabwean Stock Exchange from 2000 till 2005 in order to reveal the influence of managerial ownership on companies' performances, as identified by ROA and Tobin's Q. They reported that there is a significantly positive relationship between managerial ownership and companies' performances.

On the other hand, Vafeas (1999b) analysed 307 firms on the U.S. stock market from 1990-1994. The author indicated that the research outcomes reveal that the level of officer ownership has a significant and inverse relation with the boards' activities (Vafeas, 1999b). Furthermore, Reyna et al. (2012) examined ninety Mexican companies from 2005 to 2009, stating that the ownership of

companies' executives has a negatively significant influence on companies' performances, especially regarding Tobin's Q and an industry-adjusted Q. Furthermore, Haniffa and Hudaib (2006) studied the effect of managerial ownership on both ROA and Tobin's Q in 347 firms listed on the Kuala Lumpur Stock Exchange between 1996 and 2000. The research reported that managerial ownership has a negatively significant influence on the accounting performance, pertaining to ROA, but no influence on the marketing performance, as measured with Tobin's Q (Haniffa and Hudaib, 2006). Moreover, Kwansa et al. (2014) examined fourteen years' worth of financial data related to thirty listed companies in the NASDAQ's hospitality sector. The study reported that there is no significant relationship between the frequency of managerial ownership and the companies' profits in the hotel segment, whilst identifying a significantly negative relationship between managerial ownership and companies' profits in the restaurant segment.

However, Simoneti and Gregoric (2004) used panel data related to 182 Slovenian companies from 1995 to 1999 in order to identify the influence of managerial ownership on performance, concluding that there is no association between managerial ownership and performance. Additionally, Donnelly and Mulcahy (2008) examined fifty-one listed firms in the Irish market in 2002 in order to reveal the relationship between their ownership structures and the level of transparency and voluntary information disclosures. Their study revealed that managerial ownership is not related to the prevalence of information disclosures, and therefore has no influence on enhancing firms' transparency (Donnelly and Mulcahy, 2008). Moreover, Baek et al. (2009) utilised a sample of 460 firms from the S&P 500 index in 2000 in order to reveal the effect of managerial ownership on the level of firms' transparency and information disclosures. The research showed that managerial ownership is not related to either the level of firms' transparency or information asymmetry. Moreover, Laux and Laux (2009) indicated that there is no

relationship between rising managerial ownership and the level of earnings management or transparency in firms.

As mentioned in the previous section, Article 45(a-3) of the Listing Rule of the Saudi stock market states that firms have to disclose their senior executives' ownership in the boards' annual reports (CMA, 2004, p. 36).Indeed, the literatures reported limited empirical studies concerned with the relationship between managerial ownership and information leakage, using the cumulative abnormal returns before earnings announcements, as an information leakage measure. Furthermore, as with the other topics, no study has yet been conducted in Saudi Arabia, or even in the wider Arabic or Middle Eastern region. Additionally, no research has yet been published regarding the relationship between managerial ownership and performance. Therefore, this research provides valuable contributions to the existing literature by introducing the first study pertaining to the effect of managerial ownership on information leakage and performance. However, based on the argument that managerial ownership leads the interests of directors to match shareholders' interests, it is therefore expected that managerial ownership will have positive effects on the firms' performance. Besides, the previous empirical studies have demonstrated that managerial ownership negatively influences firms' transparency, and therefore it is anticipated that managerial ownership will positively influence both information leakage and information asymmetry. Referring to the previous literature reviews and arguments, and following the evidence of Donnelly and Mulcahy (2008), Cosh et al. (2006), Mehdi (2007), Mueller and Spitz-Oener (2006), and Fauzi and Locke (2012), the following hypothesises can be empirically tested:

H12a: There is a significant and positive relationship between managerial ownership and firm information leakage.

H12b: There is a significant and positive relationship between managerial ownership and firm financial performances.

3.4 Conclusion

This chapter has critique the theoretical context and existing empirical evidence in relation to the impact of each corporate governance component on firm performance and information leakage. Based on this discussion, a research hypothesis for each relationship was formulated. The previous empirical research indicated that no consensus currently exists in the literature regarding the association between corporate governance mechanisms, firm performance and information leakage. This chapter also assessed variables related to the board of directors and ownership structure. The variables included board size, board independence, board meetings, CEO duality, audit size, audit meetings, board subcommittees, ownership concentration, government ownership, institutional ownership, directors' ownership and managerial ownership. The research hypotheses illustrate that board size, CEO duality, ownership concentration and government ownership are all expected to have significant and negative influence on firms' financial performance, whereas board independence, board meetings, the presence of board subcommittees, audit committee size and audit committee meetings are anticipated to have significant and positive impact on firms' financial performance. Moreover, board independence, board meetings, the presence of board subcommittees, audit committee size, audit committee meetings and institutional ownership are anticipated to significantly and negatively affect information leakage, while board size, CEO duality, ownership concentration, government ownership, director ownership and managerial ownership are all expected to significantly and positively impact upon information leakage. The subsequent chapter will discuss the research methodology for investigating corporate finance practices, presenting the survey results concerning

corporate finance practices of Saudi listed firms. Table 3-1 provides a summary of the research hypotheses.

Table 3-1: Summary of the research hypotheses of the effect of corporate governance mechanisms on firm performance and information leakage

Corporate governance variables	**The research hypotheses**
Board Size	H1a: There is a significant and positive relationship between board size and firm information leakage. H1b: There is a significant and negative relationship between board size and firm financial performance.
Board Independence	H2a: There is a significant and negative relationship between board independence and firm information leakage. H2b: There is a significant and positive relationship between board independence and firm financial performance.
CEO Duality	H3a: There is a significant and positive relationship between CEO duality and firm information leakage. H3b: There is a significant and negative relationship between CEO duality and firm financial performance.
Board Meetings	H4a: There is a significant and negative relationship between the number of board meetings and firm information leakage. H4b: There is a significant and positive relationship between the number of board meetings and firm financial performance.
Board Subcommittees	H5a: There is a significant and negative relationship between the presence of board subcommittees and firm information leakage. H5b: There is a significant and positive relationship between the presence of board subcommittees and firm financial performance.
Audit Committee Size	H6a: There is a significant and negative relationship between audit committee size and firm information leakage. H6b: There is a significant and positive relationship between audit committee size and firm financial performance.
Audit Committee Meetings	H7a: There is a significant and negative relationship between the number of audit committee meetings and firm information leakage. H7b: There is a significant and positive relationship between the number of audit committee meetings and firm financial performance.
Ownership Concentration	H8a: There is a significant and positive relationship between ownership concentration and firm information leakage. H8b: There is a significant and negative relationship between ownership concentration and firm financial performances.
Institutional Ownership	H9a: There is a significant and negative relationship between institutional ownership and firm information leakage.

	H9b: There is a significant and positive relationship between institutional ownership and firm financial performances.
Government Ownership	H10a: There is a significant and positive relationship between government ownership and firm information leakage. H10b: There is a significant and negative relationship between government ownership and firm financial performances.
Director Ownership	H11a: There is a significant and positive relationship between director ownership and firm information leakage. H11b: There is a significant and positive relationship between director ownership and firm financial performances.
Managerial Ownership	H12a: There is a significant and positive relationship between managerial ownership and firm information leakage. H12b: There is a significant and positive relationship between managerial ownership and firm financial performances.

Chapter 4:

Corporate Finance Practices in Saudi Arabia:

Methodology and Results

4.1 Introduction

The previous chapter has reviewed the theoretical background and existing empirical research regarding the relationship between corporate governance mechanisms and firms' financial performance and information leakage, concluding with the devising of research hypotheses for the variables. Section 2.2 reviewed the previous literature and survey studies pertaining to corporate finance practices, revealing that there is a dearth of survey-based research relating to developing countries, particularly in the Middle East. Moreover, no survey has been undertaken into existing corporate finance practises in Saudi Arabia. Consequently, this chapter discusses the thesis' devised research methodology for investigating corporate finance practices in Saudi Arabia, including the survey sources and design, the selected sample, as well as the methods that were adopted to deliver the survey and obtain responses. Additionally, this chapter presents the survey results. Thus, the chapter is organised as follows: Section 4.2 shows the research methodology that about the survey contents and design and the processes for the delivering the questionnaire. Section 4.3 presents and discusses the survey results and the Saudi listed firms practices in the main areas of corporate finance that include capital budgeting, cost of capital, capital structure, and dividend. Section 4.4 is the conclusion.

4.2 Methodology

This research concerns corporate finance practices in Saudi Arabia. A survey was conducted in order to meet the objectives of this study, and statistical techniques were used to analyse the responses and reveal the corporate finance practices used by Saudi listed firms. Survey research includes the collection of data from a sample of participants via responses to a set of survey questions. This is an effective and systematic way of collecting data from a wide spectrum of participants in different social settings (Schutt 2006). This research used a questionnaire to generate responses from employees of Saudi listed firms, offering a wide, clear image of their corporate finance practices. In general, large sample sizes with high levels of numerical data offer statistical strength, while smaller sample sizes and qualitative data offer clarity of interpretation. The survey method employed in this study comprised a mid-way approach in between numerical data analysis and qualitative analysis, as it employed a moderately sized sample and very particular questions were asked (Graham and Harvey 2001).

4.2.1 Survey Design

The survey of corporate finance practices covered four main areas: cost of capital, capital structure, capital budgeting, and dividend policy. Based on the comprehensive review of the current literature, the corporate finance theories and models includes four main topics which are capital structure, capital budgeting, cost of capital, and dividend. The survey of Graham and Harvey (2001) about US firms was considered the first comprehensive survey about the corporate finance practices which was used latter by other researchers to investigate the corporate finance practices in different contexts such as the survey of Anand (2002) about Indian firms, Brounen et al. (2004) about European firms, and Maquieira et al. (2012) about Latin American firms. All these surveys covered the three main topics

of corporate finance that are capital budgeting, cost of capital and capital structure. The survey of Anand (2002) added in his survey more questions related to the theories of dividend. Because the survey of Anand (2002) covered the four main topics of corporate finance, this research developed a draft survey the same as those developed by Anand (2002) for the context of India, and official permission was obtained from that author to use his questions in this study. In addition, one main question was added related to the capital structure and factors that affect a firm's decision over what constitutes a suitable amount of debt; the question included was similar to the question used by Graham and Harvey (2001). Moreover, the survey included a few additional questions about firm and participant characteristics which were also similar to some of the questions used by Graham and Harvey (2001). A number of the survey questions were amended to make them suitable for the financial system of the Saudi market. For example, for the question regarding the risk free rate used in the CAPM model, the bills rate from the Saudi Arabian Monetary Agency (SAMA) was included in the options. Moreover, with regards the tax rate used in the WACC model, the Zakat was included as an option because the Saudi authorities impose the Zakat as the main financial charge for firms instead of a tax.

The survey aimed to investigate the corporate finance practices employed by Saudi listed firms, therefore the participants selected for the survey are chief financial officers (CFOs) in these firms. The CFOs are chosen because these individuals are responsible for planning their firms' financial operations, procedures, and strategies so they have the knowledge more than others about what theories and models of corporate finance that are used in their firms. Moreover, the research focused on CFOs as it follows the methodology used in the study by Anand (2002). On limitation may be presented here is that, in some firms, the main decisions of corporate finance are belong to the chief executive officer (CEO) not the CFO. But

It can be responded to this limitation is that even the corporate finance decisions may be generated at the CEO level but at the end the CFO will the individual person who has the responsibility to implement and observe these decisions so the CFO would be able to answer the survey questions clearly. The draft survey contained two main sections. The first section included six questions from A to F about the firm's and the CFO's characteristics. The second section included nine questions from 1 to 9 about the firm's financial practices related to the capital market, cost of capital, capital budgeting, and dividends policy. The survey was four pages long and comprised 62 subparts (see Appendix 1). In the first section, following Graham and Harvey's (2001) methodology, the questionnaire asked participants about their age, qualifications, and tenure, and also about their firm's level of executive ownership, target debt ratio, and frequency of paying dividends. Additional questions were included to add firm size and sector to the characteristics covered; the data for these two variables were obtained from each firm's annual financial report for 2015. The purpose of the first section was to investigate how firms' corporate finance practices are different based on these characteristics. For example, Graham and Harvey's (2001) survey in the U.S. found that large firms are more likely than small firms to use the NPV method and the CAPM model for project assessment.

In the second section, questions 1 and 2 were about capital budgeting practices and asked about the techniques used by firms to select new projects and assess project risk. The questionnaire comprised closed questions with a Likert scale of 1 to 5 for responses, in which 1 denoted never, 2 rarely, 3 sometimes, 4 almost always, and 5 always. Questions 3 to 6 were related to cost of capital practices and the methods used by firms to estimate values for the cost of capital and the risk free rate, beta, and market risk premium used in the CAPM model. In addition, a question about the WACC was included. For these questions, a Likert scale of 1 to 5 was used, in which 1 denoted never, 2 rarely, 3 sometimes, 4 almost

always, and 5 always. Questions 7 and 8 were linked to the capital structure and debt policy practised by Saudi listed firms and responses were selected from a Likert scale of 1 to 5, in which 1 denoted not important, 2 of little importance, 3 moderately important, 4 important, and 5 very important. There was also a question which asked the CFOs to rank specific financing methods based on their importance; this question was linked to the pecking-order theory. The last question, question 9, was about dividend policies, and was related to the target payout ratio, bird in hand theory, and signalling theory. A Likert scale of 1 to 5 was provided for responses, in which 1 denoted strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, and 5 strongly agree.

4.2.2 Sample and Delivery

The sample for this survey was all the CFOs of the firms listed on the Saudi Stock Exchange (Tadawul). The study began in June 2015, and at the end of May 2015 there were 165 firms listed on Tadawul. In order to deliver the survey to all of the relevant CFOs, the personal information such as name, telephone number, email address, and postal address for each of the CFOs was collected. All of this information was obtained from Tadawul and the firms' websites. When there was insufficient information about a CFO available, an email was sent to their firm asking the firm to provide the required information. To increase the response rate, three versions of the survey were available: an online version, an electronic copy in Pdf or Word format, and a hard copy. All of these versions were attached to a cover letter stating that the data analysis would be strictly anonymous and employed only for the purposes of this research. In addition, the CFOs were informed that if they included their email address in their questionnaire responses, they would receive a summary of the results from the survey. Initially, the online version of the questionnaire was delivered to the CFOs of all the 165 firms listed on Tadawul via

email, if their email addresses were available or to the main email address for their firm. All CFOs were further contacted via email and/or phone during the period from August 2015 to December 2015 to encourage them to provide their responses. A few of the CFOs preferred to provide their responses via the Pdf/Word version of the questionnaire which was sent to them by email, because they had a technical issue when opening the online version. Due to a low response rate, the researcher visited several CFOs in their offices during the period from September 2015 to December 2015 to encourage them to participate in the survey by using a hard copy of the questionnaire. The majority of the participants provided responses after two to four visits.

4.3 Results and Discussion

4.3.1 Responses

Fifty two (52) completed questionnaires were received of which sixteen (16) were received via the online version, five (5) were received in Pdf or Word format, and thirty one (31) were received as hard copies. The response rate was therefore almost 31.51%. The survey was four pages in length and contained 62 subparts. The response rate of 31.51% is considered to be good. For comparison, in America Graham and Harvey (2001) achieved a response rate of 9%, in India Anand (2002) obtained a response rate of 15%, and in Europe Brounen et al. (2004) achieved a response rate of 5%.

4.3.2 Summary Statistics

Table 4-1 shows a summary of the participating CFOs' and their firms' characteristics. From the table, the size of the firms who took part was between very small, with sales less than or equal to 199 million Riyals (1$ = 3.75 Saudi Riyals), and very large, with sales equal to 3 billion Riyals or above. For the analysis of

corporate finance practices, firms with sales equal to or above 1 billion riyals were considered to be large firms and those with sales less than 1 billion were classified as small firms. The sample of firms came from thirteen different sectors thus the results are rich in information. From table 4-1, it is clear that 23.1% of the firms which participated were from the insurance sector and 13.5% were from the retail and building and construction sectors. Other respondents' firms were from the following sectors: petrochemicals (11.5%), cement (7.7%), energy (1.9%), agriculture (7.7%), telecommunications (1.9%), multi-investment (1.9%), real estate development (5.8%), transport (1.9%), hotel and tourism (1.9%), and industrial investment (7.7%). In the response analysis, the sectors were divided into manufacturing and non-manufacturing following the methodology used by Graham and Harvey (2001).

With regards the CFOs' characteristics, 48.1% only have an undergraduate degree, while 51.9% also have a degree higher than an undergraduate degree. In addition, the analysis examined whether the CFOs' tenure has a specific effect on their corporate finance practices. In line with the study by Graham and Harvey (2001), tenure was divided into short tenure, which was defined as equal to or less than 9 years, and long tenure, which was more than 9 years. The table shows that about 51.9% of the CFOs had been in their roles for 9 years or less and 48.1% of the CFOs had been in their roles for more than 9 years. With regards the CFOs' ages, 16% were below the age of 40, 48.1% were aged between 40 and 50 and 21.2% were more than 50 years old. In the results tables, the CFOs are only divided into two groups: those 50 years old and below, and those above 50 years.

The results from the questions about techniques and strategies for setting a specific debt ratio indicated that 42.3% of the firms have a flexible target debt ratio depending on the firm's operation, while 28.8% do not have a target debt ratio. The remaining firms reported that they have tight or somewhat tight target debt ratios. In

the analysis of the results, the sample is therefore categorised into two types: those with and those without a target debt ratio.

The survey also asked participants whether their firms pay dividends; 42.3% of the CFOs indicated that their firms always pay dividends while 21.2% reported that they almost always offer dividends. A further 13.5% of the firms sometimes issued dividends, 5.8% flexibly issued dividends, and 17.3% never issued dividends. For the analysis, the firms were thus divided into two types: those which paid or those which did not pay dividends. The final characteristic of the firms that was investigated using the survey was the percentage of the firms' stock owned by its executives. The results show that for 78.8% of the firms, the executives owned less than 5% of the issued shares while for 7.7% of the firms, the executives owned more than 20% of the issued shares. Furthermore, for 7.7% of the firms sampled, the executives owned between 10% and 20% of the issued shares while for 5.8% of the firms, the executives owned between 5% and 10% of the issued shares. The level of executive ownership is presented in the response tables as low and high ownership, where ownership is considered high when it accounts for more than 5% of the firm's issued shares.

In addition, table 4-2 shows the correlations between the demographic variables of the participating CFOs and firms. For example, the table indicates that firms which frequently pay dividends to their shareholders are more likely to be large firms in the manufacturing sector with a high level of executive ownership.

Table 4-1: Demographic variables

Characteristics	No of obs.	%	Characteristics	No of obs.	%
Firm Sector			**CFO Tenure (years)**		
Petrochemicals	6	11.5	Short (≤ 9 years)	27	51.9
Cement	4	7.7	Long (> 9 years)	25	48.1
Retail	7	13.5	**CFO Age (years)**		
Energy & utilities	1	1.9	< 40	16	30.8
Agriculture & Food	4	7.7	40 - 50	25	48.1
Telecommunication	1	1.9	> 50	11	21.2
Insurance	12	23.1	**Target Debt Policy**		
Multi-investment	1	1.9	None	15	28.8
Building & construction	7	13.5	Flexible	22	42.3
Real estate development	3	5.8	Somewhat tight	8	15.4
Transport	1	1.9	Strict	7	13.5
Hotel & tourism	1	1.9	**Firm Paying Dividends**		
Industrial Investment	4	7.7	Never	9	17.3
Firm Size (Sales in Riyals as 1$ = 3.75 Riyals)			Rarely	3	5.8
≤ 199 millions	9	17.3	Sometimes	7	13.5
200 - 499 millions	11	21.2	Almost always	11	21.2
500 - 999 million	9	17.3	Always	22	42.3
1 - 2.99 billions	12	23.1	**Executive Ownership (%)**		
≥ 3 billions	11	21.2	< 5%	41	78.8
CFO Education			5 - < 10%	3	5.8
Bach	25	48.1	10% - 20%	4	7.7
Higher	27	51.9	> 20%	4	7.7
Total	**52**	**100**	**Total**	**52**	**100**

Table 4-2: Pearson and Spearman's rank correlation of firm and CFOs characteristics

	Firm Size(Sales)	Firm Sectors	CFO Age	CFO Edu	CFO Tenure	Executives Ownership	Target Debt	Paying Dividends
Firm Size (Sales)	1	.142	.013	.194	.151	.108	.031	.354*
Firm Sectors	.142	1	.202	-.116	.228	-.082	.202	.435**
CFO Age	.013	.202	1	.047	.256	-.038	.086	.100
CFO Edu	.194	-.116	.047	1	.038	.047	.042	-.120
CFO Tenure	.151	.228	.256	.038	1	.067	.237	.091
Executives Ownership	.108	-.082	-.038	.047	.067	1	-.018	.295*
Target Debt	.031	.202	.086	.042	.237	-.018	1	-.046
Paying Dividends	.354*	.435**	.100	-.120	.091	.295*	-.046	1

**, and * refer to the statistical significance at level 1% and 5% respectively

4.3.3 Results Related to Capital Budgeting Practices

Table 4-3 examines the methods and techniques applied by Saudi listed firms for making capital budgeting decisions. The participants' answers to questions in this area were based on a Likert scale of 1 to 5 where 1 correlated with never used and 4 and 5 meant almost always used and always used respectively. Most participating CFOs indicated that IRR and NPV are the capital budgeting techniques used by their firms. 75% of participants rated the IRR method as almost always or always used by their firms with a mean score of 3.88, while 63.5% of respondents considered the NPV technique as almost always or always implemented by their management for selecting projects and making capital budgeting decisions with a mean score of 3.65. This preference for capital budgeting methods by Saudi listed firms is the same as the preferences of Indian firms as noted by Anand (2002), of American firms as noted by Graham and Harvey (2001), and of Kuwaiti firms as noted by Mutairi et al. (2009). The third choice was the payback period method with 61.5% of the CFOs indicating that they used this method, with a mean score of 3.38. The most interesting outcomes were derived from investigating the results as they correlated with the firm and CFO characteristics. For example, large Saudi listed firms are significantly more likely to use IRR than small firms (score 4.39 versus 3.48). In addition, large firms are likely to use the payback period technique more than small firms (score 3.91 versus 2.97) and firms in the manufacturing sectors are likely to implement the payback period method more than firms in the non-manufacturing sectors (score 3.91 versus 2.58). Furthermore, firms that pay dividends are likely to use the payback period and IRR methods more than firms that do not pay dividends (score 3.85 versus 2.58, and score 4.21 versus 3.32, respectively). However, there are no differences in the capital budgeting methods used which correspond to the firm having or not having a target debt, the CFO's age, tenure, and education, and the firm having high or low executive ownership.

CFOs were also asked to reveal the methods that are frequently used by their firms to assess project risk. Table 4-4 shows five methods: sensitivity analysis, scenario analysis, risk adjusted discount rate, decision tree analysis, and Monte Carlo simulation. The table shows that the most popular methods used by Saudi listed firms for evaluating project risk are scenario and sensitivity analyses. 63.5% of CFOs consider scenario analysis as the method almost always or always used by their firms for assessing project risk with a mean score of 3.65. 59.6% of CFOs reported that sensitivity analyses are almost always or always used by their firms with a mean score of 3.38. Thus, the Saudi firm practice is different from the Kuwaiti firm practice as Kuwaiti firms prefer to use sensitivity analyses more than scenario analyses as noted by Mutairi et al. (2009). Analysing the responses based on the firms' characteristics shows that manufacturing firms are likely to use scenario analysis more than non-manufacturing firms (score 3.78 versus 3.59). However, there is no difference in the use of the various methods for project risk assessment between firms that are large or small, those having or not having a target debt, and firms having high or low executive ownership. Moreover, there is no difference in risk assessment practices which correlates with the CFOs age, tenure, or education.

Table 4-3: Survey responses to the question: How frequently does your firm use the following project choice criteria in your firm?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Payback Period	61.5	3.38	2.97	3.91**	2.97	3.91**	2.58	3.85***	3.54	3.00
2	ARR	38.5	2.90	2.69	3.17	2.71	3.17	2.58	3.10	3.08	2.47
3	NPV	63.5	3.65	3.59	3.74	3.48	3.91	3.21	3.91	3.81	3.27
4	IRR	75.0	3.88	3.48	4.39***	3.62	4.22	3.32	4.21**	3.95	3.73
5	PI	53.8	3.48	3.55	3.39	3.52	3.43	3.47	3.48	3.51	3.40
6	Break-even	59.6	3.65	3.72	3.57	3.34	4.04*	3.58	3.70	3.62	3.73
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Payback Period	61.5	3.38	3.44	3.18	3.26	3.52	3.50	3.27	3.54	2.82
2	ARR	38.5	2.90	2.83	3.18	2.89	2.92	3.15	2.65	3.00	2.55
3	NPV	63.5	3.65	3.76	3.27	3.81	3.48	3.81	3.50	3.66	3.64
4	IRR	75.0	3.88	4.07	3.18	3.85	3.92	3.85	3.92	3.88	3.91
5	PI	53.8	3.48	3.37	3.91	3.30	3.68	3.50	3.46	3.51	3.36
6	Break-even	59.6	3.65	3.63	3.73	3.44	3.88	3.77	3.54	3.78	3.18
***, **, * denotes the significant difference level at 1%, 2% and 10%											

Table 4-4: Survey responses to the question: How frequently does your firm use the following methodology to assess the project risk in your firm?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Sensitivity	59.6	3.38	3.31	3.65	3.41	3.52	3.47	3.45	3.46	3.47
2	Scenario	63.5	2.90	3.55	3.83	3.59	3.78**	3.37	3.85	3.70	3.60
3	Risk adjusted rate	25.0	3.65	2.48	2.87	2.48	2.91	2.53	2.73	2.76	2.40
4	Decision tree	15.4	3.88	2.17	2.48	2.18	2.52	2.42	2.24	2.27	2.40
5	Monte Carlo	7.7	3.48	1.62	1.74	1.71	1.65	1.84	1.58	1.68	1.67
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Sensitivity	59.6	3.38	3.61	2.91	3.52	3.40	3.35	3.58	3.49	3.36
2	Scenario	63.5	2.90	3.73	3.45	3.67	3.68	3.75	3.58	3.78	3.27
3	Risk adjusted rate	25.0	3.65	2.83	2.00	2.67	2.64	2.69	2.62	2.73	2.36
4	Decision tree	15.4	3.88	2.39	2.00	2.19	2.44	2.23	2.38	2.34	2.18
5	Monte Carlo	7.7	3.48	1.68	1.64	1.74	1.60	1.54	1.81	1.76	1.36
***, **, * denotes the significant difference level at 1%, 2% and 10%											

4.3.4 Results Related to Cost of Capital Practices

The survey also attempted to reveal how Saudi listed firms determine the cost of capital and as such the questionnaire investigated the methods that are applied by Saudi firms to calculate the cost of debt and equity. In addition, the survey aimed to

reveal whether Saudi firms use the CAPM approach to calculate the cost of capital and how they estimate the beta factor and risk free rate. In addition, there was a question regarding the period which they use for calculating the beta factor and how they account for the market risk premium. The last question was about how frequently they use the WACC method and what tax rate they apply when calculating the after tax cost of debt in the model.

The participants were asked to reveal which methods they frequently used to estimate the discount rate and the cost of equity for their firm. The possible responses included dividend yield, earnings yield, Gordon's model, CAPM model, and multi-factor approach. Table 4-5 shows that the most popular method among Saudi firms is the earnings yield approach, as 71.2% of Saudi firms almost always or always use the earnings yield method when estimating the cost of equity with a mean score of 3.65. 67.3% of Saudi listed firms also indicated that they almost always or always apply the dividend yield method with a mean score of 3.58. The third preference was the CAPM model, as 23.1% of the participating CFOs stated that they almost always or always implement the CAPM model to calculate the cost of equity with a mean score of 2.27. This survey result reveals that Saudi firms prefer different methods than Kuwaiti firms as Kuwaiti firms prefer WACC model (Mutairi et al. 2009). Besides, Saudi firms prefer different methods than American, European, and Indian firms. The most popular method in those countries is the CAPM method (Graham and Harvey 2001; Anand 2002; Brounen et al. 2004). This indicates that Saudi firms have different corporate finance practices to American, Indian, European, and Kuwaiti companies and confirms the importance of this research and its contributions.

In addition, where the second and third most popular methods used by Saudi firms are dividend yield and the CAPM model, the second and third most popular approaches in America and Europe are the average returns and multi beta methods.

In India, the second and third most commonly used methods are Gordon's model and the earnings yield approach. Analysis of the responses based on firm and CFO characteristics showed that there is a weak difference between the practices used by CFOs with and without higher levels of education, as CFOs with a higher level of education are more likely to use the dividend yield method for estimating the cost of equity than CFOs with only an undergraduate degree. However, there was no difference observed in the methods for estimating the cost of equity used by firms related to whether the firms were large or small, were in the manufacturing or non-manufacturing sectors, whether they pay or do not pay dividends, whether they have or do not have a target debt or whether they have high or low executive ownership, or that were related to their CFO's age and tenure.

Table 4-5: Survey responses to the question: How frequently does your firm use the following methods to estimate the cost of equity in your firm?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Dividend Yield	67.3	3.58	3.38	3.83	3.34	3.91	3.32	3.73	3.49	3.80
2	Earnings Yield	71.2	3.65	3.48	3.87	3.28	4.13	3.42	3.79	3.54	3.93
3	Gordon's Model	11.5	1.63	1.62	1.65	1.41	1.91	1.37	1.79	1.65	1.60
4	CAPM	23.1	2.27	2.31	2.22	2.31	2.22	2.21	2.30	2.35	2.07
5	Multi-factor	11.5	1.63	1.48	1.83	1.48	1.83	1.63	1.64	1.54	1.87
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Dividend Yield	67.3	3.58	3.59	3.55	3.67	3.48	3.19	3.96*	3.63	3.36
2	Earnings Yield	71.2	3.65	3.71	3.45	3.89	3.40	3.85	3.46	3.85	2.91
3	Gordon's Model	11.5	1.63	1.66	1.55	1.74	1.52	1.54	1.73	1.68	1.45
4	CAPM	23.1	2.27	2.44	1.64	2.44	2.08	2.38	2.16	2.32	2.09
5	Multi-factor	11.5	1.63	1.66	1.56	1.59	1.68	1.73	1.54	1.71	1.36

***, **, * denotes the significant difference level at 1%, 2% and 10%

The research also asked the participating firms about different concepts related to the CAPM model, such as what rate they use for the risk-free rate in the model. Table 4-6 shows that the most popular risk-free rates used by Saudi listed firms are the SAMA bills rates from 1 to 13 weeks and from 26 to 52 weeks. 9.6% of CFOs always or almost always apply the SAMA bills rates in the CAPM model with a mean

score of 1.63. The second most popular risk-free rate used is the 10-year Saudi government bonds rate. 7.7% of participating firms indicated that they always or almost always use the 10-year government bond rate as a risk-free rate with a mean of 1.52. In contrast, the most popular risk-free rate used in India is the 10-year government treasury bond rate as noted by Anand (2002) and in Kuwait is 90 days T-bill as noted by Mutairi et al. (2009). Examination of the responses based on the firm and CFO characteristics showed that large firms are more likely to use the SAMA bills rate from 1 to 13 weeks than small firms (score 1.96 versus 1.34), although this is only of weak significance. In addition, firms which pay dividends are more likely to apply the 10-year government bond rate than those which do not pay dividends (score 1.7 versus 1.21). Furthermore, firms with a low level of executive ownership are more likely to use the SAMA rate from 1 to 13 weeks, and the U.S. 5- and 10-year treasury rates as risk-free rates than firms with a high level of executive ownership. The CFOs were also asked what beta factor they use for the CAPM model. It can be seen in table 4-7 that the most popular beta factor used by Saudi listed firms is the industry average, where 26.9% of the CFOs stated that their firms always or almost always apply the industry average with a mean score of 2.02. This practice is in the line with the practice used by Indian firms as determined in the study by Anand (2002) while is contrary with the practice used by Kuwaiti firms as they prefer the published source as determined in the study by Mutairi et al. (2009). The second most popular beta factor used by Saudi listed firms is their CFO's best estimate, where 21.2% of firms always or almost always use their CFO's estimate.

Table 4-6: Survey responses to the question: What do you use for risk-free rate in a CAPM Model?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	SAMA 1-13 W	9.6	1.63	1.34	1.96*	1.48	1.78	1.37	1.76	1.49	1.93
2	SAMA 26-52 W	9.6	1.63	1.45	1.87	1.45	1.91	1.58	1.67	1.51	1.93
3	10 Year Gov. Bonds	7.7	1.52	1.38	1.71	1.31	1.78	1.21	1.70**	1.49	1.60
4	U.S. 5 Y Treasury	5.8	1.29	1.24	1.35	1.14	1.48	1.32	1.27	1.22	1.47
5	U.S. 10 Year Treasury	3.8	1.25	1.28	1.22	1.17	1.35	1.37	1.18	1.16	1.47
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	SAMA 1-13 W	9.6	1.63	1.61	1.64	1.44	1.80	1.69	1.54	1.73	1.18**
2	SAMA 26-52 W	9.6	1.63	1.63	1.64	1.44	1.84	1.69	1.58	1.68	1.45
3	10 Year Gov. Bonds	7.7	1.52	1.56	1.36	1.48	1.56	1.58	1.46	1.59	1.27
4	U.S. 5 Y Treasury	5.8	1.29	1.29	1.27	1.33	1.24	1.31	1.27	1.37	1.00***
5	U.S. 10 Year Treasury	3.8	1.25	1.24	1.27	1.26	1.24	1.15	1.35	1.32	1.00**
***, **, * denotes the significant difference level at 1%, 2% and 10%											

Table 4-7: Survey responses to the question: What do you use as your volatility or beta factor in a CAPM Model?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Published Source	23.1	1.92	1.69	2.22	1.69	2.22	1.79	2.00	1.83	2.13
2	CFO's Estimate	21.2	1.92	1.93	1.91	1.83	2.04	1.89	1.94	1.81	2.20
3	Industry Average	26.9	2.02	1.76	2.35	1.79	2.30	2.05	2.00	1.97	2.13
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Published Source	23.1	1.92	1.98	1.73***	1.81	2.04	1.85	2.00	1.98	1.73
2	CFO's Estimate	21.2	1.92	2.10	1.27	1.81	2.04	2.23	1.62	1.98	1.73
3	Industry Average	26.9	2.02	2.05	1.91	1.85	2.20	2.15	1.88	2.17	1.45*
***, **, * denotes the significant difference level at 1%, 2% and 10%											

The CFOs were also asked what period they use when calculating the value of beta for the CAPM model. The most popular period for beta calculation is monthly. In table 4-8, 23.1% of CFOs stated that their firms always or almost always use monthly share prices when calculating beta for the CAPM model with a mean score of 2.06. Similarly, the most popular period among Indian and Kuwaiti firms is also monthly as revealed in the study by Anand (2002) and Mutairi et al. (2009). In

addition, the CFOs were asked which rate was used by their firms for the market risk premium rate and it was found that the most commonly used rate employed by Saudi firms is the CFO's best estimate. In table 4-9, it is shown that 23.1% of Saudi firms always or almost always use the CFO's estimate for the market risk premium rate in the CAPM model with a mean score of 1.92. This practice is contrary to common practice in India and Kuwait, where the most popular rate used is a fixed rate of 9% to 10% and 6% to 8% respectively. The second most popular rate used by Saudi firms is the historical average, as 21.2% of firms always or almost always apply this rate with a mean score of 1.90. Table 4-9 also shows that large firms are more likely to use the historical average for the market risk premium rate than small firms (mean score 1.61 versus 1.17).

Table 4-8: Survey responses to the question: What period do you study to calculate beta of your firm in a CAPM Model?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	M share Prices	23.1	2.06	2.03	2.09	1.97	2.17	1.68	2.27	1.97	2.27
2	W share Price	13.5	1.73	1.69	1.78	1.59	1.91	1.68	1.76	1.70	1.80
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	M share Prices	23.1	2.06	2.20	1.55	2.00	2.12	2.27	1.85	2.00	2.27
2	W share Price	13.5	1.73	1.73	1.73	1.52	1.96	1.92	1.54	1.73	1.73
***, **, * denotes the significant difference level at 1%, 2% and 10%											

Table 4-9: Survey responses to the question: What accounts for market risk premium in a CAPM Model?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Fixed Rate 6- 8%	11.5	1.65	1.55	1.78	1.69	1.61	1.37	1.82	1.59	1.80
2	Fixed Rate 8-9 %	1.9	1.37	1.17	1.61**	1.24	1.52	1.16	1.48*	1.35	1.40
3	Fixed Rate 9-10 %	5.8	1.40	1.21	1.65*	1.24	1.61	1.26	1.48	1.30	1.67
4	Historical average	21.2	1.90	1.97	1.83	1.59	2.30*	1.79	1.97	1.73	2.33
5	CFO's Estimate	23.1	1.92	2.14	1.65	1.72	2.17	1.79	2.00	1.73	2.40
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Fixed Rate 6- 8%	11.5	1.65	1.71	1.45	1.63	1.68	1.38	1.92*	1.63	1.73
2	Fixed Rate 8-9 %	1.9	1.37	1.37	1.36	1.30	1.44	1.38	1.35	1.41	1.18
3	Fixed Rate 9-10 %	5.8	1.40	1.44	1.27	1.19	1.64*	1.50	1.31	1.46	1.18
4	Historical average	21.2	1.90	1.93	1.82	1.78	2.04	1.92	1.88	1.90	1.91
5	CFO's Estimate	23.1	1.92	2.07	1.36**	1.85	2.00	2.27	1.58*	1.88	2.09

***, **, * denotes the significant difference level at 1%, 2% and 10%

Participating firms were asked how frequently they use the WACC method for estimating the cost of capital; the WACC model takes into consideration the proportional weight of each kind of capital structure. 42% of CFOs stated that their firms always or almost always apply the WACC model when calculating the cost of capital with a mean score of 3.06. Evaluating the responses based on demographics, table 4-10 shows that large Saudi firms are significantly more likely to implement the WACC model when estimating the cost of capital than small firms with mean scores of 3.48 and 2.72, respectively. However, there is no difference in the frequency of implementation of the WACC model between firms that are in the manufacturing and non-manufacturing sectors, those which pay or do not pay dividends, have or do not have a target debt, have CFOs of different ages, education levels, and tenure, and have high or low executive ownership.

In addition, CFOs were questioned about what tax rate they apply, especially when calculating the after tax cost of debt, and the weights they use in their WACC calculations. Table 4-11 shows that the most popular tax rate used by Saudi listed firms is the Zakat rate which is an Islamic assessment at 2.5%. 94.2% of Saudi firms

always or almost always use the Zakat rate with a mean score of 4.61. This practice is in the line the Kuwaiti firm practices as noted by Mutairi et al. (2009). The second most popular tax rate is the statutory tax rate with 21.1% of participating firms using that rate, giving a mean score of 2.08. Saudi practices are different from the practices employed in most countries in America, Europe and Asia because they are based on Islamic law. For example, the most popular tax rates used in India are the statutory tax rate and minimum alternative tax rate (Anand 2002). For the weights used in the WACC model, the most popular values used in Saudi listed companies are book value weights. 21.1% of the participating firms always or almost always apply book value weights in their WACC computations with a mean score of 1.90. This practice is in line with corporate finance practices in India (Anand 2002) and is different from the corporate finance practice in Kuwait, as the market weights is widely used (Mutairi et al. 2009). Examining the results as they relate to CFO and firm characteristics highlights some interesting findings. There is a weakly significant link that firms in the manufacturing sector are more likely to use the Zakat rate than non-manufacturing firms (score of 4.78 versus 4.45) and this can be explained by the fact that Saudi firms in the services and tourism sectors usually have branches overseas so they deal with multiple and different types of tax rates. In addition, large firms are likely to use the statutory tax rate and minimum alternative tax rate more than small firms (mean scores 2.91 versus 1.38, and 1.48 versus 1, respectively). Manufacturing firms are also more likely to apply book value weights and market weights in the WACC model than non-manufacturing firms (mean scores 2.57 versus 1.38, and 2.26 versus 1.48, respectively), and large firms are more likely to use market weights than small firms (score 2.17 versus 1.55). Moreover, CFOs with a higher level of education are more likely to employ market weights than CFOs with only an undergraduate degree. There is no link between the choices for tax rates

and weights with whether the company pays dividends or has a target debt, with the CFOs age and tenure, or with the level of executive ownership.

Table 4-10: Survey responses to the question: How frequently does your firm use Weighted Average Cost of Capital (WACC) in estimating the cost of capital?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Using WACC	42.3	3.06	2.72	3.48**	2.59	3.65	2.32	3.48	2.97	3.27
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Using WACC	42.3	3.06	3.07	3.00	3.00	3.12	3.12	3.00	3.07	3.00
***, **, * denotes the significant difference level at 1%, 2% and 10%											

Table 4-11: Survey responses to the question: What is the tax rate used to calculate after tax cost of debt and the weights you use in the computation of WACC of the firm?

		% always or almost always	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Islamic Rate (Zakat)	94.2	4.61	4.66	4.52	4.45	4.78*	4.58	4.61	4.62	4.53
2	Statutory Tax Rate	21.2	2.08	1.38	2.91***	1.97	2.17	2.00	2.09	1.92	2.40
3	Minimum Alternative	1.9	1.21	1.00	1.48**	1.28	1.13	1.11	1.27	1.27	1.07
4	Book Value Weights	21.2	1.90	1.72	2.13	1.38	2.57***	2.00	1.85	1.86	2.00
5	Market Weights	15.4	1.83	1.55	2.17*	1.48	2.26**	1.95	1.76	1.73	2.07
		% always or almost always	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Islamic Rate (Zakat)	94.2	4.61	4.66	4.36	4.56	4.64	4.69	4.50	4.63	4.45
2	Statutory Tax Rate	21.2	2.08	2.05	2.09	2.15	1.96	1.81	2.31	2.12	1.82
3	Minimum Alternative	1.9	1.21	1.24	1.09	1.26	1.16	1.08	1.35	1.17	1.36
4	Book Value Weights	21.2	1.90	1.88	2.00	1.59	2.24	1.69	2.12	2.02	1.45
5	Market Weights	15.4	1.83	1.88	1.64	1.74	1.92	1.35	2.31***	1.88	1.64
***, **, * denotes the significant difference level at 1%, 2% and 10%											

4.3.5 Results Related to Capital Structure Practices

This research also aimed to investigate Saudi corporate finance practices related to capital structure and the survey questioned the participating firms over whether they employ capital structure policies as predicted by the pecking-order theory. The pecking-order theory suggests that when firms want to finance projects they follow a hierarchy of financial steps where the first step is using retained earnings and internal resources, the second step is receiving a loan from a financial institution

and the final step is releasing new shares to the market. In the survey, CFOs were given three sources of funding for projects to choose from which were loans from financial institutions, retained earnings, and the issue of new shares. CFOs were asked to rank these sources based on their relative importance in terms of their use in the CFO's firm. 46.2% of the CFOs indicated that their first preference for a source of financing was a loan from a financial institution and their second preference was retained earnings. Their least favoured option was issuing new shares to the market. This result shows that the pecking-order theory is not applied in the Saudi market. Moreover, 19.2% of the CFOs stated that when their firm wants to finance a project, their first preference is to issue new shares, their second is to use retained earnings and their least favoured option is to take out a loan from a financial institution. The pecking-order theory is followed by only 17.3% of the participating Saudi listed firms where they use retained earnings first followed by loans from financial institutions.

Table 4-12 also relates to a question about the pecking-order theory. In this table, the responses are presented for a Likert scale of 1 to 5 where 1 means not important and 4 and 5 mean important and very important, respectively. The results in table 4-12 agree with the responses to the previous question, as the most popular financing method noted is obtaining loans from financial institutions. 69.2% of Saudi firms reported that loans from financial institutions are important or very important for financing their projects with a mean score of 3.71 while 65.4% of firms indicated that retained earnings are important or very important for financing projects with a mean score of 3.73. These results do not agree with the pecking-order theory and the practices of Indian, Kuwaiti, and Latin American firms whose corporate finance practices are generally in line with that theory(Anand 2002; Mutairi et al. 2009; Maquieira et al. 2012). The Saudi financing practices are instead more in line with American and European practices which only give weak support to the pecking-order theory (Graham and Harvey 2001; Brounen et al. 2004). Analysing the results

as they relate to the demographic information available shows that large, manufacturing, dividend-paying firms are more likely to use loans from financial institutions than small, non-manufacturing, and non-dividend paying firms (mean scores 4.26 versus 3.28, 4.52 versus 3.07, and 4.15 versus 2.95, respectively). In addition, there is a weakly significant difference between large and small firms with regards using retained earnings for financing projects whereby large firms are more likely to use retained earnings than small firms (mean score 4.04 versus 3.48).

Table 4-12: Survey responses to the question: How important is the use of the financing pattern followed for the projects in your firm?

		% important or very important	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Loans	69.2	3.71	3.28	4.26**	3.07	4.52***	2.95	4.15**	3.65	3.87
2	Retained Earnings	65.4	3.73	3.48	4.04*	3.79	3.65	3.53	3.85	3.89	3.33
3	Issue of New Shares	30.8	2.92	2.97	2.87	3.07	2.74	3.16	2.79	3.22	2.20
		% important or very important	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Loans	69.2	3.71	3.66	3.91	3.44	4.00	3.69	3.73	3.80	3.36
2	Retained Earnings	65.4	3.73	3.83	3.36	3.70	3.76	3.50	3.96	3.63	4.09
3	Issue of New Shares	30.8	2.92	2.90	3.00	3.30	2.52	2.62	3.23	2.98	2.73
***, **, * denotes the significant difference level at 1%, 2% and 10%											

The results of the survey presented in table 4-13 relate to the added questions regarding factors that may affect or determine the amount of debt that is used by companies; these questions were similar to the questions employed in the pioneering study by Graham and Harvey (2001). The questions were added because the questions regarding capital structure used by Anand (2002) are limited and focus only on the pecking-order theory while the questions used by Graham and Harvey (2001) cover a number of concepts related to capital structure. CFOs were asked about a number of factors and whether they are considered important when deciding and setting specific amounts of debt for their firms. The responses were in the form of a Likert scale of 1 to 5 where 1 meant not important and 4 and

5 meant important and very important, respectively. Based on the Saudi listed firms' responses, the most important factor that influences a firm's debt decisions is whether the executives are willing to allow a degree of financial flexibility. 71.2% of the participating CFOs stated that financial flexibility is important or very important when deciding on a suitable amount of debt for their firms with a mean score of 3.58. This is similar to American practices as highlighted in the study by Graham and Harvey (2001) and also to European practices as determined in the study by Brounen et al. (2004). Brounen et al. (2004) indicated that financial flexibility is linked with the pecking-order model as flexibility increases the opportunities for firms to select from a variety of financing methods, but other research has found that flexibility may be significant for other theories as well.

Table 4-13 shows that large, manufacturing, and dividend-paying firms are more likely to be affected by financial flexibility when determining their suitable amount of debt than small, non-manufacturing, dividend-paying firms (mean scores 4.17 versus 3.07, 4.30 versus 2.97, and 4.06 versus 2.68, respectively). Fischer et al. (1989) have proposed a reason for why capital structures and debt/equity ratios change over time even for firms with a target debt/equity ratio. They suggested that when the transaction cost of issuing debt is fixed, a firm rearranges its debt balance only when it faces an upper or lower obstacle. In this survey, the CFOs were asked if transaction costs and/or fees for issuing debt are considered important when choosing a suitable amount of debt. Table 4-13 shows that transaction costs and fees are the second most important factor that affects the setting of debt levels by Saudi firms. 55.8% of participating firms indicated that transaction costs and fees are important or very important when determining the appropriate amount of debt for their firms with a mean score of 3.31. This result gives strong support to the idea that firms are concerned about transaction costs when they decide to issue debt. The result is contrary to the results of the studies by Graham and Harvey (2001) in

the U.S. and Maquieira et al. (2012) in Latin America, as these studies do not give any evidence to indicate that transaction costs are important. The results also suggest that manufacturing and dividend-paying firms are more likely to be concerned about transaction costs when setting debt levels than non-manufacturing and non-dividend-paying firms. Bradley et al. (1984) noted that debt levels are clearly different across sectors and industries and Graham and Harvey (2001) stated that the reason for this difference may be because of the nature of the products and the degree of competition in different sectors and industries. Titman (1984) also pointed out that buyers are less likely to buy a product if they know that the firm who produced the product may go out of business, especially if the product is unique.

The survey investigated these concepts by asking CFOs if the levels of debt set by firms in the same sector and industry have an effect on their decisions over their own debt levels, and also whether their firms limit their debt levels because they do not want to send negative signals to their customers which suggest that the firm has a high risk of going out of business. 46.2% of CFOs, with a mean score of 3.08, agreed that the debt level in their company is limited so that customers and suppliers are not worried that the firm will go out of business. This result supports the argument of Titman (1984) that customers are less likely to buy products from firms that are at risk of bankruptcy or in distress. This finding is, however, contrary to the results of an American study presented by Graham and Harvey (2001) which did not find any support for this idea. CFOs were also asked whether the level of debt of other firms in the same sector or industry influences their decisions about debt. 21.2% of CFOs, with a mean score of 2.21, indicated that the debt level in other firms in their industry is important or very important to them when they set their own debt levels. This result gives weak support for the idea that competitors' debt levels and industry debt levels have an effect on firms' debt levels. Besides, the

studies by Graham and Harvey (2001) in the U.S. and Maquieira et al. (2012) in Latin America also showed weak support for the idea that the industry has an effect on a company's debt level.

The survey also examined concepts related to the trade-off theory which argues that the optimal capital structure is based on the relationship between the cost of debt, e.g. bankruptcy, and the benefits of debt. CFOs were asked if the possible costs of bankruptcy and financial distress are important factors which are taken into consideration when determining a suitable amount of debt. 44.2% of CFOs indicated that the possible cost of bankruptcy is an important or very important factor that can influence the appropriate amount of debt for their firms with a mean score of 2.81. This result provides support for the trade-off theory, as the cost of debt is taken into account by Saudi firms when they set their debt ratio. For comparison, the studies by Graham and Harvey (2001) in the U.S., Brounen et al. (2004) in Europe, and Maquieira et al. (2012) in Latin America provide weak support for the trade-off theory.

In addition, it has been argued that when firms have a high level of free cash flow, managers spend this cash flow on inefficient projects and investments (Jensen 1986). Therefore, debt can be used by firms to counteract the effects of free cash flow to ensure management invests in efficient projects (Graham and Harvey 2001). This concept was examined in the survey by asking CFOs if the debt level in their company is used as a mechanism to ensure that the management works hard and efficiently. 40.4% of the participating firms, with a mean score of 2.75, stated that ensuring the management works hard and efficiently is important or very important consideration when determining and setting a suitable amount of debt. This outcome supports the view that issuing debt is a good mechanism for reducing levels of free cash flow to increase the efficiency of management actions. In contrast, the

practices of U.S. firms show weak support for the importance of debt for controlling management activities (Graham and Harvey 2001).

Table 4-13: Survey responses to the question: What factors influence-determine the appropriate amount of debt for your firm?

		% important or very important	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Financial flexibility (we restrict debt when we have enough internal funds)	71.2	3.58	3.07	4.17***	2.97	4.30***	2.68	4.06***	3.49	3.73
2	The transactions costs and fees for issuing debt	55.8	3.31	3.10	3.57	2.86	3.91***	2.79	3.61**	3.20	3.60
3	The debt levels of other firms in our industry	21.2	2.21	1.91	2.61	2.10	2.35	1.95	2.36	2.24	2.13
4	The potential costs of bankruptcy or financial distress	44.2	2.81	2.72	2.91	2.72	2.91	2.68	2.88	2.86	2.67
5	Debt is limited so our customers/suppliers are not worried about our firm going out of business	46.2	3.08	2.91	3.30	2.86	3.38	2.63	3.33	3.19	2.80
6	To ensure that management works hard and efficiently, debt issuance ensures a large portion of our cash flow is committed to interest payments	40.4	2.75	2.62	2.91	2.76	2.74	2.47	2.91	2.83	2.53
		% important or very important	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Financial flexibility (we restrict debt when we have enough internal funds)	71.2	3.58	3.44	4.00	3.26	3.88	3.58	3.54	3.59	3.45
2	The transactions costs and fees for issuing debt-	55.8	3.31	3.20	3.73	2.93	3.72	3.35	3.27	3.29	3.36
3	The debt levels of other firms in our industry	21.2	2.21	2.27	2.00	2.30	2.12	2.27	2.15	2.10	2.64
4	The potential costs of bankruptcy or financial distress	44.2	2.81	2.85	2.64	2.56	3.08	2.92	2.69	2.78	2.90
5	Debt is limited so our customers/suppliers are not worried about our firm going out of business	46.2	3.08	3.05	3.18	3.26	2.88	3.12	3.04	3.02	3.27
6	To ensure that management works hard and efficiently, debt issuance ensures a large portion of our cash flow is committed to interest payments	40.4	2.75	2.80	2.55	2.70	2.80	2.73	2.77	2.68	3.00

***, **, * denotes the significant difference level at 1%, 2% and 10%

4.3.6 Results Related to Dividend Practices

The survey also investigated different concepts related to dividend policies, and CFOs were asked to what extent they agreed with different statements and concepts based on the practices employed in their firms. The results are summarised in Table 4-14. The possible responses were based on a Likert scale of 1 to 5 where 1 meant strongly disagree and 4 and 5 meant agree and strongly agree, respectively. Initially, the CFOs were asked if their firm has a long term payout ratio. 75% of CFOs agreed or strongly agreed that their firm has a long term payout ratio with a mean score of 3.96. Lintner (1956) discussed several aspects of a firm's dividend policy such as the setting of long term target payout ratios, the paying of dividends from remaining monies after investment, and whether executives focus more on changes in dividends than absolute levels (Anand 2002). The survey in this study examined these aspects and 75% of the CFOs agreed or strongly agreed that their firms have long term target dividend payout ratios, with a mean score of 3.96. Moreover, 50% of the CFOs agreed or strongly agreed that their firms focus more on specific levels of dividends than on changes in dividends, with a mean score of 3.27, and 59.6% of the CFOs agreed or strongly agreed that cash dividends are based on residuals after financing desired investments from earnings, with a mean score of 3.62. These results and corporate finance practices are in line with Lintner's (1956) suggestions and with corporate practices in Indian firms (Anand 2002). In addition, 59.6% of CFOs stated that their firms are more likely to cancel dividend increases if there are good investments and growth opportunities, with a mean score of 3.44.

The survey also investigated the relevance of the bird in hand theory to Saudi listed firms. With the bird in hand theory, when firms intend to raise their stock prices, they set high dividend payout ratios (Baker and Powell, 1999). 80.8% of the participating CFOs indicated that they believe that the dividend payout ratio influences a firm's stock price in the market, with a mean score of 4.04, and this

finding gives strong support to the bird in hand theory. The signal or asymmetric information theory was examined in the survey by asking CFOs whether they believe that dividends can be used as a signal to inform investors about the future prospects of a firm. 75% of the CFOs, with a mean score of 3.87, considered dividends as such a signaling mechanism. This result confirms the strong relevance of signaling theory to the Saudi market and shows that Saudi practices are in the line with the practices of Indian firms, as stated by Anand (2002), and Kuwaiti firms , as stated by Mutairi et al. (2009).

Based on the bird in hand theory, investors prefer to receive dividends rather than earnings being retained by the company, because dividends are of lower risk than potential future earnings and capital gains (Graham and Dodd 2009). Only 13.5% of the CFOs surveyed agree or strongly agree that investors are indifferent to receiving dividends or capital gains, with a mean score of 2.5, which gives strong support for the bird in hand theory and agrees with the findings from Anand's (2002) study in India and Mutairi's et al. (2009) study in Kuwait. 48.1% of the CFOs agreed or strongly agreed that their firms set dividend policies based on shareholders' preferences, with a mean score of 3.38. In addition, because of the agency problem between management and shareholders, shareholders prefer to set high dividend payout ratios to encourage management to take advantage of external financial resources such as debt. A third party debtor can work as an external monitor and observer of management actions to effectively reduce the agency issue. This concept is supported by the results of this survey as 65.4% of Saudi firms, with a mean score of 3.73, agreed or strongly agreed that high dividend payout ratios can be used as a bounding mechanism to encourage executives to work towards shareholders' interests. This outcome is in the line with the practices in Indian firms reported by Anand (2002) and is contrary with the practice in Kuwaiti firms reported by Mutairi et al. (2009).

Table 4-14: Survey responses to the question: To what extent do you agree with the following statements about the dividend policy in your firm?

		% agree or strongly agree	Mean	Size		Sector		Pay dividends		Target debt	
				Small	Large	Others	Manu.	No	Yes	No	Yes
1	Has Long-term Target Dividend Payout Ratio	75.0	3.96	3.97	3.96	3.79	4.17	3.95	3.97	3.95	4.00
2	Focus More on Absolute Level of Dividends than Dividend Changes	50.0	3.27	3.34	3.17	3.07	3.52	3.21	3.30	3.08	3.73
3	Willing to Rescind Dividend Increase in the Event of Growth Opportunities	59.6	3.44	3.66	3.17	3.48	3.39	3.58	3.36	3.49	3.33
4	Cash Dividends as Residual after Financing Desired Investments from Earnings	59.6	3.62	3.69	3.52	3.48	3.78	3.74	3.55	3.46	4.00
5	Dividend Payout Ratio Affects the Market Value of the Firm	80.8	4.04	3.93	4.17	3.86	4.26	3.74	4.21	4.14	3.80
6	Dividends Provide Signalling Mechanism of the Future Prospects of the Firm	75.0	3.87	3.83	3.91	3.83	3.91	3.95	3.82	3.86	3.87
7	Investors are Indifferent between Receiving Dividends and Capital Gains	13.5	2.50	2.24	2.83	2.52	2.48	2.53	2.48	2.49	2.53
8	Responsive to Shareholders' Preferences Regarding Dividends	48.1	3.38	3.31	3.48	3.28	3.52	3.42	3.37	3.41	3.33
9	Dividend Payments Provide a Bonding Mechanism to Encourage Managers to Act in Best Interest of the Shareholders	65.4	3.73	3.69	3.78	3.76	3.71	3.74	3.73	3.81	3.53

		% agree or strongly agree	Mean	CFO age		CFO tenure		Education		Executive Ownership	
				≥ 50	< 50	Short	Long	Bach.	Higher	Low	High
1	Has Long-term Target Dividend Payout Ratio	75.0	3.96	4.00	3.82	3.89	4.04	3.96	3.96	4.07	3.55
2	Focus More on Absolute Level of Dividends than Dividend Changes	50.0	3.27	3.34	3.00	3.15	3.40	3.31	3.23	3.27	3.27
3	Willing to Rescind Dividend Increase in the Event of Growth Opportunities	59.6	3.44	3.49	3.27	3.52	3.36	3.23	3.65	3.39	3.64
4	Cash Dividends as Residual after Financing Desired Investments from Earnings	59.6	3.62	3.54	3.91	3.33	3.92	3.50	3.73	3.61	3.64
5	Dividend Payout Ratio Affects the Market Value of the Firm	80.8	4.04	3.98	4.27	4.04	4.04	4.15	3.92	4.07	3.91
6	Dividends Provide Signalling Mechanism of the Future Prospects of the Firm	75.0	3.87	3.85	3.91	3.81	3.92	3.81	3.92	3.85	3.91
7	Investors are Indifferent (Receiving Dividends or Capital Gains)	13.5	2.50	2.51	2.45	2.56	2.44	2.62	2.38	2.46	2.64
8	Responsive to Shareholders' Preferences Regarding Dividends	48.1	3.38	3.37	3.45	3.44	3.32	3.58	3.19	3.46	3.09
9	Dividend Payments Provide a Bonding Mechanism to Encourage Managers to Act in Best Interest of the Shareholders	65.4	3.73	3.78	3.55	3.70	3.76	3.85	3.62	3.83	3.36

***, **, * denotes the significant difference level at 1%, 2% and 10%

4.4 Conclusion

This chapter has discussed the research methodology that was followed in order to reveal existing corporate finance practices in Saudi Arabia. The survey of corporate finance practices has covered four major areas: cost of capital; capital structure; capital budgeting and dividends. The sample included Saudi listed firms, particularly the companies' chief financial officers (CFOs). The survey comprised of four pages, with 62 subsections. In order to increase the response rate, three formats of the survey were sent to participants: an online version; an electronic copy in Pdf or Word format, in addition to a hard copy. 52 completed responses were obtained, providing a 31.51% response rate. After explaining this process, the chapter presented an analysis of the survey responses, which revealed the nature of corporate finance practices in Saudi Arabia. The results showed that IRR and NPV are popular capital budgeting techniques, while the earnings yield is a popular approach for assessing equity costs. Furthermore, the Zakat rate, which is an Islamic-based rate set at 2.5%., is the tax rate that is used by 94.2% of Saudi listed firms. The responses to the capital structure questions and their analysis, provided clear evidence in relation to the pecking-order theory and the trade-off theory. Additionally, the responses indicated that Saudi firms have a long-term payout ratio, while strong support is apparent for the bird-in-the-hand theory and signalling mechanism. Building on this discussion, the following chapter discusses the research methodology for determining the relationship between corporate governance components, firm performance and information leakage. The research sample is also presented, outlining the descriptive statistics relating to the independent and control variables for this association.

Chapter 5:

Corporate Governance Effect on Firm Performance and Information leakage: Methodology and Descriptive Statistics

5.1 Introduction

The preceding chapter presented the research methodology for examining Saudi Arabia's corporate finance practices. It also provided the survey results that focused on the major areas of corporate finance, namely capital budgeting, capital expenditure, capital structure and dividend. Chapter 3 discussed the research hypotheses concerning the relationship between corporate governance components, firm performance and information leakage. Returning to this issue, this chapter explains the research methodology adopted for investigating this relationship. The Ordinary Least Squares (OLS) model and its assumptions are discussed, alongside the panel, random and fixed effects model. It was apparent that in violation of the OLS assumptions, alongside the presence of heteroscedasticity and endogeneity, the Generalized Methods of Moments (GMM) and particularly the System GMM model are the most suitable for the analysis, because they permit control of these issues. Additionally, the chapter explained the research sample and measurement method for each variable. Finally, the chapter reported the dispersive statistics relating to the independent and control variables, pertaining to the impact of corporate governance mechanisms on firm performance and information leakage. Thus, the chapter is structured as follows: Section 5.2 discussed the research methodology and the appropriate model. Section 5.3 explains the research sample and the notations and measurement of variables. Section 5.4 shows the descriptive of the independent and control variables. 5.5 is the conclusion.

5.2 Research Methodology

To investigate the influence of an independent variable on a dependent variable, the procedure applied is referred to as a regression model. Regression analysis is focused on investigating the relationship between one variable (a dependent or explained variable) and another or other variables (independent or explanatory variables) (Gujarati 1999: p123). Regression models rely on the structure of the data and also on the type of variable. The aim of this section is to discuss the appropriate models that could be applied in the empirical examination to find the effect of the corporate governance components on information leakage of the firm and also to find the effect of the corporate governance components on financial performance of the firm. To investigate these relationships, the research uses panel data, as panel data has benefits and advantages over time series and cross-sectional data. Panel data includes both time series and cross-sectional aspects, and Brooks (2008) and Baltagi (2005) reported several advantages in using panel data, such as:

- Panel data allows researchers to deal with and solve different issues and problems more easily than when using pure time series or cross-sectional data.
- Panel data can limit the bias which comes from the individual heterogeneity while time series and cross-sectional data cannot, as individuals, companies, countries, and regions are assumed to be heterogeneous.
- “Panel data give more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency” (Baltagi 2005: p5).
- It allows researchers to investigate the dynamic changes in variables and relationships over time. The strength of the panel is using data on dynamic attitude with several entities over the same time. Thus, this type of data can

help investigators to control the issue of multicollinearity that may increase with using only time series data.

- It can mitigate the influence of specific forms of bias that arise from the omitted variables in the regression outcomes.

There are two types of panel data: balanced and unbalanced, and this research uses balanced panel data. Balanced panel data has “the same number of time-series observations for each cross-sectional unit (or equivalently but viewed the other way around, the same number of cross-sectional units at each point in time), whereas an unbalanced panel would have some cross-sectional elements with fewer observations or observations at different times to others” (Brooks 2008: p490). The same techniques and estimation methods are applied in both cases. There are three main techniques and approaches to panel data analysis: pooled regression, fixed effects model, and random effects model (Greene 2012). The selected regression models need to be tested to examine the presence of autocorrelation and heteroscedasticity in estimates of the data and also to ascertain if the independent variables are endogenous variables. The statistical analysis will confirm if the research needs to use simple ordinary least squares (OLS) based on the random effects model and the fixed effects model or instrumental and dynamic panel methods such as the Generalized Methods of Moments (GMM) to tackle bias arising from the heterogeneity and dynamic endogeneity. The GMM has become widely applied and very popular among researchers in empirical studies because it controls for different forms of endogeneity (Baum et al. 2003b). The following deals with OLS estimation, fixed effect model, random effect model, and Generalized Methods of Moments (GMM).

5.2.1 Ordinary Least Squares (OLS)

The regression model can be estimated by using the simplest model between dependent and independent variables.

$$y_{it} = \alpha + \beta x_{it} + \varepsilon_{it}$$

Where y is the dependent variable and α is the intercept equal to y if x = 0. β is the coefficient of the variable x, the independent variable under examination, and ε is the error term. As this equation covers only one dependent and independent variable, it is not appropriate for the investigation of the effect of multi independent variables on a dependent variable; therefore, this equation is extended to include multi independent variables. The multi regression is a model that applies to more than one independent variable to reveal the attitude of a dependent variable (Gujarati 1999). In addition, as the regression line in the regression model cannot go through all investigated variables in the sample, there is a need for an appropriate method to estimate the parameters in the regression model. The efficient estimator in the linear regression model is ordinary least squares (OLS) (Greene 2012). The OLS approach “entails taking each vertical distance from the point to the line, squaring it and then minimising the total sum of the areas of squares (hence ‘least squares’)” which “can be viewed as equivalent to minimising the sum of the areas of the squares drawn from the points to the line” (Brooks 2008: p31). Thus, the purpose of using the OLS method is to decrease the variance between the original and estimated point (the residuals). The OLS estimation requires special features and five assumptions that confirm the validity of the hypothesis testing and coefficient estimates.

5.2.1.1 Assumptions of OLS

Greene (2012) and Brooks (2008) discussed the assumptions of OLS estimates in detail and these assumptions are outlined in the following.

- The first assumption is that $\mathrm{E}(\mathrm{u_t}) = 0$ which indicates that the average value of the errors = 0. This assumption will be presented when the constant term is contained in the regression equation. If the average value of the errors is not equal to 0, several unfavourable outcomes will increase and cause biases in the estimation.
- The second is the assumption of homoscedasticity, which states that the variance of the errors is constant ($\mathrm{var}(\mathrm{u_t}) = \sigma^2 < \infty$). If the variance of the errors is not constant, it is deemed as a heteroscedastic case. Ordinary least squares (OLS) with heteroscedasticity will continue providing unbiased coefficient estimates but will not still provide the least variance among the unbiased estimators. If the issue of heteroscedasticity is not solved, it makes OLS an inefficient estimator which may cause the over-rejection of the null hypothesis, so the inferences from the results will be deceptive (Long and Ervin 2000). Fortunately, there are several statistical tests that can detect heteroscedasticity. The Goldfeld and Quandt (1965) test is one of the simplest tests, in addition to the White (1980) test, for heteroscedasticity. In addition, Baum et al. (2003) states that the statistical tests used by Breush and Pagan (1979) and Cook and Weisberg (1983) are the major tests for detecting heteroscedasticity in OLS regression and the null hypothesis of the test is that the variance is constant. When heteroscedasticity is present, different techniques can be used for correction and one of these techniques is using Generalized Methods of Moments (GMM). Baum et al. (2003) indicates that in determining the presence of heteroscedasticity, the GMM estimator is more effective than the Instrumental Variable (IV).

- The third assumption is that $\mathrm{cov}(u_i, u_j) = i \neq j$, which assumes that there is no correlation between the errors (uncorrelated) and the covariance between them is 0. If there is a correlation between the errors, this indicates the presence of autocorrelation or serial correlation. Even though OLS with availability of autocorrelation offers unbiased coefficient estimations, these coefficient estimations are not efficient. Thus, the estimated standard error may be not be correct, which may lead to biased inferences about the determinant of variables. For the positive serial correlation of the residuals, the estimation of the standard errors would be biased compared to the original standard errors, which may cause increased possibility of a type one error that leads to over-rejection of the null hypotheses even though they are correct. In addition, it may lead to an increase in the value of R^2 compared to its corrected value. Therefore, the research needs to identify the presence of serial correlation in the model. There are different statistical tests which can detect serial correlation in the model, such as the Durbin and Watson (1951) test and the Breush-Godfrey test. There is also a Wooldridge (2002) test which is used in this research to reveal serial correlation in the research models. Drukker (2003) states that the Wooldridge test is to detect serial correlation in the panel model and it is the desired test because it is simple to apply, requires few assumptions, and can be implemented with the general conditions. However, it is argued that serial correlation in the model is the result of non-specified dynamics which come from dynamic structures that are not included in the model and not identified in the studied value. It shows that the dependent variable has more information and richer structure which are not captured by the models. Therefore, this dynamic structure and relationship needs to be investigated by a dynamic model such as Generalized Methods of Moments (GMM) which can allocate the extra structure for the dependent variable.

- The fourth assumption is that the distribution should be normal $(u_t \sim N(0, \sigma^2))$. For data with a sufficiently large sample, the presence of non-normality is practically inconsequential. Regarding the central limit theorem, the statistical test will be closely in line with the suitable distribution in spite of the presence of the non-normality error.
- Finally, OLS estimation assumes that the independent variables are not correlated with each other, so deleting or inserting independent variables in the regression model will not modify the coefficient values of the other independent variables. In statistical analysis, often the correlation degree between the independent variables will not be equal to 0 and if the degree of correlation is small, it will not cause the model to violate the accuracy. If the correlation degree between the independents is very high, this issue will affect the accuracy of the model and this issue is called multicollinearity. There are two types of multicollinearity: perfect and near multicollinearity. The presence of a high degree of multicollinearity between independent variables in the model causes different issues such as causing the R^2 to have a higher value and the coefficients to have higher standard errors. Also, inserting or deleting any independent variable from the model will cause many modifications in the significances and the value of the coefficient of the other independent variables. In addition, multicollinearity will lead to wide confidence intervals which may cause unsuitable outcomes from the significance tests and inaccurate conclusions. There are a few statistical tests which can detect the issue of multicollinearity among the independent variables, such as Spearman's rank correlation coefficient and Pearson's product-moment correlation test. In addition to these test, there is the variance inflation factor (VIF) and its inverse tolerance (TOL) which report how the variance of the a model is raised by the availability of the multicollinearity (Gujarati 2004).

5.2.1.2 Endogeneity

The issue of endogeneity is one of the main elements in the analysis that the investigators should focus on. Bhagat and Jefferis (2002) indicate that corporate governance researchers are most likely to experience the problem of endogeneity. If any regressor in the model is endogenous, the OLS estimation of all model parameters will be inaccurate and inconsistent which causes biased results (Cameron and Trivedi 2005). Endogeneity is defined as being the case when there is a correlation between the regressor and the error term u, and if there is no correlation with u, it is said to be exogenous (Cameron & Trivedi 2005). In addition, endogeneity occurs when there is an adverse causality between the independent variable and dependent variable (Wooldridge 2001). For example, the relationship between the corporate governance components and performance of the firm, so good corporate governance can improve the performance of the firm but it is also possible that high performance of the firm may lead to good quality corporate governance such as assigning more directors to the board or increasing the number of board subcommittees. Endogeneity may emerge as the result of different sources such as omitted variables, measurement error, and simultaneity. The **omitted variables bias** can occur when the researcher intends to add control variables in the regression model but because the variables are hard to measure or because the data of these variables are not available, the researcher cannot contain these control variables in the regression model (Wooldridge 2002). Thus, endogeneity can occur when there is a relationship between the omitted variable and the dependent variable and also at the same time there is a correlation between the omitted variable and the independent variables in the regression model. Therefore, the influence of the omitted variables in the regression model which is not included and detected will create biased estimations and results.

In addition, the endogenous issue can be increased in the independent variables when the independent variable in the regression model has a **measurement error**. The measurement error occurs when the variable has a clear definition and quantitative concept such as the annual income but the measure for this variable used in the research and regression model may include error (Wooldridge 2002). The measurement error in the dependent variable can lead to OLS estimation bias if there is a systematic relation between the measurement error and one or more of the independent variables. If there is no systematic relation between the measurement error and the independent variables, the OLS estimation is suitable (Wooldridge 2002). Traditionally, the issue of measurement error in the independent variable is more significant than measurement error in the dependent variable (Wooldridge 2002).

The third source of endogeneity is **simultaneity**, which can arise when there is one or more independent variables in the regression model which can be determined by the dependent variable while these independent variables may have an effect on the dependent variable. For example, simultaneity can appear in corporate governance studies in relationships between the board composition and performance of the firm as the theory indicates that the structure of the board may have an influence on the performance of the firm, while it is also possible that the performance of the firm has an effect on the board structure, therefore the board composition and performance have reverse influence which will cause the OLS and fixed effects estimations to be biased (Wintoki et al. 2012). The differences between the three sources of endogeneity are not always accurate and in practice the regression equation may include more than one source of endogeneity (Wooldridge 2002). There are several statistical tests to detect endogeneity in the regression model. The Durbin (1954), Wu (1973), and Hausman (1978) (DWH) test is one of these tests, which is used in this research to reveal the problem of endogeneity. The

DWH test has been widely applied to detect endogeneity that relies on the distinction between two estimators as one of these estimators is more effective under the null (Lee 2013). However, the researcher can use a dynamic method such as the Generalized Methods of Moments (GMM) to control for potential endogeneity in the regression model (Akbar et al. 2016).

5.2.1.3 Unobservable Heterogeneity

Unobservable heterogeneity bias is a case when there are some elements which are unobservable to the investigator and not contained in the regression model that influence the dependent variable and independent variables (Wintoki et al. 2012). For example, when considering the influence of the board on the performance of the firm, the bias comes from neglecting unobserved heterogeneity as Hermalin and Weisbach (1998) argued that executives with a high standard of ability are observed less carefully by stockholders and therefore they have less independent directors on the board while they lead their companies to gain high achievement and good performance. Thus, as these executives will lead their companies to high financial performance, researchers may conclude with biased results that the number of independent directors on the board has a negative influence on the performance of companies, which comes from unobserved heterogeneity. Moreover, as a result of the weak monitoring mechanism by shareholders of activities by executives, those executives with a high standard of ability may gain power on the board by taking the two top positions in the company to represent the CEO duality position and lead their companies to high financial performance. This indicates that in the OLS estimation model that neglects the unobserved heterogeneity of the executives with a high standard of ability may conclude based on biased outcomes that the CEO duality position has a positive influence on the performance of companies. Therefore, the potential presence of unobserved heterogeneity in the regression

model will cause the OLS model to be unsuitable because of the bias and errors in the results and outcomes caused by unobserved heterogeneity.

5.2.2 Panel Data Models

As mentioned previously, the panel data model has been used in this research because it includes several advantages which exceed the implementation of the OLS estimation. The panel data can recognise the dynamic behaviour, limit the bias caused by individual heterogeneity as the individuals are assumed to be heterogeneous, and lead to less collinearity because the investigation is conducted through individuals and time. Greene (2012: p345) states that panel data models can be categorised into three broad models: OLS pooled regression, fixed effects model, and random effects model. The general model for the data is:

$$y_{it} = \alpha + x_{it}\beta + u_{it}$$

Where u is the heterogeneity or individual effect and it comprises a "constant term and a set of individual or group-specific variables, which may be observed, such as race, sex, location, and so on, or unobserved, such as family specific characteristics, individual heterogeneity in skill or preferences, and so on, all of which are taken to be constant over time t" (Greene 2012: p345). The panel model can be analysed as an OLS model with least squares, if u is recognised for all individuals, but in most analyses the complexity is increased because u is unobserved (Greene 2012). The **pooled regression model** offers efficient OLS estimation for the common α_i and β, if u includes constant terms and the individuals are observed all the time. The simplest method to analyse the data is to make the estimation of the pooled regression by including the estimation of a single equation for all the data, so the data for y is collected together in a single column including all the observations from the time series and cross section, and also the observations of the independent

variables are collected together in a single column in the matrix of x which can be modelled with OLS estimation (Brooks 2008). Greene (2012) stated that the assumption of the pooled OLS regression model under the basis of the panel data analysis is unlikely to be available. Brooks (2008) indicated that even though pooled regression is a simple method, it has a serious limitation which is that it assumes the average value of variables and the relationships between variables are constant in the time series and cross section over all the data.

5.2.2.1 Fixed Effects Model

The fixed effects model is applied to investigate the influence of variables that change during the time. In the fixed effects model, the disturbance term u_{it} is modified to the individual effects μ_i and disturbance v_{it} which are different during the entities and time, so the model becomes (Brooks 2008):

$$y_{it} = \alpha + x_{it}\beta + u_{it} + v_{it}$$

Where μ is the unobserved effect or heterogeneity and it is assumed that there is a correlation between the unobserved effect and the independent variable x. The fixed effects approach offers a special intercept term for each entity which is constant during the time with the assumption that the relationship between the independent and dependent variables is the same over the cross-section and time (Brooks 2008). Wintoki et al. (2012) indicated that corporate governance studies mostly depend on panel data and the fixed effects model for analysis, as the traditional fixed effects model can possibly improve the bias caused by the unobserved heterogeneity, but, on the other hand, this process occurs at the expense of the strong exogeneity assumption which is not clearly known by investigators. The assumption is that, the current examination of the independent variables, such as board composition, is independent from the past data of the dependent variable such as the performance

of the firm, which is not realistic as the financial performance may lead to improvement in the board (Wintoki et al. 2012). Furthermore, the fixed effects model is not valid when some independent variables are fixed over years as the variable would be dropped from the model.

5.2.2.2 Random Effects Model

The random effects model is (Brooks 2008):

$$y_{it} = \alpha + x_{it}\beta + \varepsilon_i + v_{it}$$

It is the same as the fixed effects model with the unobserved effect or heterogeneity but it is assumed that there is no correlation between the unobserved effect and the independent variable x. Thus, the clear difference between the random and fixed effects model is whether the unobserved individual effect or heterogeneity has a correlation or not with the regressors in the model (Greene 2012). In the fixed effects approach, the random effects offers a special intercept term for each entity that is constant over the time but it is with the assumption that the intercept for each unit of the cross section would arise from a common intercept α that is the same across entities and over time (Brooks 2008). In addition, the random variable ε_i which is different in the cross section but constant during the time scales the random variation of each intercept term entity from the intercept term α (Brooks 2008).

To select the appropriate models for this research, the assumptions of the selected models have to be considered and valid to generalise the generated outcomes from the models because the violation of the assumptions causes the chosen models to be biased which leads to results which are inaccurate and invalid. The aims of this research are to investigate the effect of corporate governance components on the performance of firms and also to investigate the influence of corporate governance components on information leakage. Wintoki et al. (2012)

indicates that corporate governance studies usually have serious problems with endogeneity because it is hard to find the exogenous elements to recognise the investigated relationship. For example, several empirical studies have suggested that specific corporate governance mechanisms have a positive influence on financial performance but these studies suffered from endogeneity problems and therefore, it is not certain if governance and performance have a reverse effect or there is an unobserved factor that positively affects governance and performance at the same time (Akbar et al. 2016; Wintoki et al. 2012). In addition, the study of Morck et al. (1989) argued that the relation between the ownership structure and financial performance is possibly endogenous (Reyna et al. 2012).

Most empirical studies of corporate governance and finance experience two sources of endogeneity: unobserved heterogeneity and simultaneity (Wintoki et al. 2012). The source of endogeneity comes from neglecting the potential relation that the current quality of governance is the result of the positive effect of past performance of firms; therefore, ignoring this potential endogeneity can cause biases and issues in terms of the research inferences and outcomes (Wintoki et al. 2012). Therefore, this research conducts statistical tests to detect the issue of serial correlation using the Wooldridge (2002) test, the issue of heteroscedasticity using Breusch and Pagan (1979) and Cook and Weisberg (1983) tests, and the issue of endogeneity using the two step Durbin (1954), Wu (1973), and Hausman (1978)(DWH) test. The results of these tests confirm that the data and models of this research face serious potential heteroscedasticity, serial correlation and endogeneity. However, with the conclusion that the assumptions of the random effects model and fixed effects model which rely on the simple OLS are not valid and appropriate, using these models for this research with possible dynamic relationships could lead to biased estimation and outcomes. Thus, it is important to implement methods that can tackle the issues and offer greater robustness to the

estimation. Therefore, this research contributes to the current literature, which often applies static models, by using a dynamic method which is the Generalized Methods of Moments (GMM) as GMM can offer strong and robust outcomes even with the presence of potential endogeneity, heteroscedasticity, simultaneity, autocorrelation and unobserved heterogeneity.

5.2.3 Generalized Methods of Moments (GMM)

A large percentage of recent empirical research in econometrics has implemented Generalized Methods of Moments (GMM) estimators, especially in the field of finance and macroeconomics (Greene 2012). That is because the researchers needed to apply a statistical method that was suitable for their data and GMM is a flexible statistical method that can deal with the dynamic nature of the data and controls for the statistical issues that may occur with fixed effects and random models depending on simple OLS. The GMM approach was presented by Holtz-Eakin et al. (1988) and Arellano and Bond (1991) and was further developed in later studies including the study of Arellano and Bover (1995) and Blundell and Bond (1998). Wintoki et al. (2012) stated that the GMM method has been applied in the subjects of economics and finance when the issue of research is related to the problem of endogeneity and the potential dynamic relationship between the independent and dependent variables.

The GMM estimator is a statistical approach that integrates investigated economic and financial data with the information in the population moment conditions to make estimations for the unknown parameters of this economic or financial model (Zsohar 2012). Plasmans (2006: p19) indicates that there are two main reasons which make the GMM approach a popular method among researchers; firstly, because it has the ability to “nest most of the commonly known estimators” such as OLS, instrumental variable, or maximum likelihood estimation

and offers a “useful framework for their comparison and evaluation.” The second reason is that GMM offers a simple alternative to other estimators and models when compared in practical terms with other estimators such as the maximum likelihood estimation (Plasmans 2006). Roodman (2006) reports that the GMM estimator is designed for cases when there are variables which are dynamic, the independent variable is not strictly exogenous so it may correlate with the past or current error, there is unobserved heterogeneity, heteroscedasticity and autocorrelation within individuals, and data with short length of period and many individuals. Nickell (1981) stated that the fixed and random effects models cause seriously biased coefficients in the dynamic model where the period of time is short. The panel data usually has a small number of times and large number of individuals and the length of period is deemed short if it is below 20 (Nickell 1981).

This research uses a time period below 20; which is 9 years, so it is considered a short period. Akbar et al. (2016) indicates that the GMM method can control for endogeneity that may arise from the unobserved heterogeneity and fixed effects, simultaneity, and dynamic endogeneity. Therefore, the GMM estimator is appropriate for this research as the data has a short time period (9 years) and many individuals and also the research shows the potential dynamic nature of the data and endogeneity and also reports either the pattern of serial correlation or heteroscedasticity. To apply GMM, there are appropriate estimators which should be chosen. These estimators are the Difference GMM estimator introduced by Anderson and Hsiao (1981) and Arellano and Bond (1991) and also the System GMM estimator introduced by Blundell and Bond (1998) which is considered to be the most sophisticated estimator of the GMM method, and is used for this research. Roodman (2006: p13) stated that the Difference and System GMM estimators are structured for panel analysis and include the following assumptions:

- There is a possibility that some regressors are endogenous and the fixed individual effects are arbitrarily distributed.
- The relationship and process may be dynamic, so the past value may influence the current one.
- The idiosyncratic disturbances may contain individual-certain models of heteroscedasticity and serial correlation but are uncorrelated across individuals.
- "Some regressors may be predetermined but not strictly exogenous."
- The period of time of the research data may be short with a large number of individuals.
- Depending on the lags of the instrumental variables, the only available instruments are internal and there is no assumption that the "the good instruments are available outside the immediate data set." "However, the estimators do allow inclusion of external instruments."

5.2.3.1 First Difference GMM Estimator

The dynamic model of the panel data is recognised by the lagged dependent variable in the regressors

$$Y_{it} = \gamma\, Y_{i,t-1} + X'_{it}\,\beta + u_i + \varepsilon_{it}$$

Where X'_{it} is (K-1)×1 vector of exogenous regressors, u_i is the fixed effect, γ is a scalar, and ε_{it} is the random disturbance (Judson and Owen 1997). Inclusion of the lagged dependent variable shows the main problems and produces biased estimation of the coefficient, especially when T is small. Nickell (1981) provided an explanation for the bias of γ when there are no exogenous regressors, indicating that the bias is close to zero as (T) is close to ∞, so the least squares dummy variable (LSDV) model works well only when the period of time of the panel data is

long. Different estimators have been suggested to produce estimation for equation (1) when the period of time (T) is small. Anderson and Hsiao (1981) suggest a two instrumental variable process so as to eliminate the fixed effect; they take the first difference of the lagged variable in previous equation to be

$$Y_{it} - Y_{i,t-1} = \gamma\left(Y_{i,t-1} - Y_{i,t-1}\right) + (X_{it} - X_{i,t-2})'\beta + \varepsilon_{it} - \varepsilon_{i,t-1}$$

Arellano and Bond (1991) suggest another technique which is more efficient than the Anderson and Hsiao (1981) estimator. They propose that additional instruments can be gained in the GMM panel model if it uses the orthogonality condition that occurs between the disturbances $\varepsilon_{it}$and the lagged values of the dependent variable Y_{it} (Arellano & Bond 1991). However, the First Difference GMM estimator of Arellano and Bond (1991) received criticism from Blundell and Bond (1998). They argue that the First Difference GMM estimator produces less informative instruments in two conditions; first, when the α value rises toward unity, and second, “as the relative variance of the fixed effects increases” (Blundell & Bond 1998: p120). As a result, Arellano and Bover (1995) proposed development of the First Difference GMM estimator by suggesting that efficiency could be obtained by applying a larger set of moment conditions.

5.2.3.2 System GMM Estimator

The System GMM estimator is the most sophisticated estimator, with lower level of bias, among the suggested GMM estimators. Blundell and Bond (1998) propose the System GMM estimator by developing and extending the estimator of Arellano and Bover (1995) by estimating the model both in levels and first differences to increase the efficiency, especially in cases where the First Difference estimator is inefficient such as when the data has a short period of time. The System GMM estimator combines the regression in differences with regression in levels, so “the instruments

for the regression in differences are the lagged levels of the corresponding variables" and "the instruments for the regression in levels are the lagged differences of the corresponding variables" (Belkhir et al. 2016: p109). The Blundell and Bond (1998) System GMM estimator makes a stacked data group with the observations, so the observations which are not transformed follow the observations which are transformed. They state that all (T-2) models in first differences and (T-2) models in levels coincide to time 3,…, and T, for the instruments that are observed and the matrix of instruments for this process can be formed as follows (Blundell & Bond 1998):

$$Z_i^+ = \begin{bmatrix} Z_i & 0 & 0 & \cdots & 0 \\ 0 & \Delta y_{i2} & 0 & \cdots & 0 \\ 0 & 0 & \Delta y_{i3} & \cdots & 0 \\ \cdot & \cdot & \cdot & \cdots & 0 \\ 0 & 0 & 0 & \cdots & \Delta y_{i,T-1} \end{bmatrix}$$

Thus, this produces the equation of the System GMM estimator that contains estimating, based on the following system (Wintoki et al. 2012):

$$\begin{bmatrix} Y_{it} \\ \Delta Y_{it} \end{bmatrix} = \alpha_i + k \begin{bmatrix} Y_{it-p} \\ \Delta Y_{it-p} \end{bmatrix} + \beta \begin{bmatrix} X_{it} \\ \Delta X_{it} \end{bmatrix} + \begin{bmatrix} Z_{it} \\ ZX_{it} \end{bmatrix} + \varepsilon_{it} \qquad (\text{as } p = 1,2 \ldots . p)$$

This system still contains unobservable heterogeneity and to handle this it can be assumed that, while the independent and control variables may have a correlation with the unobservable effects, the correlation is still constant over the period of the data which is deemed to be small (Wintoki et al. 2012). This assumes further sets of orthogonality conditions:

$$E[\Delta X_{it-s}(\eta_i + \varepsilon_{it})] = E[\Delta Z_{it-s}(\eta_i + \varepsilon_{it})] = E[\Delta y_{it-s}(\eta_i + \varepsilon_{it})] = 0, \quad \forall s > p$$

From this, the System GMM estimator gains efficient estimation and controls for simultaneity, time invariant unobservable heterogeneity, and the dynamic relation

between the existing value of the independent variable and the past values of the dependent variable (Wintoki et al. 2012). Furthermore, Belkhir et al. (2016) indicates that the System GMM model leads to consistent estimators because it controls for individual heterogeneity such as that which may arise from individual certain effects, and controls for endogeneity issues such as those which may arise from the correlation between the independent variables and the regression errors because of the presence of the lagged dependent variables.

Therefore, because of the superiority of the System GMM estimator among other regression models, especially for dealing with dynamic data and the presence of endogeneity, heteroscedasticity and serial correlation, this research uses the two-step System GMM estimator of Blundell and Bond (1998) and Arellano and Bover (1995) with one and two lags to investigate the effect of corporate governance components on information leakage and also to investigate the effect of corporate governance components on the performance of firms. To process this estimator, the research uses the Stata 13 program with command xtdpdsys. In addition, there are two tests which can be conducted to detect the consistency and validity of the System GMM models. The first is the second order serial correlation (Arellano-Bond AR (2)) test because the GMM estimator offers consistent estimation if there is no second order serial correlation in the error terms (Matemilola et al. 2015). The second is the Sargan test for over-identifying restrictions to identify the validity of the instruments because the consistency of the GMM model assumes that the lagged values of the corresponding variables are valid instruments (Belke and Vogel 2014). Therefore, after conducting the System GMM models, the research performs these two tests to reveal the consistency and validity of the System GMM estimators, which will confirm and ensure the robustness and validity of the research results regarding the effects of corporate governance components on the information leakage and performance of firms.

5.3 Research Data and Sample

The research aims to investigate the effect of corporate governance components on information leakage and also the effect of corporate governance components on the financial performance of firms. The research focuses on Saudi listed firms, and in the 2014 financial year there were 163 Saudi firms listed on the Saudi Exchange Market (Tadawul). To increase the robustness and validity of the research results and inferences, the research uses two different types of firms and two periods of times to investigate the relationship between corporate governance and information leakage and performance.

There is an argument in existing literatures regarding the use of data related to financial firms, as the majority of studies that examine the relationship between corporate governance and financial performance exclude financial firms from the sample data, such as the study of Jackling and Johl (2009); Haniffa and Hudaib (2006); Kyereboah-Coleman (2007); Al-Matari et al. (2012); Mashayekhi and Bazaz (2008); Christensen et al. (2015); Dharmadasa et al. (2015); and Zhang (2012). In addition, there are several studies that investigate the effect of corporate governance on information asymmetries, information leakage, and disclosure quality and exclude financial companies from the sample, such as the study of Kanagaretnam et al. (2007); Haniffa and Cooke (2002); Elbadry et al. (2015); Cai et al. (2006); Lakhal (2005); Forker (1992); and (Zhang 2012). These research studies exclude financial firms from the data because there are differences between financial and non-financial firms in terms of regulatory requirements, disclosure requirements, and capital structure (Haniffa and Cooke 2002; Elbadry et al. 2015; Zhang 2012; and Lakhal 2005).

However, in Saudi Arabia all listed firms are liable to the same government regulations; the Corporate Governance Regulations (CGR), Listing Rules, Capital Market Law, and the disclosure requirements as set by the Capital Market Authority

(CMA 2009; CMA 2004; CMA 2010). However, there are a number of corporate governance studies which use data that includes both financial and non-financial companies in their analysis, such as the studies of Betzer and Theissen (2009); Forker (1992); Beasley et al. (2000); Ammann et al. (2013); and Lin and Chang (2011). This research aims to increase the robustness, reliability, and validity of the study outcomes and its results; therefore, the research uses two groups of data: the first one includes all the Saudi listed financial and non-financial firms, and the second data set contains only the Saudi listed non-financial firms by excluding banks and insurance companies. Using these two groups of data allows the research to reveal the comparison and differences between the data for all firms and the data for non-financial firms in relation to investigating the effect of corporate governance components on information leakage and performance, which will help the research conclude with robust and accurate results and inferences compared with other studies that use only one type of data, either for all firms or only non-financial firms.

In addition, the research uses two different periods of time: the first period covers 2006 to 2014 (9 years), and the second period covers 2009 to 2014 (6 years). The research period starts from the year 2006 because in this year the Saudi Capital Market Authority released the Corporate Governance Regulations (CGR) as guiding principles for all Saudi listed firms. From 2006, all Saudi listed firms have been required by the CGR to disclose the provisions that have been applied and the provisions that have not been applied, so from 2006 the only requirement was disclosing the corporate governance status of each firm. From the year 2009, the authority began to demand that Saudi firms implement some important corporate governance codes such as setting down rules for the internal control system, making independent directors the majority of the board, and forming audit, nomination and remuneration committees (CMA 2010). Thus, the period from 2006 until 2014 covers

the data of Saudi firms before and after the imposition of some important corporate governance codes; therefore, the research will be able to investigate the effect of setting the corporate governance codes and, especially, the influence of imposing these codes on Saudi firms. The period ends in 2014 because it is the last period that the research can cover due to the fact that all the annual financial and board reports for 2014 were issued in the first quarter of 2015. Therefore, for these reasons the first period is from 2006 until 2014.

In addition, the research uses another period of time, from 2009 until 2014 because during this period several new firms were listed in the market, which offers more observations than the period between 2006 and 2014, as the observations between 2006 and 2014 are 558 and between 2009 and 2014 there are 690. Moreover, the new listed firms after 2009 were from different sectors, a factor which adds rich information to the investigation regarding the effect of corporate governance and allows the research to offer a comparison between the results of these two periods which will confirm and ensure the robustness of the research outcomes and inferences. The research period ends in 2014 because it is the most recent year for which data is available. Because there are two groups of data with two different time periods, the research investigates four different groups of data, which are:

- Data (A) All Saudi firms from all sectors listed in the period from 2006 to 2014.
- Data (B) Non-financial Saudi firms listed in the period from 2006 to 2014.
- Data (C) All Saudi firms from all sectors listed in the period from 2009 to 2014.
- Data (D) Non-financial Saudi firms listed in the period from 2009 to 2014.

By the financial year 2014, there were 163 Saudi firms listed on the Saudi Exchange Market (Tadawul) from all sectors and also 117 non-financial firms (excluding all banks and insurance firms) listed in the Saudi Exchange Market (Tadawul). Table 5-1 gives a summary of the selected sample for the four groups of data and its

representation of the market. Table 1-1 shows that the sample of firms in all sectors between 2009 and 2014 is 115, which accounts for 70.55% of the market; the highest representation of the market for firms in all sectors. The sample of the non-financial firms between 2009 and 2014 is 85 firms accounting for 72.64% of the market, which is the highest representation for non-financial firms. Even though the samples for the period from 2006 until 2014 have less representation compared with the samples for the period between 2009 and 2014, they contain the important period that covers the time before and after the enforcement of some of the important CGRs on Saudi firms, which allows the research to investigate the effect of these reforms on the performance and information leakage of firms.

Table 5-1: Summary of the selected samples for the four groups of data

Firm type	firms in 2014	Period	No. of excluded firms	No. of selected firms	% of the selected firms	No. of annual observations
All sectors	163	2006-14 (9 y)	101	62	38.04	558
Non-finance	117	2006-14 (9 y)	66	51	43.58	459
All sectors	163	2009-14 (6 y)	48	115	70.55	690
Non-finance	117	2009-14 (6 y)	32	85	72.64	510

In addition, the research uses three different types of data to generate the variables to investigate the effect of corporate governance components on information leakage and performance of firms. The three different data types are; first, the date related to the corporate governance components; second, the data related to the information leakage variables; and third, the data related to the financial and market performance variables and control variables. The variables of the corporate governance components were collected from the annual reports submitted by the board of directors of each firm, which are required by the Capital Market Authority. Article 1(c) of the Saudi CGRs states that each firm must disclose annually the corporate governance status (CMA 2010). The sources for the reports by the board of directors are the official website of the Saudi Exchange Market (Tadawul), the official website of each firm, and information agencies that are certified by the

Capital Market Authority. The board reports are presented in pdf format, therefore the researcher needs to read all the content to find the required information related to the variables.

The second type of data is related to the information leakage variables. The information leakage variable is the cumulative abnormal returns of each firm during the 25 days before the official earnings announcement date in the window (-25, 0) which are already examined in the event study chapter. The source data of the information leakage is presented in detail in the event study chapter. The third type of data is related to financial performance and control variables. These variables were collected from the audited annual financial statements of each firm and this kind of statement has to be reviewed by auditing companies. All Saudi listed firms are required by Article 43 of the Listing Rules of the stock market to publish their audited annual financial statements within 40 days for the annual earnings announcement starting from the end of each financial period (CMA 2004). The sources for the annual financial statements are the official website (Tadawul) (www.tadawul.com.sa), the official website of each company, and certified information companies. The financial statements are presented in pdf format; therefore the required numbers and variables were collected and calculated manually.

The selected sample for this research is based on all variables of each firm being available during the entirety of the covered period; therefore, if there is any missing variable or the firm was only listed recently, the firm will be excluded from the sample. Table 5-1 shows the number of firms that were excluded because a firm had missing data or was listed or delisted recently, and therefore was not included for all the covered years. A total of 48 firms were removed from the data for the period 2009 to 2014 (all sectors); 32 firms for the non-financial firms between 2009 and 2014, 101 firms for the period between 2006 and 2014 (all sectors), and 66

firms for the non-financial firms in the period 2006 to 2014. Thus, the sample of this research is strongly balanced, which brings several advantages to the regression analysis and these advantages are presented in detail in the methodology chapter. Table 5-1 shows the final sample of the research for the four groups of data with the number of annual observations, with the firms of all sectors between 2009 and 2014 having the largest number of annual observations.

In addition, table 5-2 presents the selected sample based on sectors for the four groups of data. The table shows that most firms in the market are concentrated in the financial services, petrochemicals, cement, agriculture and food industries, and industrial investment, and building and construction sectors. During the period between 2009 and 2014, the market experienced a significant increase in the number of listed firms in the sectors of retail, insurance, multi-investment real estate development, and transport.

Table 5-2: The final samples for the four groups of data within each sector

The data / Sectors	All sectors 2006-2014	Non-financial 2006-2014	All sectors 2009-2014	Non-financial 2009-2014
Banks & Financial Services	10	0	11	0
Petrochemical	9	9	14	14
Cement	7	7	7	7
Retail	3	3	8	8
Energy & Utilities	2	2	2	2
Agriculture & Food	11	11	12	12
Telecom & Technology	1	1	2	2
Insurance	1	0	19	0
Multi-Investment	2	2	6	6
Industrial Investment	7	7	10	10
Building & Construction	6	6	10	10
Real Estate Development	0	0	7	7
Transport	1	1	4	4
Media & Publishing	2	2	2	2
Hotel & Tourism	0	0	1	1
Total	62	51	115	85

Table 5-3, 5-4 and 5-5 show the notations and measurements of the variables that are used in this research to investigate the effect of corporate governance components on information leakage and financial performance of firms. The discussion about these variables and relationships between the dependent variables and independent and control variables is presented in detail in the research hypotheses section. The sample used in this research is deemed a large sample, with panel date for 115 firms and 690 annual observations, compared with existing Saudi studies regarding the relationship between corporate governance components and performance. Importantly, this research uses a longer time period, with 9 years of observations, than other existing Saudi studies. In addition, this research is the only Saudi study that covers the period before and after the enforcement of several corporate governance codes on listed firms, and the only Saudi study that applies two groups of data (all firms and non-financial firms) in the same research. For example, the study of Ghabayen (2012) covered 102 non-financial firms in just one year of observation, 2011. The research of Al-Matari et al. (2012) used one year of observation (2010) with 135 non-financial firms. Ezzine (2011) in his study examined 96 industrial firms from 2006 to 2008. Furthermore, this current research is the first study that examines the relationship between corporate governance and information leakage in the Saudi market.

Table 5-3: Notations and measurements of the independent variables

Independent Variables	Notation	Measurement
Board Size	BOSI	The number of directors on the board
Board Independence	BOIN	The percentage of independent directors on the board
Board Meetings	BOME	The number of board meetings in each year
CEO Duality	CEDU	If the CEO and chairman is not the same person = 1, 0 otherwise
Board Subcommittees	BOCO	If the firm has the three suggested committees (audit, nomination, and remuneration) =1, 0 otherwise
Audit Committee Size	AUSI	The number of members in the audit committee
Audit Committee Meetings	AUME	The number of audit committee meetings in each year
Ownership Concentration	BLOK	The percentage of stock owned by large shareholders (own $\geq 5\%$ of issued shares)
Government Ownership	GOV	The percentage of stock owned by government (own $\geq 5\%$ of issued shares)
Institutional Ownership	INS	The percentage of stock owned by institutions (owned $\geq 5\%$ of issued shares)
Directors Ownership	DIRE	The percentage of stock owned by directors
Managerial Ownership	MANG	The percentage of stock owned by managerial shareholders
Market Reform	MARE	Year dummies so if the year is from 2009 to 2014 = 1, 0 otherwise

Table 5-4: Notations and measurements of dependent variables

Dependent Variables	Notation	Measurement
Performance of firm		
Return on Equity	ROE	The percentage of net profits to equity of owners
Return on Asset	ROA	The percentage of net profits to the total assets
Tobin's Q	Tobin's Q	((Total assets – book value of equity) + market value of equity) / total assets
Information Leakage		
CAR - Constant Mean Model	CMRM	Cumulative abnormal returns (Constant mean model) at window (-25,0)
CAR - Market Adjusted Model	MARM	Cumulative abnormal returns (market adjusted model) at window (-25,0)
CAR - Market Model	MRM	Cumulative abnormal returns (market model) at window (-25,0)

Table 5-5: Notations and measurements of control variables

Control Variables	Notation	Measurement
Size of firm	SIZE	The natural log of assets of the firm
Firm Growth	SAGR	((sales for year – sales for previous year)/sales for previous year) *100
Leverage	LVRG	The percentage of total debt to total assets
Year Dummy	Year	Each year = 1, 0 otherwise
Industry Dummy	Industry	Each industry (primary, manufacturing, and services =1, 0 otherwise

5.4 Descriptive Statistics

This section reports the descriptive statistics of the models related to the effect of corporate governance components on firm performance and information leakage. The descriptive statistics contains the mean, median, standard deviation, the maximum and minimum value, and the count number of the years' observation. Besides, it presents the descriptive outlines of the independent variables and control variables for the four groups of data that include different types of firms and covers different times of periods. Therefore, for each type of variables there are four groups of data, which are:

- Data (A) All Saudi firms from all sectors listed in the period from 2006 to 2014.
- Data (B) Non-financial Saudi firms listed in the period from 2006 to 2014.
- Data (C) All Saudi firms from all sectors listed in the period from 2009 to 2014.
- Data (D) Non-financial Saudi firms listed in the period from 2009 to 2014.

Section 5.4.1 presents the independent variables that comprise the corporate governance mechanisms related to the ownership structure and boards' aspects. Ownership structure components include the ownership concentration or the block-holders (BLOK), government ownership (GOV), institutional ownership (INS), directors' ownership (DIRE), and managerial ownership (MANAG). The board's aspects contains the board size (BOSI), board independence (BOIN), board meetings (BOME), CEO duality (CEDU), audit size (AUSI), audit meetings (AUME), and board subcommittees (BOCO). In addition, the market reform (MARE) variable is to examine the level of firm performance and information leakage before and after enforcing the Saudi CGRs to reveal the effect of the market reform. Section 5.4.2 presents the control variables which comprise the firm growth (SAGR), the leverage (LVRG), and firms' size (SIZE).

5.4.1 Descriptive Statistics of the Independent Variables

Tables, 5-6 and Appendices 2, 3, 4, and 5 contain the descriptive summaries of the independent variables that are applied in relationship between the corporate governance and firm performance and information leakage. Each table presents one of the four group of data. Table 5-6 (data C) and Appendix (2) show the variables of all firms from 2009 to 2014. The first set of the variables is related to the ownership structure. The first variable is the ownership concentration or block-holders (BLOK) and is identified by the percentage of shares owned by large shareholders who own 5% or more of the shares that are issued by the firm. The percentage is limited to 5% or more because based on the Saudi Listing Rules, the shareholder has to disclose his stock ownership if he owns 5% or more of the issued shares (CMA 2004). In the Appendix (2), the BLOK variable shows that the average mean is 36.8% and there is a downward trend from 2009 with value 38.3% till the year 2014 with value 34.3%. The maximum percentage of the ownership concentration is 95% and that is because some Saudi listed firms are dominated by family, institutions, or government ownership.

The government ownership (GOV) also is measured by the percentage of shares that owned by the government which is 5% or more of the issued shares. The maximum percentage of the government ownership is 74.3% and the higher ownership is available in the energy, petrochemical, mines, and telecom companies. Besides, the maximum percentage of the institutions ownership is 63.5% and it represents their ownership that equal or above the 5% of the issued shares of the firms. The average mean of the board directors ownership (DIRE) is 14.5% and it is measured by the percentage of stocks owned by directors. The ownership mean in year 2009 is 15.2% while in 2014 is 12.6% as there is a decreasing trend of the ownership during years 2012, 2013, 2014. The maximum percentage of director ownership 95.8% because I the Saudi market the majority of stocks of several

companies owned by families and these directors is the representative of these families. Furthermore, some of the family members take managerial and executive position in these firms, therefore, the table 5-6 (data C) and Appendix (2) show that the maximum percentage of the managerial ownership (MANG) is 45.5% and it is identified as the percentage of stocks owned by managerial shareholders.

The second set of the variables in table 5-6 (data C) and Appendix (2) is related to the board of directors and its committees. The board size (BOZI) is identified as the number of the directors in the board. The average mean of the board size is 8.5 directors which almost also is constant over the year 2009-2014. The maximum board size (BOZI) is 12 and the minimum is 4 which is nearly in the line with the size between 11 and 3 directors that is recommended by Saudi CGRs (CMA 2010). In addition, one third or more of the board's directors have to be independent based on the Saudi CGRs and the table 5-6 (data C) and Appendix (2) shows that the average mean of the percentage of the board independence (BOIN) is 51.8% but it is notice that the board independence is decreased from 54.2% in 2009 to 50.9% in 2014. The BOME variable is referred to the number of the board meetings. The average mean of the board meetings is 5.3 and the range is between 18 and 2 meetings. The CEDU is a dummy variable and it is about the CEO duality which is measured by if the CEO and chairman is not the same person the variable equal 1, 0 otherwise. The ratio of Saudi firms who apply the separation role is high in 2009 with .83 and it is increased in 2012 and 2013 with ratio .93 and .91 respectively. In addition, the mean of audit committee size (AUSI) is in increased trend from 2009 till 2014 to start with 3.2 members in 2009 and finished with 3.5 members in 2014. The range of AUSI is between 5 and 2 members and based on the Saudi CGRs, the number of the audit committee have to include at least three members (CMA 2010). Besides, the range of the audit committee meetings (AUME)

is between 28 and 0 which shows that some firms do not activate the audit committee. The average mean of AUME is 5.3 meetings.

Table 5-6 (data A) and Appendix (3) includes the independent variables of all firms between 2006 and 2014 which can reveal the differences in variables before and after 2009. In year 2009, the Capital Market Authority in Saudi Arabia started to enforce several important corporate governance codes on the listed firms. During 2006-2014, the concentration of large holders in the Saudi market is increased from 2006 with 34.8% till year 2011 with 37 but it is decreased after that to 34.4% in 2014. While the government ownership (GOV) is changed gradually in downward trend from 7.3% to 7%, the institution ownership is increased in upward trend from 9.3% in 2006 to 10.4% in 2010. The directors ownership (DIRE) is increased after 2009 while the managerial ownership (MANG) is decreased. The average mean of the board size (BOZI) is 8.5 members. In addition, the table shows that before 2009 the minimum value of the percentage of the board independence is 0% but after 2009 the minimum value becomes 20% which indicates the positive influence of the obligation codes of Saudi CGRs after 2009 which enforces firms to increase the independent directors in the board. Besides, the CEDU mean is in upward trend from 2006 which indicates influence of CGRs to encourage Saudi firms to separate the role between the CEO and chairman. The table also shows that the mean of the audit committee size is increased after 2009 and minimum members of audit committee changed from 0 before 2009 to 3 after 2009. That is because the Saudi CGRs states that the audit committee have to include at least three member and this code becomes mandatory after 2009 (CMA 2010). The mandatory code also gives the audit committee efficient role and specific responsibilities so the number of audit committee meetings in an increasing trend from 2006 and especially after 2009 as the minimum meetings is changed from 0 before 2009 to 1 after 2009. Besides, BOCO is referred to if the firm uses the three recommended committees

in the Saudi CGRs (audit, nomination, and remuneration), it will be equal to 1, 0 otherwise. The table shows that all Saudi listed firms have the three committees after 2009 because setting these committees become mandatory after 2009.

Table 5-6 (data D) and Appendix (4) report the descriptive statistics of the independent variables of the non-financial firms during the period 2009-2014. There is no big differences between the data of all firms and the data of non-financial firms during 2009-2014 except the variable related the institutional ownership. The average mean of the percentage of institutional ownership in the non-financial firms is 3.9% while the percentage ownership in all data firms is 8.1. In addition, the maximum institutional ownership in the non-financial firms is 25.6% while the maximum institutional ownership in all firms' data is 63.5.

Table 5-6 (data B) and Appendix (5) present the descriptive outlines of the independent variables for the non-financial firms from 2006 till 2014. There is no major differences in the values of variables of all firms and non-financial firms during 2006-2014 expect the variable of the institutional ownership. The average mean of the percentage of the institutional ownership for all firms' data during 2006-2014 is 9.9% while the percentage of the institutional ownership for non-financial firms is 5%. Besides, the maximum percentage of the institutional ownership in all firms is 53.6% while the maximum ownership in non-financial firms during 2006-2014 is 25.6%.

Table 5-6: Descriptive statistics of the independent variables of all data

Variables	Data A	Data B	Data C	Data D
BLOK				
Mean	35.767	31.582	36.820	34.520
Median	35.400	28.100	35.430	30.735
SD	23.322	22.900	23.262	24.138
Maximum	83.690	83.690	95	95
Minimum	0	0	0	0
GOV				
Mean	7.236	7.828	5.1203	6.246
Median	0	0	0	0
SD	17.224	18.407	14.906	16.804
Maximum	74.300	74.300	74.300	74.3
Minimum	0	0	0	0
INS				
Mean	9.991	5.008	8.107	3.979
Median	2.405	0	0	0
SD	14.799	7.082	14.306	6.419
Maximum	53.650	25.650	63.500	25.650
Minimum	0	0	0	0
DIRE				
Mean	13.495	14.262	14.515	16.122
Median	4.246	5.013	5.239	6.926
SD	16.814	17.364	19.434	20.708
Maximum	70	70	95.868	95.868
Minimum	0	0	0	.001
MANG				
Mean	1.988	2.391	1.991	2.090
Median	.006	.006	.007	.010
SD	6.960	7.614	6.116	5.977
Maximum	67.816	67.816	45.500	35.505
Minimum	0	0	0	0
BOSI				
Mean	8.547	8.290	8.578	8.392
Median	9	8	9	9
SD	1.675	1.678	1.580	1.562
Maximum	12	12	12	12
Minimum	4	4	4	4
BOIN				
Mean	55.810	54.820	51.837	51.355
Median	57.143	55.555	45.454	44.949
SD	20.652	20.858	19.140	18.882
Maximum	100	100	100	100
Minimum	0	0	0	0
BOME				
Mean	5.480	5.503	5.328	5.443
Median	5	5	5	5
SD	2.276	2.349	2.078	2.232
Maximum	18	18	18	18
Minimum	1	1	2	2
CEDU				
Mean	.858	.839	.893	.857
Median	1	1	1	1
SD	.349	.368	.310	.351
Maximum	1	1	1	1
Minimum	0	0	0	0
AUSI				
Mean	3.370	3.268	3.397	3.367
Median	3	3	3	3

SD	.790	.736	.6501	.605
Maximum	6	6	5	5
Minimum	0	0	2	2
AUME				
Mean	4.987	4.815	5.332	5.269
Median	5	4	5	5
SD	2.470	2.504	2.504	2.321
Maximum	20	20	28	20
Minimum	0	0	0	0
MARE				
Mean	.666	.667		
Median	1	1		
SD	.479	.472		
Maximum	1	1		
Minimum	0	0		
BOCO				
Mean	.733	.730		
Median	1	1		
SD	.443	.445		
Maximum	1	1		
Minimum	0	0		
Count	558	459	690	510

5.4.2 Descriptive Statistics of the control Variables

Tables 5-7 and Appendices 6, 7, 8 and 9 include the descriptive statistics of the control variables which are used in investigating the relationship between the corporate governance components and firm performance and information leakage. Appendices are presented in four table as each table represent different data. Table 5-7 (data C) and Appendix (6) report the value of the control variables for all firms during the period from 2009 to 2014. The first variable is the sales growth (SAGR) and is measured by taking the percentage of dividing the difference between the year sales and previous year sales on the previous year sales. The average mean of SAGR is 12.8% and the maximum value is 180 while the minimum value is -179.1%. Besides, the leverage (LVRG) is the percentage of total debt to total assets and the average mean is 13.9%. The maximum leverage value is 90.8% and most of the high leverage is in the petrochemical firms. The size of firms (SIZE) is identified by the natural log of assets of the firm. The average mean of the firms' size is 14.9.

Table 5-7 (data A) and Appendix (7) are about the descriptive summaries of the control variables for all firms during the period 2006-2014. The average mean of the sales growth (SAGR) is 10.7%. Besides, the average mean of the leverage (LVRG) is 14.1% and the maximum value is 69.1 compare with the value 90.8% in the period 2009-2014. The average mean of the firms' size (SIZE) is 15.2. The table 5-7 (data D and B) and Appendix (8) and (9) contain the discriptive statistices of the control varaibles for the non-financial firms during the years from 2009 till 2014 and from 2006 till 2014. The value of these tables is mosly similar to the value of the same variables for the all firms types that are presented in tables 2-9 and 2-10.

Table 5-7: Descriptive statistics of the control variables of all data

Variables	Data A	Data B	Data C	Data D
SAGR				
Mean	10.745	11.009	12.803	10.635
Median	7.483	7.515	6.742	6.850
SD	26.690	27.263	38.496	36.544
Maximum	150	150	180	180
Minimum	-85.705	-85.705	-179.186	-179.186
LVRG				
Mean	14.112	17.047	13.958	18.824
Median	5.735	10.134	4.968	12.646
SD	17.190	17.620	17.909	18.521
Maximum	69.170	69.170	90.827	90.827
Minimum	0	0	0	0
SIZE				
Mean	15.238	14.627	14.909	14.735
Median	14.856	14.624	14.583	14.660
SD	2.077	1.705	1.960	1.736
Maximum	19.644	19.645	19.645	19.645
Minimum	11.345	11.345	10.887	10.887
Count	558	459	690	510

5.5 Conclusion

This chapter has explained the research methodology adopted for examining the effect of corporate governance components on firm performance and information leakage. The research utilised panel data, due it posing several advantages over time series and cross-sectional data. Furthermore, an assessment was provided of the Ordinary Least Squares (OLS) model and its assumptions, for example homoscedasticity, no correlation between the errors, normality, in addition to the

independent variables not being in correlation. Endogeneity is one of the issues that may violate the OLS assumptions. The sources of endogeneity are the omitted variables bias, measurement error and simultaneity. Following this, the panel models, random and fixed effects model were all discussed. It was apparent that the random and fixed effects model would be invalid when the research data is characterized by serious potential heteroscedasticity, serial correlation and endogeneity. Resultantly, the GMM was adopted, because it permits control of these issues. The GMM offers two estimators, which are the Difference and System GMM estimators. System GMM is considered to be the most advanced estimator of the GMM method. Furthermore, this chapter presented the research data and sample. This included four groups of data, because the research utilised two different types of firms and two time periods. Lastly, the dispersive statistics were reported for the independent and control variables, with regard to the effect of corporate governance mechanisms on firm performance and information leakage. The subsequent chapter provides the regression analysis and model selection in relation to the association between corporate governance and performance, with a presentation and discussion of the obtained empirical results for this relationship.

Chapter 6:

Corporate Governance Effect on Firm Performance:

Regression Analysis and Results

6.1 Introduction

The previous chapter detailed the research methodology for analysing the effect of corporate governance mechanisms on firm performance and information leakage. The chapter reported the sample and data, showing the descriptive statistics for the independent and control variables identified for this analysis. Furthermore, the dependent proxies and variables used in the regression analysis were indicated, namely return on assets (ROA), return on equity (ROE) and Tobin's Q, while the independent variables were ownership concentration (BLOK), government ownership (GOV), institutional ownership (INS), directors' ownership (DIRE), managerial ownership (MANAG), board size (BOSI), board independence (BOIN), board meetings (BOME), CEO duality (CEDU), audit size (AUSI), audit meetings (AUME), board subcommittees (BOCO) and market reform (MARE). The control variables comprised of firm growth (SAGR), leverage (LVRG), firm size (SIZE), year dummy (Year) and industry dummy (Industry). The dependent variables, control variables and independent variables have already been discussed and presented in chapter 3, as well as tables 5-3, 5-4, and 5-5. This chapter presented the regression analysis that was conducted in order to investigate the effect of corporate governance components on firm financial performance. Justifications were provided for selecting the System GMM model as the most suitable analytical model. Finally, the chapter outlined the regression results relating to the effect of each corporate governance variable on firm financial performance. Thus, the chapter is organised

as follows: Section 6.2 shows the regression analysis and model selection for the relationship between corporate governance and performance. Section 6.3 presents and discusses empirical results. 6.4 is the conclusion.

6.2 Regression Analysis

This research applies the multivariate regression model to examine the effect of corporate governance components on a firm's financial performance. Since the research utilises four samples of data related to different time periods and types of firms, there will be four regression models:

- Model (A), for all firms from every sector listed during the period between 2006 and 2014.
- Model (B), for non-financial firms listed during the period between 2006 and 2014.
- Model (C), for all firms from every sector listed during the period between 2009 and 2014.
- Model (D), for non-financial firms listed during the period between 2009 and 2014.

The models contain dependent, independent, and control variables. The dependent variables include the financial performance proxies which are return on assets (ROA), return on equity (ROE), and Tobin's Q. The independent variables include the corporate governance mechanisms related to the ownership structure and boards' aspects. Ownership structure components include the ownership concentration or the block-holders (BLOK), government ownership (GOV), institutional ownership (INS), directors' ownership (DIRE), and managerial ownership (MANAG). The board's aspects contain the board size (BOSI), board independence (BOIN), board meetings (BOME), CEO duality (CEDU), audit size (AUSI), audit meetings (AUME), and board subcommittees (BOCO). Moreover, the

research also includes market reform (MARE) as an independent variable in order to compare the differences in the firm's performance before and after requiring listed firms to implement corporate governance codes. The control variables which are comprised of the firm growth (SAGR), the leverage (LVRG), firm size (SIZE), year dummy (Year), and industry dummy (Industry). Every model implements the same dependent, independent, and control variables with the exception of models (A) and (B) which contain two more independent variables, the board subcommittees (BOCO) and market reform (MARE). This is due to the fact that in the period following 2009, approximately every Saudi organisation established three obligated subcommittees, audit, nomination, and remuneration committees; therefore, there are no differences between firms that have incorporated these committees as can be seen in models (C) and (D). The measurements of all these variables are presented in tables 5-3, 5-4, and 5-5. The research hypotheses of the independent variables have been previously discussed in sections 3.2 and 3.3.

6.2.1 Dependent Variables

In order to investigate the effect of corporate governance components on firms' performance, this research will employ three different financial performance measures. Lin (2011) stated that the return on assets (ROA), the return on equity (ROE) and Tobin's Q proxies are the variables most frequently applied to examine firms' performance. Two of these measures, the ROA and the ROE, are account-based while the third measure is a market-based measure which is Tobin's Q. These measures are extensively applied in the literatures examining the relationship between corporate governance and performance; for example, the studies of Dharmadasa et al. (2015); Al-Matari et al. (2012); Chang and Leng (2004); Lin (2011); Fauzi and Locke (2012); Mehran (1995); Christensen et al. (2015); Amer et al. (2014); Ben Barka and Legendre (2016); Haniffa and Hudaib (2006); and Perfect

and Wiles (1994). Although several studies only evaluate financial performance, such as the research of Chang and Leng (2004) and Al-Matari et al. (2012), or measure two aspects of a firm's performance, such as the studies conducted by Fauzi and Locke (2012); Mehran (1995); Christensen et al. (2015); Ben Barka and Legendre (2016); and Haniffa and Hudaib (2006), this research applies three measures which aim to increase the validity and accuracy of the research results and inferences. Furthermore, utilising three financial performance proxies allows the research to make comparisons between the results of the corporate governance mechanisms and different performance proxies so as to confirm the strength of the relationship between the variables. In addition, applying these measures allows the researcher to compare the results to other empirical studies that have applied the same measures.

The ROE is defined as the total profits and earnings of the firms divided by total stockholders' equity (Chang and Leng 2004). In addition, the ROA is identified by the earnings and net income of the company to the book value of its total assets (Mehran 1995). Haniffa and Hudaib (2006) stated that the ROA can be employed to assess how effectively management utilises the company's assets to generate wealth for the shareholders and to serve their own interests. In addition, the ROE is an indicator for how wisely a firm's management invests the shareholders' equity and other funds to create profit and increase earnings. A high ROA and ROE indicates that the company's management is effective and takes into consideration the interests of the shareholders while working to minimise agency conflict.

In addition, the third performance proxy is Tobin's Q which is a market-based measurement. Perfect and Wiles (1994) indicate that Tobin's Q is popular amongst researchers due to the fact that it can measure non-tangible assets that cannot be assessed by ROA and ROE such as goodwill and growth opportunities. The Tobin's Q measurement was referred to by Tobin and Brainard (1968) and is identified by

adding the book value of the liabilities with the market value of the equity which is then divided by the book value of the total assets (Mangena et al. 2012; Dahya et al. 2008). Haniffa and Hudaib (2006) argue that the higher the value of the Tobin's Q, the more efficient the management system is while investors have a more positive perception of the firm's performance.

6.2.2 Control Variables

The research adds control variables to the regression models in order to assess for other possible factors that may also have an influence on the firm performance and as well as to conduct an accurate investigation into the relationship between the corporate governance and performance. Based on the pervious literatures and empirical studies, there are different control variables that are frequently applied in the empirical studies and are believed to have a significant impact on firm performance. These variables are firm size (SIZE), leverage (LVRG), firm growth (SAGR), time dummies (Year), and industry dummies (Industry). The measurements of these variables are presented in table 5-5.

6.2.2.1 Firm Size

Firm size is believed to influence both the corporate governance and performance. Larger firms have access to internal financial resources for their projects and growth while they can also find borrowing channels at a lower cost which will eventually help to improve the firm's performance (Mangena et al. 2012). Haniffa and Hudaib (2006) indicate that the larger firms perform efficiently since they can minimise the effect of their risks. In addition, they have the ability to work well and perform more efficiently due to the pressure of analysts and observers (Haniffa & Hudaib 2006). In addition, the firm's size has an impact on different governance mechanisms; for example, larger firms are likely to contain a greater number of board directors in

comparison to small firms (Schultz et al. 2010). Different literatures have applied the firm's size as a control variable when examining the relationship between the corporate governance and firm performance; moreover, these literatures discovered that firm size has a positive effect on performance, such as the study of Fauzi and Locke (2012) in New Zealand, Boussaada and Karmani (2015) in MENA counties, Haniffa and Hudaib (2006) in Malaysia, and Mehdi (2007) in Tunisia. On the other hand, several empirical researches found that firm size has a negative influence on performance; for example, the research conducted by Mrad and Hallara (2012) in France, and Amer et al. (2014) in Egypt. However, the study of Mueller and Spitz-Oener (2006) in Germany, and Mura (2007) in the UK reveal insignificant that there is no noticeable relationship between these two factors.

6.2.2.2 Firm Leverage

In regards to the leverage (LVRG) variable, Black et al. (2006) claim that the leverage level can influence both firm performance and corporate governance. In addition, the corporate governance also can influence the firm's ability to receive funds from financial institutions (Black et al. 2006). Increasing the level of leverage will allow further control of the management's activities since the firm is obligated to fulfill the debt agreement (Schultz et al. 2010). In addition, the control of management activities is conducted more effectively by debtholders than stockholders since financial institutions have more of an incentive to monitor the firm's management so as to ensure that they adhere to the debt agreement; in addition, it is important that they perform well in order to avoid bankruptcy and liquidation (Mangena et al. 2012). On the other hand, Haniffa and Hudaib (2006) state that when a firm accumulates large debts, the shareholders with limited liability may result in the management to undertake a risky investment in an attempt to increase profits; however, this act may have a negative effect on creditors. Several

empirical studies implement the leverage as a control variable in the relationship between the corporate governance mechanisms and performance. Previous studies have discovered a positive relationship between the leverage and performance, such as the study of Reyna et al. (2012) in Mexica, Fauzi and Locke (2012) in New Zealand, Mrad and Hallara (2012) in France, and Black et al. (2006) in Korea. However, research conducted by Chen et al. (2005) in China found a negative relationship while the study of Amer et al. (2014) in Egypt, and Mura (2007) in the UK reveal an almost insignificant relationship insignificant between leverage and performance.

6.2.2.3 Firm Growth

Firm growth is measured by the company's sales growth as was investigated in the study of Black et al. (2006). Borisova et al. (2012) defines sales growth as the difference in the current year's sales divided by the previous year sales. Black et al. (2006) indicates that firm growth has an influence on firm performance while it may also have an impact on the corporate governance mechanisms. Haniffa and Hudaib (2006) argue that other studies found a significant relationship between firm growth and performance. The increase in an organisation's sales will provide future growth opportunities. Moreover, these growth opportunities are likely to be associated with an increase in firm performance (Schultz et al. 2010). Different empirical studies utilise firm growth as a control variable in the relationship between the corporate governance mechanisms and performance; for example, research conducted by Haniffa and Hudaib (2006) in Malaysia, Black et al. (2006) in Korea, and Vafeas (1999b) in the US. Haniffa and Hudaib (2006) discovered a positive relationship insignificant whereas research conducted by Black et al. (2006) found there to be no relationship between the two aspects.

6.2.2.4 Year and Industry Dummies

The industry dummies control any influence that originates from organisational differences that may have an effect on a firm's performance (Mueller and Spitz-Oener 2006). The performance may be reliant on the sensitivity of specific industries to the development in the macroeconomic aspects, while empirical studies have evidently shown that industry has an influence on a firm's profits (Haniffa and Hudaib 2006). Black et al. (2006) indicates that the industry factor may have an influence on both the corporate governance and performance. Different literatures utilise the industry dummy as a control variable when examining the relationship between corporate governance and performance, such as the empirical research of Mrad and Hallara (2012) in France, Cheung et al. (2010) in Vietnam, Henry (2008) in Australia, Fauzi and Locke (2012) in New Zealand, and Simoneti and Gregoric (2004) in Slovenia. Moreover, the literatures applied different categories depending on the industry types; for example, Al-Janadi et al. (2013) utilised three categories which are finance, manufacturing, and services, while the study of Samaha et al. (2012) implemented two categories which are manufacturing and non-manufacturing. Cai et al. (2006) applied two categories which are manufacturing and retailers, and the research conducted by Mrad and Hallara (2012) used two categories which are financial and non-financial firms.

This research applies three main divisions of industries: primary, which includes raw material companies; secondary, including manufacturing companies; and tertiary, which consists of service industries. The year dummies are employed in different studies to control the various changes that take effect during the period of time which has not been identified (Mueller and Spitz-Oener 2006). Schultz et al. (2010) states that the year dummies are designed to provide control for contemporary correlation in the errors made by companies. In addition, Roodman (2006: p40) states that the time dummies have to be included in the GMM regression

model in order to ensure that there is “no correlation across individuals in the idiosyncratic disturbances.” There different empirical researches employed the time dummies as a control variable when investigating the relationship between corporate governance components and performance, such as the research conducted by Cheung et al. (2010) in Vietnam, Boussaada and Karmani (2015) in MENA countries, and Henry (2008) in Australia.

6.2.3 Descriptive Statistics of the Dependent Variables

This section illustrates the descriptive statistics of the model on the effect of corporate governance components on firm financial performance. The descriptive statistics include the mean, median, standard deviation, maximum and minimum value and the count of years. The disruptive tables outline the dependent variables, independent variables and control variables for the four groups of data. Because the descriptive statistics of the independent and control variables are already reported in section 5.4, this section presents the descriptive statistics of the dependent variables related to the firm financial performance proxies. These proxies contain ROA, ROE, and Tobin’s Q.

Table 6-1 and Appendices 10, 11, 12, and 13 show descriptive summaries about the three proxies of the firms’ financial performance for the four data. The ROA is measured by the percentage of net profits to the total assets and the ROE is defined by the percentage of net profits to the owner’s equity while the Tobin's Q is calculated by deducting the book value of equity from the total assets and then added to the market value of equity which is finally divided by the total assets. Table 6-1 (data C) and Appendix (10) show the descriptive outline of the financial measures for the all firms’ types during the period 2009-2014. The range of the ROA in all the sample is between 43% and -67% with mean 4.9% which shows big difference between the minimum and maximum value. The yearly information also

repots big difference especially in year 2011 as the minimum is -67.8% and the maximum is 43.9%. The possible reason for these differences is that during the years between 2009 and 2014 several new firms were listed in the Saudi market with lower value of ROA as the minimum value of ROA during 2006-2014 based on Appendix (11) is -15.2% compare with -67.8 during 2009-2014. The table 6-1 (data C) and Appendix (10) show that during 2009-2014 the increase in the value of ROA is followed by decreasing in the next year and the highest mean value of ROA is in the year 2012. Besides, the highest value in the means of ROE is also in the year 2012 with value 10.4%. It shows big variance in the all sample of ROE between the maximum value with 56.5% and the minimum value with -158.9%. The Tobin's Q data states that these is an increasing trend in the ratio of the Tobin's Q from the year 2010 till the year 2013 and the highest ratio is in the year 2013 with value 1.9 while the lowest ration is in the year 2009.

In addition, the table 6-1 (data A) and Appendix (11) presents the descriptive summaries of the performance proxies for the firms from all sectors during the period 2006-2014. The highest ROA value is 43.9% in the year 2011 and the lowest value is -15.2% in the year 2009. There is a downward in the mean value over the sample from 2006 to 2009 and the average values of the ROA for the period 2006-2014 is 6.8% while the highest yearly mean is 9% in the year 2006. For the ROE, the highest level is 54.8% in year 2014 and the lowest level is -36% in year 2013. The average mean of the period is 11.5% and the highest year value is 2006 with 16.9%. As ROA, there is a downward trend from 2006 with value 16.9% till 2009 with value 9.8%. The average means of the Tobin's Q for the period is 1.7 and the highest mean is 2.06 in year 2007. The highest ratio is in year 2013 with 9.1 and lowest ratio is in year 2009 with .633.

Besides, the table 6-1(data D) and Appendix (12) reports the descriptive details of the non-financial firms between 2009 and 2014. The ROA mean for the

period is 6.4% with big variance between the maximum value with 43.9% and minimum value with -67.8% which is the same as the data of all firms with financial firms. The yearly mean is high in year 2013 with value 7.5% and low in 2009 with value 5.1% which may be the result of the effect of global financial crisis in 2007-2008. In addition to ROA, the ROE also has the low yearly mean in 2009 with value 8% and high value in 2013 with value 11.4% while the average mean for the period is 10.6%. The maximum value of ROE is 56.5% in year 2011 and the minimum value is -59% in year 2010. There is an upward trend in ROE from 2009 till 2013. For the Tobin's Q, the mean of the ratio of the period is 1.7 and the highest yearly mean is in year 2013 with value 2.1. The maximum ratio is in year 2013 with value 9.1 and the minimum ratio is .663 in year 2012.

The table 6-1 (data B) and Appendix (13) are also showing the data of the non-financial firms but in different period which is between 2006 and 2014. The mean of ROA of all the sample is 7.8% with downward in the yearly mean value starts from 2006 with 9.9% value till the end of 2009 with 6%. The maximum value of ROA is 43.9% in year 2011 and the minimum value is -15.2% in year 2009. In ROE also, there is a decreasing trend in the yearly mean value from 2006 with value 14.2% to 2009 with value 9.5%. The aggregated mean of ROE is 11.9% and the minimum value is -28.9% in 2014 while the maximum value is 56.5% in 2011. The mean of The Tobin's Q ratio for all the sample is 1.8 while the maximum ratio is 9.1 in year 2013 and the minimum ratio is .633 in year 2009. The ratio of the Tobin's Q is dropped by approximately 54% in 2008 to 1.21 to 2.24 but it is followed by upward trend till the year 2013 with Tobin's Q ratio 2.23. The dropped in 2008 may be occurred because of the financial crisis at that time.

Table 6-1: Descriptive statistics of the dependent variables of all data

Variables	Data A	Data B	Data C	Data D
ROA				
Mean	6.858	7.817	4.919	6.430
Median	4.520	6.330	3.320	5.165
SD	8.817	9.396	8.455	9.110
Maximum	43.980	43.980	43.980	43.980
Minimum	-15.210	-15.210	-67.810	-67.810
ROE				
Mean	11.530	11.931	8.003	10.063
Median	12.580	11.300	8.695	8.935
SD	12.749	13.054	17.218	13.503
Maximum	54.810	56.590	56.590	56.590
Minimum	-36.020	-28.930	-158.962	-59.020
Tobin's Q				
Mean	1.706	1.843	1.674	1.792
Median	1.326	1.484	1.308	1.369
SD	1.030	1.086	1.071	1.191
Maximum	9.151	9.151	9.150	9.151
Minimum	.633	.633	.633	.633
Count	558	459	690	510

6.2.4 Model Selection

As was previously mentioned in the methodology section, the research utilises balanced panel data which allows the research to take advantage of time series and cross-sectional data. Many different types of statistical tests have to be conducted in order to confirm the presence of the ordinary least square (OLS) assumptions and to reveal whether any of these assumptions have been violated. Depending on the results of these statistical tests, the research determines the most suitable estimation for the research models in relation to the corporate governance mechanisms and firm performance. The research examines the multicollinearity in the model between the independent variables. The multicollinearity can occur if there is a correlation between two of the independent variables. Within the relevant literatures, the correlation between the independent variables is not recorded as zero while the correlation between these variables will not affect the accuracy or reliability of the results if the degree of the correlation is not especially high (Brooks 2008). This research applies different methods in an attempt to search for the

multicollinearity in the model. These methods are: Spearman's rank correlation coefficient as a non-parametric test, Pearson's product-moment correlation as a parametric test and the variance inflation factor (VIF).

Gujarati (2004) states that the VIF test is utilised by researchers to test for multicollinearity while the general rule for a variable to be considered as highly collinear is to have a VIF degree of more than 10. Furthermore, the recommended rule to determine when multicollinearity is an issue is when the pair-wise correlation coefficient between two independent variables exceeds 0.8 (Gujarati 2004). The results of Spearman and Pearson's rank correlation test are presented in Appendix 14, 15, 16, and 17. The Appendices report the Pearson correlation and correlation coefficient of the independent and control variables for the models A, B, C, and D in regards to the relationship between the corporate governance mechanisms and firm performance. The coefficients reveal that the highest correlation degree is .70 between the MARE and BOCO variables in models A and B and is therefore unlikely to create an issue in the suggested models since it does not exceed 0.8 degrees.

In order to increase the accuracy, table 6-2 reports the VIF levels for all independent variables for the four models while the table reveals that the highest levels of VIF are 4.12, 2.49, 4.38, and 3.21 for models A, B, C, and D respectively. These results indicate that the VIF levels for all models are far below the unacceptable range that has been reported by Gujarati (2004) which is more than 10. Therefore, the result reveals that there is no serious multicollinearity issue associated with the models since the degree of correlation in both Spearman and Pearson's correlation tests do not exceed 0.8 while the levels of VIF are far below 10.

Table 6-2: The variance inflation factor (VIF)

Independent Variables	Model A	Model B	Model C	Model D
	VIF	VIF	VIF	VIF
BLOK	3.37	3.38	2.25	2.49
GOV	2.07	2.56	1.62	1.98
INS	2.27	1.27	1.71	1.21
DIRE	1.54	1.88	1.44	1.63
MANG	1.47	1.54	1.37	1.48
BOSI	1.57	1.48	1.35	1.52
BOIN	1.13	1.23	1.27	1.40
BOME	1.41	1.40	1.33	1.33
CEDU	1.29	1.30	1.25	1.34
AUSI	1.34	1.28	1.38	1.38
AUME	1.34	1.47	1.17	1.27
SAGR	1.11	1.09	1.03	1.06
LVRG	1.31	1.61	1.45	1.70
SIZE	4.12	4.38	2.49	3.21
MARE	2.29	2.25		
BOCO	2.17	2.19		
Mean VIF	1.86	1.89	1.51	1.64

Notes: Where BLOK = the ownership concentration. GOV = the government ownership. INS = the institutional ownership. DIRE = the directors ownership. MANG = the managerial ownership. BOSI = the board size. BOIN = the board independence. BOME = the board meetings. CEDU = the CEO duality. MARE = the market reform. BOCO = the board subcommittees. AUSI = the audit committee size. AUME = the audit committee meetings. SAGR = the sales growth. LVRG = leverage. SIZE = the firm size.

In addition, as was previously discussed in section 5.2.1 the OLS estimation assumes that there is no correlation between the errors while the correlation between the errors indicates the presence of autocorrelation and serial correlation issues. The serial correlation problem results in the OLS providing insufficient coefficient estimations. Drukker (2003) indicates that the Wooldridge (2002) test is to the most suitable one for detecting the serial correlation in the panel model. The Wooldridge test is employed in this research to investigate the presence of autocorrelation in the four models. Table 6-3 reports the autocorrelation results with a null hypothesis that there is no first order autocorrelation. The table reveals that all of the models are affected by the autocorrelation issue and thereby rejects the null hypothesis which states that there is no first order autocorrelation with the exception of models A and C which measure the ROE performance and models A and B which measure Tobin's Q performance.

Table 6-3: Wooldridge Test for serial correlation (Ho: No first-order autocorrelation)

	ROA	ROE	Tobin's Q
Model A			
F(1, 61)	34.61	3.593	3.819
Prob > F	0.000	0.062	0.055
Model B			
F(1, 50)	35.13	36.62	3.452
Prob > F	0.000	0.000	0.069
Model C			
F(1, 114)	46.33	1.518	6.717
Prob > F	0.000	0.220	0.010
Model D			
F(1, 84)	23.15	14.86	6.445
Prob > F	0.000	0.000	0.013

In addition, as was previously discussed in section 5.2.1, the OLS estimation assumes that the variance of the errors of all values is constant, otherwise the model has a heteroscedastic issue. Long and Ervin (2000) state that heteroscedasticity has a negative effect on the efficiency of the OLS estimation thereby resulting in it rejecting the null hypotheses and produce misleading results. Baum et al. (2003) indicate that Breush and Pagan (1979) and Cook and Weisberg's (1983) statistical tests are primarily used for investigating the heteroscedasticity in the OLS regression while the null hypothesis of the test is that the variance is constant. Therefore, this research utilises the Breusch-Pagan/Cook-Weisberg test to detect the heteroscedasticity issue in the four models. Table 6-4 reports that the Breusch-Pagan/Cook-Weisberg test along with the table reveals that the null hypothesis of the test is strongly rejected in all four models at a significance level of 1%. This result indicates that the heteroscedasticity issue is present in the four models while the variances of the errors in the four models are not constant.

Table 6-4: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity (Ho: Constant variance)

	ROA	ROE	Tobin's Q
Model A			
chi2(25)	175.52	149.43	397.53
Prob > chi2	0.000	0.000	0.000
Model B			
chi2(25)	91.15	105.06	296.61
Prob > chi2	0.000	0.000	0.000
Model C			
chi2(21)	310.31	532.30	403.51
Prob > chi2	0.000	0.000	0.000
Model D			
chi2(21)	340.39	120.45	323.83
Prob > chi2	0.000	0.000	0.000

In addition, it is important during the regression analysis to investigate the presence of the endogeneity issue in the models. The endogeneity is discussed in the previous chapter and occurs when there is a correlation between the error term and the regressor; if there is no correlation between them, the case is referred to as exogenous. In the model containing endogeneity, the OLS estimation of all parameters will be incorrect and inconsistent which will result in biased outcomes (Cameron & Trivedi 2005). Therefore, it is significant to conduct a statistical test such as the Durbin (1954), Wu (1973), and Hausman (1978) (DWH) test to reveal the extent of the endogeneity issue. Lee (2013) indicates that the DWH test has been extensively applied in the various literatures in order to investigate the endogeneity. Davidson and MacKinnon (1993) indicate that the DWH test is employed for endogeneity which can be performed by containing the residuals of the tested variables in the regression of the main model. Therefore, this research applies the DWH test to detect the endogeneity issue. The research conducts the DWH test on the four models and the results evidently reveal that all four models contain the endogeneity issue.

6.2.5 System GMM Model

After examining all of the previous statistical tests, it can be concluded that the research models relating to the effect of corporate governance components on firm performance is negatively influenced by the serial correlation, heteroscedasticity, and endogeneity issues. Therefore, the results of the random effects model and the fixed effects model which depend on the simple OLS are not valid and not suitable for this research since it will produce biased and unreliable results. Furthermore, these results show that the research models are made up of a dynamic structure and therefore require a dynamic model in order to solve the issues of serial correlation, heteroscedasticity, and endogeneity. Brooks (2008) indicates that the serial correlation in the data originates from the dynamic structure which is not contained in the regression model and therefore has not been identified or reported in the study. Moreover, Bhagat and Jefferis (2002), Wintoki et al. (2012), Fauzi and Locke (2012), and Boussaada and Karmani (2015) argue that the corporate governance researches are more likely to face the issue of endogeneity. Wintoki et al. (2012) indicates that potential endogeneity may appear within the relationship between corporate governance and performance in various circumstances, such as when there is a dynamic relationship, the corporate governance components are affected by past performances; for example, an unsatisfactory performance may lead to the firm increasing the number of board meetings or assigning a greater number of directors to the board.

In addition, the second source of endogeneity is simultaneity which can emerge during the corporate governance in the relationship between the board structure and firm performance; according to the theory, the board structure may have an effect on the firm's performance while simultaneously the firm's performance may have an effect on the board structure (Wintoki *et al.* 2012). In addition, the unobserved heterogeneity is another source of endogeneity; for

example, Hermalin and Weisbach (1998) state that managers who possess high-level skills and abilities are monitored less carefully by shareholders which may result in there being less independent directors on the board; moreover, these managers will lead the companies so as to ensure that they perform efficiently without controlling the unnoticed heterogeneity. Therefore, the results will reveal that less independent directors lead to a more positive performance. Wintoki et al. (2012) indicate that empirical studies which fail to take into account the dynamic relationship between corporate governance and performance will produce a more inconsistent estimation. The dynamic structure and relationship needs to be examined by employing a dynamic model such as the Generalised Methods of Moments (GMM) which can allocate the extra structure in the dependent variable.

Baum et al. (2003) argue that in the presence of heteroscedasticity, the GMM model is more efficient than the Instrumental Variable (IV) in comparison to other estimators such as the maximum likelihood estimation (Plasmans 2006). Roodman (2006) indicates that the GMM estimator is designed for data which consists of endogeneity variables, unobserved heterogeneity, heteroscedasticity and autocorrelation within individuals. Various literatures applied the GMM estimation when examining the relationship between the corporate governance and firm performance such as the study of Reyna et al. (2012); Wintoki et al. (2012); Mura (2007); Tran et al. (2014); Boussaada and Karmani (2015); Mangena et al. (2012); and Al-maskati et al.(2015). Belkhir et al. (2016) and Wintoki et al. (2012) indicate that the System GMM model provides an efficient and consistent estimator. Therefore, The research applies the two steps System GMM model of Blundell and Bond (1998) and Arellano and Bover (1995) due to the fact that these are the most advanced GMM estimators which produce less biased results in comparison to other GMM estimators as was previously discussed in section 5.2.3.

This research employs the System GMM model and assumes that the corporate governance components that include the board and ownership variables as well as the control variables and market reform are endogenic variables. However, time and industry dummies variables are excluded and are considered to be exogenous variables since they were not dependent on either previous or current errors (Mangena et al. 2012; Roodman 2009). In addition, Roodman (2009) suggests that there is a trade-off between the number of lags that are employed in the GMM model to create the internal instruments and the depth of the estimation; therefore, the number of instruments should be limited by setting a specific number of lags instead of using all of the available ones. Baum et al. (2003) argue that using all of the available lags will produce an especially large number of instruments which may reduce the overall efficiency. The literatures failed to offer clear guidance on how many instruments are considered to be a large number, although it is stated that the number of instruments should not exceed the number of observations (Roodman 2006 and Roodman 2007). Therefore, since these research models contain several independent and control variables and cover a period of many years (6 years in model C and D and 9 years in model A and B), this research employs one and two lags in the System GMM estimator in order to provide a suitable number of observations as well as correct estimations.

In addition, as was previously discussed in section 5.2.3, this research will carry out two specific tests to confirm the consistency and validity of System GMM models. The first is the second order serial correlation (Arellano-Bond AR (2)) test to detect the second order serial correlation and the second is the Sargan test to confirm the validity of the instruments. In addition, Roodman (2006) states that the investigator is required to include year time dummies in the GMM model so as to prevent the cross-individual correlation and contemporaneous correlation; therefore, the time dummies are included in this research in all of the models. Based

on the study conducted by Wintoki et al. (2012), the equation for the System GMM estimator for the research models is as follows:

$$\begin{bmatrix} P_{it} \\ \Delta p_{it} \end{bmatrix} = \alpha + \kappa \begin{bmatrix} P_{it-L} \\ \Delta P_{it-L} \end{bmatrix} + \beta \begin{bmatrix} EX_{it} \\ \Delta EX_{it} \end{bmatrix} + \gamma \begin{bmatrix} EN_{it} \\ \Delta \mathrm{EN}_{it} \end{bmatrix} + \varepsilon_{it} \quad (i = 1, \dots, N;\ t = 1, .., T)$$

Where *P* is the dependent variables which is firm performance measured by ROA, ROE, and Tobin's Q, L is the period of lag, Δ is the time differencing, EX_{it} is the vector of the independent variables that are assumed to be strictly exogenous, the time and industry dummies, and EN_{it} is the vector of independent variables that are assumed to be endogenous which are the ownership concentration (BLOK), government ownership (GOV), institutional ownership (INS), directors' ownership (DIRE), managerial ownership (MANAG), the board size (BOSI), board independence (BOIN), board meetings (BOME), CEO duality (CEDU), audit size (AUSI), audit meetings (AUME), board subcommittees (BOCO), the market reform (MARE), the firm growth (SAGR), the leverage (LVRG), and the firm size (SIZE).

6.3 Empirical Results and Discussion

6.3.1 Empirical Results

In order to investigate the relationship between corporate governance components and firm performance, the research hypotheses for all variables are discussed in sections 3.2 and 3.3 while the notations and measurements for all variables are presented in tables 5-3, 5-4, and 5-5. Moreover, based on the statistical tests and the discussion shown in previous section, the System GMM estimator is the most suitable estimator for the four research models due to the fact that it acts as a control for the serial correlation, heteroscedasticity, individual heterogeneity, and endogeneity. The analysis results will follow; they are presented in different tables

based on the firms' performance measurements while each table contains the results of the four research models. In each model, the coefficient and significant for each variable are reported and followed by the number of observations, firms, and instruments, including the AR(2) and the Sargan test that were conducted for model validity.

Table 6-5 reports the effect of corporate governance components on firm performance as identified by the ROA. Model A illustrates the performance of all the firms between 2006 and 2014, revealing a significant and negative relationship between the institutional ownership (INS) and the ROA. In contrast, the director ownership (DIRE) has a significant and positive influence at level 1% on the ROA. The board independence (BOIN) and meetings (BOME) are positively and significantly correlated to the firm performance as measured by the ROA. The presence of board subcommittees (BOCO) has a negative and significant effect on the ROA. In regards to the control variables, the firm growth (SAGR) and (SIZE) have a significant influence on the ROA while the leverage (LVRG) has a negative significant influence on the ROA. The model B for non-financial firms between 2006 and 2014 shows that there is a positive significant association between the ownership concertation (BLOK) and the ROA as well as between managerial ownership (MANG) and the ROA. Furthermore, the director ownership has a negative significant effect on ROA. The CEO duality (CEDU) and market reform (MARE) are weakly related to the ROA. For the control variables, the firm growth (SAGR) and SIZE have a significant positive influence while the leverage (LVRG) has a significant negative influence on the ROA.

Model C presents the firms between 2009 and 2014, illustrating that the ownership concentration (BLOK) is significantly and negatively associated with the ROA while the managerial ownership (MANG) is significantly and positively associated with the ROA. Furthermore, the board size (BOSI) has a positive effect

whereas board meetings (BOME) have a negative effect on the ROA at 1% significance level. The CEO duality (CEDU) is significantly and negatively related to the ROA. The audit committee size (AUSI) and meetings (AUME) appear to have a significant positive influence on the ROA. For control variables, the firm growth (SAGR) is positively related while the leverage (LVRG) is negatively related to the ROA at a significance level of 1%. Model D presents non-financial firms between 2009 and 2014, revealing that ownership concentration (BLOK) and government ownership (GOV) have a significant negative influence on the ROA. In addition, the managerial ownership (MANG) has a significant positive effect on the ROA. In regards to the board, the size (BOSI) is positivity related to the ROA whereas the board meetings are negatively related to the ROA at significance level of 1%. Moreover, the audit committee size (AUSI) and meetings (AUME) have a significant positive effect on the ROA. Similar to other models, the control variables in this particular group reveals that the firm's growth (SAGR) is positively associated while the leverage (LVRG) is negatively associated with the ROA at a significance level of 1%.

Table 6-5: System GMM Regression Model of the effect of corporate governance components on the performance of Saudi listed firms (ROA)

The dependent variable is ROA (the percentage of net profits to the total assets). All coefficients are based on the two-step System GMM model of Blundell and Bond (1998) and Arellano and Bover (1995) with one and two lags. Where BLOK is the ownership concentration (the percentage of stocks owned by large shareholders). GOV is the government ownership (the percentage of stocks owned by government). INS is the institutional ownership (the percentage of stocks owned by institutions). DIRE is the directors ownership (the percentage of stocks owned by directors). MANG is the managerial ownership (the percentage of stocks owned by managerial shareholders). BOSI is the board size (the number of directors in the board). BOIN is the board independence (the percentage of independent directors in the board). BOME is the board meetings (the number of board's meetings in each year). CEDU is the CEO duality (If CEO and chairman is not the same person = 1, 0 otherwise). MARE is the market reform (If the year from 2009 till 2014 = 1, 0 otherwise). BOCO is the board subcommittees (If firm has audit, nomination, and remuneration =1, 0 otherwise). AUSI is the audit committee size (the number of members in audit committee). AUME is the audit committee meetings (the number of the audit committee's meetings in each year). SAGR is the sales growth. LVRG is leverage (the percentage of total debt to the total assets). SIZE is the firm size (the natural log of firm's assets). Industry (each industry =1, 0 otherwise). Year (each year =1, 0 otherwise).

Independent Variables	**Model A**		**Model B**		**Model C**		**Model D**	
BLOK	-.0507	(-1.3)	.4576***	(3.72)	-.072***	(-5.62)	-.0349**	(-2.19)
GOV	-.0900	(-1.04	-.2767	(-0.96)	-.0546*	(-1.75)	-.163***	(-3.15)
INS	-.2318**	(-2.1)	-.1147	-0.59)	-.0176	(-0.90)	.0445	(0.88)
DIRE	.1109***	(2.58)	-.2071**	(-2.35)	.0220*	(1.95)	-.0063	(-0.33)
MANG	.0900	(0.45)	.9288***	(2.81)	.0685**	(2.19)	.6189***	(4.02)
BOSI	.3793	(1.08)	.1849	(0.30)	1.009***	(4.95)	1.614***	(7.04)
BOIN	.0150**	(2.54)	-.0010	(-0.12)	.0043	(0.62)	-.0072	(-0.59)
BOME	.4241**	(2.41)	.2093	(0.69)	-.222***	(-6.76)	-.397***	(-4.40)
CEDU	1.065	(0.91)	4.204*	(1.74)	-3.35***	(-4.51)	-1.439	(-1.39)
MARE	-.2565	(-0.8)	-1.203*	(-1.90)				
BOCO	-2.230**	(-2.3)	-.5383	(-0.27)				
AUSI	.0624	(0.16)	.6183	(0.57)	1.872***	(7.98)	1.228**	(2.53)
AUME	-.2362	(-1.4)	-.1199	(-0.41)	.1911***	(2.95)	.4290***	(4.09)
Control Variables								
SAGR	.0275***	(8.01)	.0265***	(5.06)	.0254***	(21.77)	.0409***	(13.29)
LVRG	-.1602***	(-5.4)	-.2758***	(-4.01)	-.043***	(-4.91)	-.101***	(-7.58)
SIZE	1.667**	(2.14)	3.876**	(2.33)	.3172	(1.48)	.4202	(1.11)
Industry	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
Constant	-20.85**	(-2.1)	-75.54***	(-3.61)	-8.95***	(-3.13)	-13.95**	(-2.47)
Observations	496		408		575		425	
Number of firms	62		51		115		85	
Number of instruments	472		424		227		223	
AR(2) test	(-1.056)		(-1.446)		(-.7988)		(-.7309)	
Sargan test (chi2)	27.81		9.672		93.16		64.09	

The test statistics are reported in parentheses. ***, **, and * refer to the statistical significance at level 1%, 5%, and 10% respectively. AR (2) is the test for the second order serial correlation with H0= no serial correlation so the p-value > 0.05 indicates no serial correlation. Sargan test is to test the validity of instruments with H0= valid instruments so the p-value > 0.05 indicates the validity of instruments.

Table 6-6 displays the effect of corporate governance mechanisms on firm performance measured by the ROE. Model A illustrates all firms from 2006 until 2014, evidently showing that the director (DIRE) and managerial ownership (MANG) have a positive effect on the ROE and a significance level of 1%. The institution

ownership (INS) negatively affects the firm's ROE and has a significance level of 5%. In addition, the table states that the board meetings (BOME) are have a significant positive relationship with the ROE. In addition, the CEO duality (CEDU) also has a significant positive influence on the ROE. The market reform (MARE) has a significant negative effect on the ROE. Moreover, the audit committee size (AUSI) has a significant positive correlation with the ROE. However, the government ownership (GOV) and board subcommittees (BOCO) are weakly related to the ROE. For the control variables, firm growth (SAGR) and SIZE have a positive effect while the leverage (LVRG) has a negative effect and are all significant at level 1%. Model B illustrates non-financial firms from 2006 until 2014, shows that managerial ownership (MANG) and firm growth (SAGR) have a significant positive relationship on the firm's performance as identified by the ROE.

Model C illustrates all firms from 2009 until 2014, showing that ownership concentration (BLOK) and government ownership (GOV) are significantly and negatively related to the ROE whereas institution ownership (INS) has a significant positive relationship with the ROE. Moreover, the director (DIRE) and managerial ownership (MANG) have a significant and positive influence on the ROE. In addition, the board size (BOSI) and independence (BOIN) have a significant negative relationship with the ROE. The audit committee size (AUSI) has a significant positive relationship with the ROE while the audit meetings are weakly related. The control variables show that firm growth (SAGR) and SIZE are positively associated with the ROE at a significance level of 1%. Model D illustrates non-financial firms from 2009 till 2014, revealing that ownership concentration (BLOK) and government ownership (GOV) have a significant negative influence on the ROE. In addition, the director (DIRE) and managerial ownership (MANG) also have a significant positive effect on the ROE. The CEO duality (CEDU) is negatively associated with the ROE at a significance level of 5%. Furthermore, the audit committee size (AUSI) is positively

associated with the ROE at a significance level of 1%. The firm growth (SAGR) and SIZE are positively related whereas the leverage (LVRG) is negatively related at a significance level of 1%.

Table 6-6: System GMM Regression Model showing the effect of corporate governance components on the performance of Saudi listed firms (ROE)

The dependent variable is ROE (the percentage of net profits to the owner's equity). All coefficients are based on the two-step System GMM model of Blundell and Bond (1998) and Arellano and Bover (1995) with one and two lags. Where BLOK is the ownership concentration (the percentage of stocks owned by large shareholders). GOV is the government ownership (the percentage of stocks owned by government). INS is the institutional ownership (the percentage of stocks owned by institutions). DIRE is the directors ownership (the percentage of stocks owned by directors). MANG is the managerial ownership (the percentage of stocks owned by managerial shareholders). BOSI is the board size (the number of directors in the board). BOIN is the board independence (the percentage of independent directors in the board). BOME is the board meetings (the number of board's meetings in each year). CEDU is the CEO duality (If CEO and chairman is not the same person = 1, 0 otherwise). MARE is the market reform (If the year from 2009 till 2014 = 1, 0 otherwise). BOCO is the board subcommittees (If firm has audit, nomination, and remuneration =1, 0 otherwise). AUSI is the audit committee size (the number of members in audit committee). AUME is the audit committee meetings (the number of the audit committee's meetings in each year). SAGR is the sales growth. LVRG is leverage (the percentage of total debt to the total assets). SIZE is the firm size (the natural log of firm's assets). Industry (each industry =1, 0 otherwise). Year (each year =1, 0 otherwise).

Independent Variables	**Model A**		**Model B**		**Model C**		**Model D**	
BLOK	.0709	(0.75)	-.1084	(-0.71)	-.134***	(-6.43)	-.0665**	(-2.33)
GOV	-.4028*	(-1.85)	1.078	(1.47)	-.273***	(-4.57)	-.1179**	(-2.08)
INS	-.4673**	(-2.37)	.1451	(0.51)	.1476***	(4.86)	.1060	(1.26)
DIRE	.0847***	(4.18)	.0630	(1.40)	.0782***	(4.68)	.0278**	(2.18)
MANG	1.073***	(2.93)	1.858***	(2.95)	.2986***	(7.38)	.3563***	(2.69)
BOSI	.8962	(1.14)	-.3255	(-0.24)	-.780***	(-2.81)	.2392	(0.93)
BOIN	.0110	(1.08)	.0239	(1.61)	-.049***	(-5.64)	.0182	(1.63)
BOME	.4008**	(2.01)	.1519	(0.47)	.0850	(1.20)	-.0059	(-0.06)
CEDU	5.253***	(3.24)	-.0506	(-0.01)	-.5513	(-0.47)	-2.112**	(-2.29)
MARE	-1.615***	(-2.60)	-.8059	-0.96				
BOCO	-2.616*	(-1.90)	-2.975	(-1.25)				
AUSI	1.867**	(2.32)	2.906	(1.55)	2.979***	(5.90)	2.026***	(3.16)
AUME	.0850	(0.33)	.0503	(0.08)	-.1270*	(-1.83)	.0492	(0.39)
Control Variables								
SAGR	.0479 ***	(10.09)	.0377***	(4.49)	.0063***	(3.84)	.0311***	(7.16)
LVRG	-.1936***	(-3.05)	-.1566	(-0.68)	-.0190	(-1.04)	-.0517***	(-2.67)
SIZE	3.873***	(2.80)	1.873	(0.53)	2.742***	(8.79)	1.144***	(3.48)
Industry	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
Constant	-65.22***	(-4.00)	-58.17	(-1.40)	-30.7***	(-6.85)	-20.56***	(-5.35)
Observations	496		408		575		340	
Number of firms	62		51		115		85	
Number of instruments	472		424		227		207	
AR(2) test	(-1.201)		(-.9731)		(-.3842)		(-1.179)	
Sargan test (chi2)	31.32		21.24		90.36		61.98	

The test statistics are reported in parentheses. ***, **, and * refer to the statistical significance at level 1%, 5%, and 10% respectively. AR (2) is the test for the second order serial correlation with H0= no serial correlation so the p-value > 0.05 indicates no serial correlation. Sargan test is to test the validity of instruments with H0= valid instruments so the p-value > 0.05 indicates the validity of instruments.

Table 6-7 presents the effects of corporate governance components on firm performance measured by Tobin's Q. Model A illustrating all firms from 2006 until 2014 reveals that there is only one significant negative relationship between institution ownership and Tobin's Q. The model evidently shows that there is a weak relationship between the audit committee size (AUSI) and leverage (LVRG) and Tobin's Q. Model B illustrates non-financial firms between 2006 and 2014, revealing that there is only a significant negative association between firm growth (SAGR) and Tobin's Q. Model C illustrates all firms between 2009 and 2014, showing that director ownership (DIRE) and board size (BOSI) have a negative significant influence on Tobin's Q whereas board meetings have a significant positive effect on Tobin's Q. The audit committee size (AUSI) and meetings (AUME) have a significant negative influence on Tobin's Q. In regards to the control variables, the firm's growth (SAGR) and SIZE have a significant negative relationship with Tobin's Q. Model D illustrates non-financial firms between 2009 and 2014, indicating that there is a positive significant association between the institution ownership (INS) and board meetings (BOME) and Tobin's Q. However, the audit committee size (AUSI) and meetings (AUME) have a negative association with Tobin's Q with a significance level of 1%. In regards to the control variables, firm leverage (LVRG) and SIZE are negatively related to Tobin's Q while the firm growth (SAGR) is positively related to Tobin's Q all with a significance level of 1%.

Table 6-7: System GMM Regression Model showing the effects of corporate governance components on the performance of Saudi listed firms (Tobin's Q)

The dependent variable is Tobin's Q (((Total assets – book value of equity) + market value of equity) / total assets). All coefficients are based on the two-step System GMM model of Blundell and Bond (1998) and Arellano and Bover (1995) with one and two lags. Where BLOK is the ownership concentration (the percentage of stocks owned by large shareholders). GOV is the government ownership (the percentage of stocks owned by government). INS is the institutional ownership (the percentage of stocks owned by institutions). DIRE is the directors ownership (the percentage of stocks owned by directors). MANG is the managerial ownership (the percentage of stocks owned by managerial shareholders). BOSI is the board size (the number of directors in the board). BOIN is the board independence (the percentage of independent directors in the board). BOME is the board meetings (the number of board's meetings in each year). CEDU is the CEO duality (If CEO and chairman is not the same person = 1, 0 otherwise). MARE is the market reform (If the year from 2009 till 2014 = 1, 0 otherwise). BOCO is the board subcommittees (If firm has audit, nomination, and remuneration =1, 0 otherwise). AUSI is the audit committee size (the number of members in audit committee). AUME is the audit committee meetings (the number of the audit committee's meetings in each year). SAGR is the sales growth. LVRG is leverage (the percentage of total debt to the total assets). SIZE is the firm size (the natural log of firm's assets). Industry (each industry =1, 0 otherwise). Year (each year =1, 0 otherwise).

Independent Variables	**Model A**		**Model B**		**Model C**		**Model D**	
BLOK	.0016	(0.25)	-.0004	(-0.03)	.0018	(1.24)	-.0002	(-0.09)
GOV	-.0109	(-0.91)	.0112	(0.29)	.0041	(1.46)	.0038	(0.88)
INS	-.0239**	(-2.26)	-.0182	(-0.53)	.0043*	(1.93)	.0249***	(2.96)
DIRE	-.0014	(-0.59)	-.0049	(-0.51)	-.003***	(-3.36)	.0002	(0.13)
MANG	-.0144	(-0.50)	.0218	(0.76)	.0025	(1.47)	.0096	(0.57)
BOSI	-.0428	(-0.92)	-.1014	(-1.40)	-.099***	(-6.83)	-.0475	(-1.50)
BOIN	-.0009	(-1.21)	-.0000	(-0.06)	-.0000	(-0.13)	-.0010	(-0.94)
BOME	.0028	(0.12)	.0127	(0.39)	.0469***	(16.58)	.0449***	(3.99)
CEDU	.0057	(0.03)	-.3491	(-0.90)	-.0386	(-0.60)	.0602	(0.62)
BOCO	.2332	(1.59)	-.3158	(-1.05)				
AUSI	-.0829*	(-1.68)	-.0667	(-0.90)	-.098***	(-3.79)	-.1148***	(-2.93)
AUME	-.0164	(-1.17)	-.0196	(-0.68)	-.006***	(-3.16)	-.0294***	(-2.70)
Control Variables								
SAGR	-.0006	(-1.38)	-.0009***	(-3.04)	-.001***	(-10.4)	.0004***	(2.59)
LVRG	-.0088*	(-1.65)	.0081	(1.17)	-.0014	(-1.11)	-.0064***	(-3.12)
SIZE	.0632	(0.79)	-.0822	(-0.32)	-.254***	(-11.4)	-.3588***	(-8.30)
Industry	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
Constant	.6510	(0.58)	2.385	(0.77)	6.235***	(20.43)	7.358***	(10.55)
Observations	434		357		575		340	
Number of firms	62		51		115		85	
Number of instruments	454		406		227		207	
AR(2) test	(1.094)		(.6119)		(.0361)		(.7561)	
Sargan test (chi2)	35.64		27.34		96.39		62.86	

The test statistics are reported in parentheses. ***, **, and * refer to the statistical significance at level 1%, 5%, and 10% respectively. AR (2) is the test for the second order serial correlation with H0= no serial correlation so the p-value > 0.05 indicates no serial correlation. Sargan test is to test the validity of instruments with H0= valid instruments so the p-value > 0.05 indicates the validity of instruments.

6.3.2 Results Discussion

In order to investigate the effect of corporate governance mechanisms on firm performance, this research utilises two main aspects of corporate governance which are the ownership structure variables and board of directors' variables. The

ownership structure variables include the ownership concentration (BLOK), government ownership (GOV), institutional ownership (INS), directors' ownership (DIRE), and managerial ownership (MANAG). The directors board variables contain the board size (BOSI), board independence (BOIN), board meetings (BOME), CEO duality (CEDU), audit size (AUSI), audit meetings (AUME), board subcommittees (BOCO). In addition, the research includes the market reform (MARE) variable to reveal the difference in the firm's performance before and after the corporate governance codes became obligatory for all firms. The following sub-sections discuss the results of each variable so as to confirm or reject the research hypotheses as well as to provide answers for the research questions.

6.3.2.1 Ownership Concentration

The corporate governance plays an important role in directing the listed companies and seeking to reduce the agency problem so as to ensure that the management's interests match those of the shareholders.' In addition, the ownership structure is generally a significant aspect of the corporate governance mechanisms which can influence countries' governance systems (Darko et al. 2016). One form of the ownership structure is the ownership concentration. The research hypothesis for the ownership concentration states that the there is a significant negative relationship between the ownership concentration and the firm's financial performance. The research results of the sample between 2009 and 2014 supports the research hypothesis and indicates that the ownership concentration has a significant negative effect on the ROA and ROE. On the other hand, Model B reveals a significant positive relationship between ownership concentration and the ROA although this model is inefficient as Roodman (2006) and Roodman (2007) have argued that the instruments may reduce model efficiency if the number of instruments totals more than the number of observations. In addition, Model A evidently shows that there is

no significant relationship between the ownership concentration and the ROA and ROE. Models C and D results are more efficient since they include larger samples of 115 and 85 firms while there is a significant difference between the number of observations and instruments in comparison to Models A and B. In addition, the results also report that there is no significant relationship between the ownership concentration and Tobin's Q which rejects the research hypothesis of a negative relationship.

The significant negative relationship between the ownership concentration and the ROA and ROE indicate that only the accounting-based performance is negatively affected, not the -market-based performance. In addition, this negative relationship supports the argument put forward by Darko et al. (2016) that large shareholders intend to apply their power in the firm with the aim of utilising its resources for their own personal gain rather than taking into consideration the interests of small shareholders. Moreover, when the firm is dominated by large shareholders, it results in the firm's environment being controlled by one mindset which decreases the opportunity for directors who possess high-level abilities and skills who have the potential to improve the firm's performance and encourage growth. The negative influence on performance measured is by the ROA and ROE and is consistent with the study of Mehdi (2007) in Tunisia, Mura (2007) in the UK, and Fauzi and Locke (2012) in New Zealand. In addition, the fact that there is no association between the ownership concentration and Tobin's Q is consistent with the research conducted by Mangena et al. (2012) in Zimbabwe. The results also reveal that there is no difference between the sample of all firms and non-financial companies in regards to ownership concentration on the ROA, ROE, and Tobin's Q.

6.3.2.2 Government Ownership

Government ownership in several Saudi listed firms are considered to be high with some ownerships reaching a percentage of 74.3% of the issued shares; this form of high government ownership is often seen in energy, petrochemical, mines, and telecom companies. Therefore, it is important to investigate the effect of government ownership on firm performance. The research hypothesis for government ownership states that there is a significant negative relationship between government ownership and firms' financial performances. The research results reveal that government ownership has a significant negative influence on the ROA and ROE while this result supports the research hypothesis. Despite the fact that Model A in table 6-5, Models A and B in table 6-6, and Models C and D are more efficient than Models A and B it has been previously acknowledged that they have large sample sizes with fewer instruments. The results also show that government ownership has no significant relationship with Tobin's Q. This result indicates that government ownership has a negative effect on accounting-based performance while it has no influence on the market-based performance of a firm.

The negative effect of government ownership on the ROA and ROE confirms the argument that this type of ownership will not add value to the company. Moreover, it may have a negative impact on its progress due to the fact that the major objective of governments is to purchase stocks in the listed companies in order to increase its power and control in the market (Darko et al. 2016). In addition, the government will use its ownership in the listed companies for the benefit of politicians while it may also negatively affect the firm's performance by adding more bureaucratic regulations which can impede the company's operations (Tran et al. 2014). The negative influence of government ownership emphasises the importance of increasing the level of privatisation in the Saudi listed companies by reducing the level of government ownership so as to enhance firm performance and allow

companies to focus on growth opportunities rather than benefiting politicians. The negative relationship between government ownership and the ROA and ROE is consistent with the study conducted by Cheung et al. (2010) in Vietnam, Chen et al. (2005) in China, and Boussaada and Karmani (2015) in the banking sector of MENA region. The results show that there is no significant relationship between government ownership and Tobin's Q which is compatible with the research conducted by Darko et al. (2016) in Ghana and Zhang (2012) in China. The research outcomes reveal that the sample size has no effect on the relationship between government ownership and firm performance in all of the firms as well as the non-financial firms.

6.3.2.3 Institutional Ownership

Institutional ownership is another form of the ownership structure while there are mixed results concerning the effect of this type of ownership on firm performance. The research hypothesis for institutional ownership states that there is a significant positive relationship between institutional ownership and a firm's financial performance. The research results report different types of evidence for a relationship. Model A illustrating all firms between 2006 and 2014 reveals that institutional ownership has a significant negative influence on the ROA, ROE, and Tobin's Q while Models C and D for the period 2009-2014 report that institutional ownership is significantly and positively related to the ROE and Tobin's Q whereas it is not significantly related to the ROA. The difference in these results suggest that the institution's practices and activities improved after 2009 which subsequently led to the firms performing efficiently. In addition, Models C and D are more efficient as has previously been discussed; the models represent the period 2009-2014 which is characterised by the increased number of listed firms since several new firms entered the market during this period compared with the period 2006-2014.

Therefore, Models C and D represent 70.55% and 72.64% of the market respectively compared with 38.04% for Model A.

It can be inferred from that the results produced by of Models C and D are a more accurate representation of the Saudi market than Models A and B. Therefore, it is concluded that institutional ownership has a significant positive effect on the ROE and Tobin's Q while it has no effect on the ROA. The positive influence of institutional ownership supports the research hypothesis and confirms the argument that institutional ownerships compared to other types of ownerships have the ability to monitor managers' activities and prevent opportunistic behaviour due to the fact that they are more professional and have extensive financial knowledge; as a result, they can easily examine the manager's reports and decisions (Donnelly and Mulcahy 2008; Bos and Donker 2004). Institutions which monitor the managers' activities is an effective governance mechanism which can succeed in reducing the number of agency issues as well as ensuring that all decisions benefit the shareholders. Therefore, one specific suggestion regarding the positive influence and effective monitoring role of institutions is to incorporate the current regulations and codes along with additional rules that encourage the extensive participation of the institutional stockholders in the governance procedure (Henry 2008). The positive influence of institutional ownership is compatible with the study of Henry (2008) in Australia and Zhang (2012) in China. Furthermore, the tables reveal that there is no big difference between the sample of every firm and the non-financial sample regarding the relationship between institutional ownership and firm performance.

6.3.2.4 Director Ownership

The board of directors represent the interests of the shareholders by monitoring management activities and improving the firm's environment so as to solve any

agency issues. Previous literatures have discussed the effect of director ownership on firm performance. The research hypothesis regarding director ownership states that there is a significant positive relationship between director ownership and a firm's financial performances. The table results show that Models A and B reveal a significant positive association between director ownership and the ROA while Models C and D presents a weak significant relationship. Since Model B is not efficient, it is concluded that director ownership had a significant positive effect on the ROA during the period 2006-2014 and a nonsignificant effect during the period 2009-2014. In addition, the results also show that director ownership has a significant positive influence on the ROE. However, the outcome of the research reveal that there is a significant negative relationship between director ownership and Tobin's Q in the all sample firms while there it has no significant effect on non-financial firms. This evidently shows that the director ownership has a positive effect on ROE and has a mixed results on ROA and Tobin's Q.

The positive influence of director ownership supports the research hypothesis as well as the incentive theory which highlights the fact that when directors own shares in the firm, they have a greater incentive to improve the firm's performance since they will gain personal advantages from the increase in profits while they will also be effected by poor decision-making and strategies that negatively impacts the firm's overall value (Mehdi 2007; Hussainey and Al-Najjar 2012). Based on this, the director's interest should match that of the shareholders' and aim to increase the shareholders' wealth which can help to reduce the number of agency issues. Other studies have reported a positive influence on companies' performance, such as the research conducted by Amer et al. (2014) in Egypt, and the study of Florackis et al. (2009) and Cosh et al. (2006) in the UK. However, the negative influence of director ownership on Tobin's Q can be explained by the management entrenchment strategy that was adopted by managers which involved

focusing solely on investment and performance; this took place during their time at the expense of other long-term growth opportunities (Jackson et al. 2008). The study of Reyna et al. (2012) in Mexico also reports a negative influence of director ownership. In addition, the non-financial firms in this research displayed no significant relationship between director ownership and the ROA and Tobin's Q which indicates that there is a difference between the samples of all firms and non-financial firms in regards to director ownership. The research conducted by Henry (2008) in Australia and Mehdi (2007) in Tunisia also revealed an insignificant relationship.

6.3.2.5 Managerial Ownership

Managerial ownership is another strategy employed by firms which act as an incentive to managers to become involved in the firm's objectives. The research hypothesis for the managerial ownership states that there is a significant positive relationship between managerial ownership and firm financial performance. The research results reveal that managerial ownership has a significant positive effect on the ROA and ROE and an insignificant effect on the Tobin's Q. Therefore, the results show that managerial ownership has a positive influence on a company's accounting-based performance while it has an insignificant influence on a firm's market-based performance.

The positive influence of managerial ownership supports the research hypothesis as well as the argument that managerial ownership enhances firm performance and provides an effective strategy and mechanism for reducing the number of agency issues by motivating management to align their interests with the shareholders' objectives. Therefore, the managerial ownership mechanism can be implemented in the corporate governance regulations of the Saudi market so as to improve the governing practices of listed firms. Various literatures have also

reported the positive effect of managerial ownership on firms' performances, such as the research of Mehdi (2007) in Tunisia, Mehran (1995) in the US, Cosh et al. (2006) in UK, Daraghma and Alsinawi (2010) in Palestine, Mueller and Spitz-Oener (2006) in Germany, Fauzi and Locke (2012) in New Zealand, and Mangena et al. (2012) in Zimbabwe. Moreover, the insignificant relationship between managerial ownership and firm performance as identified by Tobin's Q is consistent with the study of Simoneti and Gregoric (2004) in Slovenia. In addition, the research's results evidently show that there is no difference between the sample of all firms and non-financial firms in regards to the relationship between managerial ownership and firm performance.

6.3.2.6 Board Size

The board of directors is the primary factor in the corporate governance system; therefore, the board's characteristics will have a large influence on the firm's performance. For example, the board is discussed and investigated throughout the literatures in order to determine its effect on the firm performance. The research hypothesis for the board size states that there is a significant negative relationship between board size and a firm's financial performance. The research results provide mixed reports about the effect of board size. The results reveal that board size has a significant positive influence on the ROA. Moreover, the board size has a significant negative influence on the ROE and Tobin's Q in regards to the sample of firms from every sector while it has an insignificant effect on the non-financial firms. The negative effect of board size supports the research hypothesis and provides evidence to the theory that a smaller board helps to reduce the number of agency issues since it can easily monitor management activities compared with a larger sized board of directors (Jensen 1993). In addition, the directors in a smaller sized

board can collaborate effectively with each other and thereby quicken the decision-making process which help to improve firm performance (Dharmadasa et al. 2015).

In contrast, the results show that board size has a positive influence on the ROE and Tobin's Q while this positive effect is supported in the various literatures. It is argued that increasing the size of the board helps the board to assign more independent directors; a greater number of directors with unique experience and knowledge will enhance the board's environment and assist them in making important decisions (Elbadry et al. 2015; Ujunwa 2012). Moreover, boards which consist of a large number of directors are also able to effectively monitor the various processes and create effeienct subcommittes that help to increase firm performance (Anderson et al. 2004; Ntim and Soobaroyen 2013). The research results that reveal board size has a postive influnce on the ROA and a negative influnce on Tobin's Q is consistent with the study of Haniffa and Hudaib (2006) in Malaysia. The positive effect on firm performance is compatible with the research conducted by Yasser *et al.* (2011) in Pakistan, Coles *et al.* (2008) in the US, Kyereboah-Coleman (2007) in Africa. In addition, the negative effect on firm performance is consistent with the study of Rodríguez-Fernández (2015) in Europe, Mamatzakis and Bermpei (2015) in the US, De Andres et al. (2005) in North America and Western Europe, Mashayekhi and Bazaz (2008) in Iran. Moreover, the research result is consistent with the Saudi study of Al-Matari *et al*. (2012) on Tobin's Q while it contrasts the Saudi study of Ghabayen (2012) on ROA. Moreover, the research outcome reveals that there are differences between the sample of all firms and non-financial firms in regards to the relationship between the board size and the ROE and Tobin's Q.

6.3.2.7 Board Independence

The primary role of the board directors is to monitor the management and executives on the behalf of the shareholders so as to minimise the agency problems and to prevent the opportunistic behaviour; therefore, the type of directors may have an influence on the board's performance. The research hypothesis relating to the effect of board independence on the firm's performance states that there is a significant positive relationship between board independence and firm financial performance. The research outcome reports mixed results as it shows that the board independence has a significant positive influence on the ROA according to Model A while it has an influence on the ROA according to Models B, C, and D. In addition, the results show that there is a significant negative association between the board independence and the ROE in Model C while it has no significant influence on the remaining models. Since Models C and D are more efficient, it can be concluded that the board independence is insignificantly related to the ROA. In addition, it has a significant negative effect on the ROE in regards to the sample of all firms and has an insignificant effect on the non-financial firms. The results indicate an insignificant and negative relationship between the board independence and Tobin's Q. The research results that reveal an insignificant effect is compatible with the pervious Saudi studies of Al-Matari et al. (2012) and Ezzine (2011) as well as with the study of Zabri et al. (2016) in Malaysia, and Zhang (2012) in China. In addition, the research results contrast with the Saudi study of Ghabayen (2012) as his study reports a negative effect on the ROA.

The negative influence of independence directors on the ROE is due to the fact that independent directors can increase the diversity and disagreement between the board members which may reduce the level of cooperation in the decision-making process and consequently impact the firm's performance (Goodstein et al. 1994). Moreover, different studies have reported that the board

independence has increased the number of agency issues and weaken the minoring role of the board (Fernandes 2008). The research results of the negative effect of the independent directors is consistent with the study of Darko et al. (2016) in Ghana, Agrawal et al. (1996) in the US. On the other hand, the research result also reports positive influences of the board independence on the ROA which is referred to in the various literatures; the independent directors will bring new experiences to the firm which can improve the board decisions and the company's activities (Ntim and Soobaroyen 2013). The positive effect is compatible with the results of the study conducted by Liu *et al.* (2015) in China and Kyereboah-Coleman (2007) in Africa. The result show a difference between the samples of all the firms and non-financial firms in the relationship between board independence and the ROE.

6.3.2.8 Board Meetings

The board meetings have a positive effect on board activities and firm performance while there is a disagreement within the empirical studies about the effect of these meetings on the firm performance. The research hypothesis for the board meetings states that there is a significant positive relationship between the number of board meetings and a firm's financial performance. The empirical results of this research report produced mixed results. For the data between 2009 and 2014, the results show that the frequency of the board meetings has a significant negative effect on the ROA and has a significant positive effect on the Tobin's Q. In addition, the board of directors' meetings have an insignificant effect on the ROE. In regards to the data between 2006 and 2014, the results show that the board meetings have a significant positive influence on both the ROA and ROE while they have an insignificant influence on Tobin's Q. The selected sample for the data between 2009 and 2014 represents around 70% of the Saudi market compare with around 39% for the data collected between 2006 and 2014.

The result shows that the board meetings have a positive effect on the market-based performance and this is justified in the literatures by revealing that an increase in the number of board meetings will improve the monitoring role of the board as well as communication between the board members and the public which gives more confidence to investors and shareholders thereby leading to a high share trading volume (Schwartz-Ziv and Weisbach 2013; Elbadry et al. 2015; Ajina et al. 2013). In addition, in regards to the agency issues in the firm, an increase in board meetings would strengthen the board's ability to monitor the management's activities which can reduce the agency's problems. The positive influence is consistent with the study of Liang et al. (2013) in China, and Brick and Chidambaran (2010) in the US. In addition, the negative influence of board meetings on the ROA can be explained by the fact that a large number of board meetings will add more expenditure, costs, and compensations to the company which can reduce the company profits (Vafeas 1999b). This negative influence is compatible with the empirical studies of Christensen et al. (2015) in Australia, and Vafeas (1999b) in the US. Moreover, the insignificant effect on performance is consistent with the study of Mehdi (2007) in Tunisia and Jackling and Johl (2009) in India. The results also reveal that there is no difference between the sample of all firms and the non-financial firms in regards to the relationship between board meetings and performance.

6.3.2.9 CEO Duality

The firm employs a strategy for assigning two different individuals to the position of board chairman and CEO in order to more effectively control the management's actions. If the CEO takes the position of board chairman it will have a negative impact on the monitoring role of the board since the CEO would be able to dominate the board activities such as setting the meeting agenda and assigning new directors

which can increase the agency problems (Haniffa and Cooke 2002). The research measurements for the CEO duality show that the value is equal to 1 when the CEO and board chairman are different people and 0 when the same individual is assigned both positions. Therefore, when the coefficient of CEO duality is positive, this will have a negative influence on the firm's performance. The research hypothesis of the CEO duality states that there is a significant negative relationship between CEO duality and firm financial performance. In regards to firms listed between 2006 and 2014, the research's empirical results reveal that the CEO duality has a weak significance and a negative influence on the ROA; moreover, it also has a strong significance and a negative influence on the ROE. For the firms listed between 2009 and 2014, the CEO duality has a significant positive effect on the ROA and ROE. In addition, the result show that there is no significant relation between the CEO duality and Tobin's Q.

The result reveals differences in the significance level between the sample of all firms and non-financial firms. In addition, the result shows the negative effect of CEO duality during the period 2006-2014 while CEO duality had a positive effect during the period 2009-2014. The possible explanation for these differences is that in 2006, the Saudi CGRs started to recommend the code which states that it is forbidden to combine the position of executives and the board chairman (CMA 2010). Therefore, the firms listed between 2006 and 2014 voluntarily implemented the separate roles since they intended to control the management's action and reduce the number of agency problems unlike the firms listed between 2009 and 2014 which applied the separation role simply because they did not want to violate the rules of the CMA; however, in reality the board chairman in their firms was controlled by the top executives who are the largest shareholders and family owners. As a result, the negative influence of CEO duality continued to exist in practices where there were no separate roles. The negative effect of CEO duality

on performance is consistent with the study of Tang (2016) and Duru *et al.* (2016) in the US, Kyereboah-Coleman (2007) in Ghana, and Ezzine (2011) in Saudi Arabia. Moreover, the insignificant relationship between CEO duality and Tobin's Q is compatible with the research of Al-Matari et al. (2012) in Saudi Arabia, and Zhang (2012) in China. However, the positive influence of CEO duality on performance between 2009 and 2014 may support the stewardship theory. The theory assumes that the CEOs are trustworthy so there is no need to monitor their activities and the CEO duality will provide the CEO with the ability to focus more on managing the firms and deal with all of the obstacles (Donaldson and Davis 1991; Finkelstein and D'Aveni 1994). The positive effect of CEO duality is consistent with the study of Donaldson and Davis (1991) in the US.

6.3.2.10 Board Subcommittees

The board subcommittees are the main supporters of the board of directors' activities. The majority of the board plans and makes decisions by initially discussing them at the subcommittees level (Kesner 1988). Based on the corporate governance regulations (CGRs) in Saudi Arabia after 2009, the listed firms are obligated to establish audit, nomination and remuneration committees (CMA 2010). Therefore, approximately all of the firms in the sample of 2009-2014 contain all three committees; therefore, the research only uses the sample of 2006-2014 to investigate the relationship between board subcommittees and performance. The Saudi CGRs indicate that establishing the audit, nomination and remuneration committees will enhance the firm's ability to make effective decisions and improve performance (CMA 2010). Therefore, the research hypothesis states that there is a significant positive relationship between the presence of board subcommittees and firm financial performance. The research results show that the board subcommittees of Model A have a significant and negative effect on the ROA, and a weak and

significant negative effect on the ROE while they have no significant effect on the ROA and ROE for Model B. As Model B is inefficient compare with Model A, it can conluded that it has negative effect on ROA and no effect on ROE. Moreover, there is no significant relation between the presence of board subcommittees and Tobin's Q.

The negative influence of board subcommittees indicates that the Saudi listed firms established all three committees to adhere to the capital market authority; however, they do not give these committees the power to perform and effectively conduct their responsibilities and roles. Therefore, these ineffective board subcommittees will add only more costs and expenses to the firm such as travel costs and compensation fees whereas the most important and strategic plans and decisions are conducted by the board of directors as opposed to the subcommittees (Vafeas 1999b; Dalton et al. 1998). The empirical study conducted by Hearn (2011) in the West African market reports that it is not important for the firm to have audit and remuneration committees in order to improve the firm's performance; moreover, it may negatively impact the information that is released to the public which could have a bad influence on the firm's value. In addition, the research conducted by Christensen et al. (2015) discovered that there is no significant relationship between the audit committee and firm performance. From this discussion, it can be suggested that the Saudi Market Authority should add more codes and regulations to ensure that all board subcommittees aim to reach the committee objectives. The result also shows that the board subcommittees are significantly and negatively related to the accounting-based performance and insignificantly related to the market-based performance.

6.3.2.11 Audit Committee Size

The audit committee plays an important role in observing the financial tasks in the company. The literatures discuss the effect of the committee on firm performance and provide inconclusive results. The research hypothesis regarding the effect of the audit committee size states that there is a significant positive relationship between the audit committee size and a firm's financial performance. The empirical result shows that the audit committee size has a significant positive influence on the ROA and ROE; this result supports the research hypothesis. Moreover, the audit committee size has a significant negative effect on the Tobin's Q. Therefore, the result indicates that the audit committee size has a positive effect on the accounting-based performance and has a negative effect on the market-based performance. The results are consistent with the Saudi study of Al-Matari et al. (2012) on Tobin's Q and contrast the Saudi study of Ghabayen (2012) on the ROA as his results suggest that there is no significant effect on the ROA. It is believed that a large audit committee will have a positive effect on the firm's performance since there will be a greater number of members working on the committee to effectively monitor the management's role; in addition, these new members can provide the necessary knowledge and skills in order to enhance the firm's performance (Kalbers and Fogarty 1993 ; Anderson et al. 2004).

The positive effect is compatible with the empirical research conducted by Kyereboah-Coleman (2007) in Africa, Afza and Nazir (2014) in Pakistan. In addition, the negative effect of the audit committee size originates from the argument that the large size of the audit committee will slow down the decision-making process as well as adding more costs and expenditure to the company's budget which can decrease the profits. The result shows no difference between the sample of all firms and non-financial firms regarding the relationship between the audit committee size and performance.

6.3.2.12 Audit Committee Meetings

The audit committee meetings are regarded as being a determining factor of the effectiveness of the audit committee. The literatures that investigate the effect of the audit committee meetings are inconclusive. The research hypothesis for the effect of audit committee meetings indicates that there is a significant positive relationship between the number of audit committee meetings and firm financial performance. The research empirical results reveal that the audit committee meetings have a significant positive effect on the ROA for the data between 2009 and 2014. Moreover, the effect of audit committee meetings on Tobin's Q is significant and negative for the period 2009-2014. The effect of audit committee meetings on the ROE is insignificant. The results indicate that the audit committee meetings have a positive influence on the accounting-based performance and a negative influence on the market-based performance. The result contrasts the Saudi study conducted by Al-Matari *et al*. (2012) which reports an insignificant influence on Tobin's Q.

The positive link between the meetings and performance is due to the fact that committee meetings increase the effectiveness of communications between the committee and the management which can improve the monitoring role and the audit tasks of the committee; furthermore, this can decrease the number of agency issues and improve the firm's performance (Lin et al. 2006; Menon and Williams 1994). The positive effect of the meetings is compatible with the empirical studies of Hoque *et al.* (2013) in Australia, and Kyereboah-Coleman (2007) in Africa. In contrast, the negative influence is justified by the notion that the committee meetings only represent the number of decisions made by the committee rather than how many were actually successful; moreover, the number of meetings are organised by firms with the objective of creating a positive image for the public rather than making improvements to the firm (Menon and Williams 1994; Bradbury 1990). The negative

link between audit committee meetings and performance is consistent with the empirical studies of Ben Barka and Legendre (2016) in France, and Darko et al. (2016) in Ghana. Several literatures report that the insignificant audit committee meetings have an insignificant influence on firm performance, such as the study of Afza and Nazir (2014) in Pakistan. Moreover, this research reports that there is no difference between the sample of all firms and non-financial firms regarding the relationship between the audit meetings and performance.

6.3.2.13 Control Variables

The research empirical results reveal that firm growth identified by the firm sales growth is strongly significant at a level of 1% and is positively associated with the ROA and ROE for all models. In addition, the sales growth has a strong significance and negatively effects Tobin's Q of the Model C that includes the all firms sample during the period between 2009 and 2014. It also has a strong significance and a positive effect on the Tobin's Q of Model D that contains the non-financial firms sample during the period between 2009 and 2014. Models A and B reveal that the effects on Tobin's Q are considered inefficient due to the fact that there is a greater number of instruments than the number of observations made. The research results indicate differences between the firms' accounting-based performance and market-based performance in regards to firm growth. In addition, the differences between the sample of all firms and non-financial firms concerning the effect on Tobin's Q imply that the banks and insurance companies convert the positive relationship between the firm growth and Tobin's Q to a negative one. The positive influence of firm growth on performance is consistent with the study of Haniffa and Hudaib (2006) and it is argued that the firm growth is more likely improve company performance. In addition, the research outcomes reveal that the firm leverage has a significant and negative influence on the ROA, ROE, and Tobin's Q for all models

except Model C in regards to the ROE and Tobin's Q proxy as their relationship is negative although insignificant.

This negative effect of leverage on firm performance rejects the argument that the high leverage allows greater control over management actions since their actions are observed by the financial institutions which can decrease the number of agency issues and improve the firm performance. The result indicates that even the leverage can help to control the management although it may add more costs, risks, and liabilities to companies as well as external controls on company management which does not necessarily lead to high performance. In addition, the negative result supports the argument put forward by Haniffa and Hudaib (2006) that the high level of leverage may encourage companies to undergo risky investments in an attempt to increase performance. The negative effect of leverage is compatible with the study of Chen et al. (2005). In regards to the firm's size, the research's empirical results reveal that firm size has a significant positive influence on the ROA and ROE in Models A and B and on the ROE in Models C and D. Furthermore, it has a significant negative effect on Tobin's Q during the period 2009-2014. Therefore, the result shows that the firm's size has a positive effect on accounting-based performance and a negative effect on market-based performance. In addition, there is no difference in the results between the sample of all firm and non-financial firms. The positive result supports the notion that larger firms have the capability to gain financial and non-financial resources for their investments at lower costs and are also able to reduce the effect of any type of risks. The positive effect is consistent with the research conducted by Fauzi and Locke (2012) in New Zealand, Boussaada and Karmani (2015) in MENA counties, Haniffa and Hudaib (2006) in Malaysia, and Mehdi (2007) in Tunisia.

6.3.2.14 Market Reform

The Capital Market Authority (CMA) in Saudi Arabia established the corporate governance regulations in 2006 to reform the market following the stock market crash. The governance regulations were initially implemented only as a set of guidelines for listed firms and only became mandatory in 2009. The research adds the market reform variable (MARE) to investigate the effect of this reforms on firm performance. Due to the effect that the governance regulations become mandatory only after 2009, the research utilises year dummies and set a value of 1 for the years from 2009 till 2014 and set the value at 0 for the years from 2006 till 2008. The research outcome reveals mixed results as the market reform had a non-significance effect on the ROA while it had a strong significance and a negative effect on the ROE. This result indicates that there is no conclusive result for the effect of market reform on the firm perofmance.

Therefore, the market reform which introduced obligatory governance codes failed to improve the firms' performance; there is a different explanation for this result. Firstly, as the governance reform is new in the Saudi market, it may require a longer period of time in order to be effectively applied in the listed firms. Secondly, it may be that the firms incorporate the obligatory codes for public appearance only rather than intending to improvement its management. For example, the firm may assign more independent directors to the board although in reality these directors are controlled by the large shareholders and family owners. In addition, the firm may establish board subcommittees although these subcommittees do not have the power and authority to effectively carry out their roles and responsibilities. Several listed companies in Saudi Arabia are owned by families and these families are the larger shareholders who would prefer to assign board chairman and independent directors who are under their control since they want to implement and direct strategic plans and make important decisions. Therefore, due to the possible effect

of these larger shareholders on violating the objectives of the governance regulations, the CMA should assess the current regulations and introduce new rules and procedures that can prevent firms from manipulating the corporate governance practices.

6.4 Conclusion

This chapter has considered the dependent and control variables used in the regression analysis. The dependent variables are return on assets (ROA), return on equity (ROE) and Tobin's Q, while the control variables comprised of firm growth (SAGR), leverage (LVRG), firm size (SIZE), year dummy (Year) and industry dummy (Industry). The chapter also presented the regression analysis that was conducted in order to investigate the effect of corporate governance components on firm financial performance. A justification was provided for selecting the System GMM model as the most appropriate analytical model in this research context. Finally, the chapter discussed and explained the regression results in terms of the effect of each corporate governance variable on firm financial performance. The results indicated that ownership concentration and government ownership have a negative influence on ROA and ROE. Government ownership was determined to have no significant correlation with Tobin’s Q. Moreover, institutional ownership has a significant positive effect on ROE and Tobin’s Q, whereas it has no impact on ROA. Moreover, director ownership had a non-significant effect on ROA, a positive influence on ROE, as well as a negative impact on Tobin’s Q. In terms of managerial ownership, this had a positive influence on a company’s accounting-based performance, alongside an insignificant influence on firms’ market-based performance. Furthermore, the research results provided a varied picture regarding the effect of board size and board independence on firms’ financial performance. The results showed that the frequency of board meetings has a negative effect on

ROA, a positive effect on Tobin's Q, as well as an insignificant effect on ROE. Concerning CEO duality, this had a positive effect on ROA and ROE, while no significant effect on Tobin's Q was found. Moreover, board subcommittees were negatively correlated to ROA, while a weak yet significant negative effect on ROE over the entire firm sample, while having no significant effect on ROA and ROE for non-financial firms. Additionally, audit committee size was found to be positively correlated to ROA and ROE, while having a significant negative effect on Tobin's Q. Audit committee meetings was in positive correlation to ROA, had a negative effect on Tobin's Q, alongside an insignificant impact on ROE. Finally, market reform was weakly significant in terms of the negative effect on ROA, while it had strongly significant, negative impact on ROE. This result suggests that the firm performed with greater efficiency between 2006 and 2008 than between 2009 and 2014. The subsequent chapter presents the event study methodology adopted to examine the extent of information leakage incidents prior to earnings announcements in the Saudi market. The chapter will also present the empirical results and discussion related to this examination.

Chapter 7:

The extent of Information Leakage before Earnings Announcements in the Saudi Stock Exchange

7.1 Introduction

The previous chapter explained the regression analysis that was applied in order to assess the impact of corporate governance components on firm financial performance. The justification was provided for adopting the System GMM model as the most suitable analytical method. Furthermore, the regression outcomes regarding the impact of corporate governance variables on firm financial performance were outlined. One of the main objectives of this research is to investigate the effect of corporate governance mechanisms on firm information leakage. Therefore, this chapter investigates the presence and extent of information leakage incidents prior to official earnings announcements in the Saudi Stock Exchange. The research focused on earnings announcements, because these are frequent announcements by all listed firms, thus being a crucial means of all investors evaluating a firm's future and deciding on their investments. The chapter provides an in-depth clarification of the event methodology, the event data and window, as well as the data and the sample. The research utilised three models for calculating the abnormal returns, namely the constant mean return model, the market adjusted model and the market model. Additionally, the research applied the cross-sectional t test as a means of assessing the hypothesis of the cumulative average abnormal returns. Finally, this chapter discusses the results of the investigation of the cumulative abnormal returns, as well as information leakage prior to the quarterly and annual earnings announcements, across the period 2006-2014. Thus, the chapter is divided as follows: Section 7.2 described the event study

methodology that used in this research. Section 7.3 discussed the empirical results and discussion to reveal the presence of information leakage in the Saudi market. 7.4 is the conclusion.

7.2 Methodology

To inspect the phenomenon of information leakage before the earnings announcements, the research applied the event study methodology which is an approach used in finance literature to examine the financial, economic, and political events or announcements, such as mergers and acquisitions, earnings announcements, dividends, and new laws, and their influence on stock prices or volumes. McWilliams and Siegel (1997, p. 626) indicated that the event study method is more common in the literature because it avoided the need “to analyse accounting-based measures of profit, which have been criticised because they are often not very good indicators of the true performance of firms”. Fama et al. (1969) stated that the event study methodology is a statistical method that is ordinarily applied to reveal how the new companies’ information and announcements can influence these companies’ performances. It is a method commonly implemented in researches related to the financial, accounting, and economic areas (Binder 1998). Arffa (2001) indicated that the assumption of implementing the event study methodology originated in the meaning of the ‘efficient market’, which states that all information publicly revealed in the market should already be reflected in companies’ stock prices. Thus, under the assumption of the efficient market, the influence of the new announcements should be available in the stock prices however, in some situations, some investors may receive the new announcement before it is officially released to the public and the market. This leakage of information causes the market to become less efficient and may lead to an increase

in corruption through individuals using this information for insider trading activities. This can harm weak investors who are not able to gain such inside information.

The procedures of event studies are generally comparable and have some differences depending on both the applied models and the limits of the event window and the estimation period (MacKinlay, 1997; McWilliams and Siegel, 1997; Binder, 1998). The following is a summary for these procedures, followed by details of the procedures that were implemented in the research:

- The first step is to identify both the event date and time, and also the event window before and after the event date that needs to be covered by the research. Furthermore, the estimation period should also be assigned to calculate the appropriate estimation of the parameters and means for the expected return models.
- The second step is to select the sample of companies that would come under the research examination and their expected duration for this examination.
- The third step is to identify the selected models that will estimate the expected normal return of stocks in the case of the event not occurring.
- When the expected return of stocks is identified, the next step is to calculate the abnormal returns during the chosen event window and cumulate these abnormal returns for specific periods during the event window.
- The final step is to define the statistical significance of the abnormal returns and the cumulative abnormal returns.

7.2.1 The Event Date

The first and most important task in the event study is to identify the event type and date, which is labelled (0 day), in the event window, and the dispenser between the pre- and post-event date. Choosing the appropriate event type and date is important in order to generate reliable outcomes regarding the implied information around the

event date. Akbar and Baig (2010) stated that the event date is the date when a new event or information is issued and announced to the public and all investors - either by firms or other types of media. The event dates utilised in this research are the quarterly earnings announcements and the annual earnings announcements of the firms listed in the Saudi Stock Exchange (Tadawul). The announcements and events, such as earnings announcements, are significant for all participants in the market in order to take important decisions related to their investments. Beaver (1968) stated that different types of information, such as earnings and financial announcements, as well as analysts' recommendations, can change the investors' views and decisions regarding their assessment of an equity. The dates of the quarterly and annual earnings announcements are unknown to all investors, and therefore they are the appropriate events chosen to investigate both the information leakage phenomenon and insider trading before the announcement date in the Saudi Stock Exchange.

All Saudi listed firms are obligated by Article 43 of the Listing Rules of the stock market to release to the public their quarterly and annual financial reports via the official electronic application and website of the Saudi Stock Exchange (www.tadawul.com.sa) (CMA 2004). Besides, listed firms are prohibited from leaking the announcements to the shareholders or third parties before they have been issued publicly on the market's official website (CMA 2004). Moreover, Article 43 states that the firms' financial reports must be released to the public as soon as they are approved by the firms, and whilst there is no strict date firms do have to declare their earnings within fifteen days for the quarterly earnings and forty days for the annual earnings announcements, starting from the end of each financial period (CMA 2004).

This research used two types of earnings announcements - the quarterly and the annual - because they have some differences. Firstly, the annual financial and

earnings report is required by the Saudi authority to be reviewed and audited by an accounting company while the quarterly financial report is only required to be approved by the firms so that the annual report is more responsible and creditable. Secondly, a study by Albogami et al. (1997) and Alzahrani (2009) showed that the investors' reactions towards the announcements of Saudi firms are different between the quarterly and annual financial reports. Therefore, investigating these quarterly and annual announcements will confirm the reliability and generality of the event study results regarding the availability of the information leakage and the efficiency in Saudi's stock market. Additionally, because the annual financial announcements are more accountable and reliable, and the investors have different reactions depending on the nature of the news, the research divides the annual announcements into two types - good or bad news - based on the nature of the disclosures in order to identify the differences in event study outcomes between the good and bad news.

7.2.1 The Data

The data of the event study utilised in this research covers a long period, which is all the earnings announcements of all the Saudi listed firms from the first quarterly earnings announcements of 2006 until the last quarterly earnings announcements for 2014. In addition, it covers all annual earnings announcements of the listed firms from the annual earnings announcements of 2006 until the annual earnings announcements for 2014. However, the research excludes any earnings announcement associated with missing stock prices during the event window and estimation period because without the stock prices of the firm for these periods, the event study cannot be performed. All earnings announcements were extracted manually from the official website of the market (www.tadawul.com.sa) by documenting the announcement date and time. When the earnings announcement

is issued during the working hours of the stock market, the announcement date is classified as a (0 day) in the event window. If the announcement is published while the market is closed, the following working day of the stock market is classified as a (0 day).

For the annual announcement, the announcements are classified based on the nature of the news, whether this is good or bad. If the current annual earnings are better than the previous year's, the news is considered as good news, whereas if the current earnings are less or equal to the earnings of the previous year, the news is deemed as bad. Moreover, the research focused on the period between 2006 and 2014 because the Saudi corporate governance codes were issued as guidance in 2006, and the authority began in 2009 in order to impose some important codes such as increasing the non-executives and independent directors, establishing audits, numeration and nomination committees, and creating a system for insider monitoring and control. Therefore, it is important to investigate this period to reveal the effect of issuing and imposing the corporate governance codes on market transparency and on the existence of information leakage issues. Furthermore, no event study has been conducted concerning the information leakage phenomenon in the Saudi market that covers this long period before and after imposing the corporate governance codes upon the Saudi listed firms. The data related to the daily Saudi market index (TASI) and the daily stock price for each firm were downloaded, firm by firm, from an information provider licensed by Tadawul. The data of the market index and daily stock prices included the period between 2005 and mid-2015 to calculate the parameters and means for the expected return models.

7.2.2 Event Window and Estimation Period

The main steps in the event study are to identify the type of event and to define the period in which the stock prices of firms included in the event will be investigated (Campbell et al. 1997). MacKinlay (1997) stated that the period of interest in the event window often includes multiple days and, at the very least, contains the event day, but it may also include days before and after the event day. McWilliams and Siegel (1997) reviewed several literatures pertaining to event study and they showed that the minimum period in the event window was one day before and after the event day, and that the maximum period was 90 days before and 100 days after the event day. Nobanee et al. (2009) indicated that choosing the limit of the event window is subjective, and McWilliams and Siegel (1997) stated that not only should the event window be long enough to catch the influence of the event, but also short enough to eliminate any disturbing influence - especially whereby a very long window may reduce the power of the test statistics. Zhang's study (2012) into the earnings announcements and information leakage, as well as the study of Meznar et al. (1994), used the length (-30, 10) as an event window. Meanwhile, McWilliams and Siegel (1997) argued that the length of the event window should be identified depending on the nature of the event, thus, if the event study seeks to explore the information leakage, the event window should contain some days before the event day so as to catch the abnormal returns connected to the leakage of information. Considering the event date is a (0) day, this research applies a medium length event window - which is (-30, 10) trading days for the annual earnings announcements and (-20, 10) trading days for the quarterly earnings announcements. This length of window is deemed sufficient for investigating the presence of information leakage before the event date and also for demonstrating the market reaction and adjustment to the earnings announcements after the event date.

In addition to the event window, the estimation period should be defined to ascertain the movement and returns of the stock price in the absence of the event.

It is used to calculate the parameters and return means for the normal expected return models. The estimation period is the days before or after the event window as it is assumed that the event doesn't have an influence on these days and so they are deemed the appropriate time to calculate the normal returns. Campbell et al. (1997) stated that the most popular and reasonable selection is to apply the estimation period before the event window, and when the event study applies the daily data, the estimation period could be over 120 days before the event window. The longer estimation period is better for minimising the effect of such events on stock prices. This research utilises a long estimation period with 200 trading days before the event window to enhance the reliability of the results of the expected normal return and to minimise any biases. Thus, the estimation period for the quarterly earnings announcements is (-220, -21) and the estimation period for the annual earnings announcements is (-230, -31).

7.2.3 Abnormal Returns

The information leakage is investigated through exploring the abnormal returns before the earnings announcements. Therefore, the main task in the event study is to identify the expected normal returns because the abnormal return is the difference between the actual return and the expected normal return (Kothari and Warner, 2006). Thus, the equation for the abnormal return for firm i at time t is:

$$AR_{it} = R_{it} + E(R_{it})$$

Where AR_{it}, R_{it} , and $E(R_{it})$ are the abnormal, actual and expected normal returns, respectively, for firm i at time t. The expected, or normal, return is defined as "the expected return without conditioning on the event taking place" (MacKinlay 1997). There are several models applied in previous literatures to identify the expected normal returns, such as the constant mean return model, the capital assets pricing

model (CAPM), the market model, and the market-adjusted model (Brown and Warner, 1980; Brown and Warner, 1985; MacKinlay, 1997; Kothari and Warner, 1997). It is common in research to use two or more different models to estimate the anticipated normal returns.

Brown and Warner (1980) indicated that there was a small difference in the abnormal performance between the constant mean return model, the market-adjusted model, and the market model, however, when there was a clustering issue the models' combined data from the market performed better than the constant return model. In addition, MacKinlay (1997) stated that the restrictions imposed by the CAPM model are doubtful and the issue can be lessened by applying the market model, which is considered the common model for estimating the expected return. To confirm the reliability and validity of the event study results, this research uses three models to estimate the expected normal return- the constant mean return model, the market model, and the market-adjusted model, as presented in Brown and Warner (1980; 1985),, Campbell et al. (1997), MacKinlay (1997), and Kothari and Warner (2006).

7.2.3.1 Constant Mean Return Model

The constant mean return model assumes the expected return for a specific security is constant, but which can be different between securities (Brown and Warner, 1980). The equation of the expected return in the constant mean return model is:

$$E(R_{it}) = \mu_i + \varepsilon_{it}$$

$$E(\varepsilon_{it}) = 0 \qquad var(\varepsilon_{it}) = \sigma^2_{\varepsilon_i}$$

where $E(R_{it})$ is the expected return of a given security i at time t, μ_i is the mean return of the security i during the estimation period, and ε_{it} is the time period t disturbance term for stock i with an expectation of (0) and variance ($\sigma^2_{\varepsilon_i}$) (MacKinlay,

1997; Campbell et al., 1997). Brown and Warner (1980; 1985) indicated that even the constant mean return model is considered a simple model but it often provides outcomes comparable to the outcomes generated by the advanced models.

7.2.3.2 Market-adjusted Model

The market-adjusted model assumes that the expected returns are equivalent across securities, but this may not be constant for a specific security at different times (Brown and Warner, 1980). In the market-adjusted model, the abnormal return for security i at time t is:

$$AR_{it} = R_{it} - R_{mt}$$

where AR_{it} is the abnormal return of security i at time t, R_{it} is the actual return of security i at time t, and R_{mt} is the market return at time t (Brown and Warner, 1980; Brown and Warner, 1985; Kothari and Warner, 1997). Therefore, identifying the abnormal returns through the market-adjusted model doesn't contain the estimation period.

7.2.3.3 Market Model

The market model is a statistical model that links any security return to the market portfolio return, with the equation of this model as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it}) = 0 \qquad var(\varepsilon_{it}) = \sigma^2_{\varepsilon_i}$$

where R_{it} is the expected return of security i at time t, R_{mt} is the market index return at time t, ε_{it} is the (0) mean disturbance term, and α_i, β_i, and $\sigma^2_{\varepsilon_i}$ are the parameters of the market model (Campbell et al., 1997; MacKinlay, 1997). MacKinlay (1997) stated that the market model is more advanced compared with the constant mean

return model as it lowers the variance in the abnormal returns by reducing the variance in the market return, which can in turn increase the chance of revealing the event's influence. For all three models of the expected returns, the daily stock return is calculated using the historical information of firms' stock by applying the following formula:

$$R_{it} = (CS_{it} - CS_{it-1})/(CS_{it-1})$$

Where R_{it} is the stock rate of return of firm i at time t, and CS_{it} is the close price of stock of firm i at time t. In addition, the market index (TASI) return is calculated by utilising the historical information of TASI and implementing the following formula:

$$R_{mt} = (CM_{t} - CM_{t-1})/(CM_{t-1})$$

Where R_{mt} is the TASI index rate of return at time t, and CM_{t} is the close value of TASI at time t.

7.2.4 Aggregation and Cumulative Abnormal Return

The research applies the constant mean return mode, the market-adjusted model, and the market model to identity the abnormal returns of each stock in order to reveal the influence of the event on the stock price during the event window, and to therefore investigate the phenomenon of information leakage before the announcements in each stock. MacKinlay (1997) stated that the abnormal return investigations have to be aggregated to produce an overall conclusion regarding the influence of the studied event, whereby the aggregation occurs in two ways - through time and across stocks. Thus, the research aggregates the event studies of each stock through time, and the research then aggregates the event studies of all the quarterly earnings announcements together through both time and stocks. Furthermore, the research aggregates the event studies of all the annual earnings announcements together through both time and stocks. The aggregation of these

events works under the assumption that there is no clustering or overlap in the event window of any of the studied stocks, which indicates that the abnormal and cumulative abnormal returns are independent across stocks (MacKinlay, 1997). The cumulative abnormal returns (CAR) are important in making different periods for the event window, and the cumulative abnormal returns are defined as the sum of the abnormal returns from t_1 to t_2 which $t_1 \leq t_2$ as shown in the following formula (Campbell et al., 1997):

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}$$

This formula is for one stock so the abnormal returns can be cumulative stock by stock, and then the cumulative abnormal returns of all the stocks would be aggregated through time as the following formula (Campbell et al., 1997):

$$\overline{CAR}(t_1, t_2) = \frac{1}{N}\sum_{i=1}^{N} CAR_i(t_1, t_2)$$

This research uses different event windows for cumulative abnormal returns to investigate the information leakage incident before the earnings announcements, but also does so to reveal the market reaction after the earnings announcements. The event windows for the quarterly and annual earnings announcements are (0,10), (0,5), (-1,0), (-2,0), (-3,0), (-4,0), (-5,0), (-10,0), (-15,0), and (-20,0), while for the annual earnings announcements, there are two windows added - (-25, 0) and (-30, 0).

7.2.5 The Test Statistics

The test statistics assess the null hypothesis concerning the abnormal and cumulative abnormal returns. The null hypothesis in the event study is that both the abnormal and cumulative abnormal returns are equal to (0) in the event window,

depending on the efficient market hypothesis. When the test result indicates statistical significance with abnormal returns and cumulative returns not equal to (0), that means the null hypothesis is rejected. MacKinlay (1997) indicated that using the statistical test for one event investigation is not likely to be adequate, and therefore the statistical test should focus on the aggregated event studies. Additionally, Brown and Warner (1985) stated that the strength of the statistical test would be weakened by the returns of one stock as it has high variance, and also the Central Limit Theorem confirms that the returns in the cross-section of stocks are independent and identically distributed so that the distribution of the sample's mean returns would be close to normal as the number of stocks rise. Therefore, the statistical test would be conducted on the events of annual and quarterly earnings announcements which are aggregated through both time and stocks, and also on the different aggregated windows of the cumulative abnormal returns. This test is to generate clear conclusions about the effect of the event on stocks as well as the presence of the information leakage in the Saudi market. The literatures argued that the parametric test depends on the significant assumption that the abnormal returns of one firm are normally distributed (Serra, 2002).

This research uses a parametric test - the cross-sectional t test - to assess the null hypothesis related to the event studies. The cross-sectional test also assumes that the abnormal returns of stocks are independent and identically distributed (Saens and Sandoval, 2005). The test was first discussed by Brown and Warner (1985) as they observed that the traditional t-statistics do not work well when examining the abnormal returns on the event date when the variance rises (Higgins & Peterson, 1998). The cross-sectional t test was discussed by Brown and Warner (1985), Higgins and Peterson (1998), Serra (2002), and Saens and Sandoval (2005). The cross-sectional test for testing the null hypothesis of the aggregated abnormal returns - which is the average abnormal returns (AAR) at time t - is

$$t_{AAR_t} = \frac{AAR_t}{SD_{AAR_t}}$$

Therefore, the average abnormal return is divided by its contemporary standard deviation cross-section and the standard deviation is as follows:

$$SD_{AAR_t} = \sqrt{\frac{1}{N(N-1)} \sum_{i=1}^{N} (AR_t - AAR_t)^2}$$

Thus, the cross-sectional test is close to the traditional t-statistics but it uses the standard deviation over the event window instead of the standard deviation over the estimation period (Higgins and Peterson, 1998). For the cumulative returns the cross-sectional test for testing the aggregated cumulative abnormal returns - which is the cumulative average abnormal returns (CAAR) from the interval time t1 to t2 - is as follows:

$$t_{CAAR_{(t1,T2)}} = \frac{CAAR_{(t1,t2)}}{SD_{CAAR_{(t1,t2)}}}$$

Where $t1 < t2$, and the standard deviation of the cumulative average abnormal returns is:

$$SD_{CAAR_{(t1,t2)}} = \sqrt{\frac{1}{N(N-1)} \sum_{i=1}^{N} \left(CAR_{i(t1,t2)} - CAAR_{(t1,t2)}\right)^2}$$

Based on the efficient market hypothesis, the average abnormal returns and the cumulative average abnormal returns are equal to (0), and therefore the following null hypothesis for the cumulative average abnormal returns can be tested:

H: The expected cumulative average abnormal return before earinings announcment is equal to (0).

7.3 The Empirical Results and Discussion

7.3.1 The Empirical Results

The research sample of the event study includes all the quarterly and annual earnings announcements published on the official website of the Saudi Stock Exchange (Tadawul), and covers the period from the 2006 to 2014 financial years. The data is divided into all the periods from 2006 to 2014, from 2006 to 2008, and from 2009 to 2014. These divisions arose because between 2006 and 2008 the Saudi corporate governance regulations were set only as a guidance for all firms, but from the beginning of 2009 the authority started to impose several important codes. Therefore, the period between 2009 and 2014 is different from the years between 2006 and 2008 as all Saudi listed firms were obligated by law from 2009 to apply several codes such as raising the number of non-executives and independents on the board, creating the audit, numeration and nomination committees, drafting internal corporate governance codes, laying down specific standards for the board membership, and establishing a special system for the firms' insider monitoring and control.

Therefore, the research aims to investigate the market transparency and the presence of the information leakage problem before and after imposing the important corporate governance regulations in order to reveal how setting the CGR as guidance and imposing its important codes improve the market transparency and decrease the issue of the information leakage. However, few earnings announcements were excluded because there was no information related to the stock prices associated with these announcements to calculate the firms' abnormal returns. Moreover, because the annual financial report is more responsible and creditable compared with the quarterly report, the research also divides the annual data based on the type of announcements into good and bad news to show how the result is different depending on the nature of the announcements.

Reporting the number of events during the period between 2006 and 2014, Table 7-1 shows the number of the quarterly earnings announcements based on the three types of period. There are 4420 quarterly earnings reports from the financial years of 2006 until the financial year of 2014.MoreoverFurthermore, the number of the quarterly earnings disclosures for the period between 2006 and 2008 is 912. For the period between 2009 and 2014, there were 3508 quarterly earnings announcements. In contrast, Table 7-2 reports the number of the annual earnings disclosures with three different kinds of period and with two types of news - good and bad. The number of the annual reports between 2006 and 2014 are 1135 divided between 663 goods news and 472 bad news. Moreover, the years between 2006 and 2008 contain 162 annual earnings announcements with 109 goods news and 53 bad news, while the years between 2009 and 2014 includes 973 annual earnings disclosures with 554 good news and 419 bad news. The results of the annual reports show that the announcements containing good news concerning the firms' earnings are more than the announcements with bad news.

Table 7- 1: Number of quarterly earnings announcements

2006-2014	**2006-2008**	**2009-2014**
4420	912	3508

Table 7- 2: Number of annual earnings announcements with good and bad news

2006-2014			**2006-2008**			**2009-2014**		
All	Good	Bad	All	Good	Bad	All	Good	Bad
1135	663	472	162	109	53	973	554	419

The following tables report the cumulative abnormal returns (CARs) before and after the quarterly and annual earnings announcements which are calculated via three models – the market-adjusted model, the constant mean return model, and the market model. The presence of abnormal returns before the earnings disclosures is a signal for insider trading based on insider information leaked before the official

announcements, and which violates the law of the market and increases the information asymmetry issue between the investors. The following table presents the event study results based on three periods which are all the samples between 2006 and 2014, the sample between 2006 and 2008, and the sample between 2009 and 2014, as all these periods cover the years from issuing the CGR as a guide and also cover the data before and after imposing the main codes in the CGR. Moreover, as the annual announcements are more credited, the results are presented based on the type of the disclosures to reveal the difference in the level of the information leakage between the good and bad news.

Table 7-3 reports the CARs of the quarterly disclosures for all the three periods that are calculated by the market-adjusted model. In the CARs between 2006 and 2014, for the pre-announcement there is a significant CAR at (-20, 0) with 0.0046 that is decreased to 0.0021 at CAR (-10, 0), and also decreased further to -0.0024 at CAR (-1, 0), one day before the announcement. In the post-announcement, the insignificant CAR is increased to -0.0004 at CAR (0, 5) but increased significantly to 0.0039 at CAR (0, 10). Thus, the results show significant CARs in the pre-announcement. In the period before imposing the CGR between 2006 and 2008, the pre-announcement CARs shows that the CAR (-20, 0) is significant with -.0205, which increased to -0.0076 at CAR (-10, 0) and to -0.0062 at (-1, 0). With the post-announcements, the CAR (0, 5) is weakly significant with -0.0065, which increased to an insignificant value of -0.0002 at CAR (0, 10). In contrast, the CARs in the period after imposing the CGR between 2009 and 2014 report that there is a significant pre-announcement CAR at (-20, 0) with 0.0111, which is significantly decreased to 0.0046, and is also decreased to -0.0014 at CAR (-1, 0), one day before the announcement. For the post-announcement period, there is a non-significant CAR at (0, 5) with 0.0012, which increased to a significant CAR at (0, 10) with 0.005.

Table 7- 3: Cumulative Abnormal Returns (CARs) around 4420 quarterly earnings announcements- (Market Adjusted Model).

Window	Mean 2006-2014	Mean 2006-2008	Mean 2009-2014
Pro-announcements			
(0, 10)	0.0039 2.85***	-0.0002 -0.05	0.005 3.73***
(0, 5)	-0.0004 -0.39	-0.0065 -1.92*	0.0012 1.13
Pre-announcements			
(-1, 0)	-0.0024 -3.95***	-0.0062 -3.47***	-0.0014 -2.34**
(-2, 0)	-0.0024 -3.31***	-0.0099 -4.39***	-0.0004 -0.63
(-3, 0)	-0.0025 -3.07***	-0.0124 -4.69***	0.0001 0.09
(-4, 0)	-0.0029 -3.315***	-0.0154 -5.26***	0.0003 0.39
(-5, 0)	-0.0021 -2.19**	-0.014 -4.36***	0.001 1.16
(-10, 0)	0.0021 1.78*	-0.0076 -2.08**	0.0046 4.02***
(-15, 0)	0.0034 2.41**	-0.0091 -2.30**	0.0066 4.63***
(-20, 0)	0.0046 2.76***	-0.0205 -4.34***	0.0111 6.64***
The cross-sectional t test is used and reported under the CARs value. Significance levels are reported as *** 1%, ** 5%, * 10%			

Additionally, table 7-4 concerns the CARs of the quarterly earnings announcements that are calculated by the constant mean return model, within the three types of periods. For the sample period between 2006 and 2014, the pre-announcement CARs shows that the CAR (-20, 0) is significant at -0.0101, which changed to -0.0114 at CAR (-10, 0), and to -0,007 at CAR (-1, 0). For the post-announcement window, the CAR (0, 5) is -0.0026, which increased significantly to 0.003 at CAR (0, 10). In the period before enforcing the CGR between 2006 and 2008, the pre-announcement CARs shows that the CAR (-20, 0) is significant at -0.0205, which decreased to -0.0529 at CAR (-10, 0) and then increased to -0.0226 at CAR (-1, 0). For the post-announcement window, the CAR (0, 5) is significant at -0.0361, which decreased to -0.039 at CAR (0, 10). In comparison, the CARs in the

period after enforcing the CGR between 2009 and 2014 show that there is a significant CARs in both CAR (-20, 0) and CAR (-15, 0) at 0.0107 and 0.0042, respectively, which decreased to a non-significant value of -0.0006 at CAR (-10, 0), and also decreased significantly to -0.003 at (-1, 0), one day before the announcement. For the post-announcement time, there is significant CARs at (0, 5) of 0.0061, which raised to 0.0151 at CAR (0, 10).

Table 7- 4: Cumulative Abnormal Returns (CARs) around 4420 quarterly earnings announcements- (Constant Mean Return Model).

Window	Mean 2006-2014	Mean 2006-2008	Mean 2009-2014
Pro-announcements			
(0, 10)	0.0039 2.28**	-0.039 -6.88***	0.0151 9.73***
(0, 5)	-0.0026 -1.98**	-0.0361 -7.88***	0.0061 5.42***
Pre-announcements			
(-1, 0)	-0.007 -9.59***	-0.0226 -9.26***	-0.003 -4.56***
(-2, 0)	-0.0094 -10.68***	-0.0326 -10.54***	-0.0034 -4.61***
(-3, 0)	-0.0121 -11.88***	-0.0428 -11.70***	-0.0042 -5.10***
(-4, 0)	-0.0145 -12.64***	-0.0511 -12.25***	-0.0049 -5.59***
(-5, 0)	-0.0145 -11.51***	-0.0528 -11.36***	-0.0045 -4.70***
(-10, 0)	-0.0114 -7.44***	-0.0529 -10.01***	-0.0006 -0.48
(-15, 0)	-0.0096 -5.30***	-0.0623 -11.25***	0.0042 2.46**
(-20, 0)	-0.0101 -4.56***	-0.0205 -4.34***	0.0107 5.17***
The cross-sectional t test is used and reported under the CARs value. Significance levels are reported as *** 1%, ** 5%, * 10%			

Moreover, table 7-5 reports the CARs of the quarterly earnings disclosures during the three types of data that are identified by the market model. In the full sample period between 2006 and 2014, the pre-announcements CARs demonstrate that the CAR (-20, 0) is significant at -0.0042 which is increased to -0.0025 at CAR (-10, 0) and to -0.0033 at CAR (-1, 0). For the post-announcement window, the CAR

(0, 5) is significant with -0.003. For the period between 2006 and 2008, the pre-announcement results report that the CAR (-20, 0) is significant with -0.0378 which increased significantly to -0.0179 at CAR (-10, 0) and to -0.0073 at CAR (-1, 0). The post-announcement CAR is significant at -0.0099 at CAR (0, 5). In contrast, the period between 2009 and 2014 shows significant CARs at (-20, 0) at 0.0045, which is decreased to 0.0015 at (-10, 0) and also to -0.0022 at (-1, 0). The post-announcement CAR is non-significant with -0.0012 at CAR (0, 5).

Table 7- 5: Cumulative Abnormal Returns (CARs) around 4420 quarterly earnings announcements- (Market Model).

Window	Mean 2006-2014	Mean 2006-2008	Mean 2009-2014
Pro-announcements			
(0, 10)	-0.0019 -1.37	-0.0002 -0.05	-0.0001 -0.10
(0, 5)	-0.003 -2.73***	-0.0099 -2.81***	-0.0012 -1.16
Pre-announcements			
(-1, 0)	-0.0033 -5.32***	-0.0073 -4.01***	-0.0022 -3.63***
(-2, 0)	-0.0036 -4.96***	-0.012 -5.18***	-0.0014 -2.08**
(-3, 0)	-0.0042 -5.06***	-0.0159 -5.81***	-0.0011 -1.51
(-4, 0)	-0.0049 -5.43***	-0.0204 -6.66***	-0.0009 -1.13
(-5, 0)	-0.0043 -4.38***	-0.014 -4.36***	-0.0004 -0.41
(-10, 0)	-0.0025 -2.03**	-0.0179 -4.68***	0.0015 1.26
(-15, 0)	-0.0038 -2.59***	-0.0227 -5.44***	0.0011 0.75
(-20, 0)	-0.0042 -2.37**	-0.0378 -7.42***	0.0045 2.56**
The cross-sectional t test is used and reported under the CARs value. Significance levels are reported as *** 1%, ** 5%, * 10%			

In addition, the research of Albogami et al. (1997) and Alzahrani (2009) showed that the investors have different perceptions of the quarterly and annual financial disclosures. Therefore, besides the event study of quarterly results, the following tables are also concerned with the results of the CARs of the annual

earnings announcements within the three kinds of periods, and also, depending on the nature of the disclosures, whether they are good or bad news. Thus, from all these outcomes, this research would conclude with valid and reliable outcomes regarding the insider trading incidents and the presence of the information leakage problem in the Saudi market.

Table 7-6 reports the CARs of annual earnings announcements depending on different times and news which are calculated by the market-adjusted model. For the full sample between 2006 and 2014, there is a pre-announcement significant CAR at (-30, 0) of 0.0129, which increased to a significant value of 0.0168 at CAR (-25, 0), and decreased to 0.0068 and 0.0016 at CAR (-15, 0) and (-1, 0), respectively. The post-announcement CARs are non-significant with values of -0.0026 and -0.0038 at CAR (0, 5) and (0, 10), respectively. Depending on the nature of the news, there are pre-announcement significant CARs in the good news at CAR (-30, 0) of 0.0232, which increased to 0.0234 at CAR (-25, 0), and decreased to 0.0097 and 0.005 at CAR (-15, 0) and (-1, 0), respectively. The CARs in the post-announcement good news are non-significant with -0.0024 at CAR (0, 5) and -0.004 at CAR (0, 10). In contrast, there are no CARs in the pre-announcement bad news as the result shows that there is a non-significant CAR at (-30, 0) with a value of -0.0016, at (-15, 0) with 0.0027 and at (-1, 0) of -0.0031. The post-announcement bad news also reports a non-significant CAR at (0, 5) of -0.0029 and at (0, 10) of -0.0037.

Moreover, for the period before enforcing the CGR between 2006 and 2008, there is a significant CAR in the full sample pre-announcement at CAR (-25, 0) of 0.0226, which decreased to 0.0074 at CAR (-2, 0) and to 0.005 at CAR (-1, 0). The full sample post-announcement shows a significant CAR at (0, 5) of 0.0266, which increased significantly to 0.0427 at CAR (0, 10). Relying on the nature of the news, the pre-announcement good news shows non-significant CARs at (-30, 0) of 0.0203

which decreased to -0.0063 at (-15, 0) and increased to 0.0026 at (-1, 0). The post-announcement good news reports a significant CAR at (0, 10) of 0.0252. In contrast to the bad news, there are non-significant pre-announcement CARs at (-25, 0) of 0.0252 and at (-15, 0) of 0.02 while there are weak significant CARs at (-3, 0) and (-2, 0) of 0.0174 and 0.0131 respectively. In the post-announcement bad news, there are significant CARs at CAR (0, 5) of 0.0587 which is increased to 0.0788 at (0, 10).

Comparing to the results of the period between 2006 and 2008, the next is the result of the yeas between 2009 and 2014 which is after enforcing the CGR. For the full sample, there are significant pre-announcement CARs at (-30, 0) of 0.0128 which is increased to 0.0158 at CAR (-25, 0) and decreased to 0.0076 at (-15, 0). The post-announcement windows show significant CARs at (0, 5) of -0.0075 and at (0, 10) of -0.0116. Based on the nature of the announcement, the pre-announcement good news shows significant CARs at (-30, 0) of 0.0238 which is decreased to 0.0129 at CAR (-15, 0), to 0.0089 at (-5, 0) and to 0.0055 at CAR (-1, 0). The post-announcement good news shows significant CAR at (0, 10) with value -0.0097. Moreover, the pre-announcement bad news reports that there are significant CARs at CAR (-4, 0) with a value of -0.0057 at CAR (-2, 0), of -0.0041, and at CAR (-1, 0) of -0.0048. In the post-announcement windows, there are significant CARs at (0, 5) with value -0.0107 and at (0, 10) of -0.0141.

Table 7- 6: Cumulative Abnormal Returns (CARs) around 1135 annual earnings announcements- (Market Adjusted Model).

Window	Mean 2006-2014			Mean 2006-2008			Mean 2009-2014		
	All	Good	Bad	All	Good	Bad	All	Good	Bad
Pro-announcements									
(0, 10)	-0.0038 -1.50	-0.004 -1.19	-0.0037 -0.91	0.0427 4.84***	0.0252 3.08***	0.0788 3.87***	-0.0116 -4.61***	-0.0097 -2.72***	-0.0141 -4.09***
(0, 5)	-0.0026 -1.29	-0.0024 -0.85	-0.0029 -1.0	0.0266 3.98***	0.0111 1.56	0.0587 4.40***	-0.0075 -3.68***	-0.005 -1.67*	-0.0107 -4.19***
Pre-announcements									
(-1, 0)	0.0016 1.39	0.005 3.03***	-0.0031 -2.01**	0.005 1.35	0.0026 0.59	0.0099 1.44	0.0011 0.88	0.0055 3.06***	-0.0048 -3.16***
(-2, 0)	0.0024 1.86*	0.0056 3.20***	-0.0022 -1.23	0.0074 1.87*	0.0046 0.98	0.0131 1.83*	0.0015 1.16	0.0058 3.08***	-0.0041 -2.31**
(-3, 0)	0.0025 1.68*	0.0064 3.17***	-0.0029 -1.33	0.0069 1.45	0.0018 0.00	0.0174 1.84*	0.0018 1.14	0.0073 3.36***	-0.0055 -2.58**
(-4, 0)	0.0024 1.38	0.0064 2.98***	-0.0033 -1.16	0.0057 1.03	0.0007 0.11	0.016 1.49	0.0018 1.02	0.0076 3.34***	-0.0057 -2.01**
(-5, 0)	0.0034 1.82*	0.0069 2.95***	-0.0016 -0.55	0.0026 0.44	-0.003 -0.44	0.0145 1.30	0.0035 1.83*	0.0089 3.66***	-0.0037 -1.22
(-10, 0)	0.0039 1.57	0.0082 2.39**	-0.0021 -0.58	-0.000 -0.01	-0.004 -0.27	0.0073 0.57	0.0046 1.89*	0.0106 3.33***	-0.0033 -0.88
(-15, 0)	0.0068 2.39**	0.0097 2.55**	0.0027 0.64	0.0023 0.21	-0.006 -0.47	0.02 1.14	0.0076 2.70***	0.0129 3.47***	0.0005 0.13
(-20, 0)	0.0114 3.26***	0.0143 3.46***	0.0073 1.20	0.0043 0.35	-0.002 -0.16	0.018 0.76	0.0126 3.57***	0.0176 4.34***	0.006 0.96
(-25, 0)	0.0168 4.37***	0.0234 5.14***	0.0074 1.12	0.0226 1.81*	0.0213 1.53	0.0252 0.99	0.0158 3.98***	0.0238 5.05***	0.0052 0.77
(-30, 0)	0.0129 3.19***	0.0232 4.81***	-0.0016 -0.23	0.0135 1.25	0.0203 1.54	-0.0005 -0.02	0.0128 2.93***	0.0238 4.60***	-0.0017 -0.23

The cross-sectional t test is used and reported under the CARs value. Significance levels are reported as *** 1%, ** 5%, * 10%

In addition, table 7-7 concerns the CARs of the annual earnings disclosures that are identified by the constant mean return model, and which are presented depending on different times and on the nature of the announcements. For the full sample between 2006 and 2014, there are significant CARs in the pre-announcement windows at (-30, 0) of 0.0224, which increased to 0.0316 at CAR (-25, 0) and to 0.033 at (-20, 0). The post-announcement windows show that the CAR (0, 5) is significant with a value of -0.0095. Based on the nature of the news, the pre-announcement good news reports significant CARs at (-30, 0) of 0.0269, which

increased to 0.0288 at CAR (-25, 0) and also increased to 0.032 at CAR (-20, 0) before decreasing to 0.0033 at CAR (-1, 0) - one day before the official announcement. In the post-announcement good news, the CAR (0, 5) is significant with a value of -0.0111. In contrast, there are significant CARs in the pre-announcement bad news at (-25, 0) of 0.0354, which decreased to 0.0201 at CAR (-15, 0), and also decreased to -0.0061 at CAR (-1, 0). The post-announcement bad news window reports as weakly significant at CAR (0, 5), with a value of -0.0071.

To compare between the CARs before and after enforcing the CGG, the full sample between 2006 and 2008 shows significant CARs in the pre-announcement windows at CAR (-25, 0) of 0.0354, which increased to 0.0673 at CAR (-20, 0), and decreased to 0.0186 at CAR (-3, 0). The full sample post-announcement reports CARs at (0, 5) of 0.0315, and was raised to 0.0504 at CAR (0, 10). For the good news between 2006 and 2008, the pre-announcement windows show significant CARs at (-20, 0) of 0.0442, which decreased to 0.0398 at CAR (-10, 0) and to 0.0181. Moreover, there is a significant CAR in the post-announcement good news at CAR (0, 10) of 0.0346. For the bad news between 2006 and 2008, the pre-announcement windows state a significant CAR at (-20, 0) of 0.1148, which is decreased to 0.0958 at CAR (-15, 0), but also decreased to 0.0714 at CAR (-10, 0).

In the period between 2009 and 2014, the full sample shows significant CARs in the pre-announcement windows at (-30, 0) of 0.0234 which increased to 0.0309 at CAR (-25, 0) and decreased to 0.0154 at CAR (-15, 0). For the full sample post-announcement, the CAR (0, 5) and (0, 10) are significant with a value of -0.0163 and -0.0081, respectively. Focusing on the nature of the news, the pre-announcement windows in the good news report significant CARs at (-30, 0) of 0.032 which were raised to 0.0324 at CAR (-25, 0) and decreased to 0.019 and 0.0082 at (-15, 0) and (-10, 0), respectively. The post-announcement in the good news shows that the CAR (0, 5) is significant with a value of -0.0167. The bad news

windows report that in the pre-announcement there is a significant CAR at -20, 0) of 0.0243 which decreased to -0.0097 at CAR (-4, 0), but also decreased to -0.0075 at CAR (-1, 0). The post-announcement window in the bad news states that the CAR (0, 5) is significant with a value of -0.0157.

Table 7- 7: Cumulative Abnormal Returns (CARs) around 1135 annual earnings announcements- (Constant Mean Return Model).

Window	Mean 2006-2014			Mean 2006-2008			Mean 2009-2014		
	All	Good	Bad	All	Good	Bad	All	Good	Bad
Pro-announcements									
(0, 10)	0.0002 0.08	-0.0021 -0.54	0.0035 0.75	0.0504 4.48***	0.0346 3.08***	0.0827 3.31***	-0.0081 -2.92***	-0.0093 -2.37**	-0.0066 -1.71*
(0, 5)	-0.0095 -3.75***	-0.0111 -3.28***	-0.0071 -1.90*	0.0315 3.52***	0.0173 1.80*	0.0609 3.30***	-0.0163 -6.60***	-0.0167 -4.71***	-0.0157 -4.76***
Pre-announcements									
(-1, 0)	-0.0006 -0.44	0.0033 1.86*	-0.0061 -3.21***	0.0071 1.72*	0.008 1.81*	0.0052 0.59	-0.0019 -1.36	0.0024 1.23	-0.0075 -4.11***
(-2, 0)	-0.0003 -0.22	0.0039 2.00**	-0.0064 -2.81***	0.0121 2.41**	0.0141 2.58**	0.0081 0.76	-0.0024 -1.59	0.0019 0.93	-0.0082 -3.79***
(-3, 0)	0.0003 0.15	0.0045 1.99**	-0.0057 -2.13**	0.0186 3.06***	0.0181 2.83***	0.0195 1.48	-0.0028 -1.61	0.0018 0.77	-0.0089 -3.60***
(-4, 0)	0.0005 0.25	0.0046 1.85*	-0.0052 -1.57	0.0257 3.55***	0.0236 3.02***	0.0299 1.95*	0.0018 1.02	0.0009 0.35	-0.0097 -3.06***
(-5, 0)	0.0026 1.19	0.0064 2.33**	-0.0027 -0.75	0.0316 3.96***	0.0298 3.40***	0.0355 2.13**	-0.0022 -1.04	0.0018 0.65	-0.0075 -2.23**
(-10, 0)	0.0103 3.56***	0.0134 3.63***	0.0059 1.28	0.0501 4.56***	0.0398 3.12***	0.0714 3.42***	0.0037 1.32	0.0082 2.28**	-0.0024 -0.55
(-15, 0)	0.021 6.37***	0.0217 5.23***	0.0201 3.72***	0.055 4.24***	0.0351 2.56**	0.0958 3.53***	0.0154 4.86***	0.019 4.57***	0.0105 2.16**
(-20, 0)	0.033 7.97***	0.032 6.58***	0.0344 4.74***	0.0673 4.41***	0.0442 2.85***	0.1148 3.44***	0.0126 3.57***	0.0295 5.97***	0.0243 3.53***
(-25, 0)	0.0316 6.68***	0.0288 5.03***	0.0354 4.41***	0.0354 2.08**	0.0107 0.58	0.0861 2.45**	0.0309 6.54***	0.0324 5.56***	0.029 3.69***
(-30, 0)	0.0224 4.61***	0.0269 4.55***	0.0161 1.95*	0.0163 1.08	0.0012 0.06	0.0476 1.59	0.0234 4.61***	0.032 5.15***	0.0121 1.42
The cross-sectional t test is used and reported under the CARs value. Significance levels are reported as *** 1%, ** 5%, * 10%									

Moreover, table 7-8 reports the CARs of the annual earnings that are calculated the market model which they are presented with three types of data times. In the full sample between 2006 and 2014, there is no significant CARs in the pre-announcement windows as the CAR (-30, 0) is non-significant with value -

0.0024 and the CAR (-1, 0) of 0.0002. In the post-announcement windows, there are significant CARs at (0, 5) and (0, 10) with value -0.0067 and -0.0102. The good news shows significant CARs in the pre-announcement windows at CAR (-3, 0) of 0.0034 which is increased to 0.0035 at CAR (-2, 0) and increased to 0.0036 at CAR (-1, 0), one day before the announcement. The post-announcement good news windows report significant CARs with value -0.0065 and -0.0109 at CAR (0, 5) and (0, 10). The bad news states CARs in the pre-announcement windows at CAR (-10, 0) of -0.009, at CAR (-4, 0) of -0.007, and at CAR (-1, 0) of -0.0046. In the post-announcement windows also there is CAR at (0, 5) of -0.0069 and at (0, 10) of -0.0092.

For comparison between 2006-2008 and 2009-2014, the full sample of the period 2006-2008 shows that there are significant CARs in the pre-announcement windows at CAR (-20, 0) of -0.028 and at CAR (-10, 0) of -0.0212. In the post-announcement windows, there is significant CAR at (0, 5) of 0.0193 which is increased to 0.0336 at CAR (0, 10). The good news shows significant CAR in the pre-announcement windows merely at (-15, 0) of -0.0266. The post-announcement windows in the good news report significant CAR at (0, 10) of 0.0204. Moreover, pre-announcement windows in the bad news show significant CAR just at CAR (-30, 0) of -0.0402 and at CAR (-10, 0) of -0.0289. The post-announcement windows in the bad news states significant CARs at (0, 5) of 0.0445 which increased to 0.0608 at CAR (0, 10).

For the period between 2009 and 2014, the pre-announcement windows in all news show no significant CARs as the CAR (-25, 0) is non-significant at 0.0033 and the CAR (-1, 0) is non-significant at 0.0043. The post-announcement windows in all news report significant CARs at (0, 5) and (0, 10) with values of -0.011 and -0.0175, respectively. In addition, the good news windows show significant CARs at (-5, 0) of 0.0055, which decreased to 0.0045 at CAR (-4, 0) and decreased to 0.0041

at CAR (-1, 0). The post-announcement windows show significant CARs at (0, 5) and (0, 10) with values of -0.0092 and -0.0171. In contrast, the pre-announcement windows in the bad news report significant CARs at CAR (-10, 0) of -0.0065, at CAR (-4, 0) of -0.0077, and at CAR (-1, 0) of -0.0058. The post-announcement windows in the bad news report significant CARs at (0, 5) and (0, 10) with values of -0.0107 and -0.0181, respectively.

Table 7- 8: Cumulative Abnormal Returns (CARs) around 1135 annual earnings announcements- (Market Model).

Window	Mean 2006-2014			Mean 2006-2008			Mean 2009-2014		
	All	Good	Bad	All	Good	Bad	All	Good	Bad
Pro-announcements									
(0, 10)	-0.0102 -4.03***	-0.011 -3.3***	-0.0092 -2.32**	0.0336 4.14***	0.0204 2.59**	0.0608 3.31***	-0.0175 -6.85***	-0.0171 -4.79***	-0.0181 -4.99***
(0, 5)	-0.0067 -3.32***	-0.006 -2.33**	-0.0069 -2.43**	0.0193 2.96***	0.007 0.98	0.0445 3.45***	-0.011 -5.36	-0.0092 -3.04***	-0.0107 -4.18***
Pre-announcements									
(-1, 0)	0.0002 0.12	0.0036 2.09**	-0.0046 -2.92***	0.0021 0.54	0.001 0.21	0.0043 0.62	-0.0002 -0.13	0.0041 2.22**	-0.0058 -3.74***
(-2, 0)	0.0002 0.11	0.0035 1.93*	-0.0045 -2.48**	0.0027 0.65	0.0018 0.34	0.0047 0.65	-0.0003 -0.20	0.0038 2.00**	-0.0057 -3.09***
(-3, 0)	-0.0005 -0.32	0.0034 1.67*	-0.006 -2.70***	-0.0002 -0.03	-0.002 -0.39	0.0041 0.43	-0.0005 -0.34	0.0045 2.08**	-0.0073 -3.30***
(-4, 0)	-0.0012 -0.66	0.003 1.37	-0.007 -2.46**	-0.0037 -0.64	-0.005 -0.70	-0.0015 -0.14	-0.0007 -0.40	0.0045 1.99**	-0.0077 -2.63***
(-5, 0)	-0.0008 -0.44	0.0029 1.18	-0.006 -1.99**	-0.0093 -1.49	-0.011 -1.38	-0.0068 -0.62	0.0006 0.29	0.0055 2.23**	-0.0059 -1.90*
(-10, 0)	-0.0035 -1.34	0.0004 0.122	-0.009 -2.40**	-0.0212 -2.06**	-0.017 -1.25	-0.0289 -2.23**	-0.0005 -0.20	0.004 1.23	-0.0065 -1.67*
(-15, 0)	-0.0035 -1.19	-0.002 -0.52	-0.0056 -1.24	-0.0257 -2.35**	-0.026 -1.92**	-0.0241 -1.34	0.0002 0.05	0.0028 0.72	-0.0033 -0.72
(-20, 0)	-0.0023 -0.62	-0.001 -0.27	-0.0038 -0.59	-0.028 -2.21**	-0.025 -1.65	-0.0338 -1.48	0.002 0.54	0.0035 0.84	-0.0001 -0.00
(-25, 0)	0.0023 0.57	0.0066 1.39	-0.0037 -0.53	-0.0036 -0.29	0.0038 0.25	-0.0187 -0.82	0.0033 0.78	0.0071 1.46	-0.0018 -0.24
(-30, 0)	-0.0024 -0.53	0.0046 0.88	-0.0121 -1.57	-0.0118 -0.91	0.002 0.13	-0.0402 -1.67*	-0.0008 -0.17	0.0051 0.93	-0.0086 -1.05

The cross-sectional t test is used and reported under the CARs value. Significance levels are reported as *** 1%, ** 5%, * 10%

7.3.2 Discussion

All investors in the efficient market would simultaneously receive all the financial information and announcements related to the stocks, however, some market analysts and investors can obtain leaked new and important information about the stocks before it is officially released to the public (Brunnermeier 2005). Therefore, the transparency of firm disclosures is the primary aspects of the efficient corporate governance regulations as investors anticipate receiving accurate and complete disclosures to conduct appropriate decisions on assessment of the firm (Heggen and Gannon 2008; Tsai 2014). Thus, effective corporate governance should increase the level of transparency and the credibility of the firms' activities as this would create an efficient system to control the acts of directors and managers and monitor their decisions. The important goals of corporate governance include protecting financial disclosures and encouraging firms to create a transparent environment by controlling and observing systems (Koh et al. 2007). Therefore, protecting financial announcements will support minimising the information asymmetry between managements, stockholders and other investors, as the financial disclosure is one of the significant channels of information that is obtained by investors in order to evaluate the success of both firms' managers and the firm itself. The OECD (2004) indicates that efficient corporate governance codes should lead to reliability and transparency in firms' disclosures for the confirmation of stockholders' interests.

The Saudi corporate governance regulations (CGR), which were legislated for in 2006, aim to organise the market and support the role of the firm's boards which controls and observes the managers' activities so as to secure the advantages focused on shareholders' interests. Additionally, the SCG aims to enhance the responsibility and transparency of both Saudi firms and the market. The Saudi Capital Market Law indicated that leaking inside information for insider

trading is prohibited and is also deemed as an illegal act (CMA 2009). As minimising insider trading and information leakage are significant steps, the authority needs continued evaluation in order to monitor the presence of the leakage of information in the market and to assess the efficiency of the current CGR and market systems so as to minimise the information leakage. Therefore, this research offers a valuable contribution as it is the first study that covers the years after the establishment of the Saudi CGR, and covers the years before and after enforcing several Saudi corporate governance codes. This helps to reveal to the researchers and the Saudi authorities the presence of the information leakage and insider trading, and how the CGR and enforcing its codes enhance the accountability and transparency of such a market. In the stock market, even though it is impossible to prevent all information leakage incidents and insider trading transactions, the effect of these transactions can be monitored by examining stock price activities prior to the official firms' disclosure dates (Keown and Pinkerton 1981).

The previous tables from 7-3 to 7-5 report the CARs before and after the quarterly earnings announcements. The tables show significant cumulative abnormal returns prior to the quarterly earnings announcement based on the market adjusted model, the constant mean return model, and the market model. Thus, all the models on all types of periods indicate the appearance of information leakage and insider trading in the Saudi market prior to the official date of the quarterly earnings disclosures. The market-adjusted model and the market model report that the significant CARs prior to the announcements in the period 2006-2008 are greater than the significant CARs in the period 2009-2014, which may indicate the positive influence of enforcing some of the important Saudi CGRs - which began in the year 2009 - on the accountability and transparency of Saudi firms. All models show negative significant CARs in the period 2006-2014, except for the positive significant CARs 20, 15, and 10 days prior to the announcement in the market-

adjusted model. Moreover, the results show different signs in the CARs of the pre-announcements in all models because the period 2006-2008 reports negative CARs while the period 2009-2014 reports positive CARs 20, 15, and 10 days before the announcement. For the post-announcement, the results suggest differences in the CARs between models as the constant mean return model shows significant CARsin 5 and 10 days, while the market-adjusted model reports CARs in the 10 days while the market models report CARs across 5 days.

Additionally, the prior tables from 7-6 through to 7-8 show the CARs before and after the annual earnings announcements. The tables show significant cumulative abnormal returns prior to the annual earnings announcement as calculated by the market-adjusted model, the constant mean return model, and the market model in both the good and bad news, and in all the periods except for the good news in the market-adjusted model. Therefore, this result depends on the annual disclosures confirming the previous outcomes of the quarterly disclosures, whereby insider trading incidents in the Saudi market based on information leaked to some investors and shareholders prior to the official date of announcement. This allowed them to use this special information for their benefit at the expense of other investors and shareholders who were not able to access the confidential information. For example, in the CARs of the good news calculated by the market-adjusted model between 2009 and 2014, there was a difference in the CARs prior to and after the announcement day, while table 7-6 shows that there is a significant CAR in (-5, 0) with a positive value of 0.0089, and in (-1, 0) also containing a positive value of 0.0055. Meanwhile, the CAR (5, 0) is significant with a negative value of -0.005 and the CAR (10, 0) is significant with a negative value of -0.0097. In addition, the result of the market model in table 7-8 concerns the good news between 2009 and 2014 and shows the pre-announcement CARs are significant at CAR (-5, 0) and CAR (-1, 0) of positive values of 0.0055 and 0.0041, respectively, while the

post-announcement CARs are significant at (0, 5) and (0, 10) with negative values of -0.0092 and -0.0171, respectively. These examples and results clearly show how investors can gain from the leaked information's positive CARs in one and five days before the official announcement date of the good news, and also how the CARs changed to negative CARs during the 5 days after this announcement.

Moreover, the pre-announcements' significant CARs in the good and bad news, in the market adjusted model in the period 2006-2008, are less than the significant CARs in the period 2009-2014, which goes against the results of the quarterly announcements and disproves the positive effect of enforcing the Saudi CGRs and their effectiveness in improving the firms and the market. Moreover, these significant CARs are concentrated in 2006-2008 at 30, 25, and 20 days before the announcement, while the CARs in 2009-2014 were concentrated on 10 and 5 days before the announcements. In addition, the tables show that the pre-announcement CARs - especially at 5 and 10 days prior to the announcements - are mostly associated with significant positive CARs in the good news, and with significant negative CARs in the bad news. The explanation for this result is that it is an indicator of the leaked information and insider trading incidents in the market because investors who gain leaked information with good news intend to buy more stocks before the stock price is further raised after the public announcement. In contrast, investors who obtain leaked information with bad news intend to sell their stocks before the stock price has fallen further after the public announcement.

For the post-announcement, the outcomes report that the market model shows more significant CARs in the post-announcement window compared with the market-adjusted model and the constant mean return model. Moreover, compared between the quarterly and annual disclosures in the market reaction, the tables show that the market reaction to all news of the annual disclosures was greater than the market reaction to all news of the quarterly disclosures, especially in the market

model and market-adjusted model during the 5 days after the official announcement date. This supports the results of the research of Albogami et al. (1997) and Alzahrani (2009) in that the market reaction towards the disclosures of Saudi firms is different between the quarterly and annual financial announcements because investors react more highly to the annual disclosures than the quarterly disclosures.

7.4 Conclusion

This chapter has assessed the presence and extent of information leakage incidents, prior to the official quarterly and annual earnings announcements in the Saudi Stock Exchange across the period 2006-2014. The chapter related the event methodology in detail, the event data, window and the sample. The event dates were the quarterly and annual earnings announcements of the firms listed in the Saudi Stock Exchange. The dates are unknown to all investors, therefore they are suitable events selected to investigate the information leakage phenomenon prior to the announcement date. The research applied a medium length event window, which is (-30, 10) trading days for the annual earnings announcements, as well as (-20, 10) trading days for quarterly earnings announcements. The estimation period for the quarterly earnings announcements was (-220, -21), while the estimation period for annual earnings announcements was (-230, -31). The analysis relied on three models to count abnormal returns, namely the constant mean return model, the market adjusted model and the market model. The cross-sectional t test was applied as a means of evaluating the hypothesis of the cumulative average abnormal returns. Additionally, this chapter discussed the results from investigating the cumulative abnormal returns and information leakage prior to the quarterly and annual earnings announcements, during the period 2006-2014. The results illustrated that all of the models across all of the periods, evidenced the availability of information leakage and insider trading in the Saudi market prior to the official

disclosure of quarterly earnings. Furthermore, significant cumulative abnormal returns prior to the annual earnings announcement were evidenced, by the market-adjusted model, the constant mean return model and the market model. This was the case for both good and bad news, as well as across all of the periods apart from good news in the market-adjusted model. Moreover, the market reaction towards Saudi firms' announcements was different between the quarterly and annual financial disclosures, because investors reacted more strongly to annual disclosures than they did quarterly disclosures. The subsequent chapter will explain the research methodology and selected model for investigating the effect of corporate governance on information leakage. There will also be a description of the dependent variables and control variables utilised in this model. Finally, the regression results and outcomes will be considered.

Chapter 8:

Corporate Governance Effect on Information Leakage:

Regression Analysis and Results

8.1 Introduction

The previous chapter presented the methodology relating to the event study, examining the existence of information leakage activities prior to the official quarterly and annual earnings announcements in the Saudi Stock Exchange, during the period 2006-2014. The research applied three models for calculating abnormal returns, namely the constant mean return model, the market adjusted model and the market model. The analysis also utilised the cross-sectional t test, as a means of evaluating the hypothesis of the cumulative average abnormal returns. Additionally, the previous chapter discussed the results of the investigation into cumulative abnormal returns and information leakage, prior to quarterly and annual earnings announcements. In this chapter, the discussion turns to the effect of corporate governance components on information leakage. The dependent variables are the cumulative abnormal returns and information leakage prior to official annual earnings announcements, which are calculated via the constant mean return model (CMRM), market adjusted model (MARM) and market model (MRM). The independent variables include ownership concentration (BLOK), government ownership (GOV), institutional ownership (INS), directors' ownership (DIRE), managerial ownership (MANAG), board size (BOSI), board independence (BOIN), board meetings (BOME), CEO duality (CEDU), audit size (AUSI), audit meetings (AUME), board subcommittees (BOCO) and market reform (MARE). The control variables comprise of firm growth (SAGR), leverage (LVRG), firm size (SIZE), year

dummy (Year) and industry dummy (Industry). The discussion will focus on the dependent and control variables, because the independent variables have already been reported in chapter 3 and tables 5-3, 5-4, and 5-5. Furthermore, there will be an outline of the regression analysis that was performed, in order to examine the effect of corporate governance components on information leakage. A justification is provided for selecting the System GMM model as the most suitable analytical model. Finally, the chapter presented and explains the regression results. Thus, the chapter is structured as follows: Section 8.2 discusses the regression analysis and model chosen for the relationship between corporate governance components and information leakage. Section 8.3 reports and discusses empirical results. 8.4 is the conclusion.

8.2 Regression Analysis

This research uses a regression analysis to investigate the effect of corporate governance components on firm information leakage and cumulative abnormal returns before the official annual earnings announcements. Because the research investigates four different types of samples, it uses four regression models, each of which represents a type of sample, as follows:

- Model (A), for all firms from every sector listed during the period between 2006 and 2014.
- Model (B), for non-financial firms listed during the period between 2006 and 2014.
- Model (C), for all firms from every sector listed during the period between 2009 and 2014.
- Model (D), for non-financial firms listed during the period between 2009 and 2014.

The regression model includes the dependent, independent, and control variables. The dependent variables include the cumulative abnormal returns CARs before the official annual earnings announcements. Three models are used to calculate the cumulative abnormal returns, which are the constant mean return model (CMRM), market adjusted model (MARM) and market model (MRM). This research implements the event window (-25, 0) to capture more CARs in this wider window and also applies the estimation period (-230, -31), as the longer period is effective to reduce the influence of such events on share prices. The event study methodology and calculating the abnormal returns CARs are already discussed in detail in the previous chapter. The independent variables include the corporate governance components, which are the ownership structures and board's features. Ownership structure components include the ownership concentration or the block-holders (BLOK), government ownership (GOV), institutional ownership (INS), directors' ownership (DIRE) and managerial ownership (MANAG). The board's features include the board size (BOSI), board independence (BOIN), board meetings (BOME), CEO duality (CEDU), audit size (AUSI), audit meetings (AUME) and board subcommittees (BOCO).

In addition, the research adds the market reform (MARE) as an independent variable to discover the level of information leakage before and after the corporate governance codes became obligatory. All models apply the same dependent, independent and control variables, with the exception of models (A) and (B), which include two more independent variables; the board subcommittees (BOCO) and market reform (MARE). This is because after 2009 almost all Saudi firms established board subcommittees, therefore in model (C) and (D) there are no differences between these firms with regards to having these committees. The measurements of the independent and control variables are presented in tables 5-

3, 5-4, and 5-5. In addition, the research hypotheses of the independent variables were discussed previously, in sections 3-2 and 3-3

8.2.1 Control Variables

To produce an accurate regression analysis and result regarding the effect of corporate governance components on firm information leakage, this research employs different control variables to control for other elements that may have an influence on information asymmetry, firm transparency, insider trading activities and information leakage and these elements are not accounted for and identified in the independent variables. According to a literature review, the most common control variables used in the study of the relationship between corporate governance and information asymmetry and information leakage are firm size (SIZE), leverage (LVRG), firm growth (SAGR) and time and industry dummies.

Firm size (SIZE) is anticipated to have an effect on corporate governance and information leakage and abnormal returns before announcements. Larger firms are expected to have more information and news to disclose than smaller firms (Ntim, Opong, Danbolt, et al. 2012). Therefore, these larger firms are expected to have incidents of leaked inside information more frequently than smaller firms. Heggen and Gannon (2008) state that it is argued that the amount of information leaked before the official announcement is associated with the size of companies. There are different empirical studies that apply size as a control variable in the relationship between corporate governance components and the phenomenon of information leakage and insider trading. For example, He and Rui's (2014) study in China found a positive relationship between the firm size and insider trading, while Heggen and Gannon's (2008) study also revealed a positive association between the size of a firm and abnormal returns before the announcements. In addition, other literature implicates firm size in the relationship between corporate governance and

information asymmetry, voluntary disclosures and firm transparency. This includes studies such as that of Donnelly and Mulcahy (2008) in Ireland, Lakhal (2005) in France, Samaha et al. (2012) in Egypt and Leung and Horwitz (2004) in Hong Kong.

Firm leverage may also have an influence on corporate governance practices, information leakage and information asymmetry. The firms with high leverage are expected to disclose more information to convince their creditors of the good condition of their firm (Ntim, Opong, Danbolt, et al. 2012). Heggen and Gannon (2008) found a negative relationship between the firm leverage and the amount of abnormal returns before the announcement. He and Rui (2014) further implicate this leverage in the relationship between ownership structures and cumulative abnormal returns. Other studies use leverage variables in the relationship between corporate governance and voluntary disclosures and information asymmetry. These include studies such as that of Baek et al. (2009) in the US, Lakhal (2005) in France, Samaha et al. (2012) in Egypt and Leung and Horwitz (2004) in Hong Kong.

In addition, firm growth is measured by the sakes growth and is expected to affect the corporate governance and information leakage incidents. Han et al. (2014) state that it is argued that investment and firm growth could become the source of information asymmetry. As the larger firms, those with high growth would have access to more insider news and improvements, so they are anticipated to have more leaked information and insider trading.

Finally, as discussed in section &&, the year and industry dummies variables are included in the research regression model in order to control for any factors that may influence the information leakage, insider trading and information asymmetry that may come from the industry or year effect and differences. There are several studies that apply the year and industry dummies as control variables to study their effect on information asymmetry, information leakage and firm transparency, including the studies of Byun et al. (2011), He and Rui (2014), Heggen and Gannon

(2008), Al-Janadi et al. (2013), Cai et al. (2006) and Samaha et al. (2012), all of which implement the industry dummies.

8.2.2 Descriptive Statistics of the Dependent Variables

This section presents the descriptive statistics of the model of the effect of corporate governance components on firm information leakage. The descriptive statistics include the mean, median, standard deviation, maximum and minimum value and the count number of the years' observation. The disruptive tables outline the dependent variables, independent variables and control variables for the four groups of data. The descriptive statistics of the independent and control variables are already presented in section 5-4. Therefore, this section reports the descriptive statistics of the dependent variables related to the cumulative abnormal returns models as information leakage proxies.

The following table 8-1 and Appendices 18, 19, 20, and 21 show the descriptive outlines of the cumulative abnormal returns and information leakage before the official annual earnings announcements for the four types of sample. The previous chapter discusses in detail the cumulative abnormal returns and information leakage in the Saudi market in different event windows. The research uses the event window (-25, 0) to investigate the relationship between the corporate governance and cumulative abnormal returns and information leakage. The models used to calculate the abnormal returns are CMRM, MARM and MRM.

Table 8-1 (data A) and Appendix (18) report the descriptive statistics for the cumulative abnormal returns for the three models for the sample of all firms between 2006 and 2014. The mean value of cumulative abnormal return (CAR) of the model CMRM is .103 and the maximum and minimum value are .591 and .001, respectively. The maximum mean value was recorded in the year 2006 and the

minimum mean value in the year 2013. In addition, the model MARM reports the mean value of CAR as being .070 and the maximum and minimum mean value as being .390 and .000, respectively. As is the case with the CMRM model, the maximum mean value of the MARM model is from the year 2006 and the minimum value from the year 2013. The MRM model reports the mean value of CAR as .076 and the maximum and the minimum mean values as being .462 and .000, respectively. All models show that there was a high level of CAR in the year 2006, which was the first year of issuance of the corporate governance regulations, while the level of CAR also decreased after 2006, which may imply that this market reform had a positive effect. Table 8-1 (data B) and Appendix (19) reveal the disruptive statistics for the sample of the non-financial firms between 2006 and 2014. The mean value of the CMRM model is .110 and the maximum and minimum mean values are .591 and .011, respectively. Besides, the mean value of the MARM model is .073 and MRM model is .081. As in data A, the highest mean value of CAR in data B is seen in the year 2006 and the lowest value in the year 2013.

Table 8-1 (data C) and Appendix (20) report the disruptive statistics for the sample of all of the firms between 2009 and 2014. The mean value of the CAR of CMRM model is .091 and the maximum and minimum values are 1.535 and .000, respectively. The mean values for the MARM and MRM models are 0.68 and .072, respectively. Table 8-1 (data D) and Appendix (21) show the disruptive outlines for the sample of the non-financial firms between 2009 and 2014. The mean value of the CMRM model is .048 and the maximum and minimum mean values are .922 and .000, respectively. The mean value of the CAR for MARM model is .062 and the mean value for the MRM model is .068. The highest CAR value for the three models can be seen in the year 2014. Table 8-1 shows that the mean value for the sample data between 2006 and 2014 is larger than the mean value of the sample between 2009 and 2014.

Table 8-1: Descriptive statistics of the dependent variables of all data

Variables	Data A	Data B	Data C	Data D
CMRM				
Mean	.103	.110	.091	.084
Median	.071	.079	.063	.061
SD	.100	.105	.110	.085
Maximum	.591	.591	1.535	.922
Minimum	.001	.001	.000	.000
MARM				
Mean	.070	.073	.068	.062
Median	.047	.051	.044	.042
SD	.071	.073	.100	.068
Maximum	.390	.390	1.631	.771
Minimum	.000	.000	.000	.000
MRM				
Mean	.076	.081	.072	.068
Median	.055	.060	.047	.047
SD	.076	.080	.103	.075
Maximum	.462	.462	1.716	.806
Minimum	.000	.000	.000	.000
Count	558	459	690	510

8.2.3 Model Selection

The research uses strongly balanced panel data, which has advantages over time series and cross sectional data. The research implements different statistical tests in order to evaluate the assumptions of the OLS and to reveal the appropriate regression estimation for the relationship between the corporate governance and firm information leakage and cumulative abnormal returns before the official earnings announcements. The first statistical test is the multicollinearity test to assess the level of correlation between the independent variables. As discussed in section 5.2.1 and 6.2.4, practically, the level of correlation in the regression model should be more than zero and the multicollinearity will be an issue if the level of correlation is very high.

To test for multicollinearity, the research applies Spearman's rank correlation coefficient as a non-parametric test, Pearson's product-moment correlation as a parametric test and the variance inflation factor (VIF) with its inverse tolerance (TOL). Gujarati (2004) indicates that the rule of thumb for the highly correlated variable in the VIF test is that the level of the VIF test will be more than 10 and also

that the rule of thumb for the pair-wise correlation coefficient is when the level of correlation exceeds 0.8. Appendix 14, 15, 16, and 17 report Spearman's rank correlation test and the Pearson correlation test results and show that the highest correlation level is .70 between the MARE and BOCO variables in models A and B, which is deemed to be unlikely to create a serious issue in the proposed models because it does not exceed the level of 0.8. In addition, table 6-2 reports that the highest levels of VIF are far below the rejected range, which is more than 10. Thus, the result shows that there is no series multicollinearity issue in the models.

In addition, as discussed in section 5.2, the assumption of the OLS model is that there is no autocorrelation or serial correlation issue between the errors. The serial correlation issue leads the OLS to produce insufficient coefficient estimations. As discussed in section 6.2.4, the Wooldridge (2002) test is used to discover the serial correlation in the model. Table 8-2 shows that the autocorrelation results in a null hypothesis; that is, there is no first order autocorrelation. From the table, models A and B in MRM have an autocorrelation issue, as they strongly reject the null hypothesis of no first order autocorrelation.

Table 8-2: Wooldridge Test for serial correlation (Ho: No first-order autocorrelation)

	CMRM	**MARM**	**MRM**
Model A			
F(1, 61)	2.651	0.001	5.290
Prob > F	0.108	0.971	0.024
Model B			
F(1, 50)	2.097	0.009	5.331
Prob > F	0.153	0.925	0.025
Model C			
F(1, 114)	2.427	1.814	1.756
Prob > F	0.122	0.180	0.187
Model D			
F(1, 84)	0.545	0.007	1.140
Prob > F	0.462	0.933	0.288

In addition, as discussed previously in section 5.2, the assumption of the OLS model is that the variance of the errors is constant and if it is not constant that means that the model has a heteroscedastic issue, which leads to inefficient OLS estimation

with over rejection of the null hypotheses. The research implements the Breusch-Pagan / Cook-Weisberg test to detect the heteroscedasticity problem. Table 8-3 shows that the null hypothesis of the test is strongly rejected in the four models, with a significance level of 1%. This outcome indicates that the heteroscedasticity issue is present in the four models and the variances of the errors are not constant.

Table 8-3: Breusch-Pagan / Cook-Weisberg Test for heteroskedasticity (Ho: Constant variance)

	CMRM	**MARM**	**MRM**
Model A			
chi2(25)	201.11	222.85	214.99
Prob > chi2	0.000	0.000	0.000
Model B			
chi2(25)	163.18	173.68	166.68
Prob > chi2	0.000	0.000	0.000
Model C			
chi2(21)	767.49	871.18	810.46
Prob > chi2	0.000	0.000	0.000
Model D			
chi2(21)	289.34	309.69	257.17
Prob > chi2	0.000	0.000	0.000

Further to the above, as discussed in sections 5.2 and 6.2.4, the researcher has to investigate the presence of an endogeneity issue in the regression model, as the assumption of OLS estimator is based on the exogenous, so if there is a correlation between the error term, the regressor will have an endogeneity problem. The research uses the Durbin (1954), Wu (1973) and Hausman (1978) (DWH) test to detect the presence of an endogeneity issue. The results of the DWH test indicate that all the four models suffer from an endogeneity issue.

8.2.4 System GMM Model

The prior statistical tests report that the research models on the effect of corporate governance components on information leakage experience serial correlation, heteroscedasticity and endogeneity issues. Therefore, simple OLS estimators such

as the random effects model and fixed effects model are not suitable because the assumptions are violated, which will lead to biased estimation and results. Bhagat and Jefferis (2002) and Boussaada and Karmani (2015) indicate that corporate governance research projects are more likely to face the issue of endogeneity. In addition, Rozanov (2008) indicates that the common issue in corporate governance studies is endogeneity and furthermore that this issue is potentially present in the results studies on the relationship between the corporate governance and insider trading because of the possible uncertainty related to the direction of causality, which may cause inconsistent estimation. One example of potential reverse causality is that the firm executives, who aim to conduct insider trading, may have an effect on selecting the directors to weaken the board monitoring role, so the hypothesis that states that the board structure has an influence on insider trading can be explained in terms of reverse causality by stating that insider trading incidents have influence on the board structure (Rozanov 2008). Another example of reverse causality is that some institutions invest only in firms with a good transparency environment and less illegal insider trading activities. Thus, in the first instant the result would be interpreted as that the institutional ownership has a negative effect on insider trading but an analysis of the real causality shows that incidents of insider trading and information leakage have a negative effect on institutional ownership (Rozanov 2008).

Thus, the research models consist of a dynamic structure, meaning that the dynamic model is therefore more appropriate to deal with the problems of serial correlation, heteroscedasticity and endogeneity. Brooks (2008) argues that the serial correlation in the data come from a dynamic structure that is not involved in the regression model and not identified nor captured in the study. A number of studies use the instrumental variable technique in investigating the relationship between corporate governance and insider trading, information leakage and

information asymmetry. These include studies by Dai et al. (2012), Jackson et al. (2008), Kanagaretnam et al. (2007), Byun et al. (2011) and Zhang (2012). The GMM method is one of the instrumental variable techniques and Roodman (2006) indicates that the GMM method is structured for a model that has endogeneity variables, unobserved heterogeneity, heteroscedasticity and autocorrelation within individuals.

Therefore, this research uses the same methodology discussed in section 5.2 and applied in section 6.2.5, which is the two-step System GMM model of Blundell and Bond (1998) and Arellano and Bover (1995). It is assumed that variables related to the corporate governance components, the control variables and the market reform are endogenic, except for the year and industry dummies variables, which are deemed to be exogenous because they do not depend on the past or the recent error term (Mangena et al. 2012; Roodman 2009). The research uses many independent variables and covers 9 and 6 years of observations, which means that it therefore implements one and two lags, as discussed in detail in section 6.2.5. The rule of thumb for the number of instruments is that it should not exceed the number of observations (Roodman 2006 and Roodman 2007). Furthermore, there are two specific tests that are used in the research to ensure the consistency and validity of System GMM models, which are the second order serial correlation (Arellano-Bond AR (2)) test used to assess the second order serial correlation and the Sargan test to ensure the validity of instruments. In addition, the year dummies are added to the GMM model to prevent cross-individual and contemporaneous correlation. Referring to the study of Wintoki et al. (2012), it can be seen that the equation for the System GMM estimator for the research models is:

$$\begin{bmatrix} \mathrm{IN}_{it} \\ \Delta\mathrm{IN}_{it} \end{bmatrix} = \alpha + \kappa \begin{bmatrix} \mathrm{IN}_{it-L} \\ \Delta\mathrm{IN}_{it-L} \end{bmatrix} + \beta \begin{bmatrix} \mathrm{EX}_{it} \\ \Delta\mathrm{EX}_{it} \end{bmatrix} + \gamma \begin{bmatrix} \mathrm{EN}_{it} \\ \Delta\mathrm{EN}_{it} \end{bmatrix} + \varepsilon_{it} \quad (i = 1, \dots, N;\ t = 1, .., T)$$

Where IN is the dependent variable, which is firm information leakage measured by CMRM, MARM and MRM, L is the period of lag, Δ is the time differencing, $\mathrm{EX}_{\mathrm{it}}$ is the vector of the independent variables that are assumed to be strictly exogenous, the time and industry dummies and $\mathrm{EN}_{\mathrm{it}}$ is the vector of independent variables that are assumed to be endogenous, which are the ownership concentration (BLOK), government ownership (GOV), institutional ownership (INS), directors' ownership (DIRE), managerial ownership (MANAG), board size (BOSI), board independence (BOIN), board meetings (BOME), CEO duality (CEDU), audit size (AUSI), audit meetings (AUME), board subcommittees (BOCO), the market reform (MARE), the firm growth (SAGR), the leverage (LVRG) and the firm size (SIZE).

8.3 Empirical Results and Discussion

8.3.1 Empirical Results

As discussed in the prior section, the System GMM method is the most suitable estimator to examine the effect of corporate governance mechanisms, information leakage and cumulative abnormal returns before the official date of the earnings announcements. This is due to the fact that the System GMM model can control for serial correlation, heteroscedasticity, individual heterogeneity and endogeneity. The expected relationship and research hypothesis between each variable and information leakage is discussed in sections 3.2 and 3.3. The following tables report the regression results based on the different models and the measurements of cumulative abnormal returns. Under each model there are the validity tests, which are the AR (2) and Sargan test.

Table 8-4 shows the influence of corporate governance mechanisms on information leakage and cumulative abnormal returns, identified by the constant mean return model (CMRM). Model A, for all firms from each sector listed between 2006 and 2014, reports that board independence has a positive effect on information

leakage, at the significant level of 5%. Market reform (MARE) and the presence of a subcommittee (BOCO) have a negative effect on information leakage, at the significant levels of 1% and 5%, respectively. The audit committee (AUSI) size also has a negative but weak significant influence on information leakage. The level of leverage (LVRG) is positively and significantly related to information leakage. Model B, for the non-financial firms listed between 2006 and 2014, indicates that the institutional ownership (INS) and board independence (BOIN) is positively associated with information leakage, with a weak significance. In addition, market reform (MARE) has a significant and positive effect while the presence of subcommittees (BOCO) has a significant and negative effect on information leakage. Model C, for all firms from each sector listed between 2009 and 2014, shows that the ownership concentration (BLOK) has a positive influence on information leakage at the significant level of 1%. Besides this, the institutional (INS) and managerial ownership (MANG) has a negative effect on information leakage at the significant levels of 1% and 5%, respectively. In addition, board independence (BOIN) and size (BOSI) is very significant and positively related to information leakage.

Board meetings (BOME) appeared to have a positive and significant impact on information leakage. Furthermore, CEO duality (CEDU) is also shown to have a positive and significant influence and the audit committee size (AUSI) is shown to have a negative and significant influence on information leakage. For the control variables, the level of leverage (LVRG) is positively associated and firm size (SIZE) is negatively associated with information leakage, all at the significant level of 1%. Model D, for the non-financial firms listed between 2009 and 2014, shows that ownership concentration (BLOK) has a significant and positive effect on information leakage. In addition, the managerial ownership (MANG) and audit committee size (AUSI) are negatively related to information leakage at the significant levels of 1%

and 5%, respectively. For the control variables, leverage (LVRG) has a positive effect, while the firm size (SIZE) has a negative effect, all significant at a level of 1%.

Table 8-4: System GMM Regression Model of the effect of corporate governance components on the information leakage of Saudi listed firms (Constant Mean Return Model)

The dependent variable is CMRM (cumulative abnormal returns, constant mean return model, at window (-25, 0)). All coefficients are based on the two-step System GMM model of Blundell and Bond (1998) and Arellano and Bover (1995) with one and two lags. Where BLOK is the ownership concentration (the percentage of stocks owned by large shareholders). GOV is the government ownership (the percentage of stocks owned by government). INS is the institutional ownership (the percentage of stocks owned by institutions). DIRE is the directors ownership (the percentage of stocks owned by directors). MANG is the managerial ownership (the percentage of stocks owned by managerial shareholders). BOSI is the board size (the number of directors in the board). BOIN is the board independence (the percentage of independent directors in the board). BOME is the board meetings (the number of board's meetings in each year). CEDU is the CEO duality (If CEO and chairman is not the same person = 1, 0 otherwise). MARE is the market reform (If the year from 2009 till 2014 = 1, 0 otherwise). BOCO is the board subcommittees (If firm has audit, nomination, and remuneration =1, 0 otherwise). AUSI is the audit committee size (the number of members in audit committee). AUME is the audit committee meetings (the number of the audit committee's meetings in each year). SAGR is the sales growth. LVRG is leverage (the percentage of total debt to the total assets). SIZE is the firm size (the natural log of firm's assets). Industry (each industry =1, 0 otherwise). Year (each year =1, 0 otherwise).

Independent Variables	**Model A**		**Model B**		**Model C**		**Model D**	
BLOK	-.0016	(-0.97)	.0001	(0.05)	.0013***	(6.88)	.0019***	(6.40)
GOV	.0010	(0.21)	-.0080	(-0.99)	-.0001	(-0.20)	.0004	(0.52)
INS	.0052	(1.09)	.0109*	(1.74)	-.001***	(-3.40)	-.0013	(-1.13)
DIRE	-.0001	(-0.32)	-.0005	(-0.99)	.0001	(0.83)	-.0002	(-1.02)
MANG	-.0018	(-0.22)	-.0064	(-0.63)	-.0005**	(-1.64)	-.0063***	(-3.33)
BOSI	.0160	(1.06)	.0208	(1.23)	.0146***	(4.56)	.0006	(0.15)
BOIN	.0003**	(2.32)	.0006*	(1.80)	.0012***	(6.00)	.0000	(0.18)
BOME	-.0013	(-0.39)	-.0042	(-0.87)	.0015**	(2.03)	-.0006	(-0.63)
CEDU	-.0721	(-1.12)	-.0056	(-0.04)	.0266***	(2.76)	.0190	(1.16)
MARE	-.0358***	(-3.48)	.0899**	(1.97)				
BOCO	-.0542**	(-2.17)	-.0972**	(-2.20)				
AUSI	-.0395*	(-1.68)	-.0583	(-1.47)	-.038***	(-5.07)	-.0197**	(-2.29)
AUME	-.0030	(-0.93)	-.0026	(-0.49)	-.0008	(-1.26)	-.0009	(-0.69)
Control Variables								
SAGR	-.0000	(-1.07)	-.0000	(-0.29)	.0000	(0.42)	.0000	(1.51)
LVRG	.0022***	(3.62)	.0002	(0.22)	.0013***	(8.50)	.0010***	(3.62)
SIZE	-.0381	(-0.94)	-.0134	(-0.22)	-.010***	(-2.68)	-.0248***	(-3.41)
Industry	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
Constant	.7749**	(1.63)	.4378	(0.58)	.1332**	(1.97)	.3713***	(3.42)
Observations	496		408		575		425	
Number of firms	62		51		115		85	
Number of instruments	472		424		227		223	
AR(2) test	(-.1020)		(-.3409)		(-.3627)		(-.1939)	
Sargan test	42.90		25.11		102.08		66.09	

The test statistics are reported in parentheses. ***, **, and * refer to the statistical significance at level 1%, 5%, and 10% respectively. AR (2) is the test for the second order serial correlation with H0= no serial correlation so the p-value > 0.05 indicates no serial correlation. Sargan test is to test the validity of instruments with H0= valid instruments so the p-value > 0.05 indicates the validity of instruments.

Table 8-5 reports the influence of corporate governance mechanisms on information leakage and cumulative abnormal returns measured by the market adjusted model

(MARM). Model A shows that there is a weak significant positive relationship between ownership concentration (BLOK) and information leakage. In addition, director ownership (DIRE) and audit committee meetings (AUME) have a negative influence on information leakage at significant levels of 5% and 1%, respectively. Model C shows that the director ownership (DIRE) is weakly significant and negatively related to information leakage while the audit committee size (AUSI) is strongly significant and negatively related to information leakage. Besides the above, model C shows that the ownership concentration (BLOK) and government ownership have a significant and positive effect on information leakage. Moreover, the institutional (INS) and director ownership (DIRE) have a significant and positive effect on information leakage at the significant level of 1%.

In addition, the managerial ownership (MANG) and the board size (BOSI) and meetings (BOME) are significantly and positively associated with information leakage. However, audit size (AUSI) is significantly and negatively related to information leakage. For the control variables, firm growth (SAGR) and leverage (LVRG) have a positive influence on information leakage while the firm size (SIZE) has a negative influence on information leakage, all at the significant level of 1%. In addition, model D reports that the ownership concentration (BLOK) is positively related to information leakage at the significant level of 1%, while the institutional (INS) and director ownership (DIRE) are negatively related to information leakage, at the significant levels of 5% and 1%, respectively. For the control variables, leverage (LVRG) has a significant positive effect and firm size (SIZE) have a significant negative effect on information leakage.

Table 8-5: System GMM Regression Model of the effect of corporate governance components on the information leakage of Saudi listed firms (Market Adjusted Model)

The dependent variable is MARM (cumulative abnormal returns, market adjusted model, at window (-25, 0)). All coefficients are based on the two-step System GMM model of Blundell and Bond (1998) and Arellano and Bover (1995) with one and two lags. Where BLOK is the ownership concentration (the percentage of stocks owned by large shareholders). GOV is the government ownership (the percentage of stocks owned by government). INS is the institutional ownership (the percentage of stocks owned by institutions). DIRE is the directors ownership (the percentage of stocks owned by directors). MANG is the managerial ownership (the percentage of stocks owned by managerial shareholders). BOSI is the board size (the number of directors in the board). BOIN is the board independence (the percentage of independent directors in the board). BOME is the board meetings (the number of board's meetings in each year). CEDU is the CEO duality (If CEO and chairman is not the same person = 1, 0 otherwise). MARE is the market reform (If the year from 2009 till 2014 = 1, 0 otherwise). BOCO is the board subcommittees (If firm has audit, nomination, and remuneration =1, 0 otherwise). AUSI is the audit committee size (the number of members in audit committee). AUME is the audit committee meetings (the number of the audit committee's meetings in each year). SAGR is the sales growth. LVRG is leverage (the percentage of total debt to the total assets). SIZE is the firm size (the natural log of firm's assets). Industry (each industry =1, 0 otherwise). Year (each year =1, 0 otherwise).

Independent Variables	**Model A**		**Model B**		**Model C**		**Model D**	
BLOK	.0018*	(1.66)	.0023	(0.83)	.0021***	(10.56)	.0007**	(2.48)
GOV	-.0004	(-0.08)	-.0097	(-1.15)	.0009***	(2.75)	-.0002	(-0.43)
INS	-.0054	(-1.50)	.0044	(0.99)	-.002***	(-8.57)	-.0020**	(-2.54)
DIRE	-.0010**	(-2.39)	-.0008*	(-1.68)	-.001***	(-9.64)	-.001***	(-5.20)
MANG	.0004	(0.09)	-.0075	(-0.49)	.0020***	(7.76)	.0000	(0.01)
BOSI	.0010	(-0.12)	-.0068	(-0.62)	.0078***	(3.25)	.0032	(0.86)
BOIN	-.0000	(-0.44)	.0002	(1.03)	-.0001	(-1.16)	-.0001	(-0.72)
BOME	.0017	(0.53)	.0008	(0.19)	.0040***	(5.92)	-.0003	(-0.38)
CEDU	.0187	(0.58)	-.0318	(-0.68)	.0128	(1.11)	-.0181	(-1.22)
MARE	-.0105	-1.41	-.0222	-0.57				
BOCO	.0114	(0.38)	.0342	(1.00)				
AUSI	-.0121	(-0.94)	-.0750***	(-2.82)	-.0064**	(-1.97)	-.0004	(-0.07)
AUME	-.0070***	(-2.65)	-.0012	(-0.34)	.0004	(0.81)	-.0007	(-0.76)
Control Variables								
SAGR	.0000	(1.39)	-.0000	(-0.84)	.0001***	(4.32)	-.0000	(-0.98)
LVRG	-.0002	(-0.53)	-.0006	(-0.62)	.0007***	(5.82)	.0010***	(5.02)
SIZE	-.0009	(-0.04)	.0050	(0.09)	-.024***	(-9.37)	-.0115**	(-2.18)
Industry	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
Constant	.0620	(0.27)	.3117	(0.36)	.3009***	(5.82)	.2374***	(3.27)
Observations	496		408		575		425	
Number of firms	62		51		115		85	
Number of instruments	472		424		227		223	
AR(2) test	(.1455)		(-.75698)		(-1.034)		(-.0780)	
Sargan test	35.54		27.00		92.77		66.50	

The test statistics are reported in parentheses. ***, **, and * refer to the statistical significance at level 1%, 5%, and 10% respectively. AR (2) is the test for the second order serial correlation with H0= no serial correlation so the p-value > 0.05 indicates no serial correlation. Sargan test is to test the validity of instruments with H0= valid instruments so the p-value > 0.05 indicates the validity of instruments.

Table 8-6 shows the effect of corporate governance components on information leakage and cumulative abnormal returns measured by the market model (MRM). Model A reports that board meetings (BOME) have a significant and positive influence while market reform (MARE) has a weakly significant and negative influence on information leakage. For the control variables, leverage (LVRG) is

positively and significantly related to information leakage. Model C states that ownership concentration (BLOK) and managerial ownership (MANG) have a significant and positive effect on information leakage while the institutional (INS) and director ownership (DIRE) have a significant and negative effect on information leakage. Board meetings (BOME) and CEO duality (CEDU) are significantly and positively associated with information leakage. However, audit committee size (AUSI) is significantly and negatively related to the level of information leakage. For the control variables, leverage (LVRG) has a significant and positive effect while firm size (SIZE) has a significant and negative effect on information leakage. Additionally, model D indicates that the ownership concentration (BLOK) and board meetings (BOME) are significantly and positively related to information leakage, while audit committee meetings (AUME) are significantly and negatively related to information leakage. For the control variables, firm growth (SAGR) and size (SIZE) have a negative and significant influence and leverage (LVRG) has a positive and significant influence on information leakage.

Table 8-6: System GMM Regression Model of the effect of corporate governance components on the information leakage of Saudi listed firms (Market Model)

The dependent variable is MRM (cumulative abnormal returns, market model, at window (-25, 0)). All coefficients are based on the two-step System GMM model of Blundell and Bond (1998) and Arellano and Bover (1995) with one and two lags. Where BLOK is the ownership concentration (the percentage of stocks owned by large shareholders). GOV is the government ownership (the percentage of stocks owned by government). INS is the institutional ownership (the percentage of stocks owned by institutions). DIRE is the directors ownership (the percentage of stocks owned by directors). MANG is the managerial ownership (the percentage of stocks owned by managerial shareholders). BOSI is the board size (the number of directors in the board). BOIN is the board independence (the percentage of independent directors in the board). BOME is the board meetings (the number of board's meetings in each year). CEDU is the CEO duality (If CEO and chairman is not the same person = 1, 0 otherwise). MARE is the market reform (If the year from 2009 till 2014 = 1, 0 otherwise). BOCO is the board subcommittees (If firm has audit, nomination, and remuneration =1, 0 otherwise). AUSI is the audit committee size (the number of members in audit committee). AUME is the audit committee meetings (the number of the audit committee's meetings in each year). SAGR is the sales growth. LVRG is leverage (the percentage of total debt to the total assets). SIZE is the firm size (the natural log of firm's assets). Industry (each industry =1, 0 otherwise). Year (each year =1, 0 otherwise).

Independent Variables	Model A		Model B		Model C		Model D	
BLOK	-.0001	(-0.18)	-.0008	(-0.37)	.0012***	(4.59)	.0008**	(2.37)
GOV	.0012	(0.25)	.0025	(0.32)	-.0001	(-0.28)	-.0011*	(-1.72)
INS	.0031	(0.89)	.0003	(0.08)	-.0014***	(-3.62)	-.0010	(-1.05)
DIRE	-.0006	(-1.61)	.0007	(0.41)	-.0008***	(-3.33)	-.0004*	(-1.78)
MANG	-.0072	(-1.04)	-.0038	(-0.54)	.0010***	(4.09)	-.0011	(-0.52)
BOSI	.0151	(1.32)	-.0016	(-0.15)	.0012	(0.57)	-.0039	(-1.05)
BOIN	.0002	(1.21)	-.0000	(-0.31)	-.0000	(-0.21)	-.0003	(-1.59)
BOME	.0083**	(2.19)	.0054	(1.20)	.0072***	(7.87)	.0033**	(2.48)
CEDU	.0538	(1.38)	-.0734	(-0.85)	.0344**	(2.37)	-.0073	(-0.38)
MARE	-.0165*	(-1.85)	-.0187	-0.53				
BOCO	-.0052	(-0.22)	.0117	(0.44)				
AUSI	-.0128	(-0.96)	-.0291	(-1.33)	-.0134***	(-2.76)	.0069	(0.90)
AUME	-.0017	(-0.51)	-.0067	(-1.16)	-.0008*	(-1.93)	-.0027**	(-2.44)
Control Variables								
SAGR	.0000	(0.77)	.0000	(0.74)	.0000	(1.35)	-.000***	(-4.02)
LVRG	.0010**	(1.99)	.0009	(0.97)	.0006***	(7.01)	.0004**	(2.07)
SIZE	-.0420*	(-1.77)	-.0234	(-0.39)	-.0241***	(-6.75)	-.013***	(-2.76)
Industry	Yes		Yes		Yes		Yes	
Year	Yes		Yes		Yes		Yes	
Constant	.4949*	(1.81)	.5928	(0.79)	.4121***	(7.22)	.2730***	(4.37)
Observations	496		408		460		425	
Number of firms	62		51		115		85	
Number of instruments	472		424		211		223	
AR(2) test	(.0123)		(-.3574)		(1.763)		(-1.177)	
Sargan test	31.96		31.26		90.75		62.87	

The test statistics are reported in parentheses. ***, **, and * refer to the statistical significance at level 1%, 5%, and 10% respectively. AR (2) is the test for the second order serial correlation with H0= no serial correlation so the p-value > 0.05 indicates no serial correlation. Sargan test is to test the validity of instruments with H0= valid instruments so the p-value > 0.05 indicates the validity of instruments.

8.3.2 Result Discussion

The following sub-sections are the results and discussion for every variable in the models related to the effect of corporate governance components on information

leakage, to confirm or reject the research hypotheses and also to give answers for the research questions.

8.3.2.1 Ownership Concentration

Reyna et al. (2012) indicate that ownership concentration can be a good control mechanism for monitoring of management activities. On the other hand, large shareholders intend to dominate the main decisions and gain control in the firm, which can increase their opportunistic behaviour at the expense of small shareholders. The research hypothesis for the ownership concentration and information leakage is that there is a significant and positive relationship between ownership concentration and firm information leakage. The research's empirical results for the data between 2009 and 2014 show that ownership concentration (BLOK) has a strong significant and positive effect on the level of information leakage and cumulative abnormal returns (CARs) before the official earnings announcements that are measured by the constant mean return, market adjusted and market models. The data from between 2006 and 2014 shows a non-significant relationship between ownership concentration and information leakage. The positive effect of ownership concentration (BLOK) supports the research hypothesis. Zhuang (1999) indicates that the large shareholders cause a poor transparency environment in the firm that leads to an increase in the information asymmetry between firms and investors. This is because large shareholders are not likely to improve the firm transparency and disclosures because this will reduce their power and control of the firm system (Zhuang 1999). Byun et al. (2011) argue that firms with a high level of concentration are more likely to enable large shareholders to use firm resources at the expense of small shareholders and therefore that these firms are less likely to disclose more information to facilitate opportunistic behaviours. One example of an opportunistic behaviour is the use of insider

information for shares trading by the management and large shareholders before it becomes public.

There are different empirical studies showing that ownership concentration has a negative influence on the level of firm disclosures, including those of Lakhal (2005) in France, Ntim and Soobaroyen (2013) in South Africa and Samaha et al. (2012) in Egypt. Byun et al.'s (2011) study reports that the ownership concentration has a positive relationship with the level of information asymmetry and informed trading. The research results showing a positive effect of ownership concentration indicate the importance of new rules and regulations that the Capital Market Authority (CMA) in Saudi Arabia should work on to mitigate the negative effect of large shareholders on firm transparency that leads to information leakage and insider trading incidents. The research result shows no differences between the firms from each sector and non-financial firms in the relationship between the ownership concentration and information leakage.

8.3.2.2 Government Ownership

There are several firms in the Saudi market that have a high percentage of government ownership, especially in the energy, petrochemical, mining and telecom sectors. Therefore, it is important to assess the effect of government ownership on firms' transparency, information leakage and cumulative abnormal returns before the public announcements. The research hypothesis for government ownership predicts that there is a significant and positive relationship between government ownership and firm information leakage. The research outcomes report mixed results, as all models show a non-significant relationship between government ownership (GOV) and firm information leakage, except for model C for the market adjusted model, which shows that government ownership (GOV) has a significant and positive influence on the level of information leakage and cumulative abnormal

returns. The positive effect of government ownership on information leakage is supported by the empirical study of Al-Janadi et al. (2013), which shows that the level of government ownership has a negative influence on the quality of firm disclosures, which can increase the information asymmetry between the management and investors. The mixed results of the research do not back the research hypothesis so it cannot give a robust verdict on the real effect of government ownership on information leakage. The research results are contrary to those of the studies of Zhang (2012) and He and Rui (2014), which reported that government ownership has a negative influence on information leakage and cumulative abnormal returns. In addition, the research results show that there is no difference in outcomes between the firms from each sector and the non-financial firms, except for those of model C in the market adjusted model, which shows that the data of firms from each sector has a positive significant effect while the data of non-financial firms has no significant effect.

8.3.2.3 Institutional Ownership

Institutional ownership is another type of ownership that may have some influence on firm transparency and information asymmetry. The literature reports contrastive results and the research hypothesis for the effect of institutional ownership on information leakage is that there is a significant and negative relationship between the two. The research's empirical outcomes show that the data between 2006 and 2014 indicates a non-significant relationship between institutional ownership and information leakage. The data between 2009 and 2014 shows that the sample of firms from every sector indicates negative and significant association between institutional ownership and the level of information leakage and cumulative abnormal returns before the public earnings announcements. The data for non-financial firms between 2009 and 2014 shows a non-significant relationship, except

for the results of the market adjusted model, which show a significant and negative relationship between institutional ownership and information leakage. The negative influence of institutional ownership supports the research hypothesis and arguments that institutional ownership provides a strong monitoring mechanism that can reduce the agency problem and opportunistic behaviours. When institutions own a high percentage of shares in the firm, they have strong incentives to monitor the management activities and their monitoring role is more effective in comparison to other types of shareholders, as they are more professional and have financial know-how, so they can effectively assess management actions, reports and decisions (Bos and Donker 2004; Donnelly and Mulcahy 2008). Therefore, firms are efficiently monitored by institutions and those that are experience less incidents of information leakage and insider trading.

The empirical study conducted by Lakhal (2005) shows that firms with high levels of institutional ownership are more likely to issue more information and voluntary disclosures, so they have less information asymmetry. In addition, Tsai's (2014) research indicates that trading depending on insider information is likely to be limited in firms with high foreign institutional ownership and this is explained as being either due to the fact that foreign institutions reduce the agency issue and information asymmetry, or the fact that foreign institutions select only the firms that have a good transparency environment. This research's outcomes show differing results for the firms from all sectors and non-financial firms, as the non-financial firms report a non-significant relationship. This indicates that institutional ownership has a weak effect on banks and insurance companies with regards to information leakage incidents. Because of the positive effect of institutional ownership on firm transparency, the Saudi authority is recommended to encourage institutions to take effective roles in the management of firms.

8.3.2.4 Director Ownership

Director ownership is believed to be a good mechanism and incentive for firms to minimise the agency problem and encourage directors to work for the best interests of shareholders (Mehdi 2007). Empirical studies report mixed results on the relationship between director ownership and firm transparency and information leakage. The research hypothesis for this relationship is that there is a significant and positive relationship between director ownership and firm information leakage. The research's empirical results show that director ownership has a significant and negative effect on the level of information leakage and cumulative abnormal returns before the public earnings announcements measured by the market adjusted model. The cumulative abnormal returns measured by the constant mean return model show no significant relationship between director ownership and information leakage. The market model shows significant and negative association between director ownership and information leakage for the data from between 2009 and 2014. The negative influence of director ownership on information leakage and information asymmetry is constant with the findings of Rose et al.'s (2013) study, which indicated the importance of director ownership on improving a firm's transparency and lowering the number of incidents of manipulation of earnings reports.

These findings are also in line with those of the empirical studies conducted by Vafeas (1999b) and Ju and Zhao (2014), which show that firms with a high level of director ownership have more board activities and their directors inhabit effective monitoring roles. As the market adjusted and market models are more sophisticated than the constant mean return model, the result showing a negative influence of director ownership on information leakage is more robust than the non-significant relationship between director ownership and information leakage. Therefore, it is suggested that the Saudi authority encourage listed firms, through new guidelines

and regulations, to make efforts to give directors greater involvement in the firm's future and objectives by increasing their shares of ownership. However, a number of studies also report a non-significant relationship, such as that of Cai et al. (2006), which reveals that there is no significant relationship between director ownership and the trading of shares based on insider information. The research shows no difference in the results between the firms from all sectors and the non-financial firms.

8.3.2.5 Managerial Ownership

Firms may use managerial ownership as incentives and rewards to ensure that the management's interests and objective are the same as those of shareholders. Therefore, it is expected that managerial ownership can reduce the agency problem and opportunistic behaviours and improve the firm's transparency. On the other hand, this mechanism may give shareholders more confidence, which will lead them to reduce their monitoring activities (Donnelly and Mulcahy 2008). This weak monitoring environment may thus result in incidents of information leakage and insider trading. The research hypothesis for managerial ownership states that there is a significant and positive relationship between managerial ownership and firm information leakage. The research's empirical outcomes show mixed signs and results with regards to this relationship. The constant mean return model for the sample data, from between 2009 and 2014, shows a significant and negative association between managerial ownership and information leakage while the market adjusted and market model for the firms from every sector between 2009 and 2014 show a significant and positive relationship between managerial ownership and information leakage. These mixed results provide weak support for the research hypothesis. Further to this, the results show that there is no significant relationship between managerial ownership and information leakage in the data

between 2006 and 2014 and also for the non-financial firms' data in the market adjusted and market models. This result is constant with the results of the empirical studies of Donnelly and Mulcahy (2008) in the Irish market and Baek et al. (2009) in the US market, which show that managerial ownership has no influence on firm transparency and information asymmetry. The research outcomes show differences in the results between the firms from all sectors and non-financial firms in the market adjusted and market models.

8.3.2.6 Board Size

The board of directors plays an important role in the corporate governance mechanism and has a large responsibility for monitoring the management's actions and leading the firm to pursue objectives in the shareholders' interests. Therefore, board size is expected to have a strong influence on firm transparency and information asymmetry. The research hypothesis for the relationship between board size and information leakage is thus that there is a significant and positive relationship between board size and firm information leakage. The research's empirical outcomes display mixed results. The sample of firms from every sector between 2009 and 2014 shows a significant and positive association between the board size and information leakage and cumulative abnormal returns measured by the constant mean return model and market adjusted model. Other models report a non-significant relationship between the firm size and information leakage. The non-significant effect doesn't support the research hypothesis, while the positive relationship between board size and information leakage does support the research hypothesis, which is backed by the argument that a reduction in board size has a positive effect on its monitoring role. It is indicated that a smaller sized board will have improved communication and cooperation between directors, which helps the board to extensively monitor management actions, which will in turn improve the

quality of firm disclosures and transparency and decrease the level of information asymmetry (Ajina et al. 2013; Lakhal 2005).

In addition, the research results from between 2009 and 2014 show that there are differences in the results between the firm data from all sectors and that from the non-financial firms, as the latter reports a non-significant relationship between board size and information leakage, which indicates that the size of the board has a greater influence in banks and insurance companies. This result is constant with that of of Zhang's (2012) study, which states that there is no significant association between the board size of Chinese non-financial listed firms and information leakage. Aside from this, it is constant with the empirical study of Huang et al. (2012), which reports that board size is not significantly related to illegal insider trading. Moreover, the study of Hussainey and Al-Najjar (2012) shows that there is no significant association between the board size and the level of information asymmetry.

8.3.2.7 Board Independence

A board of independent directors within a board is an effective mechanism for the monitoring and control of the actions of management in order to prevent opportunistic behaviours and safeguard the interests of shareholders (Elbadry et al. 2015; Ramdani and Witteloostuijn 2010). The research hypothesis for the relationship between board independence and information leakage is that there is a significant and negative relationship between the two. The research tables report inconclusive results for this relationship. The empirical outcomes show that board independence has a significant and positive influence on firm information leakage and cumulative abnormal returns measured by the constant mean return model, except for the sample of non-financial firms between 2009 and 2014, which reports

that board independence has no significant influence on information leakage. The tables also show that there is no significant association between independent directors and information leakage identified by the market adjusted and market models. This research's results do not support the research hypothesis that assumed there is a negative relationship between board independence and information leakage.

This result of a non-significant relationship is constant with the study of Zhang (2012) in China, which indicated that there is no relationship between board size and information leakage. Further to this, it is in the line the empirical study of Huang et al. (2012) in Taiwan, which reports that there is no significant association between board size and illegal insider trading. The research results are contrary to the findings of the empirical studies conducted by Kanagaretnam et al. (2007) in the U.S. and Elbadry et al. (2015) in the UK, which report that board independence has a significant and negative effect on firm information asymmetry. The research tables show no difference between the sample of firms from all sectors and the non-financial firms in the relationship between board independence and information leakage, except for the data between 2009 and 2014, which is measured using the constant mean return model.

8.3.2.8 Board Meetings

Brick and Chidambaran (2010) indicate that the board meeting is an indicator of the level of board activities and there is an argument in the literature regarding the effect of the frequency of board meetings on the board's monitoring roles and also on firm transparency and information leakage. The research hypothesis for the relationship between board meetings and information leakage states that there is a significant and negative relationship between the number of board meetings and firm information leakage. The research's empirical results are mixed. The results show

that the frequency of board meetings has a significant and positive effect on information leakage and cumulative abnormal returns, identified by the market model for all samples and which is also identified by the constant mean return and market adjusted models for the sample of firms from every sector between 2009 and 2014. The remaining samples report a non-significant relationship between the number of board meetings and the level of information leakage. The research outcomes do not support the research hypothesis completely, as the result is mixed with positive and non-significant effects, while the research hypothesis assumes a negative relationship.

These results may support the stewardship theory, which argues that firm executives are trustworthy and work for the best interests of shareholders (Donaldson and Davis 1991). Therefore, there is no need to increase the number of board meetings in order to enhance the monitoring role of the board, so these high volumes of meetings will add more costs to the firm and may also lead to leakage of insider information, as the subjects will be discussed more than is necessary. The research results contradict those of the empirical studies of Kanagaretnam et al. (2007), Elbadry et al. (2015), Ajina et al. (2013) and Xie et al. (2003), as these studies indicate that the frequency of board meetings has a significant and negative influence on information asymmetry. The research tables show that there are differences in the results between the sample of firms from every sector and non-financial firms in the constant mean return and market adjusted models between 2009 and 2014.

8.3.2.9 CEO Duality

The separation of roles between the CEO and board chairman is done in order to minimise the agency problem and to enhance the monitoring role of the board on the actions of management (Rechner and Dalton 1991). The effect of the CEO

duality or the separation of roles on firm information asymmetry, transparency and information leakage is inconclusive in the literature. The research hypothesis for this is that that there is a significant and positive relationship between CEO duality and firm information leakage. CEO duality is identified in the research by a value of 1 when the CEO and chairman are not the same individual and a value of 0 otherwise. The research's empirical outcomes show a mixed result for the relationship between CEO duality and information leakage. The tables show that the sample of firms from every sector between 2009 and 2014 indicate that CEO duality has a significant and negative influence on information leakage and cumulative abnormal returns measured by the constant mean return and market models. Further to this, all of the remaining samples report a non-significant association between CEO duality and information leakage. The empirical results do not support the research hypothesis, as this assumes that CEO duality has a positive influence on information leakage, but the research results indicate a negative and non-significant association between the CEO duality and information leakage. This outcome supports the stewardship theory, which assumes that the management is trustworthy and capable of simultaneously leading the management and board (Donaldson and Davis 1991). Therefore, the firm would be managed by one individual in both positions, which can give strong control to the CEO to monitor the firm and its valuable information from leaking to the market before it is published officially.

The negative influence of CEO duality is consonant with the empirical study of Huang et al. (2012) in Taiwan, which indicates that companies with CEO duality are less likely to see illegal insider trading activities. In addition, it is also in line with the studies of Haniffa and Cooke (2002) and Al-Janadi et al. (2013), which report that CEO duality has a significant and negative effect on information asymmetry. In addition, the non-significant relationship between CEO duality and information leakage is consonant in agreement with Zhang's (2012) empirical study in China. It

is also in line with the research of Ajina et al. (2013), which found that CEO duality has no significant effect on adverse selection and information asymmetry. However, the tables show differences in the results between the samples of firms from all sectors and the non-financial firms for the constant mean return and market models for the period between 2009 and 2014.

8.3.2.10 Board Subcommittees

Al-Janadi et al. (2013) indicate that board subcommittees are an important mechanism in the corporate governance system and that one of their main roles is to monitor the firm activities and confirm the transparency and accuracy of the firm reports and disclosures. Therefore, board subcommittees are expected to have an influence on firm information leakage. The research hypothesis for the relationship between the presence, or lack thereof, of board subcommittees is that there is a significant and negative relationship between the presence of board subcommittees and firm information leakage. The research's empirical outcomes show that the existence of board committees has a significant and negative influence on information leakage and cumulative abnormal returns measured by the constant mean return model. Besides this, there is no significant relationship between the presence of board committees and information leakage and cumulative abnormal returns identified by the market adjusted and market models. The results of the constant mean return model support the research hypothesis, while the results of the market adjusted and market models reject this hypothesis.

The negative effect of board subcommittees on information leakage and cumulative abnormal returns before the official announcement is consonant with the findings of Zhang's (2012) study in China. It is also consonant with the research of McMullen (1996), which reports that the audit committee has a postive effect on the quality and acuracy of a firm's reports and disclouseres. The studies of Anderson

and Bizjak (2003) and Vafeas (1999c) indicate that board committees have a positive influence on board effectiveness and the corporate governance system. Board subcommittees are important in corporate governance mechanisms because most decisions are first discussed in these committees and they also have a monitoring role, to ensure the accuracy of firm reports and disclosures (Al-Janadi et al. 2013;). The research results of no significant effect of board subcommittees are in line with the empirical study of Forker (1992), which shows that there is no significant relation between subcommittees and firm information asymmetry and transparency. The tables show that there are no differences in the results between the sample of firms from every sector and the non-financial firms.

8.3.2.11 Audit Committee Size

The audit committee plays a significant role in the firm, especially in aspects related to the financial process. Therefore, the size of the audit committee is expected to have an influence on firm transparency and information leakage. The research hypothesis for the audit committee size and information leakage states that there is a significant and negative relationship between the two. The research tables show that the size of the audit committee has a significant and negative effect on information leakage and cumulative abnormal returns before the public earnings announcements identified by the constant mean return model. Further to this, it has a significant and negative influence on information leakage for the market adjusted and market models for the sample of the firms from every sector between 2009 and 2014. The remaining samples report a non-significant relationship between the audit committee size and information leakage. The negative effect of audit committee size supports the research hypothesis and is justified by the argument of Anderson et al. (2004), which indicates that the audit committee that is large in size would be able to effectively monitor the firm's financial processes and operations, which would

enhance the firm's accuracy with regards to financial reports and disclosures, as well as improving the firm's transparency. This result is consonant with the empirical studies of Xie et al. (2003), Bryce et al. (2015), Al-abbas (2009) and Inaam and Khamoussi (2016), all of which report that audit committee size has a negative influence on firm information asymmetry. This results indicate the important role of audit committees in improving firm transparency, therefore the Saudi authority should ensure that each audit committee contains a large number of members and works independently, without any pressure from large shareholders. The tables show differences in the results between the sample of firms from every sector and the non-financial firms in the market adjusted and market models.

8.3.2.12 Audit Committee Meetings

The number of audit committee meetings may be deemed a sign of a committee's activities and effectiveness (Menon and Williams 1994). Therefore, audit committee meetings may have some effects on firm information asymmetry and transparency. The research hypothesis for the link between audit committee size and information leakage is that there is a significant and negative relationship between the number of audit committee meetings and firm information leakage. The research's empirical results display mixed results. Audit committee meetings have a significant and negative effect on information leakage and cumulative normal returns before the official earnings announcement identified by the market model. There is also no significant association between audit committee meetings and information leakage for the market adjusted and constant mean return models, except for the sample of firms from every sector between 2006 and 2014, which shows audit committee meetings to have a significant and negative effect on information leakage. This result showing a negative effect backs the research hypothesis and is supported by the argument put forward by Karamanou and Vafeas (2005), which holds that an

audit committee with more frequency meetings will be more able and have more time to observe and monitor the financial aspects in the firm so that it can play an important role in improving the transparency, accuracy and quality of financial information and disclosures. These results are consonant with those of the studies of Hamdan et al. (2013), Beasley et al. (2000), Farber (2005), Xie et al. (2003), Bryce et al. (2015), Elbadry et al. (2015) and Inaam and Khamoussi (2016), as these also indicate that audit committee meetings have a negative influence on firm information asymmetry. In addition, the tables show no differences in the results between the sample of firms from all sectors and the sample of only non-financial firms with regards to the relationship between audit committee meetings and information leakage.

8.3.2.13 Control Variables

The research applied control variables in order to study the relationship between corporate governance and information asymmetry and information leakage and these variables are firm growth (SAGR), firm size (SIZE), leverage (LVRG) and time and industry dummies. The empirical results report mixed outcomes for the relationship between firm growth (SAGR) and information leakage. The tables show that there is no significant relationship between firm growth and information leakage, which is the expected result from the market adjusted and the market models. The market adjusted model table shows a positive relationship between firm growth and information leakage in the sample of firms from every sector between 2009 and 2014, while the market model table shows a negative association between firm growth and information leakage in the sample of non-financial firms between 2009 and 2014. In addition, the empirical results show that a firm's level of leverage has a significant and positive influence on the level of information leakage and cumulative abnormal returns before the annual public earnings announcements. It

is argued that companies with a high level of leverage are anticipated to have more announcements to convince investors and creditors of their stable financial condition (Ntim, Opong, Danbolt, et al. 2012). Therefore, these companies are expected to have more incidents of leaked information than other companies.

This research result is contrary to that of Heggen and Gannon (2008), which indicates a negative association between firm leverage and abnormal returns before announcements. This empirical study also reports that firm size has a significant and negative effect on information leakage and cumulative abnormal returns before the annual official announcements. Thus large firms are less likely to have information leakage incidents. These results can be explained by the fact that large firms usually have a stronger control system in comparison to smaller firms, which means that they can prevent any opportunistic behaviour and illegal trading. This study's results go against the idea that larger firms have more leaked information due to a large number of events and announcements. In addition, they are contrary to the results of He and Rui (2014) and Heggen and Gannon's (2008) studies, which report a positive relationship between firm size and information leakage.

8.3.2.14 Market Reform

As the Saudi corporate governance regulations became mandatory for all listed firms in 2009, the research utilises year dummies in order to compare information leakage before and after 2009. This is in order to investigate how market reform (MARE) improves firm and the market transparency. The year dummies are reflected by a value of 1 for the years from 2009 till 2014 and the value of 0 for the years from 2006 till 2008. As the Model A is more effecint than Model B, the research's empirical results showed that the constant mean return and market models reported a significant and negative relationship between market reform and

information leakage, while the market adjusted model reports non-significant and negative association between market reform and information leakage. This result indicates that the market reform and making the CGRs obligatory for all Saudi listed firm improve the market transparency and reduce the information leakage and insider trading incidents as the information leakage incidents after 2009 are less than the information leakage incidents before 2009. However, even though the result confirms some evidence about the effect of new reform, there are different governance regulations show non-significant influence on the firm information leakage. Therefore, there new reforms should conducted in the Saudi market to improve the current corporate governance regulations.

8.4 Conclusion

This chapter has presented the dependent and control variables utilised during the regression analysis. A discussed was also provided concerning the regression analysis, which was conducted in order to investigate the influence of corporate governance components on firms' financial performance. A justification was made for identifying the System GMM model as the most appropriate during this analysis. Finally, the chapter provided and explained the regression results, concerning the effect of each corporate governance variable on firm financial performance. The results showed that for the data between 2009- 2014, ownership concentration (BLOK) had a positive effect on the degree of information leakage, which was measured according to the constant mean return, market adjusted and market models. Moreover, variable results were reported in terms of government ownership and institutional ownership. It was apparent that director ownership has a negative impact on the extent of information leakage, calculated using the market adjusted model and market model, while the constant mean return model showed no significant relationship. The research's empirical results showed mixed indicators

and results in terms of managerial ownership, board size, board independence, frequency of board meetings, size of the audit committee, audit committee meetings and CEO duality. For example, the tables indicated that the firm sample across each sector between 2009 and 2014 indicated that CEO duality has a negative influence on information leakage, measured through the constant mean return and market models, while the remaining samples indicated a non-significant correlation between CEO duality and information leakage. Additionally, the results evidenced that the existence of board committees has a negative impact on information leakage, measured through the constant mean return model, while no significant relationship was identified between the presence of board committees and information leakage, determined through the market adjusted and market models. Finally, the empirical results produced inconclusive outcomes based on the constant mean return and market models, which indicated a significant and negative correlation between market reform and information leakage. Nevertheless, the market adjusted model reported no significant correlation between market reform and information leakage.

Chapter 9:

Summary and Conclusion

9.1 Summary of the findings

This section summarises the results and findings that were reported in chapters 4, 6, 7, and 8. The aim of this research is to reveal corporate finance practices and to examine the effect of corporate governance components on firm performance and information leakage in Saudi Arabia. In order to conduct these examinations and answer the main research questions, this study comprehensively reviewed existing literatures and empirical studies as well as employing different methodologies, data, variables, statistical tests, and analyses. The primary research questions are:

- What are the corporate finance practices of Saudi firms?
- To what extent do CGRs affect firms' performances in Saudi Arabia?
- To what degree is information leakage extant within the Saudi Stock Exchange?
- To what degree does corporate governance impact upon information leakage in Saudi Arabia?

The following sub-sections present a summary of the findings as well as providing a response to the questions.

9.1.1 Corporate Finance Practices

This sub-section is related to the research question: What are the corporate finance practices of Saudi firms? In order to answer this research question, the a draft survey has been created which shares similarities with the survey of Graham and Harvey (2001) and Anand (2002); the necessary modifications have been made so as to ensure that the survey was appropriate for the economy and financial

environment in Saudi Arabia. The survey covered the main areas of corporate finance which include capital budgeting, cost of capital, capital structure, and dividend. The survey consisted of 62 subparts and the majority of questions applied the Likert scale from 1 to 5. The sample focused on the CFO of all Saudi listed firms by the end of May 2015 while there were 165 firms listed on Tadawul. 52 completed responses were collected with a response rate of 31.51. The findings of this sub-section are presented in detail in chapter 4, revealing in which ways Saudi practices are either similar to or different from the practices adopted in America, Europe, India and Kuwait. In addition, it also reveals whether Saudi's firm practices support the corporate finance theories and arguments that have been developed in western countries and taught in business schools. The findings evidently show that the most popular techniques employed for capital budgeting in Saudi firms are IRR and NPV which are similar to the practices in America, India, and Kuwait. Moreover, the most preferred analysis for assessing the project risks in Saudi firms is the scenario analysis which differs from the method adopted in Indian and Kuwaiti firms as their most preferred analysis is the sensitivity analysis. In regard to the findings relating to the cost of capital practices, the results indicated that the most popular method for estimating the cost of capital in Saudi firms are earnings and dividend yield which is different from the practices which have been implemented in American, European, and Indian firms as they all prefer the CAPM model; furthermore, it also differs from the practices adopted in Kuwait as the Kuwaiti firms expressed a preference for the WACC model. In addition, the Saudi firms prefer to utilise SAMA bills from 1 to 13 weeks at a rate for risk free rate of the CAPM model which is different from Indian firms as they appear to prefer the 10 years government Treasury bond rate; moreover, it is also different from the Kuwaiti firms as they prefer the 90 days T-bill. In regard to the beta factor, Saudi firms tend to favour the industry average which is a similar practice adopted by Indian firms although it differs from the method

implemented by Kuwaiti firms as they prefer the published source. In regard to the period that was used in calculating the beta factor, the Saudi firms prioritised the monthly share prices while this practice was the same one employed by both Indian and Kuwaiti firms. In addition, Saudi firms select the CFO's most effective estimate method for the market risk premium rate of the CAPM model which is a different practice than the one adopted by Indian and Kuwaiti firms as they apply the fixed rate of 9% to 10% and 6% to 8% respectively. In regard to the WACC model, the Saudi firms indicated that the tax rate that is widely applied is the Islamic assessment, Zakat, which is the same practice employed by Kuwaiti firms although it differs from the practice implemented in America, Europe, and India. However, Saudi firms utilise book value weights in the WACC model which is the same as Indian firms although different from the practices adopted by Kuwaiti firms since they adopt the market weights. In addition, the research results tested the various theories and concepts related to the capital structure. The results evidently showed a lack of support for the pecking-order theory. In contrast, the corporate practices adopted in in India, Latin America, and Kuwait generally provide support for the pecking-order theory. The Saudi firms indicated that financial flexibility is an important factor in determining the amount of debt; this is a similar practice to the one employed by American and European firms. Moreover, Saudi firms confirmed the importance of the transaction costs of issuing debt in making the capital structure which is considered to be a different practice from the one adopted by U.S. and Latin American firms. The Saudi practice fails to attach a great deal of importance to its competitors; furthermore, the industry level of debt in determining the firm's level of debt is a similar practice to the one implemented by U.S., European, Latin American firms. In addition, while the U.S., European, Latin American firms show a lack of awareness of the importance of transaction costs in relation to capital structure, the Saudi firms' practices provide adequate support for this factor which

confirms the trade-off theory. Saudi firms maintain that issuing a debt is an effective controlling mechanism for management actions whereas the U.S. firms did not support this concept. Moreover, in regard to the dividend theories and policy, Saudi firms prefer to establish a long-term target dividend pay-out ratio in order to focus on specific levels of dividends rather than to introduce changes and pay the dividends from the residuals from earnings following the desired investments. This practice is similar to the one employed by Indian firms. The firm also prefers to cancel dividends if there are good investments. The practices upheld by Saudi firms support the bird in relation to both the hand theory and signalling theory which is a similar practice as the one employed by Indian and Kuwaiti firms. In addition, they maintain that shareholders' preference is an important factor which should be taken into consideration when establishing the dividends policy. They also emphasise that establishing high level of dividends is an effective controlling mechanism on management actions; this practice is different from the practice adopted by Kuwaiti's firms. In addition, the research results reveal that the corporate finance practices of Saudi firms vary depending upon the firm and CFO's characteristics. Table 9-1 provides a comparison between the practices of corporate finance theories and models in Saudi Arabia and other countries based on the research findings.

9.1.2 Corporate Governance Effect on Firm Performance

This sub-section is related to the following research question: To what extent do CGRs affect firms' performances in Saudi Arabia? In order to answer this question, the research explored the various literatures and prior empirical studies and built the hypothesis for the expected relationship between the governance variables and firm performance. Next, the research applied a multivariate regression analysis to evaluate the hypotheses; the System GMM estimator was selected due to the fact that the regression models violated the OLS assumptions and experienced the

endogeneity, unobserved heterogeneity, heteroscedasticity, and autocorrelation issues. The System GMM model is able to control all of these issues. The sample contained all of Saudi's listed firms at the end of 2014. In order to increase the validity, accuracy, and robustness of the research results, the study adopted two types of firms as well as two periods of times. Moreover, it adopts three different methods to determine the dependent variable and firm performance, which are return on assets (ROA), return on equity (ROE), and Tobin' Q. Chapter 6 presents in greater detail the regression analysis and the research results showing the effect which corporate governance components have on firm financial performance. The findings reveal that the ownership concentrations have a significant negative effect on ROA and ROE; however, it has no significant effect on Tobin's Q therefore indicating that the negative effect of ownership concentration is related only to accounting-based performance rather than market–based performance. High level of ownership concentration and large shareholders also have a negative influence due to the fact that large shareholders would utilise firm resources for their own benefit over the expense and rights of small shareholders. In addition, the results evidently show that government ownership has a significant negative influence on ROA and ROE although it has no significant influence on Tobin's Q; therefore, it influences the accounting-based performance rather than the market-based performance. This result supports the argument that government ownership does not add value to a firm as the primary objective of purchasing shares is to establish a significant amount of power and influence over firms rather than to improve the firm growth and profits. Furthermore, government ownership helps to further establish a bureaucratic environment in a firm and allows its resources to benefit politicians. In regard to institutional ownership, the findings reveal that there is a significant and positive relationship between institutional ownership, ROE and Tobin's Q while there is no significant relationship between institutional ownership

and ROA. The positive influence of institutional ownership supports the argument that the institutions would add value to firms since they are more professional and they have extensive financial knowledge. In addition, the research findings report that the director ownership has a significant positive influence on ROE while it produces mixed results in regard to the effect which director ownership has upon ROA and Tobin's Q. The director ownership would encourage directors to improve firm performance since they will gain benefits from profits while they will also be affected by poor investment and plans that negatively influence the firm's value. Moreover, the findings show that there is a significant and positive relationship existing between the managerial ownership and ROA and ROE although there is no significant relationship between managerial ownership and Tobin's Q. Therefore, the positive effect which managerial ownership has upon accosting-based performance as opposed to market-based performance. The managerial ownership would enhance management performance and encourage their objectives and interests to coincide with the shareholders' interests. Therefore, it will reduce the number of agency problems and improve firm performance. In regard to board size, the research findings suggest that the board size has a significant and positive effect on ROA. The results also show mixed results for ROE and Tobin's Q proxies as board size has a significant and negative effect on ROE and Tobin's Q according to the sample of firms from every sector while it has no significant effect on ROE and Tobin's Q according to the sample of non-financial firms. These mixed results neither supports nor rejects the arguments regarding the effect of board size. In addition, the board independence reported inconclusive results as it has both a significant and negative effect on the ROE for the sample of firms from every sector while it has a non-significant effect on ROE for the sample of non-financial firms. It also has a non-significant influence on the ROA and Tobin's Q. The inconclusive results of the board independence did not provide a decisive conclusion regarding

its effect on firm performance. In addition, the board meetings' variable displayed mixed results in regard to its influence on firm performance. It showed that board meetings have both a significant and negative influence on ROA whereas it had a non-significant influence on ROE. It also revealed that this factor has a significant and positive influence on Tobin's Q. In regard to the CEO duality, the research's empirical results did not deliver a decisive conclusion in relation to CEO duality and the effect it has on ROA and ROE; furthermore, the results suggest that there is a non-significant relationship between CEO duality and Tobin's Q. In addition, the presence of board subcommittees' variable reveal that it has a strong significant and negative effect on ROA and has weak significant and negative effect on ROE. Moreover, it has no significant influence on the Tobin's Q. It therefore has a negative effect on the accounting–based performance whereas it has no influence on the market-based performance. In fact, the negative effect of board subcommittees indicates that Saudi's listed firms established all three committees in an attempt to adhere to the capital market authority; however, they do not provide these committees with the power to effectively perform and conduct their responsibilities. Therefore, these ineffective board subcommittees will only add further costs to the firm, such as travel costs and compensation fees, while most important and strategic plans and decisions are supervised by the board. In regard to the audit committee size, the findings indicate that there is a significant and positive association between the audit committee size and ROA and ROE. There is also a significant and negative association between the audit committee size and Tobin's Q. It therefore has a positive effect on the accounting-based performance while it has a negative effect on the market-based performance. The positive effect on firm performance supports the argument that an increase in members of the audit committee would enable it to effectively monitor the management's actions; in addition, these members would bring the necessary knowledge and skills to the committee in order to improve firm

performance. Moreover, the empirical results reveal that the audit committee meetings are significantly and positively related to the ROA and significantly and negatively related to Tobin's Q. In addition, they have no significant effect on ROE. Committee meetings are considered to have a positive effect on firms' performance due to the fact that an increase in the number of meetings can help to improve communications and coordination between the committee and the managers. Finally, the research results show inconclusive results in regard to the influence of market reform on firm performance as the results show a negative relationship between market reform and ROE as well as a non-significant relationship existing between market reform and ROA. The weak effect of market reform suggests that Saudi firms may require a longer period of time in order to effectively adjust governance practice and it may be that the firm incorporates the obligatory codes for public appearance rather than in an effort to improve performance. For example, the firm may assign a greater number of independent directors to the board although in reality these directors are controlled by the large shareholders and family owners. In addition, the firm may establish board subcommittees although these subcommittees lack both the power and authority to effectively carry out their roles and responsibilities. Several listed companies in Saudi Arabia are owned by families which are the larger shareholders who would prefer to assign the roles of board chairman and independent directors to those who are under their control since they wish to implement and direct strategic plans and make important decisions. (MORE)

9.1.3 The extent of Information Leakage

This sub-section is linked to the following research question: To what degree is information leakage extant within the Saudi Stock Exchange? In order to provide an answer to this question, the research utilises the event study methodology to investigate the presence of the information leakage phenomena prior to earnings

announcements in Saudi Arabia. The event date is the quarterly and annual earnings announcements made by the listed firms on Saudi's Stock Exchange between 2006 and 2014. For the event window, the research utilised an event window (-30, 10) trading days for the annual earnings announcements and (-20, 10) trading days for the quarterly earnings announcements. The estimation period is (-220, -21) for the quarterly earnings announcements and (-230, -31) for the annual earnings announcements. In order to calculate the abnormal returns, the research employed three models which are the constant mean return model, the market adjusted model, and the market model; moreover, the study applied the cross-sectional t test to assess the hypothesis of the cumulative average abnormal returns prior to the earnings announcements. The research hypothesis for the expected cumulative average abnormal return before the earnings announcement is equal to zero. The findings on the event study are presented in greater detail in chapter 7. The research results for the quarterly earnings announcements reveal significant cumulative abnormal returns prior to the quarterly earnings announcement based on all of the three models which confirms the appearance of information leakage and insider trading in the Saudi market prior to the official date of the quarterly earnings disclosures. The market-adjusted model and the market model both reveal that the significant CARs prior to the announcements during the period 2006-2008 are greater than the significant CARs in the period 2009-2014, which may indicate the positive influence of enforcing several of the important Saudi CGRs - which began in the year 2009 - on the accountability and transparency of Saudi firms. In addition, the results reveal that there are differences in the CARs for the post-announcement between models. In regard to the annual earnings announcements, the results show significant cumulative abnormal returns prior to the annual earnings announcement as calculated by the three models in both the positive and negative news, as well as in all the periods except for the positive news in the market-adjusted

model. Therefore, this result verified the theory of the quarterly disclosures which states that insider trading incidents occur in the Saudi market based on information which has been leaked to several investors and shareholders prior to the official date of announcement. Moreover, the pre-announcements' significant CARs relating to both positive and negative news in the market-adjusted mode and the market during the period 2006-2008 are less than the significant CARs in the period 2009-2014, thereby failing to support the results of the quarterly announcements; moreover, it disproves the positive effect of enforcing CGRs in Saudi and their overall effectiveness in improving the firms' performance as well as the market. Moreover, the significant CARs are concentrated in 2006-2008 at 30, 25, and 20 days prior to the announcement, whereas the CARs in 2009-2014 were concentrated within 10 and 5 days before the announcements were made. In regard to the post-announcement of annual earnings, the results suggest that the market model reveals more significant CARs in the post-announcement window compared with the market-adjusted model and the constant mean return model. In addition, in comparison to the quarterly and annual disclosures in the market reaction, the results show that the market's reaction to all of the news relating to the annual disclosures was greater than the market's reaction to all of the news of the quarterly disclosures, especially in the market model and market-adjusted model within the five days following the official announcement date.

9.1.4 Corporate Governance Effect on Firm Information Leakage

This sub-section is related to the research question: To what degree does corporate governance impact upon information leakage in Saudi Arabia? In order to answer this question, the research explored various literatures and empirical studies in order to present a review for the concept of the market transparency and information leakage and the role played by corporate governance mechanisms on firm

information leakage. Next, the research established a hypothesis for the relationship that exists between each governance component and information leakage. The research then conducted a regression analysis and applied the System GMM model to test the research hypotheses since the research model violated the OLS estimation. The research utilised the same sample of the regression analysis that examined the relationship between governance and firm performance. In regard to the dependent variables, the research implemented three methods of analysing cumulative abnormal return and information leakage to increase the level of accuracy, validity, and robustness of the results: constant mean return model, market adjusted model, and market model. In addition, the research used the event window (-25, 0) and the estimation period (-230, -31). The regression analysis and results discussion are presented in greater detail in chapter 8. The findings of the effect of corporate governance on information leakage reveal that ownership concentration has a significant and positive effect on information leakage and cumulative abnormal returns prior to the annual earnings announcements. This is due to the fact that large shareholders may create a firm environment that is lacking transparency since they wish to increase their ability to control managerial decisions as well as take advantage of firm resources. Furthermore, the results are fairly mixed in regard to the relationship that exists between government ownership and information leakage as all models suggest there is a non-significant relationship with the exception of the market adjusted model for the sample of firms from every sector which reported significant and positive relationship. In addition, in regard to institutional ownership, the results indicate a significant and negative relationship between institutional ownership and firm information leakage for all models except the constant mean return model and market model of the sample of non-financial firms which reported non-significant relationship. Institutional shareholders are more likely to improve firm transparency and disclosures in comparison to other

shareholders since they are professional and possess the necessary financial knowledge which enables them to effectively monitor the management's actions and disclosures. The findings of director ownership reveal mixed results as it has both a significant and negative influence on information leakage for the market adjusted models as well as for the market model of the sample of firms from every sector. In addition, it has a non-significant influence on the constant mean return model as well as on the market model of the sample relating to non-financial firms. In addition, the findings of managerial ownership show mixed results as it has a significant and negative effect on information leakage for the constant mean return model. Moreover, it has a significant and positive effect on information leakage for the market adjusted model and market model of the sample of firms from every sector while it has a non-significant effect on the sample of non-financial firms. The board size results were inconclusive as it has a significant and positive influence on the constant mean return model and market adjusted model of the sample of firms taken from every sector while it has a non-significant influence on the market model as well as on the constant mean return model and market adjusted model of the sample of non-financial firms. Moreover, the board independence also produced mixed results as it reported a non-significant relationship between board independence and information leakage for all models with the exception of the constant return model of the sample of firms taken from every sector which showed a significant and positive relationship. The frequency of board meetings suggest that there is a significant and positive relationship between the number of board meetings and information leakage for all models and samples with the exception of the sample of non-financial firms of the constant mean return model and market adjusted model, thereby revealing a non-significant relationship. In addition, the empirical results produced mixed outcomes for the relationship between the CEO duality and information leakage. In addition, the findings report mixed outcomes for the board

subcommittees since the presence of board subcommittees has both a significant and negative influence on information leakage for the constant mean return model, while it has a non-significant influence on information leakage for both the market adjusted model and market model. In addition, the audit committee size results reveal that there is a significant and negative association existing between the audit committee size for all models and samples except the sample of non-financial firms for the market adjusted model and market model. The large size of audit committees can effectively monitor the financial aspects of firm which would help to improve the firm's disclosures and enhance transparency. Moreover, the frequency of audit committee meetings produced mixed results as the number of audit committee meetings has a non-significant relationship with information leakage for all models and samples except the sample of non-financial firms for the market model which revealed a negative relationship. The results also showed inconclusive outcomes relating to the effect of market reforms and implementation of governance codes on Saudi's listed firms on firm information leakage. The results suggest that market reform has no significant effect on information leakage for all models and samples except the sample of firms taken from every sector for the constant mean return model.

Table 9-1: A comparison between the practices of corporate finance theories and models in Saudi Arabia and other countries based on the research findings

Corporate Finance topics	Theories and models	Corporate finance practices	
		Saudi Arabia	Other countries
Capital budgeting	Popular model used in capital budgeting	IRR then NPV	IRR then NPV (US, India, and Kuwait)
	Popular method used in assessing the project risk	Scenario analyses	Sensitivity analyses (India and Kuwait)
Cost of capital	Popular model used in estimating the cost of capital	Earnings yield	CAPM model (US, Europe, India) WACC model (Kuwait)
	The risk free rate used in CAPM model	SAMA bill	10 year government treasury bond (India) 90 day T-bill (Kuwait)
	Volatility factor used in CAPM model	Industry average	Industry average (India) Publishes source (Kuwait)
	Market risk premium used in CAPM model	CFO's estimate	Fixed rate 9%-10% and 6%-8% (India and Kuwait)
	Tax rate used to count after tax cost of debt	Zakat rate	Statutory tax rate (India) Zakat rate (Kuwait)
Capital structure	The evidence support for pecking-order theory	Weak support	Weak support (US and Europe) Support (India and Kuwait)
	The evidence support for trade-off theory	Support	Weak support (US and Europe)
Dividend	The evidence support for bird in hand theory	Support	Support (India and Kuwait)
	The evidence support for signaling theory	Support	Support (India and Kuwait)
	The evidence support for considering the dividend policy as a controller on managers' activities	Support	Support (India) Weak support (Kuwait)

**For other countries, the following literatures are used which implemented comprehensive survey for investigating the corporate finance practices:
Graham and Harvey's (2001) for US, Anand (2002) for India, Brounen et al. (2004) for Europe, and Mutairi et al. (2009) for Kuwait.

9.2 Implications and suggestions

This section describes the suggestions and implications which the research results and analysis depend upon. The section is divided into four sub-sections, which each sub-section presenting the suggested implications of the different chapters.

9.2.1 Implications of the Corporate Finance Practices Findings

The results of corporate finance practices in Saudi Arabia provide important implications for researchers, practitioners, and business schools. Graham and Harvey (2001: p 188) explain the significant implications of revealing the corporate finance practices by stating that “we hope that researchers will use our results to develop new theories and potentially modify or abandon existing views. We also hope that practitioners will learn from our analysis by noting how other firms operate and by identifying areas where academic recommendations have not been fully implemented.” The research results have revealed to both researchers and academicians the overall effectiveness of corporate finance practices in Saudi Arabia, in the context of distinct businesses and financial environments, in comparison to other countries. The research provides important information on how the theories and concepts of corporate finance, which are developed in western countries, work in the context of the major economy in Islamic and Middle Eastern countries as well as how they differ from the business and financial environment in western countries. The research findings reveal that there are several differences between the corporate finance practices adopted by Saudi Arabia and western countries such as the U.S and Europe, including developing countries such as India. Moreover, the results revel differences between the practices implemented by Saudi Arabia and Kuwait despite the fact that they are both located in the Gulf region, thereby indicating that although countries share similarities, they may adopt different corporate finance practices. Therefore, the researchers can refer to the various differences existing between corporate finance practices employed in countries with

special environments (such as Saudi Arabia) in order to review, assess, or modify the current theories and concepts of corporate finance. In addition, the result would have important implications for researchers by showing them the gap that exists between the corporate finance theories and concepts and firm practices in developing and Islamic countries, especially since knowledge in this particular field is fairly limited.

In addition, the findings would allow practitioners in developed countries to determine how practices in other countries that are faced with a different environment which can expose them to new concepts which may help to improve their practices. Moreover, the findings would allow the practitioners in Saudi Arabia to find the limitations in their practices and corporate finance theories as well as enabling them to compare their practices with those adopted in other western and developing countries which may ultimately help them to develop and advance their own practices. Moreover, according to the findings, every Saudi firm can compare its practices with the popular practices adopted in other Saudi firms which may lead them to discover more effective techniques and methods compared to the ones they currently use, especially the findings and results which are obtained from similar Saudi firms.

In addition, the research findings provide important implications for academicians and business schools. The majority of Saudi business schools that teach corporate finance refer to textbooks that have been published in western countries, especially the United States. One of the major complaints of Saudi students in these schools is that the corporate finance textbooks offer information, models, examples, and solving problems which are only related to American firms while there is no information concerning the real practices of Saudi firms and whether they utilise the same models and theories presented in these textbooks or if they apply unique models and theories. As this research is the first study which to investigate the

practices of Saudi firms, the research findings would provide a solution to this issue and may offer a significant amount of information about popular theories, models, techniques, and methods relating to corporate finance that are utilised in Saudi firms.

Finally, the research results would offer important information relevant to the Saudi authority. Therefore, the Saudi authority would determine the existing gap between the practices implemented in advanced countries and the practices of Saudi Arabia, enabling them to set new strategies, plans, and processes in an attempt to improve the Saudi practices until they become as efficient as those which are applied in advanced countries.

9.2.2 Implications of Corporate Governance and Performance Findings

The findings of the effect of corporate governance components on firm performance have important implications for researchers as well as for Saudi firms and Capital Market Authority (CMA). The findings will provide further information to researchers regarding the relationship between corporate governance and performance which is analysed by applying the dynamic System GMM model along with two types of data which consist of firms from every sector and non-financial firms. In addition, firms can benefit from the findings by understanding which governance components may increase accounting and market performance and which aspects may reduce accounting and market performance. In addition, the findings would enable the CMA to conduct a thorough assessment of the effectiveness of governance regulations in improving firm performance; this will enable the CMA to review, modify, and develop the regulations based on the research findings, especially since thisresearch is the first study that investigates the relationship between governance and performance once governance regulations had become mandatory for all listed

firms. The findings reveal that the ownership concentration has a significant negative influence on the accounting-based performance while it also has on significant influence on Tobin's Q. This result emphasises the importance for the CMA to reduce the negative effects which large shareholders on firm performance. Large shareholders can conduct opportunistic behaviour and utilise firm resources for their own benefit at the expense of small shareholders. Furthermore, large shareholders have a negative influence on the firm environment as they can take advantage of their power to control the firm and reduce the positive influence of highly skilled managers. Therefore, the CMA should seek to establish new legislations in order to further delegate ownership in the firms as well as to reduce the negative influence of large shareholders by protecting the rights of small shareholders. In addition, the findings show that government ownership has a negative influence on the accounting-based performance. This is due to the fact that the aim of government ownership is to maintain control over the firms and the market which may result in more bureaucratic processes and lead to firms being managed for the benefit of politicians. Several Saudi firms have a high level of government ownership while this ownership may reach 74.3% of the issued shares. Therefore, the CMA should increase privatisation in the Saudi market as well as increase the level of free float shares. Moreover, the research outcomes reported that the institutional ownership has a positive effect on the accounting-based and market-based performance. This is due to the fact that institutions are more professional and have more knowledge of the financial aspects; therefore, they can easily monitor the management's actions and decisions so as to improve firm performance. The average institutional ownership in the Saudi market is estimated to be at 9% which is considered relatively small. Therefore, the CMA should introduce new regulations to encourage institutions to invest in the market as well as to encourage listed firms to attract valuable institutions to increase their level of

ownership as it has a positive influence on firms' environment by improving firm activities and decisions. In addition, the results suggest that the director and managerial ownership are positively related to the accounting-based performance. The ownership would provide greater incentives to directors and managers to increase the firm performance since they will have the same interests as the shareholder; therefore, ownership is an effective technique to reduce the agency problem. According to the results, the CMA in Saudi Arabia should establish new rules and regulations to increase the level of director and managerial ownership as the current capital market regulations only require the directors of the board to keep at least one thousand shares. A new regulation should be introduced which requires directors and senior managers to possess more control over shares in order to encourage them to improve firm performance. Moreover, the results reveal that board size has a positive influence on the accounting-based performance. Moreover, the findings suggest that the size of the audit committee is positively associated with the accounting-based performance. The large size improves firm performance since a greater number of members belonging to the board and audit committee would enable them to effectively monitor the firm's management as well as bring more knowledge and skills which can enhance their decisions and overall performance. The current Saudi CGRs only require the listed firms to have somewhere between three and eleven members on the board and to have at least three members in the audit committee while there are currently no regulations which encourage firms to add more members. Therefore, since the size of the board and committee have a positive effect on firm performance, the CMA should increase the minimum number of members in the board and audit committee as well as provide greater incentives and regulations to encourage firms to increase the number of members. However, the results illustrate that the presence of board subcommittees has a negative influence on firm performance. This result contrasts with the initial

prediction that the board subcommittees would have a positive influence on firm performance. The reason for this can be explained by the fact that Saudi firms establish these committees in order to adhere to the obligatory governance regulations rather than to enhance the performance of their board and firm. Moreover, these committees are controlled by large and family shareholders and so they do not work as effectively with the authorities in order to carry out their roles and responsibilities. Therefore, these ineffective committees would only add further costs and expenses to the firm's budget without gaining any benefits. Therefore, the Saudi CMA should monitor the firm implications of board subcommittees as well as establish new regulations to ensure that the board subcommittees work without any intervention or pressure from other parties that may weaken their role. In addition, board independence and CEO duality revealed mixed and inconclusive results which confirms the weak effect of independent board members and the separate roles of the chairman and CEO. This can be explained by the fact that firms assign independent members and divide the roles between chairman and CEO, whereas the independent members and chairman are selected and controlled by large and family shareholders and are therefore unable to work independently to perform their role. Therefore, the CMA should establish new rules and regulations to ensure a transparent process when selecting the independent members and chairman. In addition, the results reveal that several governance variables have either a non-significant or inconclusive effect on Tobin's Q and marker–based performance. These results indicate that the CMA needs to improve and develop the external corporate governance mechanisms so as to increase market efficiency. Finally, the findings report that the market reform and the enforcement of CGRs in the year 2009 failed to improve firm performance. Therefore, it is necessary for the CMA to conduct a comprehensive assessment and produce a review for the current corporate

governance codes and the firm practices so as to determine the weakness that need to be reformed.

9.2.3 Implications of the Extent of Information Leakage Findings

Both researchers and the Saudi authority can benefit from the research findings in that they examine the presence and extent of information leakage and cumulative abnormal returns prior to the official earnings announcements. The findings offer new evidence for the researchers relating to market transparency and information leakage in developing countries, especially those located in the Middle East region. Moreover, the research results clearly illustrates that there are various incidents involving the leakage of information and cumulative abnormal returns in the period before the quarterly and annual earnings announcements. These findings indicate that the CMA needs to improve the market and firm transparency in order to reduce the information from being leaked to protect the rights of investors and to ensure that all investors receive firm announcements and any information at the same time. In addition, from 2009, several Saudi CGRs became obligatory for all listed firms while the findings of quarterly earnings announcements reported that the level of information leakage before 2009 was greater than the level of information leakage in the period following 2009. These findings indicate that the market reform in 2009 had a negative effect on the level of information leakage; however, this market reform has not yet been completed as the results also showed information leakage incidents following 2009. In addition, according to the findings relating to annual announcements, the market adjusted model confirms that the market reform has a positive effect on information leakage. Therefore, as these results indicate that the market reform in 2009 is inadequate to prevent or reduce insider trading prior to earnings announcements, it is necessary for the CMA to review, assess, and

improve the current corporate governance system in Saudi Arabia so as to ensure market transparency and prevent future insider trading incidents.

9.2.4 Implications of Corporate Governance and Information Leakage Findings

The research results which determine the relationship between the corporate governance mechanisms and information leakage have important implications for researchers as well as for Saudi firms and CMA. Since study of the relationship between governance and information leakage is limited, these results would provide researchers with new evidence associated with the relationship that are generated by applying the dynamic System GMM model along with two types of data which include firms from every sector and the non-financial firms. Furthermore, the results would allow Saudi firms to gain a better understanding of which governance mechanisms can reduce information leakage and asymmetry as well as increase firm transparency. Moreover, as this research is the first study to conduct an investigation into the relationship between governance mechanisms and information leakage in the Saudi market, the findings have important implications for the CMA as the findings provide a deep insight into governance components. Therefore, the CMA can refer to these findings to assess, review, and improve the current governance mechanisms so as to reduce information leakage and enhance market transparency. The findings reported that the ownership concentration has a positive effect on information leakage. This is due to the fact that large shareholders are less likely to improve the firm's transparency since it may have a negative effect on the power and control they entertain over the firm's system while an environment that is weak in transparency would enable large shareholders to utilise the firm's resources for their own benefit; moreover, it may encourage them to act in an opportunistic manner, for example leaking valuable information for their own benefit. Therefore,

as was previously suggested, the CMA should establish new rules and regulations so as to increase the widespread distribution of ownership in the market and reduce the negative influence of large shareholders on firm transparency. In addition, the findings evidently show that the institutional ownership has a negative influence on the firm information leakage. This is due to the fact that the institutions are managed by professionals that have knowledge of the financial system; therefore, they are better equipped than other shareholders to effectively monitor the management's actions and decision to reduce the agency problem, opportunistic behaviour, information leakage and increase firm's transparency. Therefore, as was previously suggested, the CMA should establish new legislations to increase the influence of institutions in the market as this would work towards improving market transparency as well as increasing efficiency. In addition, the governance ownership has a positive effect on information leakage as measured by the market adjusted model. This can be explained by the fact that government ownership would add more bureaucratic processes and systems which may reduce transparency in the system which would subsequently lead to more information asymmetry and information leakage incidents. Therefore, the CMA can reduce this negative influence on the firm information system by increasing the privatisation activities in the Saudi market. Furthermore, the findings report a negative relationship between the director ownership and information leakage. The study conducted by Vafeas (1999b) and Ju and Zhao (2014) reveals that firms with a high level of director ownership conduct more board activities while their directors effectively carry out their monitoring roles. Effectively monitoring the firm's management can help to reduce opportunistic behaviours and information leakage incidents. Therefore, it is recommended that the CMA should establish new guidelines and regulations to encourage firms to give their directors more involvement in the firm's activities by increasing the amount of shares they own since this can increase their monitoring roles and reduce the

number of information leakage incidents. Moreover, the research results suggest that they presence of board subcommittees has a negative influence on information leakage. The board subcommittees play important roles in supporting the board decisions as the majority of board decisions are initially put forward and discussed at the subcommittees' level. The subcommittees conduct important monitoring roles on the management's actions, especially in regard to the financial aspects; therefore, their role helps to reduce opportunistic behaviours and information leakage. Therefore, the CMA should establish new rules and legislations to provide the board subcommittees with greater responsibilities as well as to ensure that they can work without any interventions or pressure from the large shareholders. In addition, the findings indicate that there is a negative relationship between the audit committee size and information leakage. That is due to the fact that a greater number of members would provide more knowledge and skills to the committee while they would also help to oversee management's actions. As a result, more members can potentially reduce opportunistic behaviours, insider trading, and information leakage. Therefore, as Saudi' listed firms are required to have at least three members in the audit committee, the CMA should increase the required minimum number of members in the committee and set incentives to firms to increase the size of their audit committees. In addition, the frequency of audit committee meetings is reported to be negatively related to the information leakage as measured by the market model. Audit committees that meet more frequently are able monitor the activities of management more effectively so as to ensure the accuracy and transparency of the firm disclosures and information and prevent insider trading and information leakage. The CGRs has not established a specific number of audit committee meetings; therefore, the CMA should set guidelines and rules to encourage firms instruct audit committees to frequently meet. However, the findings reveal that board independence and the divided roles of the CEO and

chairman increase the level of the firm information leakage. These unexpected results indicate the strong influence of large and family shareholders as most of the chairman and independent members are selected and controlled by them. Therefore, as large shareholders reduce the independency of board members, the CMA should establish new regulations to reduce the influence they have over the firm at the expense of small shareholders. Finally, the findings reveal that the market reform and the enforcement of CGRs on Saudi firms in 2009 has had a negative effect on information leakage; therefore, the information leakage level prior to 2009 was greater than the information leakage following 2009, thereby indicating that the market reform has improved market transparency. However, despite the fact that this result provides evidence relating to the effect of market reform, there are different governance regulations which reveal that it has a non-significant influence on the firm's information leakage. Therefore, to the CMA should undertake an important action in order to help develop the current corporate governance regulations. The fact that various governance mechanisms fail to significantly improve market transparency could be due to many reasons. First, as these governance codes were recently applied in the Saudi market, firms may require time to adjust to these codes as well as to gain a comprehensive understanding of their objectives and benefits. Secondly, although these codes have been implemented by Saudi firms, the majority of these firms adhere to the codes only to comply with market regulations rather than to develop and improve firm performance; therefore, these governance codes do not achieve the initial objectives. Many firms in the Saudi market are dominated by large shareholders and families and so when they increase firm transparency and reduce information asymmetry, it may result in them losing control of their firms. The CMA should establish new rules to confirm and ensure the accurate implementation of governance codes. In addition, the CMA may

require more rules to help reduce the influence of larger shareholders, with a view to improving firm transparency as well as protect the rights of small shareholders.

9.3 Research Contributions

Saudi Arabia is the largest economy in the Middle East, MENA, and Arab region. Moreover, it is a major country in the Islamic world, the sole Arab country in the G20, and one of the largest oil producer countries in the world. Moreover, it has a different financial system and business environment compared to the west and other developing countries. Therefore, the research outcomes and findings of this research will offer valuable contributions to the worldwide market, including researchers, practitioners, and participants, especially in the developing markets. The research contributions to the various literatures and academicians, practitioners, and firms can be summarised as follows:

- As far as I am aware, this research is the first study that conducts a comprehensive investigation into the corporate financial practices that includes capital budgeting, cost of capital, capital structure, and dividend practices in Saudi firms. Therefore, this research offers a valuable contribution to the literatures by adding new findings relating to corporate financial practices in a country which plays a major role in the developing, Islamic, Middle Eastern, and MENA region while it also greatly differs from western and developing countries. Moreover, the research explores the financial practices adopted by developing countries which are considered to be fairly limited.
- Saudi Arabia is the largest existing economy that has a unique institutional environment characterised by the absence of tax systems, an undeveloped bond market, and intensive Islamic financial products and services. Therefore, the research significantly contributes towards knowledge in this field by revealing the

effect of the environment on corporate financial practices as well as in discovering whether corporate financial theories developed in western markets can also be applied to the Saudi market.

- The research reveals the gap existing between the corporate finance theories and models and the practices adopted by Saudi firms. This contribution is important for the Saudi authorities, firms and academicians. The Saudi authority would understand the gap between the suggested theories and practices as well as the differences between the practices of Saudi firms and developed countries which can lead to the introduction of new legalisations or guidelines with the goal of developing the financial practices in the Saudi market so that they are more in line to those adopted in more advanced countries. In addition, revealing the findings and gap can enable firms to compare their practices with other firms and to improve or change their current practices. Finally, the majority of Saudi's business schools utilise textbooks that are published in western countries such as the U.S and UK. These textbooks explain the corporate finance examples and information as well as practices that are related to the western firms. Therefore, this research is the first study that reveals to the Saudi business schools how Saudi firms utilise and practice the corporate finance theories and models.

- From 2009, the CMA started to make several governance codes obligatory for all Saudi listed firms in an attempt to improve the firm and the market. As far as I am aware, this research is the first study that examines the effect of Saudi corporate governance mechanisms on firm performance in the period before and after the year 2009. In addition, according to my current knowledge, it is the first study that investigates the effect of institutional ownership, government ownership, and managerial ownership on firm performance in the Saudi market.

- The findings relating to the effect of corporate governance on firm performance significantly contribute towards the various literatures, including Saudi CMA, and

firms. This study will provide to researchers and literatures new findings and results determining the relationship between corporate governance mechanisms and firm performance which were analysed by applying the dynamic model, the System GMM model, three measures of firm performance, two types of data, and the context of Saudi Arabia that consists of several differences in comparison to other developed and developing countries. In addition, as this research covers the period before and after the year 2009, it also covers the period before and after governance codes became obligatory for Saudi's listed firms. Therefore, the findings would help the CMA to evaluate their market reforms, especially in regard to imposing governance codes in the period following 2009 on all firms while the findings relating to the governance mechanism would enable the Saudi CMA to assess, review, and improve the current governance mechanisms as the findings reveal that different governance regulations have a non-significant effect on firm performance. Moreover, the research findings offer valuable information to allow the firms to improve their performance and practices as the results reveal to firms what types of corporate governance mechanisms can help them to increase their performance and which corporate governance mechanisms has a negative impact on performance.

- As far as I am aware, this research is the first study that investigates the extent and presence of information leakage incidents and cumulative abnormal returns prior to the quarterly and annual earnings announcements during the period before and after 2009. The findings related to this investigation have an important implication for the Saudi CMA. The CMA established the CGRs in 2006 only as a guideline to improve the performance of Saudi firms as well as market transparency and efficiency; from 2009 the CMA started to make the CGRs obligatory and enforce the market reform on listed firms. Therefore, the findings of this research would provide the Saudi CMA with the necessary

evidence and proof of the effect of their market reform and the application of CGRs on the market and firm transparency as well as the level of information leakage before and after 2009. By referring to the research results, the CMA can conduct reviews with the aim of improving and introducing changes to the current corporate governance regulations.

- As far as I am aware, this research is the first study that examines the influence of corporate governance components on information leakage in the Saudi market. The findings of this examination would provide valuable continuations to the literatures, firms, and the Saudi CMA.

- The discussion that was presented in the research hypothesis chapter reveals that examining the relationship between corporate governance mechanisms and firm information leakage and insider trading is considered to be fairly limited in the literatures; therefore, this research would significantly contribute to researchers' knowledge in this field and to the various literatures that explore this relationship, especially since this research adopted two types of data to compare the results and applied the System GMM model to control autocorrelation, heteroscedasticity, heterogeneity, and endogeneity. This enabled the research to provide valid and accurate results.

- The findings detailing the relationship existing between the governance and information leakage provide important guidelines of practice to the firm on how they can improve the transparency of their environments and to reduce the level of information leakage and insider trading. The findings provided the firms with a greater understanding of which corporate governance mechanisms are likely to reduce the level of information leakage and which ones have a positive influence on the level of information leakage.

- The Saudi CMA would be able to locate significant and valuable information in the findings of the relationship between the governance and information leakage. The Saudi CMA established and imposed the corporate governance regulation and codes on all listed firms in an attempt to reform the Saudi market and to make it more efficient and transparent in an effort to reduce the information asymmetry between the management and shareholders. As the presence of information leakage violates the market transparency, it is important for the CMA to assess the effect of the current governance codes on firms' information leakage. The research findings provide a beneficial assessment for the CMA since it reveals to the CMA the relationship between each governance code and information leakage. This information will enable the CMA to reform, change, or improve the current codes which show a positive or non-significant influence on the firm information leakage and information asymmetry.

9.4 Limitations and Future Research

Despite the research providing a significant and comprehensive investigation, utilising valid and relevant methods and analysis, the research has certain limitations which is typical during scientific research. For example, a limitation was seen with the survey method that was adopted to examine corporate finance practices, which is that the CFO respondents may have represented their personal perspectives, rather than the actual practice of their firms. In addition, there is the prospect that certain CFOs may not have clearly comprehended the questions, resulting in them providing incorrect answers. Moreover, it is expected in some firms that the main corporate finance decisions are generated at the CEO not CFO level so the CEO would have more knowledge than CFO about what theories and models used in his firms. Due to this limitation, it is proposed that in future research concerning the Saudi market, the researcher could utilise an in-depth interview

method with CEO, CFO, and top management in each firm, in order to attain a rich understanding of corporate finance practices in Saudi Arabia. Ultimately, such an interview method enables the researcher to ask additional questions, clarify the participants' responses and obtain deeper information, while also asking open-ended questions.

Additionally, the research chapter concerning the investigation of the degree of information leakage in the Saudi market has limited variables, only applying cumulative abnormal returns as a measure and indicator of leaked information. Consequently, it is recommended that potential future research applies further varied proxies and measures in relation to information leakage, for example abnormal trading volume and the price run-up index. Moreover, certain limitations were apparent relating to examination of corporate governance mechanisms' impact on firm performance and information leakage. The research investigates the effect of board independence and CEO duality on firm performance and information leakage, which is concerned with independent directors who are not large shareholders or executives, or related to individuals who are. Indeed, large and family shareholders in the Saudi market have considerable influence on firms' activity, given that several firms established by family owners and their families own a large percentage of their respective firm's shares. Subsequently, even if independent directors are not significant shareholders or related to those who are, it is the case that certain independent directors may be assigned and controlled by such large and family shareholders, resulting in their decisions not being genuinely independent. Moreover, irrespective of whether the CEO is the same individual as the chairman, the CEO and chairman are both influenced and controlled by large shareholders. The strong impact of large shareholders results in the independent directors and CEO working for the advantage of large shareholders, as opposed to the majority of shareholders. Therefore, it is proposed that future studies should

neutralise the influence of large shareholders, during the investigation of the impact of independent directors and CEO duality on firm performance and information leakage. Additionally, it is recommended that an examination be conducted into the effect of family ownership on the extent of information leakage, because such a study has not been conducted in the Saudi market context.

A further limitation concerns the study's investigation of the relationship between the number of board members, audit committee size, firm performance and information leakage. Despite the number potentially having a degree of influence, the research has not incorporated the members' backgrounds, although their qualifications and backgrounds may have greater influence than the simple number. Therefore, it is necessary for future research to incorporate a consideration of these members' characteristics, examining how they potentially effect firm performance and information leakage. Additionally, the research utilised two kinds of data on all firms from each sector and financial companies. The financial firms have certain financial discrepancies compared with the other firms. Therefore, it is recommended that this examination could be replicated, yet with a narrower focus on firms in the financial sector, for example banks and insurance companies. Another area of future research relates to the study's implementation of several independent variables, representing the governance mechanisms in the relationship between governance, performance and information leakage. However, there are certain governance aspects that are not incorporated in this study. It is proposed that for future research, examination of other governance variables and their correlation to firm performance and information leakage could be investigated. For example, research could investigate the impact on firm performance and information leakage by board compensation, nomination and remuneration committee size, frequency of meetings of the nomination and remuneration committee, the board members' political relationships, as well as family ownership.

Appendix (1)

Survey
Corporate Finance Practices in Saudi Arabia

(For multiple choice questions, please write (x) for your selected answer)

*** Please, add your email address below, if you want to receive a summary result of the survey about the corporate finance practices of Saudi listed companies.

Email:

Section 1:

A) What is your age group?

B) What is your highest qualification (e.g. undergraduate/Master etc.)?

C) How long have you been in your current position/ role?

D) What is the percentage of your firm's stocks owned by the firms' executives?

- [ ] Less than 5%;
- [ ] 5% to less than 10%;
- [ ] 10% to 20%;
- [ ] More than 20%

E) What kind of target debt ratios does your firm set?

- [ ] None;
- [ ] Flexible;
- [ ] Somewhat tight;
- [ ] Strict.

F) How frequently does your firm pay dividends to stockholders?

Never	Rarely	Sometimes	Almost always	Always

Section 2:

1) How frequently does your firm use the following project choice criteria in your firm?

	Never	Rarely	Sometimes	Almost always	Always
Payback Period					
Accounting Rate of Return (ARR)					
Net Present Value (NPV)					
Internal Rate of Return (IRR)					
Profitability Index (PI)					
Break-even Analysis					

2) How frequently does your firm use the following methodology to assess the project risk in your firm?

	Never	Rarely	Sometimes	Almost always	Always
Sensitivity analysis					
Scenario analysis					
Risk adjusted discount rate					

Decision tree analysis					
Monte Carlo simulation					

3) How frequently does your firm use the following methods to estimate the cost of equity in your firm?

	Never	Rarely	Sometimes	Almost always	Always
Dividend Yield (DPS/MPS)					
Earnings Yield (EPS/MPS)					
Gordon's Dividend Discount Model					
Capital Asset Pricing Model (CAPM)					
Multi-factor Model					

4) Did you use a Capital Asset Pricing Model (CAPM) in estimating your cost of equity capital?

	No
	Yes

(If Yes, please answer questions 4A, 4B, 4C, and 4D) (If No, please skip to question 5)

4A) What do you use for risk-free rate in a CAPM Model?

	Never	Rarely	Sometimes	Almost always	Always
1 to 13 Weeks SAMA Bills Rate					
26 to 52 Weeks SAMA Bills Rate					
10 Year Government Development Bonds Rate					
U.S.A. 5 Year Treasury Constant Maturity					
U.S.A. 10 Year Treasury Constant Maturity					

4B) What do you use as your volatility or beta factor in a CAPM Model?

	Never	Rarely	Sometimes	Almost always	Always
Published Source					
CFO's Estimate					
Industry Average					

4C) What period do you study to calculate beta of your company in a CAPM Model?

	Never	Rarely	Sometimes	Almost always	Always
Monthly Share Prices (5 years)					
Weekly Share Price (5 years)					

4D) What accounts for market risk premium in a CAPM Model?

	Never	Rarely	Sometimes	Almost always	Always
Fixed Rate 6% to 8%					
Fixed Rate 8% to 9 %					
Fixed Rate 9% to 10 %					

	Never	Rarely	Sometimes	Almost always	Always
Average of Historical and Implied					
CFO's Estimate					

5) How frequently does your firm use Weighted Average Cost of Capital (WACC) in estimating the cost of capital?

Never	Rarely	Sometimes	Almost always	Always

6) What is the tax rate used to calculate after tax cost of debt and the weights you use in the computation of WACC of the firm?

	Never	Rarely	Sometimes	Almost always	Always
Current Statutory Tax Rate					
Minimum Alternative Tax					
Book Value Weights					
Market Value Weights					
Zakat Rate					

7A) Rank in order from 1 to 3 the financing pattern followed for the projects based on their relative importance in terms of their use in your firm.

Loans from Financial Institutions	
Retained Earnings	
Issue of New Shares	

7B) How important is the use of the financing pattern followed for the projects in your firm?

	Not important	Of little importance	Moderately important	Important	Very important
Loans from Financial Institutions					
Retained Earnings					
Issue of New Shares					

8) What factors influence-determine the appropriate amount of debt for your firm?

	Not important	Of little importance	Moderately important	Important	Very important
Financial flexibility (we restrict debt when we have enough internal funds) -					
The transactions costs and fees for issuing debt-					
The debt levels of other firms in our industry-					
The potential costs of bankruptcy or financial distress-					
Debt is limited so our customers/suppliers are not worried about our firm going out of business-					
To ensure that management works hard and efficiently, debt issuance ensures a large portion of our cash flow is committed to interest payments					

9) To what extent do you agree with the following statements about the dividend policy in your firm?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Has Long-term Target Dividend Payout Ratio					
Focus More on Absolute Level of Dividends than Dividend Changes					
Willing to Rescind Dividend Increase in the Event of Growth Opportunities					
Cash Dividends as Residual after Financing Desired Investments from Earnings					
Dividend Payout Ratio Affects the Market Value of the Firm					
Dividends Provide Signalling Mechanism of the Future Prospects of the Firm					
Investors are Indifferent between Receiving Dividends and Capital Gains					
Responsive to Shareholders' Preferences Regarding Dividends					
Dividend Payments Provide a Bonding Mechanism to Encourage Managers to Act in Best Interest of the Shareholders					

*** If there are any other comments pertinent to corporate finance practices in Saudi Arabia, that you would like to share, please add them in the space provided below.

Appendix (2)

Descriptive statistics of the independent variables of data C

Variables	2009	2010	2011	2012	2013	2014	All
BLOK							
Mean	38.323	38.467	37.817	36.371	35.546	34.395	36.820
Median	40	40	37.500	35	32.500	31.570	35.430
SD	23.119	23.319	22.947	23.429	23.252	23.710	23.262
Maximum	95	95	95	95	95	95	95
Minimum	0	0	0	0	0	0	0
GOV							
Mean	5.177	5.177	5.177	5.077	5.079	5.034	5.1203
Median	0	0	0	0	0	0	0
SD	15.006	15.006	15.006	14.937	14.935	14.874	14.906
Maximum	74.300	74.300	74.300	74.300	74.300	74.300	74.300
Minimum	0	0	0	0	0	0	0
INS							
Mean	7.937	8.117	8.335	8.211	8.087	7.957	8.107
Median	0	0	0	0	0	0	0
SD	14.133	14.075	14.281	14.515	14.532	14.601	14.306
Maximum	63.500	63.500	63.500	63.500	63.500	63.500	63.500
Minimum	0	0	0	0	0	0	0
DIRE							
Mean	15.225	15.572	15.578	14.619	13.399	12.694	14.515
Median	5.757	5.310	5.239	5.264	4.877	4.461	5.239
SD	20.248	20.305	20.163	19.557	18.392	18.043	19.434
Maximum	95.857	95.846	95.868	95.689	95.442	95.352	95.868
Minimum	0	.002	.001	.001	.001	.001	0
MANG							
Mean	2.340	1.955	2.368	2.099	1.638	1.545	1.991
Median	.009	.0098	.006	.008	.005	.006	.007
SD	6.366	5.808	7.060	6.856	5.282	5.141	6.116
Maximum	35.505	35.505	45.500	45.500	35.484	35.484	45.500
Minimum	0	0	0	0	0	0	0
BOSI							
Mean	8.574	8.600	8.522	8.591	8.583	8.600	8.578
Median	9	9	9	9	9	9	9
SD	1.639	1.711	1.518	1.504	1.567	1.566	1.580
Maximum	12	12	12	12	12	12	12
Minimum	4	4	5	5	4	5	4
BOIN							
Mean	54.202	52.740	50.201	50.768	52.171	50.942	51.837
Median	50	45.454	44.444	44.444	44.444	42.857	45.454
SD	22.672	19.770	17.760	18.097	18.325	17.869	19.140
Maximum	100	100	100	100	100	100	100
Minimum	0	20	20	20	22.222	22.222	0
BOME							
Mean	5.009	5.226	5.417	5.417	5.539	5.478	5.328
Median	5	5	5	5	5	5	5
SD	1.823	2.161	2.358	2.358	2.190	1.979	2.078
Maximum	15	14	18	18	16	13	18
Minimum	2	2	2	2	2	2	2
CEDU							
Mean	.835	.887	.896	.931	.913	.896	.893
Median	1	1	1	1	1	1	1
SD	.373	.318	.307	.255	.283	.307	.310
Maximum	1	1	1	1	1	1	1
Minimum	0	0	0	0	0	0	0
AUSI							
Mean	3.287	3.365	3.339	3.443	3.435	3.513	3.397
Median	3	3	3	3	3	3	3
SD	.604	.597	.620	.665	.690	.705	.6501
Maximum	5	5	5	5	5	5	5
Minimum	2	3	2	3	3	3	2
AUME							
Mean	5.017	5.043	5.287	5.357	5.661	5.626	5.332
Median	4	4	5	5	5	5	5
SD	3.266	2.984	2.474	2.0270	2.081	1.842	2.504
Maximum	28	25	20	12	15	13	28
Minimum	0	0	0	2	1	0	0
Count	115	115	115	115	115	115	690

Appendix (3)

Descriptive statistics of the independent variables of data A

Variables	2006	2007	2008	2009	2010	2011	2012	2013	2014	All
BLOK										
Mean	34.805	35.034	36.101	36.555	37.354	37.058	35.488	35.060	34.447	35.767
Median	35.050	37.085	37.875	39.570	37.430	37.030	34.750	29.790	31.110	35.400
SD	23.853	23.960	23.656	22.957	23.157	22.846	23.665	23.425	23.689	23.322
Maximum	83.690	83.690	83.690	83.690	83.690	83.690	83.690	83.690	83.690	83.690
Minimum	0	0	0	0	0	0	0	0	0	0
GOV										
Mean	7.317	7.317	7.316	7.261	7.261	7.261	7.156	7.160	7.074	7.236
Median	0	0	0	0	0	0	0	0	0	0
SD	17.374	17.374	17.465	17.392	17.392	17.392	17.282	17.277	17.186	17.224
Maximum	74.300	74.300	74.300	74.300	74.300	74.300	74.300	74.300	74.300	74.300
Minimum	0	0	0	0	0	0	0	0	0	0
INS										
Mean	9.375	9.463	9.734	10.235	10.438	10.440	10.135	10.070	10.028	9.991
Median	0	0	0	2.500	5.150	5.250	5	5	2.5	2.405
SD	14.782	14.894	14.859	14.916	14.813	14.733	15.012	15.021	15.088	14.799
Maximum	53.620	53.620	53.620	53.620	53.620	53.620	53.620	53.620	53.650	53.650
Minimum	0	0	0	0	0	0	0	0	0	0
DIRE										
Mean	12.432	11.955	12.496	14.245	14.412	14.435	14.396	13.559	13.521	13.495
Median	2.192	2.196	4.663	7.902	5.637	4.001	4.547	5.291	4.299	4.246
SD	17.432	16.553	16.051	17.687	17.239	17.388	17.412	16.053	16.281	16.814
Maximum	70	60.257	60.257	62.872	61.524	60.260	60.257	58.360	58.456	70
Minimum	0	0	0	.004	.004	.004	.005	.001	.001	0
MANG										
Mean	3.092	2.021	1.944	2.102	1.866	1.864	1.836	1.593	1.577	1.988
Median	.006	.005	.007	.008	.0072	.006	.006	.006	.006	.006
SD	10.719	6.851	6.089	6.533	6.565	6.522	6.482	5.979	5.975	6.960
Maximum	67.816	44.388	35.510	35.505	35.505	35.505	35.484	35.484	35.484	67.816
Minimum	0	0	0	0	0	0	0	0	0	0
BOSI										
Mean	8.516	8.532	8.468	8.500	8.629	8.548	8.548	8.548	8.629	8.547
Median	9	9	9	9	9	9	9	9	9	9
SD	1.762	1.753	1.715	1.734	1.822	1.575	1.544	1.646	1.602	1.675
Maximum	12	12	12	12	12	12	12	12	12	12
Minimum	4	4	5	4	4	5	5	4	5	4
BOIN										
Mean	59.086	58.730	59.524	60.734	55.855	50.763	52.518	53.467	51.612	55.810
Median	60	60	60	58.571	56.349	50	55.555	50	47.222	57.143
SD	23.250	23.164	23.837	22.561	19.266	16.718	18.293	17.670	18.004	20.652
Maximum	100	100	100	100	100	88.889	100	100	100	100
Minimum	0	0	0	0	20	20	20	22.222	22.222	0
BOME										
Mean	5.177	5.177	5.274	5.274	5.468	5.774	5.565	5.919	5.694	5.480
Median	4	4.5	5	5	5	5	5	5	5	5
SD	2.315	1.971	2.121	2.105	2.468	2.737	2.013	2.438	2.222	2.276
Maximum	14	10	11	15	14	18	12	16	13	18
Minimum	1	2	2	2	2	2	2	2	2	1
CEDU										
Mean	.806	.806	.822	.839	.887	.887	.919	.887	.871	.858
Median	1	1	1	1	1	1	1	1	1	1
SD	.398	.398	.385	.371	.319	.319	.275	.319	.338	.349
Maximum	1	1	1	1	1	1	1	1	1	1
Minimum	0	0	0	0	0	0	0	0	0	0
AUSI										
Mean	3.113	3.065	3.242	3.339	3.403	3.452	3.532	3.516	3.661	3.370
Median	3	3	3	3	3	3	3	3	3	3
SD	1.103	.990	.592	.599	.613	.670	.718	.741	.767	.790
Maximum	6	5	5	5	5	5	5	5	5	6
Minimum	0	0	2	2	3	3	3	3	3	0
AUME										
Mean	3.581	3.935	4.323	4.984	5.0484	5.597	5.645	5.855	5.919	4.987
Median	3	4	4	4.5	4	5	5	5	5	5
SD	2.287	2.394	2.373	2.466	2.385	2.866	2.120	2.126	2.019	2.470
Maximum	11	10	12	12	12	20	11	12	13	20
Minimum	0	0	0	0	1	2	2	2	3	0
MARE										
Mean	0	0	0	1	1	1	1	1	1	.666

Median	0	0	0	1	1	1	1	1	1	1
SD	0	0	0	0	0	0	0	0	0	.479
Maximum	0	0	0	1	1	1	1	1	1	1
Minimum	0	0	0	1	1	1	1	1	1	0
BOCO										
Mean	.065	.258	.548	.774	.952	1	1	1	1	.733
Median	0	0	1	1	1	1	1	1	1	1
SD	.248	.441	.502	.422	.216	0	0	0	0	.443
Maximum	1	1	1	1	1	1	1	1	1	1
Minimum	0	0	0	0	0	1	1	1	1	0
Count	62	62	62	62	62	62	62	62	62	558

Appendix (4)

Descriptive statistics of the independent variables of data D

Variables	2009	2010	2011	2012	2013	2014	All
BLOK							
Mean	36.055	36.154	35.404	34.204	33.260	32.043	34.520
Median	33.900	34	32.400	30.600	28.980	29.020	30.735
SD	24.358	24.539	23.877	24.339	23.960	24.180	24.138
Maximum	95	95	95	95	95	95	95
Minimum	0	0	0	0	0	0	0
GOV							
Mean	6.285	6.285	6.285	6.226	6.229	6.167	6.246
Median	0	0	0	0	0	0	0
SD	16.893	16.893	16.893	16.906	16.903	16.834	16.804
Maximum	74.3	74.3	74.3	74.3	74.3	74.3	74.3
Minimum	0	0	0	0	0	0	0
INS							
Mean	3.886	4.131	4.3164	3.996	3.863	3.682	3.979
Median	0	0	0	0	0	0	0
SD	6.591	6.585	6.563	6.437	6.218	6.282	6.419
Maximum	25.3	25.3	25.3	25.3	25.4	25.65	25.650
Minimum	0	0	0	0	0	0	0
DIRE							
Mean	16.675	17.214	16.720	16.131	15.323	14.672	16.122
Median	7.665	7.426	6.210	6.227	6.119	5.706	6.926
SD	21.797	21.687	21.218	20.703	19.791	19.441	20.708
Maximum	95.857	95.846	95.868	95.689	95.442	95.352	95.868
Minimum	.002	.002	.001	.001	.001	.001	.001
MANAG							
Mean	2.568	2.249	2.235	1.933	1.845	1.710	2.090
Median	.010	.011	.006	.009	.008	.011	.010
SD	6.571	6.245	6.215	5.879246	5.591	5.416	5.977
Maximum	35.505	35.505	35.505	35.48449	35.484	35.484	35.505
Minimum	0	0	0	0	0	0	0
BOSI							
Mean	8.365	8.376	8.306	8.412	8.424	8.471	8.392
Median	8	8	8	9	9	9	9
SD	1.595	1.725	1.448	1.482	1.591	1.555	1.562
Maximum	12	12	12	12	12	12	12
Minimum	4	4	5	5	4	5	4
BOIN							
Mean	53.971	51.841	49.383	49.815	51.847	51.271	51.355
Median	55.555	45.454	44.444	42.857	42.857	44.444	44.949
SD	22.459	19.358	17.852	18.124	17.472	17.748	18.882
Maximum	100	100	88.889	100	100	100	100
Minimum	0	20	20	20	30	28.571	0
BOME							
Mean	5.106	5.282	5.576	5.482	5.670	5.541	5.443
Median	5	5	5	5	5	5	5
SD	1.982	2.292	2.588	2.033	2.331	2.124	2.232
Maximum	15	14	18	12	16	13	18
Minimum	2	2	2	2	2	2	2
CEDU							
Mean	.788	.847	.859	.906	.882	.859	.857
Median	1	1	1	1	1	1	1
SD	.411	.362	.350	.294	.324	.350	.351
Maximum	1	1	1	1	1	1	1
Minimum	0	0	0	0	0	0	0
AUSI							
Mean	3.259	3.353	3.318	3.412	3.388	3.471	3.367
Median	3	3	3	3	3	3	3
SD	.580	.571	.582	.623	.619	.647	.605
Maximum	5	5	5	5	5	5	5
Minimum	2	3	2	3	3	3	2
AUME							
Mean	4.694	4.906	5.247	5.306	5.741	5.718	5.269
Median	4	4	5	5	5	5	5
SD	2.564	2.398	2.734	2.104	2.111	1.750	2.321
Maximum	15	12	20	12	15	13	20
Minimum	0	0	0	2	2	3	0
Count	85	85	85	85	85	85	510

Appendix (5)

Descriptive statistics of the independent variables of data B

Variables	2006	2007	2008	2009	2010	2011	2012	2013	2014	All
BLOK										
Mean	30.25	30.47	31.66	32.44	33.35	32.97	31.78	30.95	30.330	31.58
Median	28.10	28.10	28.10	28.60	30.30	28.10	25	26.20	26.300	28.10
SD	23.50	23.61	23.33	22.88	23.09	22.62	23.12	22.69	22.797	22.90
Maximum	83.69	83.69	83.69	83.69	83.69	83.69	83.69	83.69	83.690	83.69
Minimum	0	0	0	0	0	0	0	0	0	0
GOV										
Mean	7.891	7.891	7.824	7.824	7.824	7.824	7.824	7.829	7.724	7.828
Median	0	0	0	0	0	0	0	0	0	0
SD	18.56	18.56	18.58	18.58	18.58	18.58	18.58	18.58	18.483	18.40
Maximum	74.30	74.30	74.30	74.30	74.30	74.30	74.30	74.30	74.300	74.30
Minimum	0	0	0	0	0	0	0	0	0	0
INS										
Mean	4.411	4.475	4.785	5.278	5.526	5.527	5.120	5.004	4.943	5.008
Median	0	0	0	0	0	0	0	0	0	0
SD	6.956	7.035	7.186	7.488	7.424	7.226	7.089	6.844	6.934	7.082
Maximum	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.40	25.650	25.65
Minimum	0	0	0	0	0	0	0	0	0	0
DIRE										
Mean	13.21	12.66	13.34	14.89	15.45	15.04	14.98	14.32	14.407	14.26
Median	2.016	2.016	5.046	9.211	8.865	5.648	6.026	5.706	5.077	5.013
SD	18.53	17.67	17.08	18.44	17.88	17.42	17.45	16.25	16.549	17.36
Maximum	70	60.25	60.25	62.87	61.52	60.26	60.25	58.36	58.456	70
Minimum	0	0	0	.005	.004	.004	.004	.001	.001	0
MANG										
Mean	3.731	2.439	2.346	2.505	2.220	2.217	2.222	1.928	1.910	2.391
Median	.006	.006	.008	.007	.008	.004	.006	.006	.009	.006
SD	11.73	7.499	6.656	7.146	7.197	7.149	7.100	6.555	6.551	7.614
Maximum	67.81	44.38	35.51	35.50	35.50	35.50	35.48	35.48	35.484	67.81
Minimum	0	0	0	0	0	0	0	0	0	0
BOSI										
Mean	8.255	8.275	8.196	8.235	8.392	8.294	8.294	8.294	8.373	8.290
Median	8	8	8	8	8	8	9	8	9	8
SD	1.765	1.767	1.709	1.739	1.866	1.553	1.527	1.653	1.612	1.678
Maximum	12	12	12	12	12	12	12	12	12	12
Minimum	4	4	5	4	4	5	5	4	5	4
BOIN										
Mean	57.54	57.12	57.30	57.77	54.51	49.69	51.72	54.17	53.513	54.82
Median	60	60	57.14	57.14	55.55	45.45	55.55	55.55	50	55.55
SD	24.259	24.134	24.664	22.483	19.604	16.412	18.328	17.240	18.615	20.85
Maximum	100	100	100	100	100	88.889	100	100	100	100
Minimum	0	0	0	0	20	20	20	30	28.57143	0
BOME										
Mean	5.137	5.255	5.333	5.314	5.373	5.804	5.608	5.941	5.765	5.503
Median	4	5	5	5	5	5	5	5	5	5
SD	2.383	1.978	2.206	2.232	2.482	2.871	2.069	2.517	2.337	2.349
Maximum	14	10	11	15	14	18	12	16	13	18
Minimum	1	3	2	2	2	2	2	2	2	1
CEDU										
Mean	.784	.804	.804	.824	.863	.863	.902	.863	.843	.839
Median	1	1	1	1	1	1	1	1	1	1
SD	.415	.401	.401	.385	.347	.347	.300	.347	.367	.368
Maximum	1	1	1	1	1	1	1	1	1	1
Minimum	0	0	0	0	0	0	0	0	0	0
AUSI										
Mean	3.059	2.980	3.176	3.255	3.314	3.314	3.412	3.373	3.529	3.268
Median	3	3	3	3	3	3	3	3	3	3
SD	1.139	1.029	.555	.5232	.509	.547	.638	.599	.674	.736
Maximum	6	5	5	5	5	5	5	5	5	6
Minimum	0	0	2	2	3	3	3	3	3	0
AUME										
Mean	3.098	3.608	4.059	4.784	4.980	5.588	5.549	5.765	5.902	4.815
Median	3	3	4	4	4	5	5	5	5	4
SD	2.100	2.350	2.370	2.468	2.429	3.047	2.052	2.045	1.952	2.504
Maximum	11	10	12	12	12	20	11	11	13	20
Minimum	0	0	0	0	1	2	2	2	3	0
MARE										
Mean	0	0	0	1	1	1	1	1	1	.667

Median	0	0	0	1	1	1	1	1	1	1
SD	0	0	0	0	0	0	0	0	0	.472
Maximum	0	0	0	1	1	1	1	1	1	1
Minimum	0	0	0	1	1	1	1	1	1	0
BOCO										
Mean	.078	.255	.529	.765	.941	1	1	1	1	.730
Median	0	0	1	1	1	1	1	1	1	1
SD	.272	.440	.504	.428	.238	0	0	0	0	.445
Maximum	1	1	1	1	1	1	1	1	1	1
Minimum	0	0	0	0	0	1	1	1	1	0
Count	51	51	51	51	51	51	51	51	51	459

Appendix (6)

Descriptive statistics of the control variables of data C

Variables	2009	2010	2011	2012	2013	2014	All
SAGR							
Mean	7.424	19.486	15.172	13.207	7.997	13.534	12.803
Median	0	7.892	12.650	9.652	4.422	7.1921	6.742
SD	57.141	46.138	30.605	30.777	23.215	32.188	38.496
Maximum	180	180	160	160	170	180	180
Minimum	-179.186	-65.099	-83.966	-80.834	-43.634	-68.108	-179.186
LVRG							
Mean	14.348	13.339	13.321	14.093	14.264	14.384	13.958
Median	4.983	2.922	4.969	5.432	4.408	6.760	4.968
SD	19.452	18.006	17.430	17.788	17.750	17.299	17.909
Maximum	90.828	71.810	68.607	64.871	61.728	66.274	90.827
Minimum	0	0	0	0	0	0	0
SIZE							
Mean	14.720	14.797	14.881	14.939	15.021	15.094	14.909
Median	14.391	14.451	14.569	14.584	14.735	14.745	14.583
SD	1.965	1.947	1.949	1.973	1.968	1.977	1.960
Maximum	19.509	19.572	19.623	19.637	19.636	19.645	19.645
Minimum	11.212	10.989	11.087	10.887	11.268	11.345	10.887
Count	115	115	115	115	115	115	690

Appendix (7)

Descriptive statistics of the control variables of data A

Variables	2006	2007	2008	2009	2010	2011	2012	2013	2014	All
SAGR										
Mean	19.677	17.881	18.697	-5.034	13.271	8.207	5.515	5.515	7.079	10.745
Median	12.686	14.259	14.666	-4.236	11.968	6.958	2.659	2.659	4.399	7.483
SD	26.818	24.729	28.552	27.672	23.188	26.234	22.868	22.868	17.571	26.690
Maximum	150	122.964	150	104.622	114.437	147.531	150	150	77.126	150
Minimum	-12.39	-46.157	-70.86	-85.705	-40.724	-80.834	-43.63	-43.63	-23.96	-85.705
LVRG										
Mean	9.328	12.207	15.872	15.877	14.631	14.962	15.183	14.267	14.683	14.112
Median	2.705	4.448	7.814	6.905	4.798	5.879	5.735	5.442	8.877	5.735
SD	11.950	15.628	18.522	19.061	18.559	17.879	18.140	17.356	16.572	17.190
Maximum	46.042	58.668	65.761	69.170	62.429	57.591	55.709	57.638	50.910	69.170
Minimum	0	0	0	0	0	0	0	0	0	0
SIZE										
Mean	14.832	15.036	15.156	15.220	15.257	15.336	15.389	15.438	15.481	15.238
Median	14.510	14.743	14.760	14.831	14.938	14.969	15.037	15.047	15.119	14.856
SD	1.930	2.002	2.073	2.085	2.096	2.096	2.123	2.154	2.181	2.077
Maximum	18.931	19.352	19.420	19.509	19.572	19.623	19.637	19.636	19.645	19.644
Minimum	11.694	11.708	11.687	11.654	11.573	11.484	11.426	11.398	11.345	11.345
Count	62	62	62	62	62	62	62	62	62	558

Appendix (8)

Descriptive statistics of the control variables of data D

Variables	2009	2010	2011	2012	2013	2014	All
SAGR							
Mean	-1.725	19.232	16.300	13.842	5.493	10.672	10.635
Median	-.308	8.858	13.727	9.652	2.427	5.814	6.850
SD	47.059	43.696	31.995	33.690	23.497	30.964	36.544
Maximum	170	180	160	160	170	180	180
Minimum	-179.186	-65.099	-83.966	-80.834	-43.634	-68.108	-179.186
LVRG							
Mean	19.283	17.994	17.961	19.008	19.264	19.432	18.824
Median	10.227	11.627	12.904	14.967	15.949	18.337	12.646
SD	20.457	18.865	18.129	18.319	18.181	17.528	18.521
Maximum	90.827	71.810	68.607	64.871	61.728	66.274	90.827
Minimum	0	0	0	0	0	0	0
SIZE							
Mean	14.608	14.642	14.715	14.761	14.822	14.865	14.735
Median	14.546	14.520	14.614	14.745	14.742	14.764	14.660
SD	1.717	1.738	1.744	1.755	1.742	1.755	1.736
Maximum	19.509	19.572	19.623	19.637	19.636	19.645	19.645
Minimum	11.212	10.989	11.087	10.887	11.268	11.345	10.887
Count	85	85	85	85	85	85	510

Appendix (9)

Descriptive statistics of the control variables of data B

Variables	2006	2007	2008	2009	2010	2011	2012	2013	2014	All
SAGR										
Mean	13.945	17.243	20.845	-3.408	16.062	16.012	7.346	4.373	6.660	11.009
Median	8.821	14.087	16.445	-.055	8.472	13.73	5.822	.826	2.732	7.515
SD	20.936	25.085	30.625	28.514	33.195	24.542	28.564	24.766	19.172	27.263
Maximum	110.325	122.964	150	104.622	150	114.437	147.531	150	77.126	150
Minimum	-12.398	-46.157	-70.864	-85.705	-41.73	-40.724	-80.834	-43.634	-23.967	-85.70
LVRG										
Mean	11.103	14.642	19.182	19.198	17.725	18.106	18.368	17.294	17.808	17.047
Median	5.267	9.9604	10.709	10.227	8.392	11.055	9.375	11.359	12.078	10.134
SD	12.479	16.233	18.847	19.481	19.107	18.248	18.518	17.740	16.699	17.620
Maximum	46.042	58.668	65.761	69.170	62.429	57.591	55.709	57.638	50.910	69.170
Minimum	0	0	0	0	0	0	0	0	0	0
SIZE										
Mean	14.242	14.442	14.548	14.619	14.656	14.733	14.770	14.802	14.830	14.627
Median	14.055	14.376	14.522	14.655	14.646	14.664	14.749	14.847	14.774	14.624
SD	1.519	1.624	1.690	1.732	1.752	1.747	1.756	1.773	1.784	1.705
Maximum	18.931	19.352	19.420	19.509	19.572	19.623	19.637	19.636	19.645	19.645
Minimum	11.694	11.708	11.687	11.654	11.573	11.484	11.426	11.398	11.345	11.345
Count	51	51	51	51	51	51	51	51	51	459

Appendix (10)

Descriptive statistics of the dependent variables of data C

Variables	2009	2010	2011	2012	2013	2014	All
ROA							
Mean	3.716	4.814	4.483	5.721	5.294	5.483	4.919
Median	2.240	4.050	3.990	3.660	3.340	3.130	3.320
SD	7.693	8.052	10.425	7.426	8.728	8.076	8.455
Maximum	29.910	38.610	43.980	38.540	33.410	35.560	43.980
Minimum	-17.010	-32.260	-67.810	-8.430	-16.820	-12.150	-67.810
ROE							
Mean	5.944	8.284	8.597	10.476	4.976	9.741	8.003
Median	5.645	8.700	8.590	9.720	9.540	9.210	8.695
SD	15.719	14.350	14.583	12.225	27.489	14.062	17.218
Maximum	51.740	50.240	56.590	55.520	55.710	54.810	56.590
Minimum	-60.672	-59.020	-49.540	-45.116	-158.962	-52.339	-158.962
Tobin's Q							
Mean	1.557	1.396	1.596	1.724	1.912	1.860	1.674
Median	1.332	1.247	1.233	1.289	1.421	1.455	1.308
SD	.765	.595	.943	1.184	1.372	1.276	1.071
Maximum	4.797	4.159	6.585	8.231	9.150	9.004	9.150
Minimum	.633	.678	.689	.663	.737	.667	.633
Count	115	115	115	115	115	115	690

Appendix (11)

Descriptive statistics of the dependent variables of data A

Variables	2006	2007	2008	2009	2010	2011	2012	2013	2014	All
ROA										
Mean	9.088	8.076	6.849	5.280	6.651	6.325	6.771	6.351	6.330	6.858
Median	7.335	5.315	5.320	2.670	4.645	5.135	3.765	3.440	3.840	4.520
SD	8.780	8.305	9.441	8.204	8.272	9.413	8.728	9.199	8.914	8.817
Maximum	29.100	27.330	43.450	29.910	38.610	43.980	38.540	33.410	35.560	43.980
.Minimum	-11.07	-13.54	-13.11	-15.21	-13.67	-11.01	-8.430	-15.07	-12.15	-15.21
ROE										
Mean	16.993	14.969	12.698	9.876	12.127	11.847	12.475	10.863	11.530	11.530
Median	17.270	13.235	13.525	7.570	11.440	10.460	13.020	11.535	12.580	12.580
SD	13.234	11.925	13.391	12.351	11.581	12.786	11.336	13.792	12.749	12.749
Maximum	47.070	45.350	53.270	51.740	50.240	56.590	55.520	55.710	54.810	54.810
Minimum	-13.40	-16.13	-18.77	-21.14	-24.72	-17.84	-11.38	-36.02	-28.93	-36.02
Tobin's Q										
Mean	1.872	2.065	1.1844	1.438	1.415	1.687	1.738	2.025	1.928	1.706
Median	1.72	1.907	1.115	1.232	1.171	1.196	1.254	1.360	1.336	1.326
SD	.834	.919	.350	.618	.600	1.051	1.137	1.521	1.352	1.030
Maximum	4.246	4.727	2.515	3.469	3.149	6.585	5.950	9.151	7.499	9.151
Minimum	.873	.756	.644	.633	.678	.702	.783	.884	.949	.633
Count	62	62	62	62	62	62	62	62	62	558

Appendix (12)

Descriptive statistics of the dependent variables of data D

Variables	2009	2010	2011	2012	2013	2014	All
ROA							
Mean	5.179	6.060	5.624	7.116	7.512	7.089	6.430
Median	3.21	5.880	5.800	4.830	6.090	4.8	5.165
SD	7.919	8.929	11.822	8.053	8.725	8.675	9.110
Maximum	29.910	38.610	43.980	38.540	33.410	35.560	43.980
Minimum	-15.210	-32.260	-67.810	-8.430	-15.070	-12.150	-67.810
ROE							
Mean	8.005	9.266	9.653	11.216	11.422	10.815	10.063
Median	6.520	9.450	8.830	8.950	9.850	9.210	8.935
SD	12.769	15.001	15.076	11.727	12.932	13.258	13.503
Maximum	51.740	50.240	56.590	55.520	55.710	54.810	56.590
Minimum	-35.950	-59.020	-49.540	-20.700	-28.660	-28.930	-59.020
Tobin's Q							
Mean	1.540	1.464	1.731	1.849	2.101	2.066	1.792
Median	1.333	1.291	1.276	1.308	1.484	1.551	1.369
SD	.758	.656	1.051	1.327	1.532	1.424	1.191
Maximum	4.797	4.158	6.585	8.231	9.151	9.004	9.151
Minimum	.633	.678	.689	.663	.737	.667	.633
Count	85	85	85	85	85	85	510

Appendix (13)

Descriptive statistics of the dependent variables of data B

Variables	2006	2007	2008	2009	2010	2011	2012	2013	2014	All
ROA										
Mean	9.925	9.123	7.927	6.068	7.647	7.211	7.758	7.470	7.220	7.817
Median	8.780	8.360	7.610	3.570	6.150	5.910	4.830	5.860	4.800	6.330
SD	9.353	8.748	10.094	8.832	8.784	10.158	9.337	9.741	9.597	9.396
Maximum	29.100	27.330	43.450	29.910	38.610	43.980	38.540	33.410	35.560	43.980
Minimum	-11.07	-13.54	-13.11	-15.21	-13.67	-11.01	-8.430	-15.07	-12.15	-15.21
ROE										
Mean	14.273	13.896	12.188	9.568	12.025	11.420	12.025	11.203	10.780	11.931
Median	14.690	12.330	12.610	7.110	10.450	9.250	8.950	9.850	9.970	11.300
SD	12.253	12.344	14.253	12.865	12.276	13.905	12.343	13.597	13.817	13.054
Maximum	38.440	45.350	53.270	51.740	50.240	56.590	55.520	55.710	54.810	56.590
Minimum	-13.40	-16.13	-18.77	-21.14	-24.72	-17.84	-11.38	-28.66	-28.93	-28.93
Tobin's Q										
Mean	2.037	2.246	1.219	1.522	1.494	1.831	1.895	2.234	2.109	1.843
Median	1.879	2.004	1.144	1.346	1.296	1.330	1.416	1.581	1.501	1.484
SD	.829	.909	.374	.649	.631	1.108	1.198	1.603	1.429	1.086
Maximum	4.246	4.727	2.515	3.469	3.149	6.585	5.950	9.151	7.499	9.151
Minimum	.873	.756	.644	.633	.678	.702	.783	.884	.966	.633
Count	51	51	51	51	51	51	51	51	51	459

Correlation matrices of data A

	SAGR	LVRG	SIZE	BLOK	GOV	INS	DIRE	MANG	BOSI	BOIN	BOME	CEDU	AUSI	AUME	MARE	BOCO
SAGR	1	.125**	.071	.026	-.031	-.018	.070	.037	-.033	-.026	.009	-.020	-.025	-.115**	-.280**	-.192**
LVRG	.165**	1	.058	-.023	-.006	-.219**	.029	.087*	-.054	-.101*	-.097*	-.122**	-.065	-.142**	.034	.122**
SIZE	.022	.074	1	.640**	.238**	.589**	-.118**	-.013	.555**	-.169**	.061	.102*	.360**	.124**	.083*	.111**
BLOK	-.023	.018	.680**	1	.408**	.501**	.122**	-.018	.265**	-.258**	.210**	.080	.220**	.167**	.012	.027
GOV	-.049	.022	.377**	.497**	1	.188**	-.029	-.182**	.093*	-.064	.392**	.101*	.165**	.190**	-.011	-.090*
INS	-.040	-.24**	.563**	.483**	-.027	1	-.004	-.055	.361**	-.033	.063	.123**	.240**	.058	.040	.039
DIRE	-.001	.009	-.155**	.230**	-.008	-.065	1	.307**	.075	-.063	.040	-.081	-.093*	-.089*	.050	.102*
MANG	.017	-.006	-.193**	.011	-.120**	-.159**	.343**	1	.166**	-.182**	-.130**	-.307**	.001	-.174**	.006	.088*
BOSI	-.029	-.020	.515**	.261**	.045	.261**	.004	-.135**	1	-.055	.000	-.042	.263**	.094*	.018	.111**
BOIN	-.007	-.073	-.143**	-.222**	-.100*	.028	-.141**	-.132**	-.060	1	-.075	.008	.021	-.043	-.127**	-.074
BOME	-.043	-.096*	.087*	.237**	.420**	-.029	.112**	-.059	.002	-.049	1	-.038	.248**	.291**	.097*	.070
CEDU	-.055	-.12**	.100*	.078	.093*	.156**	-.075	-.376**	-.052	.007	-.052	1	-.044	.045	.095*	.022
AUSI	-.044	-.071	.399**	.227**	.180**	.233**	-.096*	-.107*	.249**	.001	.199**	-.038	1	.209**	.184**	.133**
AUME	-.093*	-.124**	.126**	.187**	.248**	.080	-.030	-.112**	.067	-.023	.338**	.031	.246**	1	.311**	.220**
MARE	-.212**	.068	.078	.014	-.003	.022	.051	-.037	.017	-.113**	.084*	.095*	.205**	.298**	1	.708**
BOCO	-.172**	.126**	.101*	.026	-.084*	.003	.069	.042	.110**	-.058	.046	.022	.174**	.199**	.708**	1

Note: The left half is Pearson's coefficients and the right half is Spearman's non-parametric coefficients. * Correlation is significant at the 0.05 level (2-tailed) and ** Correlation is significant at the 0.01 level (2-tailed). Where BLOK = the ownership concentration. GOV = the government ownership. INS = the institutional ownership. DIRE = the directors ownership. MANG = the managerial ownership. BOSI = the board size. BOIN = the board independence. BOME = the board meetings. CEDU = the CEO duality. MARE = the market reform. BOCO = the board subcommittees. AUSI = the audit committee size. AUME = the audit committee meetings. SAGR = the sales growth. LVRG = leverage. SIZE = the firm size.

Correlation matrices of data B

	SAGR	LVRG	SIZE	BLOK	GOV	INS	DIRE	MANG	BOSI	BOIN	BOME	CEDU	AUSI	AUME	MARE	BOCO
SAGR	1	.153**	.137**	.067	-.009	.020	.062	.070	-.013	.008	-.008	-.009	-.022	-.173**	-.234**	-.125**
LVRG	.182**	1	.494**	.205**	-.016	.063	.024	.039	.156**	-.071	-.104*	-.081	.063	-.055	.068	.184**
SIZE	.092*	.444**	1	.529**	.291**	.436**	-.055	.038	.496**	-.275**	.075	.033	.273**	.034	.097*	.128**
BLOK	.006	.192**	.629**	1	.492**	.364**	.287**	.011	.175**	-.376**	.296**	.009	.145**	.136**	.025	.050
GOV	-.044	-.005	.561**	.595**	1	.286**	-.005	-.230**	.146**	-.118*	.431**	.109*	.218**	.262**	-.011	-.099*
INS	.037	.043	.314**	.318**	.128**	1	.106*	-.073	.263**	-.128**	.133**	.040	.171**	-.018	.061	.065
DIRE	-.014	-.029	-.093*	.369**	-.003	.131**	1	.381**	.151**	-.047	-.058	-.060	-.163**	-.169**	.054	.127**
MANG	.016	-.056	-.156**	.067	-.133**	-.153**	.353**	1	.234**	-.190**	-.154**	-.346**	-.020	-.125**	-.004	.094*
BOSI	-.023	.121**	.403**	.154**	.071	.186**	.082	-.105*	1	-.098*	.045	-.092*	.254**	.075	.026	.109*
BOIN	.014	-.043	-.294**	-.347**	-.137**	-.116*	-.129**	-.130**	-.099*	1	-.074	.008	-.001	-.062	-.097*	-.045
BOME	-.053	-.117*	.174**	.312**	.443**	.067	.037	-.068	.047	-.048	1	-.043	.233**	.278**	.091	.095*
CEDU	-.055	-.087	.026	.024	.102*	.057	-.054	-.380**	-.105*	.011	-.057	1	-.097*	.027	.080	.013
AUSI	-.028	.038	.329**	.149**	.223**	.155**	-.131**	-.089	.211**	-.056	.187**	-.098*	1	.167**	.160**	.134**
AUME	-.136**	-.079	.110*	.184**	.308**	-.040	-.086	-.101*	.056	-.035	.322**	.013	.236**	1	.383**	.300**
MARE	-.165**	.083	.090	.024	-.002	.045	.048	-.042	.020	-.085	.079	.080	.189**	.347**	1	.704**
BOCO	-.117*	.160**	.105*	.038	-.086	.036	.084	.048	.105*	-.028	.061	.013	.188**	.255**	.704**	1

Note: The left half is Pearson's coefficients and the right half is Spearman's non-parametric coefficients. * Correlation is significant at the 0.05 level (2-tailed) and ** Correlation is significant at the 0.01 level (2-tailed). Where BLOK = the ownership concentration. GOV = the government ownership. INS = the institutional ownership. DIRE = the directors ownership. MANG = the managerial ownership. BOSI = the board size. BOIN = the board independence. BOME = the board meetings. CEDU = the CEO duality. MARE = the market reform. BOCO = the board subcommittees. AUSI = the audit committee size. AUME = the audit committee meetings. SAGR = the sales growth. LVRG = leverage. SIZE = the firm size.

Correlation matrices of data C

	SAGR	LVRG	SIZE	BLOK	GOV	INS	DIRE	MANG	BOSI	BOIN	BOME	CEDU	AUSI	AUME
SAGR	1	.063	.051	.013	-.020	.012	-.039	.032	-.047	-.083*	-.015	.022	.027	-.017
LVRG	.097*	1	.317**	.110**	.048	-.098**	.030	.169**	-.042	-.208**	-.091*	-.111**	.016	-.117**
SIZE	.004	.273**	1	.468**	.294**	.524**	-.068	.057	.432**	-.198**	.086*	.063	.305**	.024
BLOK	-.016	.139**	.521**	1	.278**	.374**	.110**	.049	.161**	-.418**	.040	.075*	.141**	.008
GOV	-.006	.042	.358**	.376**	1	.218**	-.039	-.114**	.087*	-.056	.369**	.087*	.174**	.201**
INS	.013	-.195**	.429**	.395**	.018	1	-.083*	-.027	.305**	-.111**	.041	.087*	.145**	-.058
DIRE	-.106**	.010	-.041	.308**	.069	-.112**	1	.393**	.126**	-.015	.004	-.066	-.076*	-.059
MANG	-.034	-.021	-.156**	.066	-.111**	-.064	.353**	1	.122**	-.095*	-.058	-.323**	.034	-.117**
BOSI	.002	-.028	.415**	.168**	.041	.217**	.035	-.105**	1	-.043	.038	-.029	.280**	.081*
BOIN	-.014	-.183**	-.205**	-.406**	-.057	-.084*	-.122**	-.113**	-.059	1	.051	-.050	-.009	.079*
BOME	-.049	-.124**	.101**	.069	.379**	-.025	.034	-.087*	.038	.029	1	-.057	.298**	.261**
CEDU	.005	-.146**	.070	.072	.065	.117**	-.004	-.297**	-.039	-.041	-.090*	1	-.132**	.037
AUSI	.013	.014	.388**	.170**	.237**	.164**	-.109**	-.129**	.292**	-.006	.283**	-.127**	1	.192**
AUME	.006	-.108**	.018	.071	.270**	.005	.019	-.091*	.081*	.054	.270**	.042	.182**	1

Note: The left half is Pearson's coefficients and the right half is Spearman's non-parametric coefficients. * Correlation is significant at the 0.05 level (2-tailed) and ** Correlation is significant at the 0.01 level (2-tailed). Where BLOK = the ownership concentration. GOV = the government ownership. INS = the institutional ownership. DIRE = the directors ownership. MANG = the managerial ownership. BOSI = the board size. BOIN = the board independence. BOME = the board meetings. CEDU = the CEO duality. MARE = the market reform. BOCO = the board subcommittees. AUSI = the audit committee size. AUME = the audit committee meetings. SAGR = the sales growth. LVRG = leverage. SIZE = the firm size.

Correlation matrices of data D

	SAGR	LVRG	SIZE	BLOK	GOV	INS	DIRE	MANG	BOSI	BOIN	BOME	CEDU	AUSI	AUME
SAGR	1	.152**	.147**	.089*	.004	.063	-.030	.080	.010	-.072	-.046	.011	.051	-.042
LVRG	.193**	1	.517**	.302**	-.026	.102*	-.048	.056	.133**	-.263**	-.205**	-.016	.041	-.112*
SIZE	.143**	.500**	1	.489**	.264**	.440**	-.075	-.024	.495**	-.339**	.038	.065	.226**	.000
BLOK	.027	.270**	.560**	1	.351**	.222**	.292**	.098*	.160**	-.461**	.097*	.038	.110*	.033
GOV	.024	-.018	.432**	.440**	1	.276**	-.025	-.231**	.124**	-.123**	.397**	.120**	.220**	.286**
INS	.079	.070	.342**	.205**	.179**	1	.080	-.025	.302**	-.159**	.086	.035	.087*	-.079
DIRE	-.099*	-.065	.000	.442**	.068	.035	1	.420**	.129**	-.069	-.060	-.042	-.179**	-.131**
MANG	-.031	-.044	-.175**	.095*	-.130**	-.133**	.308**	1	.141**	-.139**	-.109*	-.364**	-.015	-.150**
BOSI	.045	.083	.432**	.149**	.062	.242**	.046	-.165**	1	-.127**	.090*	-.073	.307**	.042
BOIN	.000	-.220**	-.386**	-.447**	-.091*	-.204**	-.150**	-.116**	-.126**	1	.002	-.057	-.022	.039
BOME	-.050	-.204**	.095*	.112*	.388**	.057	-.020	-.090*	.085	-.003	1	-.048	.269**	.250**
CEDU	-.023	-.066	.061	.044	.094*	.046	.028	-.359**	-.095*	-.046	-.079	1	-.164**	.045
AUSI	.084	.067	.317**	.136**	.293**	.111*	-.177**	-.127**	.305**	-.036	.268**	-.178**	1	.170**
AUME	-.051	-.124**	.040	.093*	.368**	-.079	-.033	-.124**	.035	.020	.285**	.052	.186**	1

Note: The left half is Pearson's coefficients and the right half is Spearman's non-parametric coefficients. * Correlation is significant at the 0.05 level (2-tailed) and ** Correlation is significant at the 0.01 level (2-tailed). Where BLOK = the ownership concentration. GOV = the government ownership. INS = the institutional ownership. DIRE = the directors ownership. MANG = the managerial ownership. BOSI = the board size. BOIN = the board independence. BOME = the board meetings. CEDU = the CEO duality. MARE = the market reform. BOCO = the board subcommittees. AUSI = the audit committee size. AUME = the audit committee meetings. SAGR = the sales growth. LVRG = leverage. SIZE = the firm size.

Appendix (18)

Descriptive statistics of the dependent variables of data A

Variables	2006	2007	2008	2009	2010	2011	2012	2013	2014	All
CMRM										
Mean	.198	.141	.127	.075	.080	.092	.055	.047	.114	.103
Median	.174	.124	.111	.076	.048	.073	.039	.041	.091	.071
SD	.140	.105	.107	.057	.085	.075	.064	.037	.096	.100
Maximum	.591	.492	.485	.234	.407	.395	.438	.189	.389	.591
Minimum	.015	.015	.002	.001	.001	.002	.002	.001	.004	.001
MARM										
Mean	.112	.088	.089	.058	.059	.063	.047	.045	.066	.070
Median	.095	.061	.072	.046	.037	.040	.037	.037	.042	.047
SD	.095	.080	.076	.041	.075	.066	.053	.039	.070	.071
Maximum	.361	.390	.339	.191	.373	.354	.324	.202	.362	.390
Minimum	.001	.002	.001	.001	.000	.000	.000	.000	.004	.000
MRM										
Mean	.121	.095	.101	.061	.064	.079	.049	.050	.061	.076
Median	.099	.075	.083	.046	.045	.058	.031	.048	.038	.055
SD	.101	.076	.080	.048	.079	.084	.065	.038	.066	.076
Maximum	.456	.325	.316	.234	.428	.462	.458	.188	.272	.462
Minimum	.009	.003	.001	.003	.001	.002	.000	.001	.002	.000
Count	62	62	62	62	62	62	62	62	62	558

Appendix (19)

Descriptive statistics of the dependent variables of data B

Variables	2006	2007	2008	2009	2010	2011	2012	2013	2014	All
CMRM										
Mean	.223	.141	.138	.079	.084	.100	.057	.046	.124	.110
Median	.192	.124	.121	.082	.046	.084	.041	.042	.096	.079
SD	.141	.109	.110	.058	.092	.079	.068	.034	.093	.105
Maximum	.591	.492	.485	.234	.407	.395	.438	.140	.389	.591
Minimum	.015	.015	.002	.001	.001	.002	.002	.001	.006	.001
MARM										
Mean	.120	.092	.096	.055	.067	.069	.050	.044	.065	.073
Median	.106	.063	.078	.041	.040	.046	.040	.038	.043	.051
SD	.099	.083	.078	.041	.081	.070	.056	.035	.062	.073
Maximum	.361	.390	.339	.191	.373	.354	.324	.143	.254	.390
Minimum	.000	.003	.003	.001	.000	.000	.000	.000	.004	.000
MRM										
Mean	.130	.097	.111	.062	.069	.088	.054	.051	.064	.081
Median	.100	.076	.095	.043	.045	.066	.032	.053	.039	.060
SD	.105	.076	.082	.051	.086	.090	.070	.035	.064	.080
Maximum	.456	.325	.316	.234	.428	.462	.458	.133	.248	.462
Minimum	.011	.003	.001	.003	.000	.002	.000	.001	.002	.000
Count	51	51	51	51	51	51	51	51	51	459

Appendix (20)

Descriptive statistics of the dependent variables of data C

Variables	2009	2010	2011	2012	2013	2014	All
CMRM							
Mean	.083	.083	.122	.055	.054	.147	.091
Median	.071	.059	.087	.037	.046	.109	.063
SD	.069	.076	.133	.066	.046	.177	.110
Maximum	.448	.406	1.124	.438	.222	1.535	1.535
Minimum	.000	.001	.002	.000	.001	.001	.000
MARM							
Mean	.056	.061	.098	.045	.068	.081	.068
Median	.045	.042	.059	.027	.047	.053	.044
SD	.041	.063	.133	.054	.154	.095	.100
Maximum	.230	.373	1.109	.324	1.631	.771	1.631
Minimum	.000	.000	.000	.000	.000	.000	.000
MRM							
Mean	.066	.062	.101	.051	.069	.082	.072
Median	.048	.047	.066	.032	.047	.049	.047
SD	.059	.067	.122	.060	.161	.098	.103
Maximum	.431	.428	.968	.458	1.716	.806	1.716
Minimum	.003	.000	.001	.000	.000	.000	.000
Count	115	115	115	115	115	115	690

Appendix (21)

Descriptive statistics of the dependent variables of data D

Variables	2009	2010	2011	2012	2013	2014	All
CMRM							
Mean	.075	.078	.103	.055	.053	.143	.084
Median	.068	.046	.084	.037	.046	.112	.061
SD	.054	.079	.081	.065	.043	.127	.085
Maximum	.234	.407	.445	.438	.178	.922	.922
Minimum	.000	.001	.002	.000	.001	.006	.000
MARM							
Mean	.053	.060	.074	.047	.054	.086	.062
Median	.041	.038	.051	.030	.047	.057	.042
SD	.037	.066	.078	.058	.044	.100	.068
Maximum	.191	.373	.455	.324	.200	.771	.771
Minimum	.000	.000	.000	.000	.000	.000	.000
MRM							
Mean	.060	.063	.091	.053	.054	.087	.068
Median	.048	.045	.060	.032	.050	.049	.047
SD	.046	.073	.092	.064	.043	.105	.075
Maximum	.234	.428	.462	.458	.174	.806	.806
Minimum	.003	.000	.001	.000	.001	.000	.000
Count	85	85	85	85	85	85	510

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