

EVALUATION OF THE IMPACT OF THE DEMUTUALIZATION PROCESS ON STOCK EXCHANGE VALUE

By

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ABSTRACT

Since the business climate of stock exchanges is facing many challenges due to many turbulent changes, traditional stock exchanges are no longer able to keep up with these changes as they lack the required financial flexibility to do so. As a result, many have changed their ownership and governance structure by adopting the strategy of "demutualization". In fact, the stock exchange could have three different views; market, firm and broker-dealer. The current study focused mainly on the "firm" view of a stock exchange as it gives the motive to investigate its internal structure by examining the impact of demutualization on its financial performance and internal governance mechanisms. Also, the study examined the impact of the changes in internal governance mechanisms on the exchange's financial performance. Consequently, several empirical models were constructed and nine hypotheses were developed and tested by applying multivariate regression analysis by utilizing unbalanced panel dataset of the stock exchanges that are members of World Federation of Exchanges during the period of 1995-2012.

The findings revealed that the demutualization has a significant impact on the financial performance in terms of liquidity, profitability and capital structure "mainly the debt maturity". In addition, demutualization of the stock exchange has a significant impact on its board composition and director's pay structure. Furthermore, the findings showed that the change in board size enhances the financial performance of the stock exchange, whereas board independence has an inverse relationship with financial performance. The study clarified that adopting demutualization is considered as one of the successful strategies in managing liquidity and in adjusting the capital structure through the debt maturities. As a result, demutualization supports an exchange in maintaining its financial flexibility and keeping the credit rating within the acceptable range especially in light of the uncertainty of economic environment and competitive conditions. These actions influence critically an exchange's profitability position and in turn, improve its financial performance. On another level, demutualization sheds light on the importance of the board of directors as an effective mechanism in supporting the significant financial decisions and enhancing the stock exchange's superior performance. Overall, this study concluded that demutualization enhances the value of a stock exchange.

DEDICATION

This thesis is dedicated to my father (*may his soul rest in peace*) whose memory inspired me to accomplish this thesis and to my beloved mother for her unfailing support and continuous encouragement throughout the years of study.

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TABLE OF CONTENTS

Chapter One: Introduction

1.1 Introduction.....	1
1.2 Mutual Stock Exchanges.....	2
1.3 Challenges Facing the Mutual Stock Exchanges.....	3
1.4 Demutualization of Stock Exchanges.....	4
1.5 The Research Problem.....	5
1.6 Aim and Objectives.....	12
1.6.1 Aim of the study.....	12
1.6.2 Objectives of the study.....	13
1.7 Research Questions.....	13
1.8 The Research Approach.....	13
1.9 Thesis Overview.....	14

Chapter Two: Theoretical Background on Demutualization of Stock Exchanges

2.1 Introduction.....	15
2.2 Mutual Exchanges.....	16
2.2.1 Advantages of Mutual Exchanges.....	17
2.3 Stock Exchanges Demutualization.....	19
2.3.1 Definition of the Demutualization Process.....	21
2.4 Reasons of Demutualization.....	24
2.4.1 Globalization and Competition.....	25
2.4.2 Technology Development.....	26
2.5 Demutualization and Other Strategies.....	27
2.6 The Changes in Ownership and Governance Structure	31
2.7 Conclusion.....	34

Chapter Three: Demutualization and Performance of Stock Exchanges

3.1 Introduction.....	36
3.2 Demutualization and Stock Exchanges Performance.....	37
3.2.1 Demutualization and Financial Performance.....	43
3.3 The Gap in the Literature of Financial Performance.....	50
3.4 Liquidity and Corporations Performance.....	52
3.4.1 The Motives of Cash Holdings.....	55
3.4.2 Theories of Cash Holdings.....	59
3.4.2.1 Trade-off theory.....	60
3.4.2.1.1 Determinants of Cash Holdings.....	61
3.4.2.2 Pecking Order Theory.....	64
3.4.2.2.1 Determinants of Cash Holdings.....	66
3.4.2.3 Free Cash-Flow Theory.....	67
3.4.2.3.1 Determinants of Cash Holdings.....	68
3.5 Capital Structure/ Leverage.....	69
3.5.1 Trade-off Theories.....	71
3.5.1.1 Determinants of Capital Structure.....	74
3.5.2 The Pecking Order Theory.....	77
3.5.2.1 Determinants of Capital Structure.....	79
3.5.3 The Agency Theory.....	82
3.5.3.1 Determinants of Capital Structure.....	85
3.5.4 Other Determinants of Capital Structure/Leverage.....	88
3.5.4.1 Macroeconomic Variables.....	89
3.5.4.2 The Global Financial Crisis.....	91
3.6 Conclusion.....	92

Chapter Four: Demutualization and Corporate Governance Mechanisms

4.1 Introduction.....	94
4.2 Theories and Corporate Governance Mechanisms.....	96
4.2.1 Agency Theory.....	96
4.2.2 Resource Dependence Theory.....	98
4.3 Demutualization of Stock Exchanges and Corporate Governance mechanisms.....	99
4.4 Determinants of Corporate Governance Mechanisms.....	104
4.4.1 Board Size Determinants.....	105
4.4.2 Board Independence Determinants.....	107
4.4.3 Director's Remuneration Determinants.....	112
4.5 Internal Corporate Governance Mechanisms and Performance.....	116
4.5.1 Board Size and Performance.....	117
4.5.2 Board Independence and Performance.....	118
4.5.3 Director's Remuneration and Performance.....	121
4.6 Conclusion.....	125

Chapter Five: Developing the Conceptual Framework

5.1 Introduction.....	127
5.2 Linking the Literature to the Research Hypotheses.....	129
5.2.1 Demutualization and Financial Performance.....	129
5.2.2 Demutualization and Internal Corporate Governance Mechanisms.....	138
5.2.3 Linking the Internal Governance Mechanisms and Exchange's Performance..	143
5.3 Conclusion.....	146

Chapter Six: Research Methodology

6.1 Introduction.....	148
6.2 Research Philosophy.....	154
6.2.1 The Philosophy of This Research.....	157
6.3 Research Purpose.....	158
6.4 Research Approach.....	162
6.5 Research Strategy.....	163
6.5.1 The Selection of Archival Research Strategy.....	164
6.6 Research Choices.....	166
6.7 Time Horizons.....	168
6.8 Data Collection and Data Analysis.....	169
6.8.1 Data Type and Collection.....	169
6.8.2 Sample Size and Period Covered by the Study.....	171
6.8.3 Selection and Validity of Research Variables.....	173
6.8.3.1 Financial Performance.....	174
6.8.3.2 Internal Corporate Governance Mechanisms.....	177
6.8.3.3 Demutualization Variable.....	181
6.9 Data Analysis Procedures.....	183
6.9.1 Empirical Research Models.....	194
6.10 Conclusion.....	200

Chapter Seven: Analysis and Findings

7.1 Introduction.....	202
7.2 Hypotheses Testing.....	206
7.2.1 Results of Non-Parametric Test.....	206

7.2.2 Multivariate Regression Analysis.....	209
7.2.2.1 Demutualization and financial performance of stock exchanges.....	214
- <i>Findings and Discussions for Model 1</i>	215
- <i>Findings and Discussions for Model 2</i>	221
• <i>Findings and Discussion for Model 2-1</i>	223
• <i>Findings and Discussion for Model 2-2</i>	226
- <i>Findings and Discussions for Model 3</i>	230
7.2.2.2 Demutualization & Internal Governance Mechanisms of stock exchanges..	234
- <i>Findings and Discussion for Model 4</i>	235
- <i>Findings and Discussion for Model 5</i>	238
- <i>Findings and Discussion for Model 6</i>	240
7.2.2.3 Internal Corporate Governance Mechanisms and Financial Performance..	244
- <i>Findings and Discussions for Model 7</i>	245
7.3 Robustness Check.....	248
7.4 Conclusion.....	256
Chapter Eight: Conclusion, Limitations and Recommendations	
8.1 Introduction.....	259
8.2 Review of Objectives and Research Questions.....	260
8.3 Research Findings.....	263
8.4 Contributions of the Study.....	270
8.4.1 Contributions to Theory.....	271
8.4.2 Contributions to Practice.....	272
8.4.3 Contribution to Methodology.....	274

8.5 Limitations of the Study.....	275
8.6 Opportunities for Future Research.....	276
References.....	278

List of Tables

Table	Title	Page Number
Table 2.1	Stock Exchanges Privatisation/ Demutualization	21
Table 7.1	Test of Normality	205
Table 7.2	Results of Wilcoxon Signed Rank	207-208
Table 7.3	Calculations and Findings of RESET Test	210
Table 7.4	Calculations and Findings of Goldfeld-Quandt Test	212
Table 7.5	Results of Heteroscedasticity and Autocorrelation Tests	213
Table 7.6	GLS Regression Findings of Model 1	215
Table 7.7	GLS Regression Findings of Model 2	221
Table 7.8	GLS Regression Findings of Model 2-1	223
Table 7.9	GLS Regression Results of Model 2-2	226
Table 7.10	GLS Regression Findings for Model 3	230
Table 7.11	GLS Regression Findings for Model 3	231
Table 7.12	Fixed-effects (within) IV Regression of Model 4	235
Table 7.13	G2SLS Random-Effects IV Regression Findings of Model 5	238
Table 7.14	GLS Regression Findings of Model 6	240
Table 7.15	GLS Regression Findings of Model 6 with ROA lagged for One Year	243
Table 7.16	GLS Regression Findings of ROA and Internal Governance Mechanisms	245
Table 7.17	GLS Regression Findings of ROE and Internal Governance Mechanisms	246
Table 7.18	GLS Regression Results for Model 1(Robust)	249
Table 7.19	GLS Regression Results for Models 2, 2-1 and 2-2(Robust)	250
Table 7.20	GLS Regression Results for Model 3(Robust)	251
Table 7.21	Fixed-effects (within) IV Regression for Model 4(Robust)	252
Table 7.22	G2SLS Random-Effects IV Regression for Model 5(Robust)	253
Table 7.23	GLS Regression Results for Model 6(Robust)	254
Table 7.24	GLS Regression Results for Model 7(Robust)	255

List of Figures

Figure	Title	Page Number
Figure 2.1	Phases of Exchange Demutualization	23
Figure 5.1	The Conceptual Framework	145
Figure 6.1	Research Onion	149
Figure 6.2	Research Choices	167
Figure 7.1	Summary of The Research Findings	257

GLOSSARY OF ACRONYMS

ATS	Alternative Trading System
ASX	Australia Stock Exchange
BSE	Bombay Stock Exchange
CFO	Chief Financial Officers
ETF	Exchange Traded Fund
ECN	Electronic Communication Network
IOSCO	International Organization for Securities Commissions
GLS	Generalized Least Squares
LSE	London Stock Exchange
MONSTRs	Market-Oriented new Systems for Terrifying Exchanges and Regulators
NSE	National Stock Exchange
NYSE	New York Stock Exchange
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
RESET	Regression Equation Specification Error Test
SEC	Securities and Exchange Commission
SOEs	State-Owned Enterprises
2SLS	Two –Stage Least Squares
WFE	World Federation of Exchanges

Chapter ONE

Introduction

		Page number
1.1	Introduction	1
1.2	Mutual Stock Exchanges	2
1.3	Challenges Facing the Mutual Stock Exchanges	3
1.4	Demutualization of Stock Exchanges	4
1.5	The Research Problem	5
1.6	Aim and Objectives	12
	1.6.1 Aim of the study	12
	1.6.2 Objectives of the study	13
1.7	Research Questions	13
1.8	The Research Approach	13
1.9	Thesis Overview	14

1.1 Introduction

Stock exchanges are one of the oldest financial institutions, as their history can be traced to the 12th century when brokers started trading in debt and government securities in France, followed by unofficial share markets across Europe through the 1600s. The Amsterdam Stock Exchange was the first official stock exchange in the year 1602. By the beginning of the 1700s, fully operational stock exchanges spread in France, England and latterly in the United States (ECB, 2007). Traditionally, stock exchanges traded under a mutual/cooperative structure that was not profit oriented, however, technological advancement and increased competition among other

factors have driven stock exchanges to operate under new structures; demutualized/corporate. Although demutualization has offered the means for the stock exchanges to compete in such a highly dynamic market, mutual stock exchanges encompass many benefits and improvements and some schools still prefer such structure. Accordingly, this research will thoroughly review and examine the aggregate impact of demutualization on stock exchanges as explained in later sections of this chapter. The following section will briefly introduce the main characteristics for the mutualized and demutualized structure and will provide an overview for the factors that derived the stock exchanges towards demutualization.

1.2 Mutual Stock Exchanges

Traditionally, stock exchanges operated as ‘clubs of brokers’ or mutual associations, whose members enjoyed rights of ownership, control, and trading. All decision making was done democratically on a one member, one vote basis (OMOV). Akhtar (2002) argued that mutual/cooperative structure of stock exchanges enabled the members to enjoy monopoly power as those members are the only ones who could deal in stock exchanges (i.e. buying and selling securities). Although it could be argued that such monopoly power could yield a conflict of interest, but such exclusive rights protected the members’ interests while assuring that they protect their specialized services and reputation and thus act on the exchanges’ users best interest as well. In addition, each party has voting rights (Di Noia, 1998). Under the mutual cooperative structure, the physical location played a significant role for trading, where trading took place in a central location. Only members/brokers had exclusive trading floor access and were allowed to trade in the exchange via their rights of ownership, control and trading. In order to gain membership rights, brokers were to satisfy certain requirements applied by the exchange and had to pay membership fees. Moreover, seated memberships were not freely transferable (Akhtar,

2002). Consequently, through offering membership rather than employment contracts, the mutual structure minimized the contracting cost (Shleifer and Vishny, 1997). While listed companies have no authority to trade their stocks under the mutual structure, members act as intermediaries for those companies and hold the responsibility of their interests. In return, members of mutual stock exchanges share the net profit of the venue, returned in the form of lower access fees or trading costs (Akhtar, 2002), with the exception of the London Stock Exchange, that paid large dividends to its members from 1802 until 1948, unlike all the other cooperatives that paid no dividends, as it was operating on a for-profit basis (Donnan, 1999).

1.3 Challenges Facing the Mutual Stock Exchanges

Until the end of the nineteenth century the economy was stable, the globalization was less promoted, the competition between exchanges was not playing a serious role and so the cooperative structure of stock exchanges was improving optimality. The technological evolution changed the stock exchanges' environment dramatically. Macey and O'Hara (2002) and Lee (2002) pointed out that due to the environmental changes stock exchanges' services are now executed electronically. This has increased the competition among exchanges as the traditional operative structure of a stock exchange became obsolete especially, in regards of its physical location, thus diminished the members' roles (Lee, 2002). In addition, it leads to the creation of automated trading systems such as Alternative Trading System (ATS) and Electronic Communication Networks (ECNs) that have the same economic functions as a stock exchange (e.g. Akhtar, 2002; Lee, 2002). Moreover, it eliminated the national boundaries of trading time and geographical location between markets and investors' roles (Galper, 2001). Therefore, created new competition and opportunities between stock exchanges and investors were able to trade on foreign markets just as they would in domestic markets. Such changes have led to

deregulation of the stock exchanges, which redefined the constraints imposed on all players including investors, brokers/dealers and the stock exchange itself.

1.4 Demutualization of Stock Exchanges

The climate business in this era faced many challenges, which forced these venues to change their structure and adopt a new one that can be a lifeline in facing these changes to the business climate in regards to stock exchanges. Adaptation to those challenges required the stock exchanges to implement huge investments in technology and to increase the efficiency of their services and decision-making processes. Although, many scholars provide definitions of the demutualization process, this particular study will follow the definition provided by Aggarwal (2002) who emphasized that demutualization is the conversion of the stock exchange from non-profit/mutual organisation owned by its members to a for profit corporation owned by its stockholders. Under this new structure, trading rights are separated from ownership ones. The new owners (stockholders) provide the stock exchange with the capital needed and in return, they expect to receive profits. In addition, the exchange's stockholders are represented by elected board of directors who are answerable to them.

In a demutualized stock exchange, the return of stockholder which is called dividends, is a portion of corporations' surplus/net income that are distributed according to the number of stocks held by each owner/stockholder where the higher the number of shares held, the greater the dividends each shareholder receives (Baarda, 2006). Implementing the demutualization process/strategy is twofold. It involves changing the legal ownership of the exchange and its governance structure. Changing the legal ownership means transferring from being membership entity to share ownership. Changing the governance structure to corporations separates the ownership rights and trade rights. In this organisational form, the voting right principle is one

share-one vote, with a board of directors elected by shareholders. Therefore, changes associated with the demutualization process increased flexibility of the governance structure under which investors' had their share of participation. It increased efficiency of the exchanges functions through improving trading platforms, increasing access to investment resources and access to global markets. However, changes in legal ownership where shares can be traded freely required implementing limitation on ownership to avoid potential takeovers (Akhtar, 2002). Furthermore, the changes in the governance structure could lead to potential conflict of interests between owners and controllers (agency problem). Consequently, changing the governance structure gives the chance to link the corporate governance objectives and mechanisms with the demutualization of stock exchanges and its performance.

Corporate governance is a popular topic and has been the focus of many research studies especially after various corporate financial scandals worldwide. The governance structure of any corporate entity affects the firm's ability to respond to external factors that have some bearings on its performance (Denis and McConnell, 2003). The notion of good corporate governance derived from its influence on the organisational outcomes of board structure in terms of both; size and independence. Therefore, it is worthy to investigate what kind of board is satisfied with the requirements of 'good board' to improve mechanisms of corporate governance and enhance the demutualized stock exchanges performance.

1.5 The Research Problem

A Cost and Revenue Survey performed by the World Federation of Exchanges (2013) on its fifty-seven members of stock exchanges clarified that by the end of year 2012; nine stock exchanges were demutualized, twenty-three were publicly listed, eight were private limited companies owned by their members, seven were associations or mutually owned and ten stock

exchanges had other legal statuses. From the increasing number of stock exchanges that demutualized or were planning to demutualize in the near future, a question is raised; is demutualization the safeguard that save many stock exchanges from extinction by empowering their performance and strengthen their governance structure? By conversion from mutual/cooperative to demutualize/corporation structure, the primary objective of a stock exchange changes from maximising the members' interests to maximise profit/stockholders wealth alongside with satisfying other stakeholders' interests. Accordingly, to fulfill this new objective, a stock exchange has to improve its performance and enhance its own value. Domowitz and Steil (2001) clarified that there are different incentives of operations under both structures of stock exchanges (i.e. mutual vs. demutualized). In addition, Scullion (2001) argued that a stock exchange demutualize when its potential market capitalization is maximised alongside with increasing the value of its shareholders and all other stakeholders. Previous literature illustrated that the decision behind the demutualization relied on several challenges such as globalization, the development of technology, and increasing competition among each other as well as competition with new competitors; Alternative Trading Systems (ATSs). In addition to that, the traditional exchanges were lacking in the financial flexibility to cope with these environmental changes (Aggarwal, 2002).

Numerous theoretical studies support the idea that demutualization of stock exchanges ought to be a characteristic move to enhance stock exchanges' performance. On the other hand it is still empirically inconspicuous how diverse demutualization influences a stock exchange's performance. Unlike regular firms, a stock exchange could have three different views; as a market, as a firm and as a broker-dealer. (Di Noia, 2001). Consequently, by reviewing the previous literature, it can be noticed that some studies have dealt with a stock exchange as a

‘market’, others have dealt with it as a ‘firm’ and in some cases combined the two views. Following the market view, some empirical studies focused on market indicators/measures to analyze the impact of demutualization such as efficiency (e.g. Schmiedel, 2001; Schmiedel 2002; Serifsoy, 2005), liquidity (Treptow, 2006), market quality (e.g. Krishnamurti, Sequeira and Fangjian, 2003; Otchere and Abou-Zied, 2008). In addition, among these studies, some of them suffered from some drawbacks. Both studies applied by Schmiedel (2001; 2002) failed to establish a link between demutualization and the efficiency of stock exchanges. Moreover, both Krishnamurti, Sequeira and Fangjian (2003) and Otchere and Abou-Zied (2008) focused on their analysis by using only one stock market; the Indian stock market and the Australian Stock Exchange (ASX) respectively. In line with the different views of a stock exchange presented by Di Noia (2001), especially the firm view; Mulherin, Netter and Overdahl (1991) and Macey and Kanda (1990) argued that stock exchanges are self-interested economic organisations that provide financial instruments. In addition, following the definition of demutualization process provided by Aggarwal (2002) which emphasized that a traditional stock exchange converted from a mutual/cooperative non-profit organisation to a for-profit corporation where the new owners (i.e. stockholders) who are presented by elected board of directors can provide the exchange with the needed capital and in turn they expect to receive return/profit. Consequently following the ‘firm view’ of a stock exchange gives this particular study the motive to examine the impact of demutualization on a stock exchange’s financial performance with a belief that improving the financial performance could be a reflection of the power of the new organisational structure (i.e. demutualized structure) and will reveal how strong and healthy the internal structure of a stock exchange is. Consequently, a stock exchange with strong internal structure will increase its production efficiency, its ability to compete with other stock exchanges and

eventually this will enhance the value of a stock exchange as a firm as well as a market. In general, Richard et al. (2009) argued that the organisational/business performance covers three specific areas of firm outcomes: (1) financial performance (i.e. return on assets (ROA), profits, etc.); (2) performance of product market (i.e. market share, sales, etc.); and (3) stockholder return (i.e. total stockholder return, economic value added (EVA), etc.). The major organisational performance measures applied in finance and accounting studies to assess the financial performance of an organisation are the accounting-based measures/financial ratios which can be presented as values, ratios and percentages (e.g. Penman, 2001). Moreover, accounting measures include profitability, leverage, liquidity measures, cash-flow and efficiency measures (e.g. Carton and Hofer, 2007; Richard et al., 2009; Santos and Brito, 2012). Previous literature included few empirical studies focused on examining the impact of demutualization on stock exchanges' performance using different areas (i.e. financial/operating performance, product market/sources of revenue and return of stockholder). In context of demutualization of stock exchanges, some empirical studies focused only in analyzing one area of organisational performance; financial performance such as Azzam (2010) and Morsy and Rwegasira (2010), others combined two areas; financial performance and stockholder return such as Mendiola and O'Hara (2003) or financial performance and product market/sources of revenue such as Otchere and Abou-Zied (2008) and Oldford and Otchere (2011), taking into consideration that the study of Otchere and Abou-Zied (2008) also examined the impact of demutualization on market quality as presented earlier. Moreover, Otchere (2006) combined the three areas of performance (i.e. financial performance, product market/sources of revenue and stockholders return). previous literature focusing on examining the impact of demutualization on the financial performance of stock exchange provided mixed evidence as some of them supported the trend toward

demutualization (e.g. Otchere and Abou-Zied, 2008; Azzam, 2010; Oldford and Otchere 2011) and others proved the opposite e (e.g. Mendiola and O'Hara, 2003; Otchere, 2006; Morsy and Rwegasria, 2010; Otchere and Mohsni, 2016). The common feature of these studies in analyzing the financial performance of a stock exchange is focusing on the profitability perspective. However, some scholars showed the importance of considering another perspectives; the capital structure/leverage as a core area in analyzing the financial performance of stock exchanges as well as its role in explaining the reasons behind the changes on the profitability of a stock exchange after the decision of conversion (i.e. demutualization/self-listing). As for instance, Mendiola and O'Hara (2003) and Otchere (2006) argued that the decline in ROA and ROE (i.e. profitability ratios) is referred to the decline in the level of leverage and the increase in the level of equity (i.e. alternative source of funds) as a result of the decision of self-listing (i.e. IPOs). On the other hand, Otchere and Abou-Zied (2008) argued that the increase of the ROA after the demutualization/self-listing of the Australian Stock Exchange (ASX) is due to the change in its capital structure strategy after the conversion. As for the authors, the stock exchange started to use its equity as an alternative source of funds in financing its activities such as acquiring new assets rather than using the debt/leverage source alongside the improvements that occurred in the exchange's operating profit and net profit which gives a clear justification of the increase in the ROA ratio. Similarly, Azzam (2010) examined the impact of demutualization on the profitability and the leverage of a stock exchange, where the findings exhibited a significant decline in the debt/leverage level and an increase in the profitability of a stock exchange after the demutualization. Interestingly, the annual reports of the selected stock exchanges of this particular study provided some evidence regarding this point as for instance, NYSE and NASDAQ clarified that an adequate capital is needed for maintaining the level of growth and the

development of the exchange's business activities which can be met mainly from the internal generated funds (i.e. cash and cash equivalent), debts (i.e. borrowings under the current credit facilities) and issuing equity. However, using more debts could notably increase the exchange's level of leverage and that could reduce its liquidity level, affecting its credit rating negatively and facing difficulties in accessing capital markets. On the other hand, issuing additional equity could lead to equity dilution of the current stockholders. Consequently, NYSE and NASDAQ hold higher level of cash reserves to be invested mainly for enhancing their technology operations by developing their system platforms. Moreover, they use this significant level of cash for the repayment of their debt obligations and for current and future acquisitions, partnerships and joint ventures (e.g. NYSE and NASDAQ OMX annual reports 2007 and 2011). The preceding arguments shed light on the importance of the capital structure of a stock exchange after the conversion dealing with both external sources (i.e. debt and equity) and internal sources (i.e. liquidity/ cash and cash equivalent). In addition, the literature of corporate field is rich of theoretical and empirical backgrounds concerning specifically the liquidity through the cash holdings factor (i.e. cash and cash equivalent) and the leverage/capital structure including the debt maturity (i.e. short-term vs. long-term) showing the importance of these perspectives and their influence on corporation's financial performance. Since none of the empirical studies in the context of demutualization of stock exchanges have consider such perspectives (i.e. debt maturity and cash holding), this study will follow the theoretical foundation and the existing literature applied in the field of corporate finance in order to develop the association of the aforementioned perspectives with the demutualization of stock exchanges thus, this will add new insights to knowledge as it will exhibit financial policies and procedures that a stock exchange would opt after the decision of conversion in order to improve its financial

performance especially in such a competitive environment. Simply, this will reveal more details on the sources of improvements that could be generated from adopting such a strategy.

Moreover, the majority of these studies followed the same methodological approach known as MNR methodology referring to the early work of Megginson, Nash and Van Randenborgh (1994), where there are two groups to be compared; a tested group that includes the demutualized stock exchanges and a control group which includes the stock exchanges that are not demutualized (i.e. mutual stock exchanges) which is used as a benchmark, simply by testing the hypotheses using parametric or non-parametric tests. If there are significant differences between the means or medians of the tested variables pre-post the demutualization, this would be largely attributed to the demutualization effect. On the other hand, limited studies (e.g. Azzam, 2010; Morsy and Rwegasria, 2010; Oldford and Otchere, 2011) applied different methodological approach, where there is only one group (i.e. tested group); taking into consideration that the study of Oldford and Otchere (2011) also used the MNR methodology in part of their analysis. Accordingly, if there are significant differences in the means or the medians of the tested variables pre-post the demutualization by testing the hypotheses using parametric or non-parametric tests, this may or may not be attributed to the demutualization as there could be other factors that have significant impact on the tested variables and this can be sorted out by having sufficient data and applying statistical regression (for better illustration on these approaches see chapter 6).

In another level, following the definition of demutualization process provided by Aggarwal (2002), the governance structure of exchanges changed due to the separation of ownership and trading rights where the stockholders (new owners) of demutualized stock exchanges are presented by an elected board of directors shed the light on the importance of the new

governance structure of a stock exchange and the vital role of its board of directors as an internal governance mechanism. Nevertheless, examining the internal governance mechanisms of the demutualized exchanges and identifying its theoretical foundation have not received any significant attention with the exception of just one study conducted by Angulo, Slimane and Alidou (2014), which examined the impact of demutualization on some aspects of internal mechanisms of corporate governance, however with core limitations such as their analysis was applied to just one single stock exchange (i.e. London Stock Exchange). In addition, the methodological approach applied in their study focusing on comparing the tested variables pre-post the demutualization of the selected stock exchange only without comparing their findings with other stock exchanges for instance, exchanges under the mutual structure or even control for other variables that could influence the internal governance mechanisms other than the demutualization. Finally, this study will be the first to take an in-depth investigation of the impact of the demutualization process on the financial performance, and the new factor of corporate governance mechanisms through empirical modeling and testing. The study further examines the ability of changes in corporate governance mechanisms derived by demutualization to affect the performance of the stock exchange.

1.6 Aim and Objectives

1.6.1 Aim of the study

This study aims to quantify the impact of demutualization process on the financial performance, internal corporate governance mechanisms and hence the value of stock exchanges that are members of World Federation of Exchanges (WFE).

1.6.2 Objectives of the study

- 1- To critically review the relevant literature for the impact of demutualization on stock exchanges' financial performance.
- 2- Examine the theoretical foundations for the corporate governance mechanisms in regard to the corporations and their performance in order to develop the association of demutualization of stock exchanges with the corporate governance mechanisms.
- 3- Construct an empirical model to investigate the impact of demutualization on the financial performance of a stock exchange and on its internal corporate governance mechanisms in addition, examine the ability of the changes in internal governance mechanisms derived by demutualization to enhance the performance of the stock exchange.

1.7 Research Questions

The following research questions will help to achieve the objectives in this research:

1. What are the impacts/effects of demutualization on the financial performance of the stock exchange?
2. What are the impacts/effects of demutualization on the internal corporate governance mechanisms of the stock exchange?
3. What is the impact of the changes in internal corporate governance mechanisms derived by demutualization on the exchanges' financial performance?

1.8 The Research Approach

This study will focus on evaluating the financial performance, and internal corporate governance mechanisms of stock exchanges prior to, and following, the demutualization process. The study will define the benefits involved in such a transformational process and address the problem through two types of analysis; first, descriptive analysis to compare the means and medians,

respectively, of relevant variables relating to financial performance and corporate governance mechanisms for historical stock exchange data (i.e. secondary data) pre and post demutualization and second, regression analysis of relevant variables. The results from these tests will provide insight into factors affecting the demutualization process and its effect on stock exchange performance. More detail will be discussed in chapter 6.

1.9 Overview of thesis

Chapter two reviews the theoretical background on the traditional structure of a stock exchange and provides the reasons behind adopting the demutualization structure. Different definitions of demutualization are reviewed in order to clarify the dimensions of such a strategy.

Chapter Three reviews previous literature regards the impact of demutualization on exchanges' financial performance from different perspectives.

Chapter Four presents the importance of corporate governance mechanisms, especially the internal ones and how these mechanisms could impact the performance of corporations supported by theoretical and empirical backgrounds in order to develop the foundation for examining the relationship between corporate governance mechanisms and demutualization to develop a comprehensive understanding of their impact on the exchanges' structure and performance.

Chapter Five outlines the theoretical framework used in this study.

Chapter Six provides the research design and methodology of the study. It will also show how the data collected fits in the study.

Chapter Seven will illustrate the analysis and interpretation of findings.

Chapter Eight will finalize the thesis providing the conclusion, research limitations and recommendations.

Chapter Two

Theoretical Background on Demutualization of Stock Exchanges

		Page number
2.1	Introduction	15
2.2	Mutual Exchanges	16
	2.2.1 Advantages of Mutual Exchanges	17
2.3	Stock Exchanges Demutualization	19
	2.3.1 Definition of the Demutualization Process	21
2.4	Reasons of Demutualization	24
	2.4.1 Globalization and Competition	25
	2.4.2 Technology Development	26
2.5	Demutualization and Other Strategies	27
2.6	The Changes in Ownership and Governance Structure	31
2.7	Conclusion	34

2.1 Introduction

Since firms and investors have been trading through stock exchanges; scholars were and still are seeking to improve the efficiency of the market, and its structure so that it can serve all sides better. Traditionally, mutual/cooperative was the known structure for stock exchanges, under which trading has been taking place. As a result of increasing competition and the need for stock exchanges to raise new capital and introduce new products to increase its revenues; technological advancement, globalization and other environmental factors that arise in the process of

enhancing the market, the demutualization process has been introduced and adopted by stock exchanges. Stock exchanges adopt demutualization for its various benefits and ability to increase the value of the stock exchange, although mutual stock exchanges had witnessed many benefits and improvements and some schools still prefer such a structure.

2.2 Mutual Exchanges

Traditionally, stock exchanges operated as ‘clubs of brokers’ or mutual associations, whose members enjoyed rights of ownership, control, and trading. All decision making was done democratically on a one member, one vote basis (OMOV). Akhtar (2002) pointed out, that mutual/cooperative structure of stock exchanges enabled the members to enjoy monopoly power as members are the only ones who can deal in stock exchanges (i.e. buying and selling securities). Generally, the primary objective of a firm under mutual/cooperative structure is to maximise its members’ income by providing them with goods and services and thus the produced surplus will be used initially for maintaining a sufficient reserve needed for developing the firm and the remainder of this surplus will be returned to them in proportion to their utilization of the firm’s services. In line with point, Baarda (2006) argued that, in cooperatives, the members’ return is distributed in relation to the purchases and usage of the services that each member provides under the umbrella of the cooperative. Skurnik (2002) and Grant (2005) clarified that, since members of a cooperative are owners/controllers, so the value of a cooperative organisation is the best of its members’ interests. Similarly, Akhtar (2002) argued that the members of mutual/cooperative stock exchanges are having seats after satisfying certain requirements and paying regular charges (i.e. annual membership fees) applied by the exchange, although this seated membership is not freely transferable. In addition, those members share the net profit/surplus of the venue which is returned in the form of lower access fees or trading costs.

However, Donnan (1999) argued that this is not the case of the London Stock Exchange (LSE), as it was operated on a for-profit basis and paid large dividends to its members from 1802 until 1948 unlike all the other cooperatives that paid no dividends.

2.2.1 Advantages of Mutual Exchanges

The mutual/cooperative structure of stock exchange is still preferable to some scholars who showed advantages of adopting such a structure (e.g. Shleifer and Vishny 1997; Kongden 1998). The following section will review the advantages of mutual structure by discussing different dimensions, such as monopoly power, members' homogeneity, cost of contracting and relationship investments.

Monopoly Power

Members of stock exchanges under the mutual structure have exclusive trading floor access to trade in the exchange as they are given the ownership and the control of its assets by law. The Hansmann (1988) study inferred that traditional exchanges were dealing with their customers with a high degree of monopoly power. This was how the members avoided the cost of paying outsider prices for the trading services they obtained. There was a belief that the monopoly position raises a potential conflict of interest between the exchange members and exchange users. The members are able to exploit the exchange users, and as result the users threaten to leave the exchange in response to this pressure. Di Noia (1998) argued that the cooperative structure gives the balance of self-interests to both parties that members were still protecting their specialized services and reputation, while at the same time the users were able to avoid exploitation by members.

Homogeneity

Simply, homogeneity means sameness, as members of cooperatives have common interests; this means little or no conflict of interests between members in the context of stock exchanges. Members of cooperatives have common interests which are protected by homogeneity of their jobs and skills, as Hansmann (1988) provided a successful example of cooperatives (i.e. labour cooperatives) where the workers who are members of the cooperative, exercise similar tasks. Moreover, the importance of the homogeneity feature is strongly perceived, especially in distinguishing firms' types; worker/member-owned firms from investor-owned firms (Hansmann, 1988). In line with Hansmann (1988) ideas, Hart and Moore (1998) clarified that homogeneity is decisive to the efficient running of cooperatives as increasing the divergence between members' interests will result in inefficient cooperatives. In the context of stock exchanges, the New York Stock Exchange (NYSE) proved that the homogeneity feature is historically evident for having a successful cooperative organisation as the exchange under this structure pursues to maximise the efficiency, probity and reliability of the market, and not to maximise profit as in the public firms (NYSE, May 2003).

Cost of Contracting

The idea that stock exchanges were historically run as mutual-cooperative organisations did not give enough explanation on why stock exchanges adopt such a structure, as some scholars have explored the economic benefits behind adopting the mutual/cooperative structure (e.g. Hansmann 1988; Shleifer and Vishny 1997). The early work of Hansmann (1988) explored the relationship between members' homogeneity and contracting cost as minimizing the contracting cost would be an advantage of the exchange when membership is homogeneous, although, this advantage would become a cost if the members' interests were divergent. This was the case when

globalization of financial markets took a place with the co-existence of national and international traders who have the same voting rights on the same trading floor. If each group wants to maximise their self-interests, the exchanges' overall prospective will not be maximised, because each group tries to vote for their own interests as opposed to voting for the exchanges' common interest. In line with Shleifer and Vishny (1997) ideas on how the mutual structure can minimize the contracting cost. The mutual structure of the venue minimizes the contracting cost through offering membership instead of employment. The exchange sells membership to individuals, who in order to participate, have to pay membership fees and contribute a portion of their profit to be invested in the venues' infrastructure requirements – technology and facilities.

Relationship Investments

Adding to the monopoly power and the homogeneity between members, research has shown that adopting the cooperative structure has been favourable for the stock exchange and its users as a result of the specific relationship investment. Macey and O'Hara (1999) explained this relationship as: the stock exchange is the place that provides various services, while users/ listing firms provide the securities that the exchange trades and provides to investors. Due to this specific relationship investment, there is a possibility of each side being able to exploit the other, thus controlling large stakes of the venue, due to the non-diversifiable investments in the relationship. Still the cooperative structure proves to be the best in maximising the benefits for both parties, since each party has voting rights.

2.3 Stock Exchanges Demutualization

Until early 1990s, the majority of stock exchanges acted as mutually-owned or state-owned organisations, such as the London Stock Exchange, the New York Stock Exchange, American Stock Exchange and the Italian Stock Exchange (Borsa Italiana). The business climate in this era

faced many challenges such as globalization, competition and advances in technology that forced the traditional stock exchanges to change their structure in order to cope with these environmental changes. However, the traditional stock exchanges suffered from high level of financial inflexibility which prevented them from competing with each others (Aggarwal, 2002). In 1993, the Stockholm Stock Exchange was the first stock exchange that took steps toward demutualization and converted from mutually-owned/non-profit organisation into investor-owned/ for-profit corporation, followed by a number of stock exchanges around the world (see Table 2.1).

Generally, the primary objective of a corporation is to maximise its stockholders' returns/wealth, protect all other participants' interests by improving the corporate performance, accountability and to ensure the commitment of board of directors in managing the firm in an efficient and transparent manner. Moreover, the return of stockholders which is called dividends is a portion of corporations' surplus/net income that are distributed according to the number of stocks held by each owner/stockholder where the higher the number of shares held, the greater the dividends each shareholder receives (Baarda, 2006). Consequently, a demutualized stock exchange will perform similar to any investor-owned firm (i.e. for-profit corporation) thus; the exchange's stockholders will expect to receive their dividends at a certain time in the future contrary to a stock exchange under the mutual structure (e.g. Bradley, 2001; Akhtar, 2002).

Table 2.1 Stock Exchanges Privatisation/ Demutualization

TABLE 1 ■ EXCHANGES PRIVATIZATION/DEMUTUALIZATION²					
Demutualized Exchanges	Year	Demutualized Exchanges	Year	Demutualized Exchanges	Year
Stockholm Stock Exchange	1993	Athens Stock Exchange	1999	Chicago Mercantile Exchange	2002
Helsinki Stock Exchange	1995	Stock Exchange of Singapore	2000		
Copenhagen Stock Exchange	1996	Hong Kong Stock Exchange	2000		
Amsterdam Stock Exchange	1997	Toronto Stock Exchange	2000	Proposed Demutualizations	
Borsa Italiana	1997	London Stock Exchange	2000	NYMEX	
Australian Stock Exchange	1998	Deutsche Börse	2000	International Petroleum Exchange	
Iceland Stock Exchange	1999	Euronext	2000	Chicago Board of Trade	
Simex	1999	The Nasdaq Stock Market	2000	Chicago Board of Options Exchange	

Source: Aggarwal (2002)

Senbet and Ochtere (2008) clarified that the increase in the number of demutualized stock exchanges around the world showed the necessity of adopting a new structure (corporation) to meet the industry challenges. Under this new structure, the new owners inject the stock exchange with the needed capital for expanding their business activities and provide the market with a variety of products and services which increase the exchange's value. For instance, this is evidenced by the Deutsche Stock Exchange/Börse's expansion plan, as the exchange after demutualization added new products and services such as trading in derivatives and clearing and settlement. Moreover, NASDAQ has established one of the best and most Exchange Traded Fund (ETF); QQQ, which has a significant effect on its trading volume (Aggarwal, 2002). Consequently, this diversification in products and services attracts more order flow, enhance the exchange's trading activities (i.e. increase its trading volume), increase its trading commissions and eventually improve its liquidity position (e.g. Lee, 2002; Aggarwal, 2002).

2.3.1 Definition of the Demutualization Process

From the foregoing discussion, it can be noticed that the demutualization process emphasized on the conversion of mutual/non-profit-organisations into investor-owned/for-profit corporations. However, Steil (2002) argued that the emphasis of the demutualization process does not

necessarily rely on the legal ability of exchanges to distribute the profit (surplus funds) to its owners but rather focuses on the separation of ownership and trading rights. To get a better understanding of the demutualization process, a number of definitions of the demutualization process have been introduced by several scholars. The following section demonstrates these definitions:

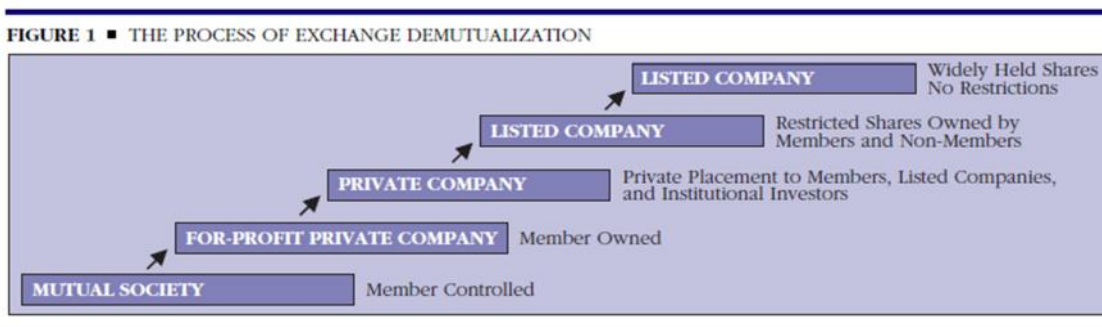
-IOSCO discussion paper referred that *“the transformation of an exchange into a for-profit shareholder-owned company is referred to as demutualization”* (IOSCO, 2000, p. 1). The previous definition emphasized that the demutualization process is simply the conversion from non-profit (mutual) member-owned organisations into for-profit shareholder corporation. However, in light of Steil (2002) as illustrated previously, some scholars elaborate the concept of demutualization by emphasizing the separation between ownership and membership rights associated with reducing the role of the existing members especially their intermediary services and by adding non-members (shareholders) who allow stock exchanges to raise the capital needed to expand its business activities (i.e. investments in infrastructure and technology). In addition, Elliott (2002) focused on a different aspect of demutualization as it decouples the ownership rights from trading rights.

Aggarwal (2002, p. 106) clarified that demutualization is:

The process of converting a non-profit, mutually owned organization to a for-profit, investor-owned corporation. The members of mutually owned exchanges--that is, broker dealers with “seats” on the exchange--are also its owners, with all the voting rights conferred by ownership. In contrast, a demutualized exchange is a limited liability company owned by its shareholders. Trading rights and ownership can be separated; shareholders provide capital to the exchange and receive profits, but they need not conduct trading on the exchange. Although demutualized exchanges will continue to provide many if not most of the same services, they will have different governance structures in which outside shareholders are represented by boards of directors.

Furthermore, Oldford and Otchere (2011, p. 70), defined the demutualized stock exchanges as “one whose members’ rights have been decoupled from ownership rights and the exchange has taken on commercial, profit-oriented objectives”. As presented previously, the objectives and questions of this research study (see Chapter 1) are appropriately following the definition of demutualization as suggested by Aggarwal (2002). Aggarwal (2002) provided a detailed definition of the demutualization process including several dimensions; the conversion from non-profit into for-profit organisations (profit-oriented objectives); changing the governance structure of exchanges associated with the decoupling of membership rights from the ownership rights; the important role of the elected board of directors (governance mechanism) by stock exchanges’ shareholders (owners/non-members). Accordingly, it is important first to highlight the phases of exchange demutualization and the strategies that had been taken by stock exchanges to change their ownership and governance structure in an attempt to face the increase in competition and the advances in technology and so promoting its performance.

Figure 2.1: Phases of Exchange Demutualization



Source: Aggarwal (2002)

As shown in figure 2-1 the process of stock exchange demutualization has different stages. The first one begins with the transition from a non-profit organisation into a for-profit corporation. The members become the owners of the exchange through an interchange of members’ seats

(membership) for stocks in the new organisation/corporation equal in proportion to the previous voting rights held by those members (Elliott, 2002). In the second phase, the stock exchange becomes a private company where the owners include chosen private investors such as listed firms and institutions through private placement. Then, the final stage is to become a listed company with or without restrictions (i.e. public offering) (Aggarwal, 2002). Another form of demutualization is where an exchange can become a subsidiary of a listed public company. For example, The OM Stockholm's börsen AB-Swedish Stock Exchange- is a subsidiary of the OM Group (IOSCO, 2000).

2.4 Reasons of Demutualization

The fact that the financial industry has included many similar enterprises, and has opted different forms (i.e. outside ownership structure) in the same era along with the traditional stock exchanges cooperative structure, gives us a conclusive indication that history alone cannot explain the reason behind adopting such a structure (Mendiola and O'Hara, 2003). Chaddad and Cook (2004) found that the steps taken by the various institutions for adjusting their structure in the market, followed by the deregulation of markets and the technology innovations change the rules of the game. Also they clarified that these changes encouraged the demutualization process which led to increase the efficiency of business and to remove the financial constraints of the new company. Until the end of the nineteenth century the economy was stable, the globalization was less promoted, and the competition between exchanges was not playing a serious role, so the cooperative structure of stock exchanges was improving optimality. Macey and O'Hara (2002) pointed out that nowadays, the services provided by stock exchanges are executed in an electronic form which leads to increase the competition between stock exchanges.

2.4.1 Globalization and Competition

One of the characteristics of globalization is making societies more alike and comparable. Obviously, the minimization of each society's autonomy has a direct effect on trading businesses nationally and globally. Steil (2002) clarified that the reasons behind the demutualization of stock exchanges (e.g. European exchanges) are: first, the direct competition between stock exchanges which lessen the ability of members to prevent the new trading remedy and so diminishing their intermediation role (i.e. disintermediation), and second, the internationalization of a stock exchange membership which open the door for large international financial institutions (i.e. banks) to decrease the control of the domestic banks, thus increasing their voting rights. In linking the impact of competition on the decision of stock exchanges to demutualize, traditional stock exchanges (i.e. mutual/cooperative structure) lacked of efficiency, financial flexibility and sufficient capital (e.g. Hart and Moore, 1996; Aggarwal, 2002) wherefore the costs associated with such a structure are greater compared to the generated benefits (Mendiola and O'Hara, 2003) thus a decision to adopt a new structure (i.e. demutualize/investor-owned) was a must to cope with such a competitive environment. Empirically, in concerning the competition as a major catalyst of stock exchanges demutualization, a study conducted by Hazarika (2005) exploring the reasons behind changing ownership from mutual to demutualized stock exchanges and its impact on stock exchanges' trading volumes and costs. The sample included two stock exchanges demutualized for different reasons; the London stock exchange which demutualized due to the competition pressure and the Borsa Italiana which was demutualized by the government despite its member resistance. Hazarika (2005) concluded that competition plays a great role in the demutualization process. In the case of the London stock exchange; demutualization has increased the trading volumes with a continuing decline in the trading costs

after demutualization which at the end is more beneficial for the investors. In contrast; in the case of Borsa Italiana, the trading costs increased and the investors were worse off after demutualization. Ramos (2006) investigated the impact of competition on stock exchanges decision to demutualize/going public using different proxies of competition (i.e. Economic Freedom Index; international capital market control) and the findings revealed that stock exchanges located in countries with higher level of economic freedom and less capital market control are more likely to demutualize (go public).

2.4.2 Technology Development

The advancement in technology has a significant impact on many business sectors, especially the trading activities of stock exchanges. A traditional stock exchange had a trading floor where the brokers executed the trading orders visually and verbally (Lee, 1998). Advances in technology have changed the way of performing the exchanges' operations entirely. Now investors can trade in more than one exchange with lower level of trading costs (i.e. resulting in lower fees to the brokers) which diminished the the intermediary role of exchange's members (Galper, 2001). At this point, Domowitz and Steil (1999) argued that members of an exchange may oppose any innovations that can decrease the demand on their intermediation services even if this would enhance the exchange's value.

Raising of New Competitors

Development in technology is not limited on just changing the traditional (physical) trading floor to automated trading one, but opened the door toward the raise of Alternative Trading Systems (ATs) as new competitors to traditional stock exchanges. Lee (2002) referred to them as MONSTRs (market-oriented new systems for terrifying exchanges and regulators) where the birth of these new trading systems boosted the competition and made it more complicated

between rivals in the stock exchange industry. Akhtar (2002) clarified that stock exchanges were changing their businesses structures due to developments in technology which facilitated the presence of Alternative Trading Systems (ATSs) including Electronic Communication Networks (ECNs), growing market competition and integration, as well as globalization. Consequently, these factors dissolve the significance of the traditional/physical stock exchanges. Moreover, Macey and O'Hara (2005) argued that the presence of the new competitors (ATS) enforced stock exchanges to install costly trading platforms. The core function of Alternative Trading System (ATS) is its ability to match trading parties (buyers and sellers) electronically without the need of brokers' intermediary services (Smith, Selway III and McCornick, 1998).

2.5 Demutualization and Other Strategies

Other strategies can be noticed - though are not new - alongside the trend of stock exchanges demutualization are mergers, acquisitions and alliances among stock exchanges. Hasan, Schmiedel and Song (2012) clarified that the period of 1990s witnessed an increasing trend of consolidation among stock exchanges through alliances and mergers and acquisitions in order to broaden its global business activities. These global consolidations are beneficial for markets as well as investors as they may foster competition among stock exchanges and promote the capital flows across borders (U.S. Securities and Exchange Commission, 2007). Martynova and Renneboog (2008) clarified that the existence of mergers and acquisitions among normal firms has been noticed over many decades and come in waves. However, due to the special nature of stock exchanges, the mergers between stock exchanges may differ compared to ordinary firms. Therefore, the effect of merger of stock exchanges is more far-reaching, as it may affect the stock exchanges (i.e. its operations), listed firms and investors and in turn the efficiency of the whole market, unlike the mergers of normal firms which just focus on the firms. Mergers

between stock exchanges open the door towards opportunities and advantages that can benefit stock exchanges from such synergies. In relation to the importance of technology development alongside the pressure exerted by various parties (i.e. financial intermediaries; issuers; investors; stakeholders) for revising their cost structures and reducing their fees, Chesini (2007) clarified that a stock exchange needs to adopt advanced electronic systems in order to increase its revenues (turnover) and reduce the cost of handling orders and that could happen through consolidation with other stock exchanges. In line with Chesini (2007), Philips, Faseruk and Glew (2014) emphasized that the adoption of electronic systems will facilitate the opportunity of increasing trading volumes and reduce the associated costs for individual exchanges, though these savings are much greater when stock exchanges merge. From this perspective, consolidations (i.e. mergers) of stock exchanges will increase the number of traders and listed firms. Lee (2002) argued that many stock exchanges in order to survive, maintain their trading volumes and the number of listed companies went to link to other stock exchanges. Consequently, this will increase their order flows and lead to gain positive network externalities for traders (Pagano, 1989). Lee (2002) clarified that one of the main reasons behind the domination of a small number of stock exchanges is the positive link between order executions and network externalities, where the probability of executing a trader's order is higher, especially when this is done on an existing trading system with relatively large number of traders (i.e. high number of submitted orders) contrary to order's execution on a new trading system with small number of traders. In addition, the linkage between mergers of stock exchanges and economies of scale was predicted by Pirrong (1999) and asserted by Malkamaki (1999) as this beneficial relation can lead to decrease the cost of transactions (i.e. trading and listing fees) which serve the interests of listed firms and investors as well. Pagano and Padilla (2005) argued that the

consolidation of stock exchanges creates a number of potential gains such as providing services with lower fees to their users (i.e. issuers, intermediaries and investors). Moreover, in line with point, Ramos (2006) argued that mergers activities generate economies of scale through sharing focal services and mutual facilities. In addition, another strategy adopted by stock exchanges in a way to deal with increasing competition is creating strategic alliances. Hughes (2002) explained that alliances are the means of validating the old saying liquidity attracts liquidity. When exchanges form an alliance, this creates positive trading environments and provides a variety of products which in turn attracts more investors and generates liquidity. The effectiveness of this strategy was questioned by many scholars as opposed to mergers, as this strategy depends on creating beneficial contractual agreements for all participants involved which is difficult to be achieved due to the changing environment (Lee, 2002). In agreement with the illustration of Lee (2002), Hasan, Schmiedel and Song (2012) examined the impact of merger, acquisition and alliances (i.e. joint venture and non-equity alliances) on stock exchange stockholders' value creation (wealth). Their findings showed that the average stock price of a stock exchange has a significant positive relationship with mergers, acquisitions and alliances, though mergers and acquisitions create more value than alliances. Adding to that, joint ventures create more value than non-equity alliances. Similarly, in studying the causes and effects of competition for order flow by focusing on mergers of U.S regional stock exchanges, Arnold et al. (1999) clarified that merging stock exchanges succeeded in attracting more orders and narrowing the bid-ask spreads compared to other regional stock exchanges that did not experience any merger activities. In concerning the demutualization phenomenon and its role in facilitating such consolidations/integrations between stock exchanges, Aggarwal and Dahiya (2006) clarified that stock exchanges demutualize and become publicly-listed companies to increase their operational

freedom which facilitate their ability to engage in merger and acquisition activities. The growing threat from ATSS or ECNs has forced stock exchanges to adopt efficient trading systems by migrating from the traditional/physical trading floor to the electronic trading order flows and thus their liquidity were pulled up by larger stock exchanges. Moreover, Aggarwal and Dahiya (2006) emphasized that the stock exchanges located in Europe (i.e. the demutualization strategy was a forerunner in this continent) dealt with such a threat more effectively than other stock exchanges and this is due to that the demutualized/investor-owned exchanges enjoy higher flexibility in their governance structures compared to the traditional/member-owned stock exchanges. As for example, Toronto stock exchange after demutualization purchased the Canadian Venture Exchange in a way to close the door toward any domestic competition from one hand and to consolidate the market from another (Elliott, 2002). In line with Aggarwal and Dahiya (2006), Philips, Faseruk and Glew (2014) argued that the increase in merger activities between stock exchanges is largely attributable to the demutualization of individual stock exchanges. Akhtar (2002) clarified that after demutualization and in a way for survival and enhancing its business prospects, stock exchanges merge and or integrate their domestic markets to establish a single national exchange which may attract foreign investors, establish cross-border linkages between stock exchanges within or outside the region through building alliances and merge with other stock exchanges. As when there is a merger between two exchanges, the exchange can increase its volume with the same overhead costs thus, more benefits to investors and brokers as they have access to more listed securities on the same platform. For instance, after the demutualization in 1996, Copenhagen Stock Exchange (i.e. the only stock exchange in Denmark) merged with FUTOP (i.e. Danish derivatives market) in 1997; likewise the Helsinki Stock Exchange which demutualized in 1995 merged with SOM (i.e. Finnish derivatives

exchange) in 1997. In addition, regarding mergers on the domestic level, for instance mergers between regional exchanges and between stock and derivatives exchanges in the same country is a way to analyze whether mergers are a strong motivation for stock exchanges demutualization, Ramos (2006) provided evidence that stock exchanges demutualized to participate in merger activities. Moreover, Ramos (2006) extended his analysis by examining the link between the decision to become a publicly-listed exchange and consolidation activities (i.e. acquisitions), the findings revealed that demutualized stock exchanges will take decisions to go public to open the door toward acquisitions. The findings of Ramos (2006) are consistent with previous literature concerning the firm/corporation's decision of going public in general.

By applying a survey method to compare between the motivations behind the decision of going public (i.e. IPOs) and the decision of remaining under the private form by collecting the opinions of 336 chief financial officers (CFOs), Brau and Fawcett (2006) found that the core motivation of firms behind the decision to go public is to facilitate potential acquisition activities, however, the main purpose behind remaining private is to maintain ownership and control of decision-making. Similarly, in banking industry, Rosen, Smart and Zutter (2005) investigated the reasons behind going public by analyzing data of banks under different structures (i.e. private vs. public) and the findings revealed that banks take a decision of going public seeking acquisitions.

2.6 The Changes in Ownership and Governance Structure

Implementing the demutualization process is twofold. It involves changing the legal ownership of the exchange and its governance structure. In this section the study will review the changes associated with these major dimensions.

Ownership Defined

Changing the ownership structure from mutual to demutualized stock exchanges means transferring from being a membership entity to share ownership. Akhtar (2002) showed that this conversion can be achieved by assigning a given value per seat. At this point, the members have the option to become owners, or to sell their seats to non-members. Also he suggested that exchanges must put limitations on ownership by one holder or group of holders from 5% to 10% to avoid excessive control of the syndicate. This means one huge owner cannot dictate major decisions for the entire exchange as was the case in a stock exchange under the mutual structure, where each member voted only for his own interest. However, it will be strategic alliances and mergers (i.e. locally or globally) in the form of equity swaps between different exchanges since shares can be freely traded. Consequently, limitations on ownership must be applied. By applying limitations on ownership, potential takeovers by other exchanges could be avoided. As for instance, the bidding war for the Sydney Futures Exchange by the Australian Stock Exchange and Computershare in 1999, and OM Gruppen's, the Swedish technology company that runs the Stockholm Stock Exchange, moved to acquire the London Stock Exchange in 2000. Both failed due to the ownership limitation applied by brokers and the exchanges themselves.

Governance Structure

There are different types of stock exchanges around the world according to the governance structure; those registered as cooperative/mutual associations, or those who transformed and become for-profit stockholders-owned organisations/private limited companies with a paid-up capital bases (IOSCO, 2001). As of the end of 2012, World Federation of Stock Exchanges (WFE) statistics indicated that almost 74% of its member exchanges were for-profit entities (WFE, 2013). The importance of corporation's governance structure is relied on its ability to

react toward external changes that could affect its performance. Berglof and Von Thadden (1999) argued that firms with good corporate governance are performing better than firms with weak one. Changing the governance structure of stock exchanges from cooperatives to corporations alongside with the separation of ownership and management gives the chance to link the corporate governance objectives and mechanisms with the demutualization of stock exchanges and its performance. Although the separation of ownership rights and trade rights is one of the advantages of corporation, there is a potential conflict of interests between owners and controllers (agency problem). Jensen and Meckling (1976) and Eisenhardt (1989) clarified that this potential conflict entails control by firm's stockholders through establishing governance structures that could monitor and control the behaviour of its management team. A formal definition of corporate governance presented by OECD (2015, p. 9) as:

Corporate governance involves a set of relationships between a company's management, its board, its shareholders and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined

In addition, Denis and McConnell (2003) argued that the corporate governance mechanisms according to the studies applied in the US market can be distinguished to internal and external mechanisms. The internal mechanisms include the structure of equity ownership and the board of directors of a firm, while, the external mechanisms includes the legal system and the external market. In corporate governance scope, the majority of research deal with internal issues associated with misalignment between management and owners' objectives, managerial opportunism and misrepresentation of managerial incentives. Accordingly the firm may deploy internal governance mechanisms to deal with such issues. Board monitoring function has been the core element in the field of corporate governance where board of directors considered as 'the

apex of the internal control system' (Jensen, 1993, p. 862). The board of directors is responsible for adopting control mechanisms to align the management's behaviour with the owners' interests where these control mechanisms comprise the selection, monitoring, evaluation and removal of management team in case of poor performance, alongside with the determination of managerial incentives and evaluation of organisational performance (e.g. Mizruchi, 1983; Zahra and Pearce, 1989). Simply, good practice of corporate governance prevents misuse of firms' resources or controlling their stockholders which provides better allocation of resources, appropriate decision making thus, improvement of firms' performance (OECD, 2015). Corporate governance is a popular topic and got more attention especially after many corporate financial scandals worldwide, wherefore investors and corporations realized how important to establish efficient governance mechanisms in capital market (Conyon and Peck, 1998). Accordingly, the change of a stock exchange's governance structure and consequently its internal mechanisms due to adopting demutualization strategy will be discussed extensively later in chapter four.

2.7 Conclusion

This chapter has started by reviewing the traditional structure of stock exchanges (i.e. mutual/cooperative structure), where the members enjoyed the rights of ownership, control, and trading and so their primary objective is to maximise the members' interests. The homogeneity between members and the great degree of monopoly power they have, made this structure more favourable. However, changing in the business climate (i.e. globalization, increasing competition and development of technology) and increasing the divergence between members of stock exchanges make it very difficult for exchanges under such a structure to cope with such environmental challenges. All these factors enforced the exchanges to adopt a new structure; the demutualized structure. Many definitions of demutualization have been introduced by many

scholars; however, this particular study will follow the definition provided by Aggarwal (2002). Established from this definition, the demutualization process emphasized in the separation of ownership and trading rights which in turn, converts the exchanges from non-profit organisations to for-profit corporations with the primary objective set to maximise profit/stockholders' wealth rather than maximising the members' interests. The theoretical background of the demutualization strategy seems to support the idea that adopting such a strategy is value enhancing for a stock exchange and its stockholders. Accordingly, many scholars were interested to examine how diverse the demutualization influences the performance of stock exchanges. The next chapter will then present a review of literature pertaining to previous empirical studies concerning the impact of demutualization on stock exchanges performance focusing mainly on its financial performance.

Chapter Three

Demutualization and Performance of Stock Exchanges

		Page number
3.1	Introduction	36
3.2	Demutualization and stock exchanges performance	37
	3.2.1 Demutualization and Financial Performance	43
3.3	The Gap in the Literature of Financial Performance	50
3.4	Liquidity and Corporations Performance	52
	3.4.1 The Motives of Cash Holdings	55
	3.4.2 Theories of Cash Holdings	59
	3.4.2.1 Trade-off theory	60
	3.4.2.1.1 Determinants of Cash Holdings	61
	3.4.2.2 Pecking Order Theory	64
	3.4.2.2.1 Determinants of Cash Holdings	66
	3.4.2.3 Free Cash-Flow Theory	67
	3.4.2.3.1 Determinants of Cash Holdings	68
3.5	Capital Structure/ Leverage	69
	3.5.1 Trade-off Theories	71
	3.5.1.1 Determinants of Capital Structure	74
	3.5.2 The Packing Order Theory	77
	3.5.2.1 Determinants of Capital Structure	79
	3.5.3 The Agency Theory	82
	3.5.3.1 Determinants of Capital Structure	85
	3.5.4 Other Determinants of Capital Structure/Leverage	88
	3.5.4.1 Macroeconomic Variables	89
	3.5.4.2 The Global Financial Crisis	91
3.6	Conclusion	92

3.1 Introduction

The World Federation of Exchanges carried out a Cost and Revenue Survey (WFE, 2013) of their stock exchanges' members which clarified that among its fifty-seven members: nine stock exchanges were demutualized; twenty-three were publicly listed; eight were private limited companies owned by their members; seven were associations or mutually owned; ten stock exchanges had other legal statuses. From the increasing number of stock exchanges that demutualized or planning to demutualize in the near future, a question raised; is the demutualization strategy adopted by many stock exchanges save them from extinction by

empowering their performance and strengthens their governance structure?. By converting to for-profit organisations, the primary objective of stock exchanges has been changed as now they seek to gain profit (short-term objective) and maximising the stockholders wealth (long-term objective) alongside with satisfying other stakeholders' interests. Accordingly, to accomplish this new objective, a stock exchange has to improve its performance and enhance its own value. In line with the previous discussion, Scullion (2001) argued that a stock exchange demutualizes when its potential market capitalization is maximised alongside with increasing the value of its shareholders and all other stakeholders. In contrast, the traditional stock exchanges may lack of this motive as its primary objective is to enhance its members' interests, not maximising the profit/stockholders wealth, as under the mutual/cooperative governance structure, where ownership and trading rights are coupled together (e.g. Hart and Moore, 1996; Di Noia, 1999), the members are the owners and the controllers of stock exchanges. Thus, the mutual structure of stock exchanges was dominated for many years in order to protect their monopoly power (Otchere and Mohsni, 2016). Moreover, Domowitz and Steil (2001) clarified that there are different incentives of operations under both structures of stock exchanges (i.e. mutual vs. demutualized). Since the members of a stock exchange are the only channel to the exchange's trading system, they generate profits mainly from the intermediation services provided to non-members (i.e. executing their orders).

3.2 Demutualization and stock exchange's performance

It has been argued that there are different views of stock exchanges; the stock exchange as a market where the securities can be traded, as a firm that concentrates on the production side and as broker-dealer where the exchange is an intermediary among intermediaries, gathers the trading orders and provides the way to execute them Di Noia (2001). In line with Di Noia

(2001), Mulherin, Netter and Overdahl (1991, p. 594) defined a stock exchange as “*a firm that creates a market in financial instruments*”. Similarly, Macey and Kanda (1990, p. 1009) argued that stock exchanges are “*self-interested economic organizations*”. In addition, following the definition of demutualization process provided by Aggarwal (2002) which emphasized that a traditional stock exchange converted from a mutual/cooperative non-profit organisation to a for-profit corporation where the new owners (i.e. stockholders) whom are presented by elected board of directors can provide the exchange with the needed capital and in turn they expect to receive return/profit. Previous literature on examining the performance of stock exchanges regularly focused on the ‘market view’. Accordingly, some studies focused on a few market indicators/measures such as efficiency (e.g. Schmiedal, 2001; Schmiedal 2002; Serifsoy, 2005), liquidity (Treptow, 2006), market quality (e.g. Krishnamurti, Sequeira and Fangjian, 2003; Otchere and Abou-Zied, 2008). In identifying and examining the benefit of demutualization on increasing the efficiency of stock exchanges, Schmiedel (2001) utilized a parametric stochastic frontier model to assess the cost efficiency of European stock exchanges for the period 1985-1999 and the findings showed that demutualization had a constructive outcome on cost efficiency. In the following year, Schmiedel (2002) employed a nonparametric method for assessing the overall productivity (i.e. improvements in technology and efficiency) of European stock exchanges for the period 1993-1999 and found that the stock exchanges under mutual/cooperative structure are more productive. The Schmiedel work (2001; 2002) toward the impact of demutualization has restrictions as the fact that the pattern of demutualization was still new at the season of composing these studies (i.e. limited numbers of demutualized stock exchanges) and so the findings regarding stock exchanges governance were vague. In filling this gap, Serifsoy (2005) examined the impact of changing the governance types/regimes on

exchanges' performance (i.e. efficiency and productivity) by utilizing a balanced panel data of 28 stock exchanges from different regions (i.e. Americas, Europe, Africa, Asia and Pacific) with a longer period than Schmiedels' papers (1999-2003). The findings of Serifsoy (2005) showed that demutualized stock exchanges improved its efficiency compared to mutual exchanges, yet the higher level of productivity was displayed in the stock exchanges under the mutual structure. Likewise, there was no obvious proof found that the publicly-listed exchanges have higher level of efficiency and productivity compared to the demutualized exchanges. However, Treptow (2006) argued that the demutualization strategy adopted by a stock exchange improved its efficiency which was a problem immanent in its mutual structure. In addition, Treptow (2006) clarified that liquidity (i.e. measured by trading volume and spreads) is the appropriate key indicator for determining a stock exchange's efficiency as it reflects the essence of competition among stock exchanges however, the studies directed by Schmiedel (2001; 2002) and Serifsoy (2005) did not provide clear proof regarding the impact of demutualization on the exchanges' efficiency and did not build up a connection between demutualization and liquidity. His findings revealed that the demutualization has a significant influence on an exchanges' liquidity compared to a stock exchange with mutual structure as the trading volume increased and spreads reduced. On another level, Domowitz and Steil (1999) argued that the members of a mutual exchange may resist innovations that lead to improve its services' quality and so enhance its own value if this will threaten their intermediation services whereas, in the case of a demutualized stock exchange, the stakeholders will favour any step toward enhancing the exchange's value. Accordingly, some studies were interested in investigating the influence of demutualization on market quality (e.g. Krishnamurti, Sequeira and Fangjian, 2003; Otchere and Abou-Zied, 2008). Krishnamurti, Sequeira and Fangjian (2003) examined the impact of demutualization on market

quality (i.e. transaction cost) by comparing the data of 40 traded stocks traded in two leading Indian stock exchanges; Bombay Stock Exchange (BSE) under the mutual structure and National Stock Exchange (NSE) under the demutualized structure. Their findings showed that NSE increases its quality as it provides investors with low cost transactions compared to BSE. Moreover, they concluded that demutualization provide a stock exchange with good governance equipped with a competent management team beside the facilitation of adopting advanced trading systems. A major drawback of this study is that the impact of demutualization did not expressed clearly, as it employed only two stock exchanges with different structures but positioned in the same market (i.e. India), which is insufficient to yield a powerful conclusion. Similarly, Otchere and Abou-Zied (2008) assessed the impact of demutualization and self-listing on market quality of the Australian Stock Exchange (ASX) as a single case study. However, the market quality was evaluated using the transaction cost which captured by the effective bid-ask spreads. Their findings revealed that the increase in the stock exchange's trading volume after demutualization/self-listing leads to a reduction in the effective bid-ask spread and so the market quality had improved. Like Krishnamurti, Sequeira and Fangjian (2003), a core drawback of the Otchere and Abou-Zied (2008) study is that it used only one stock exchange thus, their findings cannot be generalized. The theoretical background presented previously in the previous chapter supports the idea that demutualization of a stock exchange ought to be a characteristic move to improve its performance and enhance its financial position. Before reviewing the related literature regards the impact of demutualization on the financial performance of stock exchanges, it is worthy first to clarify the concept of organisational performance in general and its different dimensions in order to link it with the context of the demutualization of stock exchanges and its financial performance.

Organisational Performance

The importance of satisfying the primary objective of for-profit organisations/corporations and thus maximising stockholders wealth is relied on that stockholders pledge in providing resources to organisations for the longest period and so they are the only residual claimants that need more information to take decisions in their own favour (Carton and Hofer, 2007). Consequently, they can receive their investments' returns against organisations' assets after firstly satisfying all other claimants/stakeholders who also consider as resources' providers (i.e. employees, lenders and government). Simply, in order to maximise the value of stockholders, they have to maximise the value of corporations' other stakeholders (e.g. Freeman, 1984; Copeland, Koller and Murrin, 2000). In addition, stockholders are always looking for investment opportunities that maximise their return in relation to the risk-bearing associated with such opportunities, therefore using stockholders' perspective is favourable as they have homogeneous position of performance (Carton and Hofer, 2007). In general, organisational/business performance is consider to be the essential dependent variable of researchers' interests in different areas (i.e. accounting; finance; management) where competition in market, capital and inputs reflect the importance of the role of organisational performance in surviving and success of the business (Richard et al., 2009). In addition, Richard et al. (2009) emphasized that the organisational/business performance is not a structure with singular dimension and so cannot be assessed with one operational measurement. However, it has a multidimensional conception and related mainly to three sources; the stakeholders, heterogeneity in resources, environments and strategies and timeframe. In consistent with Freeman's ideas (1984) of the firm's role in serving multiple stakeholders, which are broadly defined as any individual or group who can affect or be affected by the organisation's objectives and actions such as stockholders, managers, employees, customers,

suppliers, creditors and local communities who have legitimate claim, critical contributions and expecting their goals and interests to be accomplished and satisfied (Freeman and McVea, 2001). Accordingly, each stakeholder will focus on performance measurements that are related directly to his own interest and goal (Hillman and Keim, 2001). In addition, Mitchell, Agle and Wood (1997) referred in his study to a narrower view of stakeholders presented by Clarkson (1994). This narrower view is relying on the direct relations of the economic interests of a firm and each group of stakeholders that are bearing risks in relation to such interests; “*voluntary or involuntary risk-bearers*” (Clarkson, 1994, p. 5 as quoted in Mitchell, Agle and Wood, 1997). The importance of this narrower view of stakeholders is shown in determining the legitimate claim of each group of stakeholders and this is mirrored in the popularity of financial/ accounting measurements, which are associated with a firm’s managers and stockholders (Richard et al., 2009) as these two groups have the higher legitimate claims among other groups of stakeholders (Mitchell, Agle and Wood, 1997). Accordingly, Harrison and Wicks (2013, p. 102) defined a firm performance as “*the total value created by the firm through its activities, which is the sum of the utility created for each of a firm’s legitimate stakeholders*”. On the other hand, firms are heterogeneous in many aspects related to their resources and capabilities (i.e. large vs. small firms) which are controlled by these firms to implement strategies that improve their efficiencies and effectiveness (Barney, 1991). In addition, the existence of competition will lead to increase the differences in resources and strategies of these firms (Richard et al., 2009). The analysis of a firm’s resources can open the door towards different strategic choices such as the relationship between the firm’s resources and profitability and how the firm can manage these resources over time (Wernerfelt, 1984). As for instance, a firm with a sufficient level of technological capabilities (i.e. resource) will increase its returns thus maintain and attract skillful people who

are able to develop new invention ideas compared to their rivals. Consequently, this firm can direct its higher returns to increase its research and development (R&D) expenditures and in turn it can maintain and protect its current position (Wernerfelt, 1984). Moreover, the time frame is very important factor to be considered when measuring the performance of firms. Richard et al. (2009) argued that measurement of firm performance needs a better understanding of time series characteristics linking the organisation's activity to its performance. Furthermore, Richard et al. (2009) argued that the organisational performance covers three specific areas of firm outcomes: (1) financial performance (i.e. return on assets (ROA), profits, etc.); (2) performance of product market (i.e. market share, sales, etc.); and (3) stockholder return (i.e. total stockholder return, economic value added (EVA), etc.).

3.2.1 Demutualization and Financial Performance

In general, the financial performance relied on reflecting the financial health of a firm by determining strengths and weaknesses of operating and financial features and evaluating the efficiency of management the business activities. The major organisational performance measures applied in finance and accounting studies to assess the financial performance of an organisation are the accounting-based measures/financial ratios, which can be presented as values, ratios and percentages (Penman, 2001). Accounting measures are the measures that depend on the financial information presented in the main financial statements of firms, where most of accounting measures are presented as values, ratios and percentages (Carton and Hofer, 2007). Traditional and powerful tool used by decision makers (financial managers, financial analysts, creditors and investors) to evaluate the financial performance is the financial ratios. Financial ratios are means used to analyze the firms' financial statements by exploring the relationship between its financial items rather than utilizing its absolute value. By using such a

tool, an evaluation of current and past performance can be made within a firm itself, across firms within an industry and between different industries. In spite of the significant challenges in using the accounting measures, Richard et al. (2009) argued that the accounting measurements are the popular means in measuring the organisational performance. Despite the existence of variations in applying the Generally Accepted Accounting Principles (GAAP), still there is a common basis in presenting the accounting data cross firms. Further, the firm's financial statements are subjected to audit by independent auditors/accountants and reviewed by the Securities and Exchange Commission (SEC) as in publicly-traded firms or by the Internal Revenue Service (IRS) in financing institutions (i.e. banks) (Carton and Hofer, 2007). Consequently, in context of the demutualization of stock exchanges, previous literature provided some empirical studies that were concerned with investigating the impact of demutualization on the performance of stock exchanges through determining their performance using the financial performance, product market/sources of revenue and stockholder return (e.g. Mendiola and O'Hara, 2003; Otchere, 2006; Otchere and Abou-Zied, 2008; Azzam, 2010; Morsy and Rwegasira, 2010; Oldford and Otchere, 2011). Some of these studies focused only in one area of performance; financial performance such as Azzam (2010) and Morsy and Rwegasira (2010), others combined two areas of performance; financial performance and stockholder return such as Mendiola and O'Hara (2003) or financial performance and product market/sources of revenue such as Otchere and Abou-Zied (2008) and Oldford and Otchere (2011), taking into consideration that the study of Otchere and Abou-Zied (2008) also examined the impact of demutualization on market quality as presented earlier. Moreover, Otchere (2006) combined the three areas of performance (i.e. financial performance, product market/sources of revenue and stockholders return). Following the 'firm view' of a stock exchange gives this particular study the motive to examine

the impact of demutualization on a stock exchange's financial performance with a belief that improving the financial performance could be a reflection of the power of the new organisational structure (i.e. demutualized structure) and will reveal how strong and healthy the internal structure of a stock exchange is. Consequently, a stock exchange with strong internal structure will increase its production efficiency, its ability to compete with other stock exchanges and eventually this will enhance the value of a stock exchange as a firm as well as a market. Consequently, the following section will review the empirical studies that mentioned above although, focusing mainly on the area of financial performance. In addition, the findings of these studies provided mixed evidence as some of them supported the trend toward demutualization and others proved the opposite.

By reviewing these empirical studies, it has been noticed that all of them have emphasized on examining the profitability perspective in referring to the impact of demutualization on the financial performance of stock exchanges. From early studies, Mendiola and O'Hara (2003) examined the impact of changing governance structure of eight stock exchanges from mutual to self-listing (initial public offerings/ IPOs) on its performance using accounting-based measures. Their findings revealed mixed evidence across the tested exchanges, especially for the profitability ratios measured by return on assets (ROA) and return on equity (ROE). As the return on assets (return on equity) has improved only in four (five) stock exchanges after the conversion. Similarly, the findings provided by Otchere (2006) showed a decline in both ROA and ROE although the ratio of net profit margin (i.e. profitability ratio) showed a slightly increase comparing listed and non-listed stock exchanges. Interestingly, both authors; Mendiola and O'Hara (2003) and Otchere (2006) argued that the decline in ROA and ROE is referred to the increase in the level of equity as a result of the decision of self-listing (i.e. IPOs) in addition to

the difficulties in market conditions in 2000 that had a significant impact on stock exchanges. Moreover, the findings of Morsy and Rwegasira (2010) showed that the ROA and ROE increased comparing the difference in medians (using Wilcoxon signed rank test) of both ratios pre and post the demutualization for the selected stock exchanges, although the result of ROE is not statistically significant. In addition, the authors applied several simple regressions after controlling for the size, growth, age and leverage as these variables could have a significant effect rather than the demutualization strategy itself; however the findings showed poor predictions for both ratios. Recently, Otchere and Mohsni (2016) examined the impact of the demutualization and self-listing on risk-taking behaviour of stock exchanges however, part of their analysis showed that the profitability ratios (i.e. ROA and ROE) are lower for the demutualized stock exchanges compared to the mutual ones. On the other hand, other studies provided evidence supports adopting the demutualization. Otchere and Abou-Zied (2008) examined the impact of demutualization/self-listing of the Australian Stock Exchange (ASX) on its financial performance using the profitability ratios; ROA, ROE and net profit margin. Their findings revealed a significant increase for all ratios after the conversion of ASX and also the findings remains constant also when comparing these ratios with a group of non-listed stock exchanges. In addition, the authors extended their analysis to a new level when considering the probability influence of the economic growth (i.e. GDP growth) on a stock exchange's revenue, income and in turn on its profitability. Accordingly, the profitability ratios have been adjusted to the GDP and the results remain the same. Similarly, Azzam (2010) showed that the demutualization is value enhancing of a stock exchange where the profitability ratios (i.e. ROA and ROE) increased significantly after the conversion using the regression technique with controlling for several variables such as the last global financial crisis, macroeconomic variables

(i.e. GDP growth, inflation and interest rate) and other characteristics of a stock exchange. Moreover, Oldford and Otchere (2011) examined the impact of changing the governance structure of stock exchanges (i.e. mutual, demutualized and publicly listed) on profitability. Their findings exhibited significant improvements in profitability ratios (i.e. ROA, ROA and net profit margin) of the publicly-listed exchanges better than the demutualized exchanges, although both structures are better than the exchanges under the mutual structures. However, by analyzing a subsample that include only the publicly-listed exchanges (i.e. this group has experienced the three governance structures) to test if the stage of public listing brings a better financial performance compared to the stage of demutualization, the results revealed that profitability does not reach a progressive level in the public/self-listing stage surpassing what is achieved in the demutualization stage.

In another level, Mendiola and O'Hara (2003) argued that a stock exchange under the mutual structure has limitations regard raising new capital as it has no option in selling stocks to the public, however by adopting the demutualization strategy the exchange can distribute stocks to their members/owners and in an advance stage the exchange can sell stocks to outside investors through private placement or public offering (IPO). At this point, some studies showed the importance of analyzing the capital structure of a stock exchange as another perspective of its financial performance (e.g. Mendiola and O'Hara 2003; Azzam, 2010; Morsy and Rwegasira, 2010). Mendiola and O'Hara (2003) used the debt to equity ratio to present the level of leverage used by a stock exchange and their findings showed a significant decrease in this ratio after the conversion (i.e. self-listing). From this result, Mendiola and O'Hara (2003) clarified that the change in profitability provided earlier is somehow related to the change of the exchange's capital structure (i.e. decrease in leverage). Simply, when a stock exchange become a publicly-

listed exchange (IPO) they use the equity capital through issuing stock in financing activities rather than leverage/debt which cause the ROE ratio to decline. On the other hand, Otchere and Abou-Zied (2008) argued that the increase of the ROA after the demutualization/self-listing of ASX is due to the change in the strategy of ASX capital structure after the conversion. As for the authors, the Australian Stock Exchange abandoned its dependence on using debt especially with the long-term maturity after the conversion as in year 2003 there was no long-term debt shown in the balance sheet of ASX. Consequently, Otchere and Abou-Zied (2008) concluded that after the conversion the ASX has used the equity as an alternative source of funds in financing its activities such as acquiring new assets rather than using the debt/leverage source. In addition, the improvements that occurred in the exchange's operating profit and net profit gives a clear justification of the increase in the ROA ratio. In addition, the findings of Azzam (2010) exhibited a significant decline in the debt/leverage ratio (i.e. total debt over total assets/debt ratio) of a stock exchange after the demutualization and also the results of this regression model showed that large stock exchange use higher level of debt. In contrast, Morsy and Rwegasira (2010) showed that there is no significant relationship between demutualization and the leverage (i.e. debt ratio and debt to equity ratio) of a stock exchange.

Another perspective of the financial performance that has been examined although with limited empirical studies is the efficiency (e.g. Mendiola and O'Hara, 2003; Otchere, 2006; Oldford and Otchere, 2011) as following the objective of a for-profit organisation, it is expected that the conversion of the structure of a stock exchange will lead to enhance its efficiency. Mendiola and O'Hara (2003) used the total assets turnover ratio as a proxy for the efficiency of a stock exchange and the findings revealed a significant decline for all the tested exchanges with exception to the Australian Stock Exchange that showed an improvement of its efficiency after

the conversion. The authors argued that the decline in such ratio is relatively due to the engagement of some stock exchanges in merger and acquisition activities that led to increase the assets of these exchanges which make the interpretation on this result more complicated. On the other hand, in determining the impact of self-listing decision and the efficiency of the exchange using two ratios; operating expense/cost ratio (i.e. operating expenses/cost to operating revenue) and total expense/cost ratio (i.e. total expenses/cost to total revenue), Otchere (2006) showed an increase in both; the operating expense/cost ratio and the total expense/cost ratio for the self-listed exchanges comparing the period before and after the conversion, albeit the increase in the operating expense/cost ratio is not statistically significant as the process of self-listing through the initial public offering will incur the exchange with more cost and expenses for years. However by comparing these ratios with the non-listed exchanges (i.e. control group), the results showed a significant decline in the operating expense/cost ratio after the conversion, although this was not the case in the total expense/cost ratio that is nearly similar to the ratio of the control group. Moreover, Oldford and Otchere (2011) assessed the impact of changing the governance structure of a stock exchange (i.e. mutual, demutualized and self-listing) on its efficiency measured by the total revenue to total expenses. Their findings revealed that the efficiency of demutualized and publicly-listed exchanges is better than the efficiency in mutual ones. Although, by analyzing a subsample that include only the publicly-listed exchanges (i.e. this group has experienced the three governance structures) to test if the stage of public listing brings a better financial performance compared to the stage of demutualization, the findings that the demutualization increase the efficiency of a stock exchange significantly, albeit the relationship between the self-listing decision and the efficiency is positive but not statistically significant. The last perspective that considered as a part of the financial performance of an exchange is the

liquidity, although only one study considers this perspective. Morsy and Rwegasira (2010) examined the impact of demutualization on the financial performance of stock exchanges using a bundle of financial ratios that evaluate the financial performance from different perspectives; profitability, leverage, efficiency (discussed earlier) and liquidity. Morsy and Rwegasira (2010) used the current ratio (current assets/current liabilities) to measure the liquidity of a stock exchange as this ratio indicates the current assets that can be converted to liquid cash in the short-term to pay off the short-term obligations. By comparing the current ratio before and after the demutualization, the findings revealed a decline in this ratio after the conversion, albeit not statistically significant.

3.3 The Gap in the Literature of Financial Performance

From the critical analysis of the preceding section, it has been noticed that all the previous studies that examined the impact of demutualization/self-listing on the financial performance of stock exchanges focused mainly on the profitability perspective in their analysis which is logically acceptable since the structure of a stock exchange changed from a non-profit organisation to a for-profit corporation where its primary objective is to maximise profit and stockholders' wealth. However, considering only the profitability perspective will not draw the whole picture of the financial performance of a stock exchange and so the real impact of the demutualization strategy.

As shown previously, there is a strong link between the profitability and the capital structure of a stock exchange, as on one side Mendiola and O'Hara (2003) argued that the decline in the ROE is related to the decrease in the level of leverage/debt used by a stock exchange after the decision of self-listing where the stock exchange used the equity as an alternative source of funds. On the other side Otchere and Abou-Zied (2008) provided a justification on the increase of the ROA of the ASX after the conversion (i.e. demutualizing/self-listing) linking this change to the intense

decline in the level of debt, especially the long-term debt, used by the exchange after the conversion where the assets of the exchange are financed mainly by the equity capital. The preceding arguments shed light on the capital structure of a stock exchange after the conversion with concentration only on the external funding sources; debt and equity, although ignoring that the debt source has different maturities; short-term and long-term. On another level, these arguments also ignored the role of the internal sources of fund (i.e. retained earnings and cash holdings) as alternatives of external funding sources. Interestingly, the annual reports of the selected stock exchanges of this particular study provided some evidence regarding this point as for instance, NYSE and NASDAQ clarified that an adequate capital is needed for maintaining the level of growth and the development of the exchange's business activities which can be met mainly from the internal generated funds (i.e. cash and cash equivalent), debts (i.e. borrowings under the current credit facilities) and issuing equity. However, using more debts could notably increase the exchange's level of leverage and that could reduce its liquidity level, affecting its credit rating negatively and facing difficulties in accessing capital markets. On the other hand, issuing additional equity could lead to equity dilution of the current stockholders. Consequently, NYSE and NASDAQ hold higher level of cash reserves to be invested mainly for enhancing their technology operations by developing their system platforms. Moreover, they use this significant level of cash for the repayment of their debt obligations and for current and future acquisitions, partnerships and joint ventures (e.g. NYSE and NASDAQ OMX annual reports 2007 and 2011). In addition, the literature of corporate field is rich of theoretical and empirical backgrounds concerning specifically the liquidity through the cash holdings factor and the leverage/capital structure including the debt maturity (i.e. short-term vs. long-term) showing the importance of these perspectives and their influence on corporation's financial performance.

Since none of the empirical studies in the context of demutualization of stock exchanges have consider such perspectives, this study will follow the theoretical foundation and the existing literature applied in the field of corporate finance in order to develop the association of the aforementioned perspectives with the demutualization of stock exchanges. Consequently, this will add new insights to knowledge as it exhibited the internal financial policies and procedures that a stock exchange would opt after the decision of conversion in order to improve its financial performance especially in such a competitive environment.

3.4 Liquidity and Corporations Performance

The management of corporate liquidity is an inherent part of corporation's financial policy and strategy and maintains its financial flexibility. In this particular study the terminologies; liquidity and cash holdings will be used interchangeably. Generally, the cash item considers as the most liquid item shown in a corporation's balance sheet and has a significant attention from many parties such as stockholders, investors, financial analysts and companies themselves (Subramaniam et al., 2011). As for instance, Dittmar, Mahrt-Smith, and Servaes (2003) pointed out that the largest corporations worldwide held 9% of its book value of total assets as cash and cash equivalents at the end of year 1998. Ferreira and Vilela (2004) found that corporations in the European Monetary Union (EMU) had 15% of its total book value of assets as cash or cash equivalents at the end of year 2000. Similarly, all public firms listed in Amex, NYSE and NASDAQ stock exchanges had on average 20.45% of its total assets as cash and cash equivalents in 2011 (Gao, Harford, and Li, 2013). From the previous illustration, it has been noticed that corporations are increasing its reserves of cash and cash equivalents. Accordingly, a question can arise of why are corporations holding such high level of cash and cash equivalents in their assets. Based on the assumption of a perfect capital markets (Modigliani and Miller,

1958) where holding cash /liquid assets is irrelevant as for instance there is no transaction costs thus, corporations can access capital markets and raise funds needed to finance its investment projects easily with no cost and so the stockholders wealth will not be affected. However, in the real world there are transaction costs, asymmetric information, taxes and bankruptcy costs and other financial restrictions which are associated when corporations use external sources of fund, so making the decision of increasing the reserve of cash or liquid assets will give the chance to decrease the transaction costs from raising funds, not to liquidate the firm's assets to make payments and can be used as a source of funds for financing new investments in case of the higher cost of external funds thus, influence the stockholders' wealth (Opler et al. 1999). Consequently, previous literature showed that there are different motives and theories to explain why corporations choose to hold cash/liquid assets and its determinants. However, before going through these motives and theories, it is quite worth firstly to review if there is a link between changing ownership of a firm and its liquidity management (i.e. cash holdings). Reviewing the literature of other industries considers the changing of ownership of firms; the insurance industry can be a good example to be followed. As this industry has wide range of different ownership structures especially the mutual insurer which gives good example of cooperative structure against stock insurer as a form of corporate structure (Mayers and Smith, 1994). Mayers and Smith (1981) argued that mutual insurers are involved in activities with a comparative advantage that need lower level of managerial discretion compared to stock insurance companies. Similarly, Fleckner (2006) argued that the conversion of stock exchanges from its mutual structure where its members are the owners and the controllers to the demutualized structure where a separation between ownership and management exists gives the managers a greater managerial discretion and so increases the flexibility in taking decisions compared to its traditional structure.

In supporting the managerial discretion hypothesis, Mayers and Smith (1988) using cross-sectional analysis, argued that stock insurance companies consider one among others that have higher discretion compared to mutual insurers that have the lowest managerial discretion in insurer ownership structure. Mutual insurers need less managerial discretion as mutuals are involved in low risk businesses compared to stock insurers that participate in more business activities that are highly risky in nature (Lamm-Tennant and Starks, 1993). In one recent study, Xie et al. (2017) investigated the impact of changing ownership structure of U.S. insurance companies (i.e. mutual vs. stock insurers) on liquidity strategies (i.e. cash holdings), their findings revealed that stock insurers hold higher levels of cash compared to mutual insurers and they attribute this result to stock insurance company participating in risky business activities which need higher levels of managerial discretion, contrary to mutual insurers that participate in business activities with predictable outcomes (i.e. less risky) so a little need for retaining cash which decrease their managers' managerial discretion. Moreover, mutual insurers have no free traded shares and so little threat of takeover is expected compared to stock insurers. Megginson, Ullah, and Wei (2014), examined the level of cash reserves comparing two groups of Chinese firms; non-privatised versus privatised firms (i.e. partially privatised) and their findings revealed that the increase in the level of cash is associated with a decline in firms' state ownership. They implied that their finding is due to soft-budget constraint theory, where government provides support to state ownership enterprises through easing access to borrowing/credit and taxes discounts (Kornai, Maskin and Ronald, 2003). In contrast, Chen et al. (2018) argued that state-owned enterprises are managed and controlled by entrenched managers who strive for political purposes rather than maximising stockholder wealth and this is lead to increase its agency problems. Accordingly, they examined the relationship between state ownership (i.e. government

hold more 50% of shares) of newly-privatised firms from different countries and the cash policy. Their findings revealed a significant positive relationship between state ownership and cash holdings which is consistent with agency policy. From the previous discussion, it seems that changing ownership of stock exchanges could have a significant impact on its liquidity position through examining its level of cash holding. Accordingly, the following sections will provide other determinants of liquidity/cash holdings presented by different motives and theoretical foundations and so the whole picture will be clarified.

3.4.1 The Motives of Cash Holdings

The Transaction Motive

It is normal to understand that corporations hold cash to perform the daily operations without a need to liquidate non-cash assets (i.e. selling assets) or to use external funds (i.e. using debts or equity from capital markets) thus corporations will find a way to economize the transaction costs associated with the previous actions in case of cash shortfalls (Keynes, 1936). This motive has been examined theoretically and empirically from many scholars. Theoretically, some of the initial models that link the demand of cash/money to the transaction costs were introduced and applied by Baumol (1952). By extending the model of Baumol (1952), Miller and Orr (1966) suggested that there are significant economies of scale with transaction costs. Empirically, several studies provide evidence in supporting the relationship between the economies of scale and cash holdings (e.g. Frazer, 1964; Vogel and Maddala, 1967; Mulligan, 1997). Frazer (1964) conducted a cross-sectional study comparing large and small-sized firms and the findings showed that large firms had lower cash balance, large non-cash liquid assets and less creditor indebtedness (i.e. bank) compared to small firms. Vogel and Maddala (1967) pointed out that cash level is affected by firm's size as large firms tend to have lower cash reserve related to

firm's assets and sales. Liu, Tsou and Wang (2008) examined the presence of economies of scale in managing the cash of Taiwanese firms and the findings revealed that these firms especially with higher profitability and lower level of leverage increased its cash holdings. Faulkender and Wang (2006) argued that a sufficient level of liquidity is needed for a firm to finance its investments and avoiding transaction costs associated with using external sources from capital markets (i.e. debt or equity) and also there is a potential information asymmetry cost could be associated with issuing equity. Moreover, firms that failed to generate adequate cash flows from its operating activities that needed for debt redemption could retain more liquidity to lessen the costs of financial distress.

The Precautionary Motive

Adding to the transaction motive, corporations also hold cash as a safety valve against unexpected contingencies (i.e. cash flow volatility; changing economic condition; restriction on external funding; adverse financial shock). Theoretically, Miller and Orr (1966) denoted that firms that suffer from cash flow volatility increased its cash reserves. Empirical evidence regard the link between the variability of cash flow and the cash holdings is provided by some scholars such as Opler et al. (1999) and Bates, Kahle and Stulz (2009). Denis and Sibilkov (2009) pointed out that constrained firms hold higher level of cash in response to costly external funding. Moreover, the link between the uncertainty of macroeconomic and cash holding had been tested empirically. Changes in macroeconomic uncertainty (i.e. increase) obstruct firms from using its resources efficiently, as for Baum et al. (2004) the changes in macroeconomic uncertainty had a negative impact on the ability of firms' managers in adjusting the level of cash reserves to the optimal level with respect to the characteristics of a firm. Similarly, Ang and Smedema (2011) pointed out the firms with higher level of cash are well prepared to face the condition of

recession compared to firms suffered from cash shortage. In addition, another vital determinant of cash holding is investment opportunities. As firms within industries surrounded by investment opportunities which measured by market to book value and/or research and development spending intend to reserve higher level of cash, thus firms would not miss any investment opportunities especially the profitable ones (e.g. Opler et al., 1999; Bates, Kahle and Stulz, 2009). Recently, another critical factor that can be related to the precautionary motive is the financial crisis which affects the firms' operating cash flows negatively and that leads to increase its financial distress costs, thus firms' liquidity could be affected too. Previous literature revealed that the global financial crisis had negative influence on corporations' cash holdings as corporations used the cash reserves in financing its day-to-day operations alongside paying off its debt. Duchin, Ozbas and Sensoy (2010) examined the impact of global financial crisis on U.S. corporations' cash holdings and the findings showed a significant declined in cash reserves significantly during the period of financial crisis, however, after the crisis period corporations experienced higher investment activities related to the retained level of cash. Similarly, Campello, Graham and Harvey (2010) argued that the cash holdings decreased during the financial crisis significantly especially, for firms that suffered from credit/financial constraints and the level of investment also declined extensively. Jung and Kim (2008) examined the impact of Asian financial crisis on cash holdings of Korean firms and they pointed out that such an unexpected event did affect the generated cash flow negatively, thus firms increase its reserves of cash to overcome the crisis impact. Song and Lee (2012) tested the long-term impact of Asian financial crisis on the liquidity management of 5,059 firms from different East Asian countries and their findings showed that the Asian crisis had significant impact of firms' liquidity policies as the level of cash reserves increased significantly after the crisis period (1997-1998) due to

their actions of decreasing the investment activities (i.e. acquisitions and capital expenditures) after the crisis. Pinkowitz, Stulz and Williamson (2013) argued that U.S. profitable firms retained higher level of cash after the crisis (i.e. financial crisis, 2008) compared to before crisis. Over years, economic environment surrounding corporations become unpredictable and unstable and more precisely this increase the uncertainty of macroeconomic conditions. Accordingly, similar to the importance of firms' characteristics in determining its cash holdings, macroeconomic factors are no less important determinants (Baum et al. 2004). Several empirical studies examined the impact of macroeconomic uncertainty on corporation's liquidity (e.g. Almeida, Campello and Weisbach, 2004; Baum et al., 2004; Baum et al., 2008). Kim, Mauer and Sherman (1998) argued that countries with encouraging economic environment (i.e. measured by growth rate in index) motivate firms to retain a sufficient level of cash for financing potential and profitable investments as their findings revealed a significant positive relationship between cash holdings ratio and growth rate in index. Chen and Mahajan (2010) examined the impact of macroeconomic factors on corporations' liquidity (i.e. cash holdings) from 34 countries and the findings showed a significant positive relationship between GDP growth and cash holdings which implies that firms hold higher levels of cash in countries with growing economy to fund future investment opportunities. Similarly, Anand et al. (2018) examined the impact of macroeconomic variables on cash holdings for firms listed in the Indian National Stock Exchange and the findings revealed a statistically significant positive relationship between GDP growth and cash holdings which implies that firms in economic growth tend to reserve higher level of cash. Moreover, by examining another influential macroeconomic variable; the inflation rate, the findings revealed the increase in liquidity is associated with the increase of the inflation rate. At this point, Chen and Mahajan (2010) argued that the cash holdings ratio includes both

cash and marketable securities and although the increase of inflation could decrease the level of cash as holding cash is bearing no interest contrary to the investment in marketable securities (i.e. cash equivalents) that considers an interest-bearing item, firms could invest more in marketable securities which may offset the decline in cash reserves.

The Agency Motive

The agency motive of cash holdings posited from the agency problems as the main common problem raised from the separation between ownership and management thus, a conflict of interests between a firm's managers (agents) and its stockholders (owners) may exist. From this perspective, managers have incentives to hold higher level of cash reserves. Regarding this motive, previous literature revealed some reasons of why a firm's manager may intend to hold higher level of cash reserves (e.g. Jensen, 1986; Opler et al., 1999). Instead of paying the dividends to stockholders even with poor investment opportunities, managers keep higher levels of cash in the firm, in order to increase their power and control over the firm, which will open the door toward increasing the managerial discretion (Jensen, 1986). Following the notion of agency cost of debt where there are different interests between debt-holders and stockholders (i.e. underinvestment problem), thus firms with higher level of debts find it difficult and even costly to raise funds according to this type of agency cost. Accordingly, to avoid such a scenario where a firm suffers from higher agency cost of debt, managers need to lower its level of debt and search for another alternative, which could logically be retaining higher levels of cash and liquid assets especially with the presence of potential investment opportunities (Opler et al., 1999).

3.4.2 Theories of Cash Holdings

The previous discussion showed the motives that explain the reasons behind holding cash; however, corporations need to understand the characteristics that influence its decision regarding the

level of cash reserves needed that maximise its profit and decrease its cost of capital (Ferreira and Vilela, 2004). Previous literature revealed that the link between the cash holding decision and corporation's value can be explained through several theories such as; the trade-off theory, the pecking order theory and the free cash-flow theory.

3.4.2.1 Trade-off theory

Originally, this theory suggests that any corporation needs to determine its capital structure that will lead to maximising its value as the financial distress is the potential cost associated with using debt as an external source of funds. Thereof, if the cost of using the debt is greater than the benefit of tax shield, this could have an inverse impact on the value of the firm. At this point, the firm's management team will try to determine the sufficient level of debt used to offset the increase of the financial distress cost which simply means to balance the benefits and costs. According to this scenario, firms should maintain a sufficient level of cash to secure the money needed instead of using external funding (i.e. debt) and so avoid the increase in the cost of debt (Myers, 1977).

Similar to debt, holding cash has benefits and costs. Thus, this theory confirms that corporations should set the optimal level of cash where the marginal cost of holding cash equal to the marginal benefit of those holdings in order to maximise the stockholders wealth (Opler et al., 1999; Martínez-Sola et al., 2013). Accordingly, the benefits of holding a sufficient level of cash could be related to the motives discussed earlier. As for the transaction cost motive, firms can raise the funds needed through capital markets by using debt as an external source of funds which is associated with fixed and variable costs or liquidating/selling its assets or cutting off dividends, however dealing with imperfect capital markets this will cause higher transaction costs which can be avoided by maintaining sufficient cash reserves (Opler et al., 1999).

Moreover, higher level of cash holdings gives the firm the chance to chase the profitable investment opportunities at a lower cost as the opportunity cost of missing these investments will be higher in case of cash shortfalls (Dittmar, Mahrt-Smith and Servaes, 2003). Following the precautionary motive, firms may stockpile a level of cash or liquid assets to avoid financial constraints such as difficulties in accessing capital markets or the available external sources of fund are costly (Almeida, Campello, and Weisbach, 2004). In addition, firms that subject to potential financial distress (i.e. bankruptcy) retain higher level of cash as a precaution tool (e.g. Opler et al., 1999; Ferreira and Vilela, 2004; Harford, Mansi and Maxwell, 2008; Subramaniam et al., 2011). Moreover, holding higher levels of cash could arise a conflict between managers and stockholders (agency problem) as this could open the door in front of managers to use this cash inefficiently (i.e. bad investment decisions) which could decrease the value of the firm (Jensen and Meckling, 1976).

3.4.2.1.1 Determinants of Cash Holdings

Leverage

One of the main determinants used in previous literature of cash holdings is the firm's leverage. Firms with higher leverage (level of debts) refer to its easy access to capital markets to raise external funds thus; they are more liable to debt issuers' monitor and control. Following this scenario, the level of cash needed will decline (e.g. Ferreira and Vilela, 2004; Drobetz and Grüninger, 2007). On the other hand, increasing the level of debts can increase the probability of financial distress and bankruptcy thus; firms with higher level of debt will increase its reserves of cash in order to decrease such financial distress (Ferreira and Vilela, 2004). Accordingly, the trade-off theory could not give a clear relationship between the firm's leverage and its cash holdings.

Size

According to this theory, a negative relationship between the firm's size and the level of cash reserves has been contended through previous studies. Large firms are more diversified and less liable to bankruptcy compared to smaller ones as any shortfall of cash reserves from one business sector can be resolved through generating cash from another sector or by liquidating non-core assets (e.g. Titman and Wessels, 1988; Rajan and Zingales, 1995; Opler et al., 1999). Following the transaction motive, Miller and Orr (1966) and Faulkender (2002) suggested that economies of scale has significant impact in managing firms' cash, as large firms will hold less level of cash compared to small ones. In light of the previous discussion, the cost of borrowing is a form of fixed fees and irrelevant to the size of loan, thus raising fund from external sources (i.e. debt) seems to be expensive for small firms which will force them to hold higher levels of cash reserves (e.g. Kim, Mauer and Sherman, 1998; Peterson and Rajan, 2002).

Growth Opportunities

Another vital determinant is growth opportunities. It is generally accepted that investment opportunities need a source of funds. In case of cash shortfall, firms will miss the valuable investment opportunities as these firms will engage with costly external funding. Following the trade-off theory based on the transaction motive, firms should maintain a sufficient level of cash to avoid the higher cost of external sources of funds and to exploit any available profitable opportunities in the market (e.g. Opler, et al., 1999; Ferreira and Vilela, 2004). Moreover, firms with profitable investment opportunities suffer from higher costs of financial distress as in case of bankruptcy, the positive net present value of these opportunities almost diminished thus, with a sufficient level of cash reserves, firms could avoid such costs (Ferreira and Vilela, 2004). Accordingly, a positive relationship between growth opportunities and cash holdings is expected.

Dividends Payments

Based on the transaction motive, the trading-off theory showed that firms that paid dividends can raise the funds needed (i.e. cash) with a minimum cost by cutting off the dividends, however, firms that do not pay dividends will use external sources of fund from the capital markets (i.e. debt or equity) and so bearing higher costs (e.g. Opler et al., 1999; Ferreira and Vilela, 2004; Al-Najjar and Belghitar, 2011). Consequently, a negative relationship between dividends and cash holding is expected. However, following the precautionary motive, Ozkan and Ozkan (2004) argued that firms who paid dividends would hold more cash than firms that do not pay dividends as they are interested in supporting their dividends policy thus, trying hardly to avoid shortage in cash levels. In line with this assumption, Drobetz and Grüninger (2007) argued that firms especially that pay dividends have strong monitoring from capital markets thus; they can easily raise the needed fund using external sources. Empirically, Brav et al. (2005) and Drobetz and Grüninger (2007) argued that paid-dividends firms are reluctant to cut the amount of dividends paid to raise the cash needed and alternatively will hold more cash and so their findings revealed a positive relationship between dividends and cash holdings.

Non-Cash liquid Assets

The firm's current assets include the most liquid items which are the cash and cash equivalent alongside with other non-cash liquid assets which can be converted to cash easily with lower transaction costs (i.e. accounts receivables and inventories). Opler et al. (1999) argued that in case of raising the liquidity level, firms frequently liquidate their accounts receivables through securitization which applied in large firms and factoring which applied in small ones (Bigelli and Sánchez-Vidal, 2012). These non-cash liquid assets could be considered as cash substitutes. Accordingly, firms with higher level of non-cash liquid assets will hold lower level of cash

reserves (e.g. Ozkan and Ozkan, 2004; Ferreira and Vilela, 2004, D'Mello, Krishnaswami and Larkin (2008), Bates, Kahle, and Stulz (2009), Gill and Mathur (2011), Al-Najjar (2013) and Guizani (2017).

Assets Tangibility

The assets tangibility refers to the fixed assets a firm owned in its total assets. Drobetz and Grüninger (2007) argued that a firm with higher level of tangible assets will hold lower level of liquid assets (i.e. cash and cash equivalent) as in case of cash shortage, a firm can sell these tangible assets. John (1993) examined the relationship between liquidity (i.e. cash holdings) and costs of financial distress by utilizing 223 firms and the findings revealed a significant negative relationship between cash holdings and assets tangibility. Similar, empirical studies support the negative relationship between liquidity and assets tangibility such as Drobetz and Grüninger (2007) and Pereira Alves and Morais (2018).

3.4.2.2 Pecking Order Theory

The pecking order theory was originally introduced by Donaldson (1961) who observed that firms regard the financing decisions prefer internal funds over external financing and this is why it is called the financing hierarchy theory (Opler et al., 1999). Extending the findings of Donaldson (1961), Myers (1984) and Myers and Majluf (1984) showed that information asymmetry between the firm's managers from one side, its current stockholders and outside investors from the other side are the reasons behind these financial preferences. Simply, for fulfilling the new investment opportunities needs, firms will follow the financial hierarchy in selecting its sources of fund which starts primarily with using the retained earnings (internal generated fund) and if this level of retained earnings is not enough, firms will go for their cash reserves. In case of having insufficient level of internal funds (i.e. retained earnings and

accumulated cash) firms will start using external funding starting first with issuing debt and the last external resort is issuing equity if the level of debt used is not enough. From the previous explanation, this theory showed that using its equity to finance the available investment opportunities is very costly for the firm. Information asymmetry arises when one of the transaction parties (firm's insiders) such as the managers of the firm has better knowledge and information regard the firm's activities and its future investment opportunities than the others (outsiders) such as investors, stockholders and creditors and that is happened most of the time (Myers and Majluf, 1984). When firms intend to finance its new investment opportunities using their equity (i.e. issuing new shares), the valuation of these new shares will be underpriced as managers cannot convey the valuable information of new investments to market participants (i.e. outside investors) thus, the potential outside investors will not be able to distinguish between bad or good opportunities. Consequently, the firm's financing decision to issue new shares is considered a bad sign as these new investors will ask for higher return compared to the return of the current stockholders which lead to increase the cost of external financing (Opler et al., 1999). From the previous discussion, in case of insufficient internal funds, firms will prefer to use debts especially the lower risky ones rather than using equity (Myers and Majluf, 1984).

From the point view of managers, using debts with fixed rate are much safer in limiting the expected losses that can be gained by the current stockholders and will need not to share the firm's profit with new stockholders. Moreover, using the equity is not preferable unless the pricing of the new issued shares is higher than its market value. In preference of using debt over equity, Frydenberg (2004) argued that using debt will provide firms with good signal of quality to the market than using equity especially to firms suffer from higher level of asymmetric information as the costs of information will increase in case of issuing new equity.

3.4.2.2.1 Determinants of Cash Holdings

Leverage

This theory posits that firms primarily prefer to use the available internal sources (i.e. retained earnings and accumulated cash) and then using the external funding (i.e. debt and equity) to fulfill the investments needs. By linking the level of cash holdings with the level of debt used by a firm; the usage of debt will increase when investment needs are greater than the level of retained earnings and the accumulated cash and declines when investments needs are lower than the retained earnings and the accumulated cash (e.g. Ferreira and Vilela, 2004; Al-Najjar and Belghitar, 2011). In addition, firms with higher level of debt will increase the chance of bankruptcy (Kaplan and Stein, 1993) thus, holding a sufficient level of cash reserve will decrease the bankruptcy cost. In line with this point, Opler et al. (1999) argued that firms with a sufficient level of internal funds (i.e. retained earnings) can maintain higher level of cash and pay off the debt used (i.e. the principal and the interest) thus, firms with unconstrained investment plans will use the surplus of its internal funds to increase the level of cash or to repay its debts. Accordingly, a negative relationship between the two variables is expected.

Size

By controlling the investment policy, large firms are more successful compared to small ones and so they hold higher levels of cash (Opler et al., 1999). Lòpez-Gracia and Aybar-Arias (2000) pointed out that large firms rely mainly of self-financing (i.e. retained earnings and cash reserves) in applying their financial policy, where small firms rely on short-term financing (i.e. bank credit and commercial credit).

Growth Opportunities

Following the precautionary motive, Ferreira and Vilela (2004) argued that firms with high investment opportunities hold higher level of cash, as if firms suffer from a shortage of its cash level may miss up these investment opportunities and especially the profitable ones. Moreover, Shyam-Sunder and Myers (1999) pointed out that frequently, firms that maintain higher levels of cash flow have higher investment opportunities as these firms expected to be more profitable in the near future. In addition, firms with more growth activities have higher levels of information asymmetry where using external sources to finance these activities is very costly thus, firms have an incentive to maintain more cash (Drobetz and Grüninger, 2007) and so a positive relationship between cash holdings and growth opportunities is expected. In contrast, Drobetz and Grüninger (2007) also proposed that firms with higher growth opportunities (i.e. market to book value) may lack of sufficient cash flow that can be accumulated, and so a negative relationship can be expected between the two variables. From the previous discussion, the pecking order theory is relevant for both positive and negative relationship between cash holdings and growth opportunities where the last presented by market to book ratio (Drobetz and Grüninger, 2007).

3.4.2.3 Free Cash-Flow Theory

This theory suggests that firms' managers have incentives to hold higher level of cash reserves which will facilitate their control on firms' assets, thus increasing their discretionary power over the financing and investment decisions (Jensen, 1986). One of the main advantages of holding excess cash is that the managers will not use external funding (i.e. debt or equity) and consequently there is no need to supply much of information about the firm's new projects to capital markets (Ferreira and Vilela, 2004) thus, avoid a higher degree of monitoring and controlling of capital markets (Opler et al., 1999). On the other hand, this excess of cash could

open the door toward financing new investments with negative present values which could negatively affect the stockholders' wealth. Managers of firms with sufficient level of cash could maintain higher level of financial flexibility to mitigate the underinvestment problem and avoid the costly external sources of fund; however potential costs could be associated with such level of cash through managers' misuse (Harford, 1999). In line with this point, Dittmar, Mahrt-Smith, and Servaes (2003) pointed out that the managers who hold more cash and little concerned with stockholders' interests (i.e. maximising their wealth) could overspend this cash in acquisition activities alongside with financing investments in projects with negative present values. In contrast, firms with the higher level of cash reserves could be engaged in acquisition activates as forms of foreign investments (e.g. Harford, 1999; Hanlon, Lester, and Verdi, 2015). On another level, Fama and Jensen (1983) and Stulz (1988) argued that managers are naturally risk-averse, thus they intend to hold higher level of cash reserves.

3.4.2.3.1 Determinants of Cash Holdings

Leverage

Following the free cash-flow theory, firms with high level of debt are subjected to high degree of monitoring and controlling by capital markets as simply, managers of these firms are comply with debt requirements and covenants which lead to lessen their discretionary power. In contrast, firms with lower level of debt are less monitored and controlled by capital markets and discretionary power for their managers. Consequently, high levered firms will hold less cash and vice versa (Ferreira and Vilela, 2004).

Size

Ferreira and Vilela (2004) argued that managers of large firms have superior discretionary power as these firms have larger shareholder dispersion (i.e. free riding). Moreover, large firms have a

little chance being a takeover target as to have such a large target, bidder needs more financial resources (e.g. Opler et al., 1999; Drobetz and Grüninger, 2007). Due to the previous discussion, large firms intend to hold more cash. In addition, Al-Najjar and Belghitar (2011) argued that large firms have a high degree of information asymmetry between stockholders and managers and due to this, these managers have more flexibility over firms' investments and financial policies, thus these firms hold higher level of cash. Saddour (2006) argued that large firms have higher level of cash flow generated from its operational activities thus, they hold more cash.

Growth opportunities

In case of firms that lack of profitable investment opportunities, entrenched managers would maintain more cash rather than paying dividends to their stockholders (Jensen, 1986) and make sure that they have the essential funds needed for future investment opportunities regardless the net present value (i.e. positive or negative) of these opportunities (e.g. Ferreira and Vilela, 2004; Drobetz and Grüninger, 2007). Consequently, a negative relationship between cash holdings and growth opportunities is expected.

3.5 Capital Structure/ Leverage

According to Myers (2001) capital structure presents the mixture of debt and equity needed for investments. In this particular study the terminology of capital structure and leverage will be used interchangeably. By determining the capital structure, a firm can detect the portion of debt against equity and its financing plans which used to determine the design and time schedual of issuing a particular debt (Myers, 2000). Modigliani and Miller (1958) introduced a theoretical model with assumptions of corporate capital structure. They argued that the value of a firm is not influenced by its capital structure under the perfection of capital market assumption. Accordingly, they assumed that there are no taxes, no bankruptcy cost and other costs such as

transaction, agency and information asymmetry costs, thus capital structure is irrelevant to firm's value. In the real world, the perfect capital market does not exist, thus using external sources of funds (i.e. debt and equity) is significant for a firm, as for instance, a firm must pay their taxes and they may face the risk of going bankrupt. Previous literature revealed that there are several theories used to clarify firms' financing choices of debt and equity. However, since debt has different maturities (i.e. short-term vs. long-term), dealing with the level of leverage considering its maturities will provide deep insights in investigating the capital structure of corporations and especially for this particular study. Custódio, Ferreira and Laureano (2013) clarified that determining the debt maturity structure is a vital factor for a firm as it affects its financial policy and its behaviour, especially in the presence of financial shocks (i.e. liquidity and credit). Moreover, analyzing capital structure of a firm using the total debt only may disguise critical differences between short-term and long-term debts (e.g. Titman and Wessels, 1988; Van der Wijst and Thurik, 1993). To the best of this study's knowledge, no empirical study in favour of the context of stock exchanges demutualization examined the impact of such a strategy on the debt choice (i.e. short-term and long-term), however, literature of corporate finance area provided some important insights that this particular study could follow especially in linking the change of ownership structure (i.e. state ownership enterprises vs. privatised firms) and the debt choice. The separation between ownership and management could raise a potential conflict between a firm's managers and its stockholders thus, using debt may mitigate such a conflict (e.g. Jensen and Meckling, 1976; Stulz, 1990). Many scholars showed the importance of using short-term debt as a tool to lessen the agency costs associated with managers' discretion by exposing them under continual supervisory monitoring by investors as well as lenders and rating agencies (Datta, Datta and Raman, 2005). Rajan and Winton (1995) and Stulz (2000) argued that

firms could use debt with short-term maturity as a flexible and an effective device in facilitating the process on monitoring the managers' actions with little effort. Moreover, Stulz (2000) argued that to a certain point, the short-term sourcing fund (i.e. bank loan) could be unavailable and to not forego potential investment opportunities, a firm's managers will be inclined to use long-term debt as an alternative source of funding except that this decision may affect the value of the firm negatively. Accordingly, in a scenario where there is a weak alignment of interests between a firm's managers and its stockholders, managers could avoid the extensive monitoring of external financiers by using long-term debt rather than using short-term debt, nevertheless such an action may lead to increase the agency costs (Datta, Datta and Raman, 2005). Choi (2015) investigated the relationship between the managerial ownership and debt choice (i.e. long-term debt) by dividing a sample of Chinese firms to two groups (i.e. state-owned vs. private firms), the findings showed a positive relationship between state-owned and long-term debt and a negative relationship between private firms and long-term debt. Similarly, Mendoza, Yelpeo and Ramos (2019), examined the relationship between state ownership and debt maturity (i.e. long-term debt) using a sample of 20,586 Chilean firms. They argued that firms with state ownership use more debt with long-term maturity as this type of ownership facilitates the financing need through long-term debt even with lower collaterals.

3.5.1 Trade-off Theories

By extending the Modigliani and Miller (1958) theorem, the trade-off theory claims that a firm will use debt till reaching the point where the present value of potential costs of financial distress offset the marginal benefit from tax shields (Myers, 2001). A firm can benefit from using debt, as the interest paid (the cost of debt) is a tax-deductible expense thus, the amount of tax is decreased and a tax shield is created. In a correction of their paper - Modigliani and Miller

(1958) - Modigliani and Miller (1963) showed that increasing the portion of debt in a firm's capital structure can lead to decrease the average cost of capital due to the influence of the tax shield and so generate higher level of return lead to increase the value of the firm. On the other hand, Berk and DeMarzo (2013) refers that when a firm faces difficulties in paying off its debt obligations it is said that this firm is in financial distress. A firm with capital structure that includes higher portion of debt to equity used to finance its current operations and the expected investment opportunities in the future could increase the probability of going bankrupt (Kraus and Litzenberger, 1973). The costs associated with bankruptcy can be classified to direct and indirect costs. Direct costs include costs such as credit, restructuring and legal costs, where indirect costs are comprised of costs such as losses the confidence of customers and decline in number of employees (Baker and Martin, 2011). Accordingly, the value of a levered firm is equal to the value of a firm excluding the leverage and the present value of costs of financial distress adding the present value of tax shields (Berk and DeMarzo, 2013). From the previous discussion, firms seek to have an optimal target structure by trading off the benefits of using debt against the associated costs, thus they set a debt to equity target and moving for the sake of achieving it (Myers, 1984).

Static Trade-Off Theory

Following the same concept of this theory, the debt target is a trade-off between the advantages of tax shields against the costs of financial distress considering only the decision of a single period and without having the option of target adjustment (Baker and Martin, 2011). It is possible for a firm to have a constant optimal debt target but this will be very costly to this firm to afford as maintaining this target fixed all the time will require persistent balance between the debt and equity used which may raise transaction costs. As for Fischer, Heinkel, and Zechner

(1989), even with a lower level of transaction costs, firms may suffer from a delay in adjusting the level of debt to equity targets and so enormous deviation in debt levels can occur. In light of this, Brennan and Schwartz (1984) and Kane, Marcus, and McDonald (1984) argued that firms instead of maintaining a fixed debt target, they have a lower and upper limit for this target to float within, thus once this debt target crosses the lower or the upper limit, firms can adjust their capital structure and reach back the optimum level again.

Dynamic trade-off Theory

Myers (1984) argued that the validity of the static trade-off theory is conditioned with the absence of the adjustment costs, however with the presence of capital market imperfections and frictions such as transaction costs can prohibit a firm from immediate adjustments of the debt target. According to this dynamic model, the decision of a firm optimal capital structure focuses on multiple periods not only a single one (i.e. static trade-off model). Frank and Goyal (2009) pointed out that the optimal capital structure at any time period is determined by the expected capital structure next period. Most of the time, firms allow their debt levels to stray from their optimal targets unless these debt levels go too far from the passable range (i.e. lower or upper limit) then firms will adjust these levels of debt in a way to reach the optimal levels again (Fischer, Heinkel, and Zechner, 1989). As for Fischer, Heinkel, and Zechner (1989), even with a lower level of transaction costs, firms may suffer from a delay in adjusting the level of debt to equity targets and so enormous deviation in debt levels can occur. In light of this, Brennan and Schwartz (1984) and Kane, Marcus, and McDonald (1984) argued that firms instead of maintaining a fixed debt target, they have a lower and upper limit for this target to float within, thus once this debt target crosses the lower or the upper limit, firms can adjust their capital structure and reach back the optimum level again. Barclay and Smith (2005) pointed out that the

firm's manager (i.e. chief financial officer-CFO) must adjust its debt level, whenever the adjustment costs is lower than the costs of the debt target variation. From the previous discussion, the process of taking financial decisions can be divided to two stages; the first stage considers the setting up of the debt target and the second one is taking into account the adjustments needed to reach the target that has been formed in the first stage (e.g. Jalilvand and Harris, 1984; Ozkan, 2001).

3.5.1.1 Determinants of Capital Structure

Tangibility

The tangibility determinant refers to the level of tangible assets available used by a firm as collateral to the level of debt provided by debtors. A high level of tangibility could act as safety device, as it can be liquidated in case of bankruptcy. Accordingly, debtors can protect their interests and decrease their risk, hence they can lend firms with the needed fund. Following the trade-off theory a positive relationship is expected between the two variables. Empirically, several studies support this prediction (e.g. Titman and Wessels, 1988; Rajan and Zingales, 1995; Ozkan, 2002; Wiwattanakantang, 1999; Suto, 2003; Deesomsak, Paudyal and Pescetto, 2004; Antoniou et al. 2008; Bessler, Drobetz and Grüninger, 2011; Noulas and Genimakis, 2011). Considering the maturity of debt, Nivorozhkin (2002) pointed out that firms with higher level of tangible assets used as collateral for obtaining long-term debt following the matching maturity principle where tangible assets are financed by long-term debt and the opposite is true for short-term assets that are relied on short-term debt.

Size

Following the trade-off theory, size of firms plays a vital role in determining its capital structure. In general, large firms are more diversified, less exposed to financial distress which in turn leads to decrease the bankruptcy cost and have good reputations especially in debt markets, thus they are relying heavily on debt financing (e.g. Rajan and Zingales, 1995; Titman and Wessels, 1988; Frank and Goyal, 2009). Hovakimian, Opler and Titman (2001) pointed out that large firms are less exposed to cash flow volatility where these firms can benefit from the debt tax shield when using the debt funding. Moreover, large firms have an easy access to capital markets (i.e. debt market) with lower costs compared to small firms (Fama and French, 2002). Many empirical studies support the positive relationship between leverage and size of firms such as Suto (2003), Deesomsak, Paudyal and Pescetto (2004), Voulgaris, Asteriou and Agiomirgianakis (2004), Crnigoj and Mramor (2009), Bessler, Drobetz and Grüninger (2011), Sheikh and Wang (2011), K dzior (2012), Jõeveer (2013), Serghiescu and Vaidean (2014) and Arsov and Naumoski (2016). In addition, larger firms rely in using long-term debt compared to small firms that prefer short-term debt financing (Marsh, 1982).

Profitability

The trade-off theory derived from the trading off between the benefits of using debt against the associated costs, that is the taxes and bankruptcy cost. Firms can benefit from the tax deductible of interest payments which will create tax shield and so will encourage profitable firms to use more debt in its financing decisions (DeAngelo and Masulis, 1980). On the other hand, profitable firms are less exposed to bankrupt, thus the higher the profitability of a firm the lower its bankruptcy cost (Fama and French, 2002). From the previous discussion, there is a positive relationship between profitability and level of debt. Several studies that provided empirical

evidence supporting such a relationship like Jensen, Solberg and Zorn (1992), Hovakimian, Opler and Titman (2001), Hovakimian, Hovakimian and Tehranian (2004) and Kayhan and Titman (2007).

Growth Opportunities

The trade-off theory predicts a negative relationship between the level of debt and the growth opportunities. Myers (1977) argued that firms with level of leverage/debt are likely to forego profitable projects/investment opportunities, thus with increasing the future growth opportunities, firms will go for the equity financing. In similar manner, Antoniou, Guney and Paudyal (2008) clarified that increasing the financial distress cost is associated with increasing the expected growth opportunities, which will lead firms to decrease its level of debt. As for Baskin (1989), firms with higher growth opportunities are largely exposed to bankruptcy. In case of increasing information asymmetries and so overvaluation (i.e. market to book value is greater than one) may lead to higher growth opportunities, firms will be enforced to use equity rather than debt financing (e.g. De Jong, Kabir, Nguyen, 2008; Antoniou, Guney and Paudyal, 2008). Moreover, growth opportunities are like intangible assets, where both cannot be collateralized (i.e. unlike tangible assets). Accordingly, growth opportunities or intangible assets may lose their value in case of firms suffer from financial distress (i.e. higher bankruptcy costs) (e.g. Myers, 1984; Barclay, Smith and Watts, 1995; Myers, 2001).

Liquidity

According to this theory, a positive relationship between leverage/debt and liquidity is expected. Ozkan (2001) argued that firms with higher level of liquidity may support using more debt due to their ability in paying off these short-term liabilities in due date. Moreover, Antoniou, Guney and Paudyal (2008) examined the impact of liquidity on debt maturity (i.e. short-term debt vs. long-

term debt) and their findings revealed that there is a negative relationship between liquidity and debt maturity which implies that liquidity/liquid asset is not supporting the usage of long-term debt as the creditors may be exposed to the risk shifting to highly risk projects as unexpected move taken by the firm's managers or even due to unexpected changes in the environmental conditions.

3.5.2 The Pecking Order Theory

Another influential theory of capital structure although with no need of determining an optimal capital structure like the trade off theory is the pecking order theory. From the point of view presented by Myers and Majluf (1984); under the assumption of perfect capital markets in analyzing a firm with existing owned assets (assets-in-place) and an investment opportunity which needs a source of finance thereof, the investors would not exactly know the value of the issued securities to finance the new opportunities. Accordingly, by following this scenario; issuing new stocks with an expected positive present value of an investment opportunity would be considered good news to investors. In contrast, if firm's managers are working in favour of the current stockholders - as proposed by Myers and Majluf (1984) - they are opposed to issue new equity (i.e. common stocks) unless it is overvalued as issuing undervalued (low price) stocks will transfer the value from the current stockholders to the new investors. In light with this point, Myers (2001) argued that the managers will refuse to issue undervalued stocks unless the value transferred from to new stockholders is greater than the offset associated with the net present value of investment opportunity. Therefore, in case of the new issuing announcement, the stock price will go down (e.g. Asquith and Mullins, 1986; Myers, 2001) and this drop in price is due to that firm's managers have better information access and advantage compared to outside investors which refers to what is called information asymmetry (e.g. Dierkens, 1991;

Myers, 2001). According to the pecking order theory, the information asymmetry is one of the main factors that affecting the financing decisions, as firms will prefer internal sources (i.e. retained earnings) of finance over the external ones (i.e. debt and equity-issuing stocks). In order to simplify this, the notion of this theory (e.g. Myers, 1984; Myers and Majluf, 1984) follows the adverse selection of the available sources of finance (i.e. internal vs. external sources). At this point, Frank and Goyal (2009) argued that a firm uses retained earnings has no adverse selection problem, however, this problem can slightly exist when using debt and reaching its extreme level when using equity. Since using the equity source of funds is associated with risk premium, outside investors will ask for a higher return compared to the debt source. Thus, a firm will first use its retained earnings and if this amount of internal funds is insufficient, it will use debt as this external source has fixed cost so less sensitive to information asymmetry and the final resort to firms is to use the equity source as it is highly sensitive to information asymmetry (e.g. Myers, 1984; Myers and Majluf, 1984; Myers, 2001). Moreover, Fama and French (2012) argued that in case of using the debt, firms prefer to use debt with short maturity over debt with long maturity. Interestingly, by testing the hypotheses of this theory empirically; previous literature showed mixed evidence supporting it. In supporting the pecking order theory, Shyam-Sunder and Myers (1999) utilized 157 American firms for the period from 1971 to 1989, and the findings of their study revealed that each one dollar of firms' financing deficit matches one dollar change in its debt issues. On the other hand, Frank and Goyal (2003) followed the context of the pecking order theory applied by Shyam-Sunder and Myers (1999) and argued that by increasing the sample size to 768 American firms and the time span from 1971 to 1998, the predictions of Shyam-Sunder and Myers (1999) did not hold. Surprisingly, the findings of Frank and Goyal (2003) showed that external sources of fund used extensively by

some firms as the internal funding is insufficient in financing the firms' investments. Moreover, the proportion of debt did not overbear the proportion of equity as the financing deficit has been tracked by the issued equity rather than the issuance of net debt. In addition, firm size is a very critical factor; large firms are supporters for the pecking order theory as these firms are receiving much attention from the financial analysts thus they are less affected by the adverse selection problem. According to Frank and Goyal (2003), the pecking theory failed to explain the financing decisions of small high-growth firms and even with large firms (the great supporters of the theory) especially in the 1990s.

3.5.2.1 Determinants of Capital Structure

Tangibility

Following the financial hierarchy, firms with higher level of fixed (tangible) assets will use lower level of debts as internal financing is preferable. Moreover, firms with higher tangibility are less exposed to information asymmetry costs. Accordingly, a negative relationship is predicted between tangibility and debt level. Empirically, many studies provide evidence supporting this relationship such as Booth et al. (2001), Bauer (2004), Mazur (2007), Crnigoj and Mramor (2009), Sheikh and Wang (2011).

Size

According to the pecking order theory, the size of a firm could represent the level of information asymmetry between capital markets and insiders of a firm (i.e. board and managers). Large firms are less exposed to higher information asymmetry costs, hence they can use equity rather than debt financing (e.g. Kester, 1986; Mazur, 2007; Baker and Martin, 2011). Rajan and Zingales (1995) also argued that larger firms can release more information to outside investors compared to smaller ones, thus they should use more equity funding. Chen and Strange (2005) examined

the impact of size on debt ratio using the book value and the market value proxies and pointed out that size had reverse relationship with book value of debt ratio, however this was not the case using the market value of debt ratio (i.e. significant positive relationship). In addition, Frank and Goyal (2009) pointed out that larger firms are widely known and have good reputation due to their longer existence in the market, thus they have the ability to maintain higher level of retained earnings. Firms with relatively small size bear more cost in attempt to issue equity and even more for issuing long-term debt, wherefore they are more leveraged compared to large ones and prefer to use short –term debt (i.e. bank loans) that is lower level of fixed costs (e.g. Smith, 1977; Titman and Wessels, 1988).

Growth Opportunities

Firms with higher investment opportunities will need more financing sources, as if the retained earnings is insufficient, debt is preferred as the second alternative. Frank and Goyal (2009) clarified that the higher the investment opportunities with constant profitability level, the higher its usage from debt financing. In supporting the positive relationship between growth opportunities and the level debt, many empirical studies support this outcome such as Titman and Wessels (1988), Bevan and Danbolt (2002), Crnigoj and Mramor (2009), Noulas and Genimakis (2011). Moreover, in considering the debt maturity, Fama and French (2012) pointed out the that pecking order theory as introduced by Myers (1984) and Myers and Majluf (1984) predicts that firms prefer primairly to use its retained earnings followed by debt financing especially the debt with short-term maturity rather than the equity and this is could be due to the sever information asymmetry associated with equity financing and also due to the costs of issuing as these costs are high for issuing stocks, low for short-term debt and zero for retained earnings. In addition, Custódio, Ferreira and Laureano (2013) argued that firms with higher information

asymmetry which lead to adverse selection prefer to use short-term debt to “avoid locking in their cost of financing with long-term debt since they expect to borrow at more favourable terms later. Similarly, Barclay and Smith (1995) and Berger et al. (2005) argued that the higher the potential growth for a firm the higher the issuing of short-term debt.

Profitability

As discussed previously, the pecking order theory proposed that firms will use the internal financing (i.e. retained earnings) as its first option, if this internal funding is insufficient, they will use debt and the last resort is to use equity financing (e.g. Myers, 1984; Myers and Majluf, 1984). Several studies clarified that a firm's profit consider as the internal source of funds needed to finance new projects/investments (e.g. Delcours, 2007; De Bie and De Haan, 2007; De Jong, Kabir and Nguyen, 2008; Antoniou, Guney and Paudyal, 2008). According to De Bie and De Haan (2007), firms prefer internal funding, thus the profitable ones have lower leverage ratios. As for Deesomsak, Paudyal and Pescetto (2004) argued that the preference of firms with higher level of profits is not to use additional equity (i.e. new issuance of common stocks) to avoid the prospective of equity dilution. From the previous discussion, the pecking order theory predicted a negative relationship between profitability of a firm and its level of debt. Many empirical studies support the prediction of the pecking order theory like Titman and Wessels (1988), Nivorozhkin (2002), Fama and French (2002), Deesomsak, Paudyal and Pescetto (2004), Huang and Song (2006), Crnigoj and Mramor (2009), Voulgaris, Asteriou and Agiomirgianakis (2010), Al-Najjar (2011) and Sheikh and Wang (2011).

Liquidity

According to the pecking order theory, internal funding is the first source among others can be used by a firm and is sourced by its profitability and liquidity levels (Mazur, 2007). The assets

liquidity refer to the available cash and other liquid assets that can be quickly converted to cash (De Jong, Kabir and Nguyen 2008). Following the assumptions of the pecking order theory, firms with sufficient liquidity level will utilize these liquid assets as internal source of funds before using the external sources (i.e. debt and equity). Accordingly, a negative relationship is expected between a firm's liquidity and its level of debt. Empirically, several studies support this relationship like Titman and Wessels (1988), Rajan and Zingales (1995), Bevan and Danbolt (2002), Suto (2003), Deesomsak, Paudyal and Pescetto (2004), Viviani (2008) and Sheikh and Wang (2011).

3.5.3 The Agency Theory

The existence of this theory indicates that determining a firm's capital structure depends not only on the trade-off and pecking order theories but on agency costs. In an organisation, it can be accepted that the interests of managers (agents) may not always aligned with the interests of the stockholders (principales) creating what is called the agency conflict/problem and thus affect the superior corporate strategy. According to Jensen and Meckling (1976), conflicts could be between managers and stockholders (agency cost of equity) and between debt holders and stockholders (agency cost of debt). In general, managers are hired to act on behalf of firm's stockholders although, the managers will behave for their own interests in case of they do not take possession of the firm (i.e current owners sell part of their ownership to outside investors). Consequently, firm's managers will have only a portion of the profit/gain but will tolerate the whole cost of their activities to enhance profit. Firm's managers have incentives to follow strategies that could bump up its level of compensation by increasing the size of the firm (e.g. Donaldson, 1984; Baker, Jensen, and Murphy, 1988) or reducing the risk associated with their employment such as losing their jobs or reputation (Amihud and Lev, 1981). As a result,

managers could spend cash on non-profitable (i.e. low or negative net present value) investment opportunities or have unexpected return that is less than the cost of capital referring to the managerial overinvestment problem (De Jong, 2002) which is opposed to what stockholders expect (i.e. invest in profitable and high returns projects). Moreover, this agency cost could be worsen with the participation of free cash flow (Jensen, 1986). Therefore, the free cash flow problem can be addressed by using debt rather than using equity (e.g. Fama and French, 2002; Drobetz and Fix, 2005). Using debt enforces firm's managers to contractually repay the principal and the interests of the debt alongside with a probability of bankrupting the firm in case of default. Accordingly, using debt could control the managers' discretion behaviour and enhance their discipline. It has been argued that managers in firms with essential level of free cash flow can use this excess of cash in two forms; as they can pay out dividends to the stockholders or repurchase shares instead of wasting it or make investments in projects with unexpected return (i.e. low return) which lead to control managers behaviour toward the free cash flow. Unlike the debt contract, there is a weak promise to pay dividends as there is no contractual commitment for such payments (Jensen, 1986). On the other hand, Rozeff (1982) and Easterbrook (1984) argued that firms who regularly pay dividends can reduce agency costs when managers and their policies are subject to capital markets discipline in case of raising capital. In line with this point, Charest (1978) and Aharony and Swary (1980) pointed out that cutting dividends by managers, could have negative impact on firms' stock prices in a form of an equilibrium capital market reaction toward the agency costs of free cash flow. In addition, another favour of using debt was clarified by Grossman and Hart (1982) as firms with higher probability of bankruptcy (i.e. managers are not seeking high profits) will encourage their managers to increase their efforts to increase firms' profits rather than losing their benefits from consuming perquisites. On the other

hand, Jensen and Meckling (1976) added that also it could be a conflict between debt holders and stockholders, as debt covenant make stockholders do suboptimal investment (Harris and Raviv, 1991). If the chosen investment generates higher level of returns, stockholders will possess most of profit/gain, however if this investment flops, debtholders will tolerate the consequences (Harris and Raviv, 1991). Simply, since stockholders have limited liability and seek higher return, they may invest in risky projects as if these projects are successful, stockholders will gain all the return however, when things go wrong and these projects are unsuccessful and so the bankruptcy risk will increase, debtholders will bear all the losses (e.g. Harris and Raviv, 1991; Drobetz and Fix, 2005). This problem is called overinvestment or asset substitution or risk shifting and consider as an agency cost of using debt which occur when firm's stockholders have the motive to exploit its debtholders after issuing debt (Drobetz and Fix, 2005). Another problem arise from the agency relationship between stockholders and debtholders or between old and new stockholders is the underinvestment or overhang problem. Firms with high levels of debt encourage managers to reject projects with positive net present values especially when the debt payment is due and so stockholders will not be able to finance these investments by using equity. Thus unlike the stockholders who will bear the whole cost of the investment (as the stock price will decline due to the decrease of the level of cash flow after the investment); debtholders will benefit fully or partly from these investments as they still require the payment of their interests (Myers, 1977). In a way to mitigate this problem, firms could elicit ways to terminate standing debt or to neutralize its effect before starting new projects (Berkovitch and Kim, 1990). As for terminating standing debt, Myers (1977) pointed out that considering the debt maturity, especially, the short-term debt that matures prior to the date of taking a new project decision, could solve the underinvestment problem. Moreover, Bodie and Taggart (1978) proposed using

callable bond which can be called before engaging in new projects. On the other hand, in a way to neutralize the potential conflict between debtholders and stockholders, managers can use convertible debt (i.e. bond) as it simply can be converted from debt to stocks and so debtholders will have an equity claim (e.g. Jensen and Meckling, 1976; and Green, 1984).

3.5.3.1 Determinants of Capital Structure

Profitability

In general, profitable firms have higher levels of free cash-flow, thus agency costs may increase (Jensen, 1986). Accordingly, to mitigate the agency cost associated with free cash-flow, firms may increase its level of debt as a mean to discipline their managers potential behaviour (e.g. less free cash-flow lead to less managerial discretion) and increase the monitoring activities by creditors (e.g. Harris and Raviv, 1990; Harris and Raviv, 1991). Empirical evidence supporting the positive relationship between firms' profitability and its level of debt were provided by studies such as Fama and French (2002) Garcia and Mira (2008) and Margaritis and Psillaki (2010).

Size

According to Jensen (1986), managers with excess of free cash flow may spend it to increase the size of the firm thus, increase their control on the firm's resources and benefit from prerequisites. In order to mitigate this discretionary behaviour and the potential agency conflict, firms may use more debts as a monitoring device to control the firm's managers activities. In addition, monitoring cost is high for small firms compared to large ones therefore, larger firms are motivated to use higher level of debts than small firms.

Growth Opportunities

One of the vital factors that can explain the impact of agency costs and the level of debt used by a firm is the growth opportunities. As discussed previously, to mitigate the problem of overinvestment (asset substitution or risk shifting) which could be raised because of taking decision to invest in risky projects (even with negative net present values) and so the risk shifts from stockholders to debtholders, firms could prefer using equity rather than debt when there are high investment opportunities available (Jensen and Meckling, 1976). In contrast, Myers (1977) argued that firms with higher level of debt may forgo investment opportunities with positive net present value which lead to transfer wealth from stockholders to debtholders and that is called underinvestment (debt overhang), thus firms with higher investment opportunities may prefer equity to debt as a source of funds. Moreover, firms with higher level of growth especially the intangible investments have lower debt as these firms try to avoid the commitment with debt repayment as these types of investment do not generate revenues and do not have liquidity value (e.g. Bevan and Danbolt, 2002; Deesomsak, Paudyal and Pescetto, 2004). Empirical evidence supporting such a negative relationship between growth opportunities and level of debt were provided by many studies such as Titman and Wessels (1988), Chung (1993), Barclay, Smith and Watts (1995), Rajan and Zingales (1995), Bevan and DanBolt (2002), Nivorozhkin (2002), Huang and Song (2006), De Jong, Kabir and Nguyen (2008) and Qiu and La (2010). In addition, debt maturity plays a vital role in mitigating the agency costs associated with using debt such as overinvestment–asset substitution-(Jensen and Meckling, 1976) and underinvestment problem (Myers, 1977). These suboptimal investment decisions taking by firms' managers can lead to raise the conflict between debtholders and stockholders as well as the negative impact on the value of firms (Billett, King and Mauer, 2007). Accordingly, Myers (1977) suggested that a

solution for the underinvestment problem by using short-term debt as this debt maturity could be matured before the growth/ investment opportunity. Empirical evidence support the suggestion of Myers (1977) was introduced by several studies such as Barnea, Haugen, and Senbet (1980), Leland and Toft (1996), Childs, Mauer, and Ott (2005), Billett, King and Mauer (2007), Heyman, Deloof and Ooghe (2008), Ortiz-Molina and Penas (2008) and Stephan, Talavera and Tsapin (2011).

Tangibility

After the issuance of debt, firms' managers may decide to invest suboptimally or underinvest which lead to transfer gains from debtholders to stockholders and so the agency cost of debt will increase (e.g. Jensen and Meckling, 1976; Deesomsak, Paudyal and Pescetto, 2004). In addition, firms with sufficient level of tangible assets have higher liquidation value, have higher level of debt in their balance sheet, thus in case of default and probability of bankruptcy, they will have high market value (i.e. opposite to intangible assets) compared to others with lower liquidation (e.g. Williamson, 1988; Harris and Raviv, 1990; Gaud et al., 2005). Moreover, Scott (1977) argued that firms with lower tangibility (less collaterals) may use higher level of equity or bear higher interest rate. If this is the case, firms with higher level of tangible assets (less sensitive to asymmetric information) which can be used as collateral could lessen the creditors' risk and so mitigate the agency cost of debt. Accordingly, the agency theory predicts that increasing the tangibility will give the option to firms to increase its level of debt. Several studies provide evidence of this direct relationship such as Bradley, Jarrell and Kim (1984), Titman and Wessels, (1988), Chen (2004), Zou and Xiao (2006), De Jong, Kabir and Nguyen (2008), Sheikh and Wang (2011) and Rampini and Viswanathan (2013).

Agency Costs

Following the free-cash hypotheses, managers of firms with higher level of leverage /debt have a contractual commitment to pay-off the principal and the cost of debt (i.e. interests) by a specific due date, where if they fail to do so, the firms may be bankrupted. In addition, this may lead to a better control of the discretion power of managers in spending the available cash flow and encourage them to act in favour of the firms' stockholders and so managing the firms' assets in an efficient and productive way. Empirically, the findings of Filbeck and Gorman (2000), Volugaris, Asteriou and Agiomirgianakis (2007) and Alipour, Mohammadi and Derakhshan (2015) provided a positive and significant between the leverage/debt and agency cost. Previous literature used assets utilization ratio in measuring agency cost. Moreover, Volugaris, Asteriou and Agiomirgianakis (2007) showed that there is a negative relationship between assets utilization ratio and long-term debt, however, Alipour, Mohammadi and Derakhshan (2015) provided a positive relationship between the two variables.

3.5.4 Other Determinants of Capital Structure/Leverage

The previous sections provide firms' characteristics that have impact on the decision of the capital structure (i.e. level of debt) however, there are other factors that cannot be controlled such as the economic variables of a country. Fan, Titman and Twite (2012) argued that the financing choices of a corporation is determined by factors related to its characteristics and its organisational environment. Booth et al. (2001) argued that leverage/debt ratios of developing countries are affected significantly by the same type and way of variables of developed countries however, for country-specific factors (i.e. inflation rate, GDP growth and development of capital markets) there are significant differences in the way that determining the level of debts.

3.5.4.1 Macroeconomic Variables

Economic Growth

Previous literature showed the importance of the economic growth of a country which represented by gross domestic product (GDP Growth) in determining its capital structure (i.e. level debt). In countries with higher economic growth, firms could increase its level of debt for financing new projects (De Jong, Kabir and Nguyen, 2008). Empirical evidence that supports the positive impact of GDP growth on the level of debt used by a firm were provided by many studies (e.g. Booth et al., 2001; De Jong, Kabir and Nguyen, 2008; Frank and Goyal, 2009; Kayo and Kimura, 2011; Hanousek and Shamshur, 2011; Dang, 2013). Conversely, Bokpin (2009) argued that firms in countries with higher level of GDP growth rate generate more profit and could maintain higher level of retained earnings which can be used as a funding source instead of using debt. Similarly, several studies provide evidence support the negative relationship between GDP growth and leverage/debt like Demircug-Kunt and Maksimovic (1999) Gajurel (2006), Bastos, Nakamura and Basso (2009) and Camara (2012).

Inflation Rate

Another macroeconomic variable that has significant impact on firms' capital structure is the inflation rate. Booth et al. (2001) argued that even the increase of the inflation rate leads to raise the assets' monetary value, it increases the interest rate and the monetary risk which would adversely affect the firm's level of debt. Brigham and Ehrhardt (2011) argued that firms in countries with higher level of inflation rate lead to increase the interest rate, thus firms will lessen its level of debt. Ma (1998) pointed out that higher level of inflation probably associated with inflation uncertainty, thus the real value of earnings and future payments are uncertain. Hatzinikolaou, Katsimbris and Noulas (2002) indicated that increasing the uncertainty of

inflation will increase the firm's business risk (i.e. bankruptcy risk) as the volatility of firm's cash flow will increase and the tax shield of debt in its capital structure will be highly uncertain. Consequently, firms should have lower levels of debt. Several empirical studies provide evidence support adverse impact of inflation on firm's level of debt (e.g. Demirguc-Kunt and Maksimovic, 1996; Booth et al., 2001; Hatzinikolaou, Katsimbris and Noulas 2002; Gajurel, 2006; Bayrakdaroglu, Ege and Yazici, 2013; Venanzi, Naccarato and Abate, 2014). On the other hand, firms may increase its level of debt when inflation rate is high. Taggart (1985), argued that the inflation rate will lead to an increase in the real value of the tax deductible interest on borrowed fund. In line with Taggart (1985), Lemma and Negash (2013) argued that firms under inflationary condition will use higher levels of debt as the inflation factor will increase the advantage of real tax of debt and decrease the real value of borrowing/debt. In general, higher inflation rates would have an adverse impact in both the stock and bond markets, as a result the required rate of return increase thus, the price of securities will go down and consequently the cost of capital will increase. Increasing the cost of capital could convert some projects to become unprofitable so the economy growth will decline and in turn stock market could be affected negatively. From the former illustration, Mokhova and Zinecker (2014) pointed out that under this condition, the cost of debt will decrease and firms would prefer debt on equity funding. Accordingly a positive relationship between the inflation rate and the level of debt used by a firm is expected (e.g. Homaifa, Zietz and Benkato, 1994; Barry et al., 2008; Frank and Goyal, 2009; Sett and Sarkhel, 2010; Hanousek and Shamshur, 2011; Lemma and Negash, 2013; Mokhova and Zinecker, 2014). Moreover, other studies revealed that inflation has no impact on capital structure or at least on the book value of debt (e.g. Bastos, Nakamura and Basso, 2009; Frank and Goyal, 2009).

3.5.4.2 The Global Financial Crisis

One of the major events that happened in the decade was the global financial crisis of 2007/2008. The impact of this financial crisis reached many countries worldwide (i.e. developing and developed countries) financially and economically through its financial markets and other financial institutions (i.e. international banks; international finance corporations) (e.g. Cetorelli and Goldberg, 2011; Chudik and Fratzscher, 2012). Global financial crisis had a negative impact on firms' investment plans as during this event where many firms faced difficulties in securing external funding thus, lead them to forgo promising investment opportunities (e.g. Campello, Graham and Harvey, 2010; Duchin, Ozbas, and Sensoy, 2010). Since business risk and uncertainty are highly associated with events, such as the financial crisis, Deesomsak, Paudyal and Pescetto (2004) argued that the East Asian financial crisis that occurred in 1997 increased the risk of the affected countries which enforced lenders to increase the premium attached to the interest rate thus, raising the capital will become more costly. In addition, Ivashina and Scharfstein (2010) argued that during the financial crisis, banks cut down the level of new lending to corporations. Cornett et al. (2011) pointed out that during the global financial crisis, banks were forced to limit their credit supply. According to Bancel and Mittoo (2010), global financial crisis is negatively influence a firm's financial flexibility, thus firms with higher level of available internal sources of fund (i.e. retained earnings and cash holdings) have better financial flexibility and lower levels of debt. From the previous discussion it is shown that the capital structure of firms could be affected by global shocks such as the global financial crisis. Another perspective that has been considered in previous literature is the impact of global financial crisis on debt maturity (i.e. short-term and long-term). Custódio, Ferreira and Laureano (2013) showed that shortening the debt maturity of U.S. firms could be explained not only by demand-supply

factors such as information asymmetry but by supply-side factors such as liquidity and credit shocks (i.e. global financial crisis 2007-2008). Similarly, Fosberg (2013) pointed out that firms increased their financing using short-term debt during the global financial crisis as this level of debt maturity increased from 1.3% in 2006 reaching 2.2% in 2008. Nevertheless, Fosberg (2013) argued that the short-term debt was unfavourable after the financial crisis subsided as firms started to use long-term debt financing by the end of year 2009. Demirgüç-Kunt, Martinez-Peria, and Tressel (2015), examined the impact of the global financial crisis on firms' capital structure using 277,000 firms using 79 countries and found that the level of debt and debt maturity decreased in developed countries, developing countries and even countries that did not encounter crisis. Several empirical studies provided evidence of an inverse relationship between the financial crisis and debt maturity such as Krishnamurthy (2010), Almeida et al. (2012), Gürkaynak and Wright (2012), Gourinchas and Obstfeld (2012), Dick, Schmeling and Schrimpf (2013) and Gorton, Metrick and Xie (2015).

3.6 Conclusion

This chapter has started by reviewing the concept of the organisational performance in general, which is basically covered three main areas: the financial performance (e.g. profits, ROA, etc.); product market (i.e. sales, etc.); stockholder return (i.e. total stockholder return, etc.). Then the chapter reviewed the previous literature presenting the empirical studies applied in context of demutualization and stock exchanges' performance following different views of stock exchanges; 'the market' and 'the firm' views. Considering the impact of demutualization on the financial performance of stock exchanges, it has been noticed that all empirical studies focused on the profitability perspective. In addition, some of these studies extended the analysis of exchanges' financial performance to include other perspectives such as leverage/capital

structure, efficiency and liquidity. However, by looking closely to the liquidity and leverage/capital structure perspectives, to the best of this study's knowledge, there is no empirical study considered the impact of demutualization on liquidity from the cash holdings perspective or on the debt maturity (i.e. short-term vs. long-term). Accordingly, this study has followed the field of corporate finance in order to link the context of demutualization of stock exchanges with these new perspectives. Consequently, this chapter has reviewed in detail the theoretical and empirical backgrounds of the liquidity (i.e. cash holdings) and leverage/capital structure (i.e. debt maturity). Fulfilling these gaps in previous literature will add new insights to knowledge in the context of demutualization and its impact on stock exchanges performance/value. Establishing from the definition of the demutualization process introduced by Aggarwal (2002), changing the governance structure of stock exchanges where the new owners (i.e. stockholders) are presented by an elected board of directors highlights the important role of the corporate governance mechanisms in enhancing the performance of exchanges and this will be discussed in the next chapter.

Chapter Four

Demutualization and Corporate Governance Mechanisms

		Page number
4.1	Introduction	94
4.2	Theories and Corporate Governance Mechanisms	96
	4.2.1 Agency Theory	96
	4.2.2 Resource Dependence Theory	98
4.3	Demutualization of Stock Exchanges and corporate governance mechanisms	99
4.4	Determinants of Corporate Governance Mechanisms	104
	4.4.1 Board Size Determinants	105
	4.4.2 Board Independence Determinants	107
	4.4.3 Director's Remuneration Determinants	112
4.5	Internal Corporate Governance Mechanisms and Performance	116
	4.5.1 Board Size and Performance	117
	4.5.2 Board Independence and Performance	118
	4.5.3 Director's Remuneration and Performance	121
4.6	Conclusion	125

4.1 Introduction

As discussed previously, this study follows the definition of the demutualization process provided by Aggarwal (2002) where the governance structure of exchanges changed due to the separation of ownership and trading rights and the stockholders (new owners) of demutualized stock exchanges are presented by an elected board of directors. Nevertheless, examining the

governance mechanism of the demutualized exchanges and identifying its theoretical foundation have not received any significant attention. Accordingly, this chapter will shed light on the importance of corporate governance mechanisms on enhancing the corporations' performance in order to develop the association of corporate governance mechanisms with the demutualization and performance of stock exchanges. Corporate governance infers the link between the management of the firm and its stakeholders as it incorporates the rules and standards to be followed in order to accomplish the objectives set by a firm and therefore, the performance of the firm is monitored. The importance of corporate governance matter had been arisen since the conversion of firms from its conventional structures (mutuals) to corporation structures where the separation of ownership and management exists in a way to reduce the potential principal-agent conflict. Denis and McConnell (2003) suggested that corporate governance of a firm is a combination of two different mechanisms; external and internal mechanisms as trade-off between management members' personal benefits and achieving the estimation objectives of shareholders. Accordingly, this chapter will review the related theories to induce the importance of the role of board of directors as internal corporate governance mechanism, its structure (i.e. board size and board independence) and the managerial incentives paid to its directors (i.e. director's remuneration). In addition, since the aim of this particular study is to examine the impact of demutualization on the internal corporate governance mechanisms and due to the methodological approach that adopted by this study, this chapter will present the potential determinants that could influence these mechanisms alongside the demutualization strategy. Moreover, this chapter will also present the impact of these internal mechanisms on performance.

4.2 Theories and Corporate Governance Mechanisms

4.2.1 Agency Theory

Jensen and Meckling (1976) clarified the relationship between one or more principals who assign an agent to do certain tasks on their behalf as the separation between ownership and control exist. Agency theory defines the relationship between the principals of the firm (stockholders) and its agents (managers) in order to resolve the problems between the two parties. These problems can arise when there are inefficiencies and incomplete information. The first problem can occur when there is a conflict between the principals and the agents' goal and difficulty or bearing expensive cost in assessment of the agents' performance, whereas the second problem occurs when there are different actions taken by each party toward risk (Eisenhart, 1989). The divergence of interests between shareholders and corporate managers can lead to value loss of stockholders and resolving these conflicts will raise costs. Jensen and Meckling (1976) clarified that agency costs consist of a) monitoring costs which are applied by the principal to alleviate dishonest behavior of the agent, b) bonding costs to ensure that managers are working for the sake of stockholders and c) the residual loss which occurred due to the failure of the previous actions (monitoring and bonding) to control the divergent behavior of the managers. In addressing the agency problems and the importance of corporate governance mechanisms, Davis, Schoorman and Donaldson (1997) argued that the agency theory provides several corporate mechanisms in order to align the interests between principal and agent, minimizing agency costs and protect the interests of stockholders. In addition, Fama and Jensen (1983) pointed out that in order to solve the agency problem in line with clear implications of corporate governance; a need for a sufficient monitoring system is a must. They indicated that the board of directors plays an important role as an information provider that feeds the stockholders with information on any

unacceptable behaviour by the managers. In light of the foregoing discussion, many scholars focus on studying the impact of corporate's board of directors (i.e. internal mechanism) functions and characteristics on corporate performance. From the perspective of agency theory, board size is a vital factor in determining the effectiveness of the board. Many empirical studies examined the relationship between board size and corporate performance but the findings turned up to be inconclusive. There is a view that firms with large board size have a variety of expertise leading to better decision making and sufficient monitoring of managing directors (e.g. CEO) performance. Jensen and Meckling (1976) argued that firms with large size of board of directors may improve the board effectiveness and help the management in reducing the agency cost as a result of poor management performance and hence lead to better financial results. An opposite view supports firms with small boards and its positive impact on firm performance, as large boards may suffer from difficulty of communication and coordination problems among its members resulting in higher agency problems. Small boards are seen as more effective in monitoring management and have fewer communication and coordination problems (Firstenberg and Malkiel, 1994). Another important mechanism is board independence, as independent directors (outside directors) are needed to monitor and control management actions, limiting opportunistic behaviour thus helping to reduce agency conflicts between managers and stockholders (e.g. Jensen and Meckling, 1976; Fama and Jensen, 1983). Furthermore, another issue that had much attention in literature of corporate governance, especially from the agency perspective is the director's remuneration (i.e. pay-back package). According to agency theory, the purpose of remuneration contracts is to reward directors in such a way that they strive in aligning the interests of the agents and principals, thus maximise stockholders' wealth and so lead to better firm's performance (Jensen and Meckling, 1976, Fama and Jensen, 1983).

4.2.2 Resource Dependence Theory

Another theory that provides a theoretical foundation used in corporate governance; the resource dependence theory. Barney (1991) defined the firm's resources as what a firm owns and controls such as its assets, capabilities, attributes, knowledge and information, in order to develop and implement the appropriate strategies that increase its efficiency and improve its effectiveness. A core argument of the resource dependence theory is the interdependence between organisations and their environment for survival and success as organisations rely on the external environment to secure the needed resources. In the context of the importance of the board of directors as an internal mechanism, Pfeffer and Salancik (1978) clarified that when a firm add new individual/member to its board, it expects he/she will support and aid the firm in solving its problems. Accordingly, organisations can use board members (i.e. external representatives) to create links with the external environment in order to lessen the environmental uncertainty and secure a stable stream of resources and that is referred to what is called the co-option method (Pfeffer and Salancik, 1978). Examining the board of directors, particularly the board composition (i.e. board size and inside vs. outside directors) through the resource dependence theory has provided a better understanding of the role of board of directors upon theoretical and empirical anatomy (Pfeffer, 1972; Johnson et al., 1996). In context of linking the board composition and firm's performance, Pearce and Zahra (1992) emphasized that board composition facilitates resources exchange between a firm and its external environment as a substantial need for effective financial performance. In addition, another relevant point that underlies the importance of the board of directors as a dependence resource is facilitating the accessibility to financial sources needed by a firm. As corporate firms need to raise its capital to expand its activities and maintaining its success especially in time of uncertainty in economic

conditions, an appointment of outside directors with specific background to join the board can ease the access to external sources of capital (Pfeffer, 1972). Mizruchi and Stearns (1988) evidenced a higher correlation of firm's access to external financial sources (i.e. debt financing) and the existence of bankers among members of the board of directors. Moreover, Mizruchi and Stearns (1994) examined the factors affecting the level of borrowing in American manufacturing companies and the findings revealed that having members with connections to different financial institutions and a chief executive officer (CEO) with a background and experience in the finance field have a significant impact on firm's financing decision (i.e. level of borrowing).

4.3 Demutualization of Stock Exchanges and Internal Corporate Governance Mechanisms

Traditionally, stock exchanges were operated as 'clubs of brokers' or mutual associations, whose members enjoyed rights of ownership, control, and trading. All decision making was done democratically on a one member, one vote basis (OMOV). As Akhtar (2002), pointed out that mutual/cooperative structure of stock exchanges enables the members to enjoy monopoly power as those members are the only ones who can deal in stock exchanges. Skurnik (2002) and Grant (2005) clarified that members of cooperatives are owners/controllers so the value of a cooperative organisation is the best of interests for its members. The climate business in this era faced many challenges such as globalization, the development of technology, and the increase of competition among stock exchanges forced these venues to demutualize and change their ownership and governance structures. Changing the governance structure of stock exchanges from cooperatives to corporations will change the primary objective from maximising the members' interests to maximise the stockholders' wealth and hence enhance the value of the stock exchange itself. One of the main features associated with this conversion is decoupling the relationship between the ownership rights and trading rights through electing a board of directors

(Aggarwal, 2002). By reviewing the mentioned theories, there is a belief that by adopting the demutualization strategy, stock exchanges will apply changes in its internal corporate governance mechanisms to fit the new suit of its governance structure. In the following section, the study will review some features of the changes in board of directors' characteristics (i.e. board size, board independence and managerial incentives) in order to develop the link between demutualization and corporate governance mechanisms. The features will be drawn from the insurance industry as it includes insurance firms with different ownership structures as O'Sullivan and Diacon (2003) argued that choosing the insurance industry which comprises both mutual and stock insurers facilitates the examination of the importance of the board governance within the scope of different structures of ownership.

Board Size

A repeated question has been asked by many scholars who were interested in corporate governance is: what is the optimal board size? Buchannan and Tullock (1962) clarified that the optimal board size is a trade-off relation between the value that can be added to decision making from adding an additional director to the board members and the increase of the associated transaction costs from increasing the number of board members. With a belief that board size will differ due to the ownership structure (e.g. mutuals vs. corporations) and the nature of industry, so the answer to this question is hard to be determined by a certain number. Accordingly, this particular study does support the trend of many researches in this manner where there may be a link between board size and a stock exchange's performance. The agency theorists support the idea that firms with small boards are effective in monitoring business activities and hence enhancing the firm's performance (e.g. Yermack, 1996; Jensen, 1993). Hermalin and Weisbach (2003) argued that the negative relationship between board size and

profitability of a firm considered as one of the most consistent result in empirical studies. In addition, other scholars argued that firms with large board size could hinder the coordination and communication between board members especially with the limited time available for expressing their ideas and opinions which lead to slow the process of decision making and could initiate agency problems such as free-riding problem (e.g. Lipton and Lorsch, 1992; Jensen, 1993; Eisenberg, Sundgren and Wells, 1998; Dalton, et al., 1999). On the other hand, the notion of the resource dependence theory would support firms with large size boards as they can benefit from creating larger networks and greater access to market information (Zahra and Pearce, 1989). Dalton and Dalton (2005) argued that a board with more directors can benefit from assorted qualities as far as experience, skills, nationality and gender which provides varieties of expert opinion and advice which small board may lack of these advantages. In light of the relationship between the board size and the ownership structure of firms, Bond (2009) argued that the optimal board size in cooperatives may reach nineteen or even twenty seven members which leads to the enhancement of the cooperatives' performance. Franken and cook (2013) stated that cooperative could benefit from large board to operate a representative and legitimate democratic function. In an opposite view, other scholars argued that investor-owned firms with board size less than ten members (i.e. seven or eight directors) will make it easier to be controlled by firms' CEOs and enhance firms' performance (e.g. Lipton and Lorsch, 1992; Jensen, 1993). In line with Lipton and Lorch (1992), Jensen (1993) pointed out that small board size could be a consequence of organisational changes (i.e. structure, strategies, culture etc..) and changes in technology which acquire firms to decrease its costs and in some cases reducing the number of its workforce (i.e. downsizing). Board size is considered as one of the main configurations of firm's board of directors. It refers to the total number of directors (members) of the board which vary from firm

to firm due to the differences of corporate ownership structure, regulations and culture of each corporate firm.

Board Independence

Changing the operational environment of firms will result in a change in the characteristics and composition of its board of directors (Williamson, 1983). The previous discussion of both the agency and the resource dependence theories, clarified the importance of the independent directors as members of the board of directors. Independence of directors refers to the proportion of the outside directors versus inside director within the firm's board of directors. Fama and Jensen (1983) emphasized the importance of existing outside independent directors among the firm's board members as an effective tool towards managers' monitoring. Interestingly, the majority of the annual reports of the selected stock exchanges used in this current study, highlight the importance of having higher number of independent directors among their board members. As for the Australian Stock Exchange, including a higher number of independent directors would enhance the action of its directors to work in the best of the exchange's interests (ASX, 2002). Moreover, the London Stock Exchange referred to the increase in the number of independent directors as a successful step to comply with the requirements of the 'Combined Code'-Principles of Good Governance and Code of Best Practice-during the year 2003. Similarly, NASDAQ emphasized that as a self-regulatory organisation (SRO), the exchange complied with the SEC's new rules with respect to SROs, which proposed the majority of independent directors among SROs board, audit, remuneration and regulatory committees (NASDAQ, 2004). However, in regard to the impact of changing ownership of firms and its impact on board independence, evidence from insurance industry can be reviewed from the early empirical work of Mayers, Shivdasani and Smith (1997), as they examined the impact of changing ownership on

board composition (i.e. outside directors) in mutual and stock insurance firms. They concluded that conversion from mutual to stock firms makes corresponding changes in board composition and mutual firms employ more outside directors compared to stock firms. Furthermore, mutual firms with high fraction of outside directors have lower expenditures on salaries, wages and rent. O'Sullivan and Diacon (2003) argued that in mutual firms, the shares are not freely tradeable and hence the managers will not confront the same external pressures as in stock insurers, such as pressure from major stockholders or the threat of takeover. Their results suggested that mutuals are using strong board governance due to the weak of ownership control and hence a higher proportion of independent (outside) directors can be utilized, which is not the case of stock insurers that are subjected to pressure from strong stockholders and higher capital market control and so are less reliance on independent directors monitoring. Furthermore, they noticed that mutual insurers did not perform better than stock insurers.

Director's Remuneration

Directors have responsibilities regarding firms' stakeholders, as they are monitoring the managers, assuring compliance with rules, laws and regulations and taking responsibility for the success or the failure of improving the firms' performance (Lee and Isa, 2015). Accordingly, an internal governance mechanism that recently has much attention in the literature is the remuneration of directors (Dong and Ozkan, 2008). Generally, a managerial incentive (i.e. remuneration) is a vital component of good corporate governance, as it has the ability to motivate, retain and align the interests of management – both directors and executives and stockholders. Eisenhardt (1989) clarified that providing directors with incentive instruments will diminish the agency loss. These incentives could be financial rewards, acquiring shares at lower costs and/or binds the executives' compensation to the accomplished level of stockholders

returns and keeping up part of these rewards for the future for upgrading the corporation's value over the long run and in accordance with stockholders' interests. Based on the agency theory, Mayers and Smith (1981) applied the managerial discretion hypothesis of insurance industry to explain the coexistence of multiple ownership structures (e.g. mutual; stock insurers) and clarified that multiple ownership structures have different sets of governance tools to lessen agency costs. They explored that stock insurers have governance tools which are not available to mutuals (i.e. equity ownership; stock-based compensation; the threat of takeover) and argued that mutuals should have a comparative advantage in activities which requires low managerial discretion. In line with Mayers and Smith (1981), Jensen and Murphy (1990) suggested that managerial remunerations could include stock options, equity ownership and performance-related pay such as financial incentives for maximising the firms' value, however, this could be a problem for mutual organisations as ownership rights are not freely transferable so they do not have incentive schemes (i.e. stock options) that can be provided to the managers conversely in the case of investor-owned organisations. O'Sullivan and Diacon (2003) examining the executives remuneration in both mutual and stock insurers and concluded that stock insurers have a higher significant increase in executives remuneration compared to the mutual ones.

4.4 Determinants of Corporate Governance Mechanisms

It has been noted that previous literature on dealing with corporate governance mechanisms focused mainly on its impact on firm performance as these internal governance mechanisms were treated as exogenous variables as explained later in this chapter; however, some scholars extended the literature and treated these mechanisms as endogenous variables, thus explored the determinants of such mechanisms (i.e. board size and board independence and director's remuneration). Since the aim of this particular study is to examine the impact of demutualization

on the internal corporate governance mechanisms and due to the methodological approach that adopted by this study, the following sections will present the potential determinants that could influence these mechanisms alongside the demutualization strategy. Previous literature argued that there are two core functions of the board of directors; the advisory and the monitoring functions. Fama and Jensen (1983) clarified that the board of directors of a firm has a vital role in advising and providing the chief executive officer and the managers with the needed information and the available resources. Boone et al. (2007) related this to what they called 'the scope of operations hypothesis' and Lehn, Patro and Zhao (2009) referred to this as 'the advisory function' where both agreed that this function is induced by the scope/scale and the complexity of a firm. On the other hand, the monitoring function which implied that the board of a firm is monitoring the performance and the behavior of managers to assure that the managers and stockholders' interests are aligned (e.g. Fama, 1980; Fama and Jensen, 1983; Hermalin and Weisbach, 1998).

4.4.1 Board Size Determinants

As previously noted, some scholars refer to the advantages of small board as it is effective in monitoring business activities and hence enhancing the firm's performance (e.g. Jensen, 1993; Yermack, 1996). Others, argued that firms with large board size could hinder the coordination and communication between board members especially which could lead to slow the process of decision making and could initiate agency problems such as free-riding problem (e.g. Lipton and Lorsch, 1992; Eisenberg, Sundgren and Wells, 1998; Dalton et al., 1999). On the other hand, some scholars support firms with large size boards as they can benefit from creating larger networks and greater access to market information (e.g. Zahra and Pearce, 1989; Dalton and Dalton, 2005). In determining the board size, several scholars have pointed out that the size of a

firm has an important role in re-structuring the size of board, as firms with large size are involved with higher level of business activities and more diversified compared to small ones, thus they need more information and advising. Accordingly a positive relationship between board size and size of firms is expected. Boone et al. (2007) examined this relationship by utilizing 442 US publicly-listed firms (i.e. IPOs) and their findings revealed that the board size has a positive relationship with size of firms which implied that board size increases with the increase of scope/scale and complexity of firms. Similarly, Lehn, Patro and Zhao (2009) examined the relationship between board size and firm size for 81 UK companies of different industries. Their findings exhibited a positive relationship between the two variables, which indicated that firms with higher level of operations and diversity need more information and advice thus large boards. Following the above studies, these findings are consistent with the findings of other scholars such as Linck, Netter and Yang (2008), Coles, Daniel and Naveen (2008), Guest (2008), Ting (2011) and Monem (2013). Another determinant of board size is growth opportunities. Lehn, Patro and Zhao (2009) argued that board size has an inverse relationship with growth opportunities, as a high-growth firm would acquire more monitoring activities and so this could increase the cost of monitoring over its benefit and this type of firms could suffer from the free-riding problem especially if it has a large board. In addition, they clarified that high-growth firms are dealing with unpredictable environmental conditions and thus the cost of dealing with such challenges (i.e. changing corporate strategy) is adversely related to the size of board. Other scholars reported similar outcome consistent with the findings of Lehn, Patro and Zhao (2009), such as Raheja (2005), Linck, Netter and Yang (2008) and Coles, Daniel and Naveen (2008). Other determinants that could affect board size such as the leverage and performance (i.e. profitability) were used by Guest (2008). Guest (2008) argued

that the significant relationship between board size and profitability implies that large board could hinder the coordination and communication between board members and so lead to a negative impact on firm performance. As for debt/leverage, several studies used this determinant as an indicator for firms' complexity, where a positive relationship is expected between board size and leverage. Linck, Netter and Yang (2008) argued that debt/leverage has a direct relationship with firm's board size by utilizing around 7000 firms over the period 1990-2004. Guest (2008) examined the relationship between board size and debt/leverage by using a set of UK firms for the period 1998-2002, the findings showed a significant positive relationship between the two variables. Monem (2013) provided evidence from Australia, using a set of 1000 firms, that there is a direct relationship between board size and debt/leverage of firms.

Interestingly, in the context of demutualization of stock exchanges and to the best of this study's knowledge, only one study conducted by Angulo, Slimane and Alidou (2014) who examined the impact of the conversion from mutual to demutualized on the board size by calculating the difference in means using the paired t-test 5 years before the demutualization year (i.e. 1996-2000) compared to 5 years after the demutualization year (i.e. 2002-2007). They used a single case study; the London Stock Exchange (LSE). Their findings revealed that the board size decreased after demutualization which indicated the stock exchange after the conversion diminished the role of their members and so their number on its board decreased consequently.

4.4.2 Board Independence Determinants

Similar to the board size, the importance of board independence is related to the advisory and monitoring functions. Following 'the scope of operations hypothesis', Boone et al. (2007) examined this relationship by utilizing 442 US publicly-listed firms (i.e. IPOs) and their findings revealed that the board independence (i.e. the fraction of outside directors) has a positive

relationship with size of firms which implied that board independence increases with the increase of scope/scale and complexity of firms as larger firms suffered from agency problems compared to small ones, thus larger firms need more advising actives. Consistent with the findings of Boone et al. (2007), Lehn, Patro and Zhao (2009) examined the relationship between board independence and firm size for 81 UK companies of different industries. Their findings exhibited a positive relationship between the two variables which indicated that firms with higher level of operations and diversity which increase their need for more information and advising thus higher fraction of outside directors. Other studies provide similar findings such as Linck, Netter and Yang (2008) and Coles, Daniel and Naveen (2008). In contrast, limited studies provided inverse relationship between the two variables such as the study conducted by Berry, Fields and Wilkins (2006), where the findings revealed a significant negative relationship between board independence and firm size, however the authors did not provide a clear justification of this result. Rashid (2018) examined the relationship between the fraction of outside directors and firm size by utilizing a sample of non-financial firms listed on the Dhaka Stock Exchange, using the firm size as an indicator to its operations' complexity, as since large firms enjoy economies of scale, they can opt more outside directors. Their findings revealed a positive relationship between board independence and firm size albeit the relationship is insignificant. Another determinant that could affect the board composition (i.e. board independence) is growth opportunities. Lehn, Patro and Zhao (2009) exhibited a converse relationship between board independence and growth opportunities, as high-growth firms need more monitoring activities, thus this may increase the monitoring cost and so reduce the number of outside directors. Similarly, other studies like Raheja (2005) and Coles, Daniel and Naveen (2008) provided the same findings. In contrast, Rashid (2018) argued that growth opportunities

could influence the board independence as outside directors are more attracted to high-growth firms. His findings revealed a positive relationship between the fraction of outside directors and growth opportunities, albeit the relationship is insignificant. Following the agency theory, the level of debt used by a firm is considered as another governance mechanism that can mitigate the agency costs (Harris and Raviv, 1991) where the levered firms are committed to many obligations due to the debt covenant that control the potential misuse of firm's cash flow (Jensen, 1986). Accordingly some empirical studies adopted the idea that board independence and level of debt are substitute governance mechanisms thus, an inverse relationship between the two variables exists (e.g. Bathal and Rao, 1995; Rashid, 2018). Bathal and Rao (1995) examined the relationship between board independence and debt/leverage, their findings revealed a significant negative relationship between the two variables which implies that board independence and debt/leverage are substitute governance mechanisms. Berry, Fields and Wilkins (2006) showed that there is a negative relationship between board independence and debt/leverage, albeit insignificant by using 109 firms (IPOs) over the period 1979-1986. Rashid (2018) examined the relationship between the fraction of outside directors and debt/leverage by utilizing a sample of non-financial firms listed on the Dhaka Stock Exchange, the findings revealed a negative relationship between the two variables, albeit insignificant. On the other hand, other studies deal with the level of debt used by a firm as a reflection of its complexity thus; highly levered firms need more monitoring activities through increasing the number of independent directors among its board members and so a positive relationship between the two variables is expected. Guest (2008) examined the relationship between board independence and debt/leverage by using a set of UK firms for the period 1998-2002, the findings showed a significant positive relationship between the two variables. By utilizing around 7000 firms over the period 1990-2004, Link,

Netter and Yang (2008) argued that debt/leverage has a direct relationship with firm's board independence. Monem (2013) provided evidence from Australia, using a set of 1000 firms, that there is a direct relationship between board independence and debt/leverage of firms. Sarpal (2015) investigated the relationship between board independence and debt/leverage using a sample of non-financial firms listed in the Bombay Stock Exchange, the findings exhibited a significant positive relationship between board independence and debt/leverage.

Hermalin and Weisbach (1998) pointed out that the power of chief executive officer (CEO) influenced by the role of monitoring acted by independent directors. Accordingly if the CEO has the ability to improve the firm's performance, he/she will try to restrict the monitoring role of the independent directors and its associated costs. Lasfer (2006), utilizing 1583 UK firms for the period 1996-1997, examined the relationship between board independence and firm's performance. The findings revealed a significant negative relationship between the two variables. Boone et al. (2007) examined this relationship by utilizing 442 US publicly-listed firms (i.e. IPOs) and their findings revealed that the board independence has a significant negative relationship with firm's stock return. Other empirical studies exhibited the same negative relationship albeit their findings are insignificant such as Baker and Gompers (2003), Coles, Daniel and Naveen (2008), Monem (2013) and Rashid (2018). In contrast, Berry, Fields and Wilkins (2006) examined the relationship between board independence and firm's performance by using 109 firms (IPOs) over the period 1979-1986. Their findings revealed a significant positive relationship between the two variables. This implied that profitable firms may induce higher level of cash flow and that could lead to exaggerated consumption of prerequisites that need more monitoring activities. Similarly, Sarpal (2015) investigated the relationship between board independence and performance by using a sample of non-financial firms listed in the

Bombay Stock Exchange, the findings exhibited a significant positive relationship between board independence and performance. On another level, some empirical studies consider board size one of the determinants of board independence. Following Jensen (1993), where both small board and higher number of independent directors enhance the corporate governance of firms. Li (1994), using a set of 390 manufacturing companies in different countries (i.e. United States of America, Japan and Western Europe), examined the relationship between board independence and board size. His findings revealed a significant negative relationship between the two variables. Similarly, Mak and Li (2001) examined the relationship between board independence and board size by using a set of 147 of Singapore public-listed firms. Their findings revealed a significant negative relationship between the two variables, which indicated that both small board size and board independence are complementary mechanisms. In contrast, Berry, Fields and Wilkins (2006) examined the relationship between board independence and firm's board size by using 109 firms (IPOs) over the period 1979-1986. Their findings revealed a significant positive relationship between the two variables. Similarly, Rashid (2018) argued that there is a positive and significant relationship between board independence and size of board. In addition, other studies showed that there is no significant relationship between board independence and board size (e.g. Prevost, Rao and Hossain, 2002; Sarpal, 2015). Prevost, Rao and Hossain (2002), utilizing 132 firms from New Zealand, examined the relationship between board independence and size of board. Their findings revealed a positive relationship between the two variables, albeit insignificant. Sarpal (2015) investigated the relationship between board independence and board size using a sample of non-financial firms listed in Bombay Stock Exchange, the findings exhibited a positive relationship between the two variables, albeit not significant. Interestingly, in the context of stock exchanges, Angulo, Slimane and Alidou (2014) investigated the impact of

the conversion from mutual to demutualized on the number of independent directors by calculating the difference in means using the paired t-test for 5 years before the demutualization year (i.e. 1996-2000) compared to 5 years after the demutualization year (i.e. 2002-2007). They used a single case study; the London Stock Exchange (LSE). The findings revealed that the number of independent directors increased after demutualization which implied that the stock exchange after demutualization followed the notion of agency theory in increasing their monitoring activities by adding more independent directors.

4.4.3 Director's Remuneration Determinants

Following the notion of agency theory, the main objective is to find mechanisms that could reduce the potential conflict between a firm's managers and its stockholders, simply to align the interests between the two parties. Accordingly, linking the pay-level structure with performance is one of the mechanisms used in order to minimize the agency costs (Andreas, Rapp and Wolff, 2012). Hence, some scholars clarified the importance of having efficient written contracts to link the pay-level with the performance of firms thus, aligning the interests between agents and stockholders (e.g. Prendergast, 1999; Yermack 2004, Farrell, Friesen and Hersch, 2008). Several studies were interested in investigating the determinants of director's remuneration. One of the core determinants of director's remuneration is the size of a firm as a proxy for firm complexity. Farrell, Friesen and Hersch (2008), utilizing a sample of 237 firms (Fortune 500 firms) for the periods 1988-2004, found a significant relationship between board remuneration and firm's size. They implied that larger firms need more monitoring services. Thus, larger firms will include more independent directors with a higher level of compensation and equity-based compensation. Adams and Ferreira (2009), using unbalanced panel data of 1,939 firms over the period 1996—2003, revealed a significant relationship between board remuneration and firm's size. Andreas,

Rapp and Wolff (2012) used panel data for German firms over the period 2005-2008. Their findings revealed a direct relationship between board of remuneration and size of firms. Interestingly, Lee and Isa (2015) investigated the determinants of board remuneration in financial institutions, especially, the Malaysian banking industry by using 21 banks. Their findings exhibited a significant positive relationship between board remuneration and bank's size. Other studies provided similar results such as Ryan and Wiggins (2004), Linn and Park (2005) and Brick, Palmon and Wald (2006). Another determinant of board compensation is growth opportunities. Bryan et al. (2000) argued that firms with higher levels of growth/investment opportunities include stock option in their compensations due to the potential risk associated with its business activates. Their findings revealed a significant positive relationship between growth opportunities and board remuneration. Similarly, Ryan and Wiggins (2004) utilized the data of board compensation of firms with different sizes over the period 1995-1997. Their findings exhibited that a direct relationship between growth/investment opportunities and board remuneration. Linn and Park (2005) examined the relationship between investment/growth opportunities and remuneration of outside directors for the period 1996-2001. They argued that firms with higher level of investment opportunities pay more compensation to outside directors compared to firms with lower investment opportunities thus, this leads to increase the total compensation paid to firms' directors. Previous studies also exhibited a potential relationship between board remuneration and the leverage/level of debts used by a firm. Following Jensen (1986) and Stulz (1990), leverage/level of debt is used by firms as disciplinary device to lessen agency costs as levered firms are committed to debt covenants; paying principle of debt and interest. Moreover, if firms are involved in risky investment, debt-holders will ask for premiums (i.e. higher interest) in order to control the managerial discretion especially toward

overinvestment (i.e. investment in high risky projects even with negative present values) (John and John, 1993). Consequently, Bryan et al. (2000) argued that there is a significant negative relationship between board remuneration and leverage. Similarly, the findings of Andreas, Rapp and Wolff (2012) revealed a significant negative relationship between board remuneration and leverage in German firms. However, Brick, Palmon and Wald (2006) found a significant positive relationship between cash compensation of directors and leverage which implies that firms are depending heavily on using debt as the equity source is eroding, thus need more monitoring activities. Another determinant that could affect the board remuneration is the firm's performance. Following the notion of agency theory, Jensen and Murphy (1990) argued that incentive/compensation provided to firm's directors is an effective device to align the interests between stockholders and directors. Moreover, Hermalin and Weisbach (1998) clarified that a sufficient compensation received by firm's directors could lead to increase the efficiency of their monitoring activities. By analyzing a set of Spanish-listed firms over the period 1990-1995, Crespi-Cladera and Gispert (2003) examined the relationship between board remuneration and firm's performance by using accounting (i.e. ROA) and market (i.e. stock return) measures. Their findings revealed a positive and significant relationship between the two variables. In addition, they argued that the accounting measure is more powerful than the market one in determining the board remuneration. Moreover, they also consider the past performance (i.e. using the lag of performance) and they pointed out that past performance (i.e. lag for one period) using accounting measure is more powerful compared to the current performance and past performance using market measure (i.e. using lag for two periods) is more effective compared to market measure of one lag period in determining the board remuneration. Adams and Ferreira (2009) clarified that there is a positive relationship between board remuneration and firm's

performance. Andreas, Rapp and Wolff (2012) examined the relationship between board remuneration and German firms' performance. Their findings exhibited a significant positive relationship between the two variables. Similarly, by utilizing a sample of Malaysian banks, Lee and Isa (2015) pointed out a positive and significant relationship between bank's performance and board remuneration. Moreover, previous literature argued that board structure (i.e. board size and board independence) could have a significant impact on board remuneration. Following the concept of agency theory, Lipton and Lorsch (1992) and Jensen (1993) argued that a small board is more effective as it does not suffer from coordination, communication and free-riding problems that could be the case in large boards. On the other hand, Core, Holthausen and Larcker (1999) clarified the importance role of independent directors in increasing the effectiveness the board and in turn enhancing the performance of firms. Accordingly, Lee and Isa (2015) examined the impact of board structure on board remuneration. Their findings revealed a significant negative relationship between board size and board remuneration which implied that banks with small board size are paying more remuneration to board members where banks with large board size are accepting such lower pay-levels as they are concerned more with their prestige from joining such banks. On the other hand, a positive relationship between board independence and board remuneration was found which indicated that banks with higher number of independent directors among their board members are paying higher level of compensation in order to attract good and professional independent directors. Andreas, Rapp and Wolff (2012) hypothesized that a positive relationship is expected between board size and board remuneration, as large board size include more members and so firms could pay more remuneration however, their findings revealed a significant and negative relationship between the two variables. On the other side, their findings revealed a positive and significant relationship between board

independence and board remuneration as they implied that German firms paid large compensation to the independent directors in order to keep them among their board members.

Adams and Ferreira (2009) examined the relationship between board remuneration, board size and board independence. Their findings revealed a significant negative relationship between board remuneration and board size and a significant relationship between board remuneration and board independence by using a regression technique without firms fixed effects. However, when they included firms fixed effects, the significance of these relationships disappear. Ryan and Wiggins (2004) investigating the relationship between board remuneration and board structure (i.e. board size and board independence), their findings exhibited a negative and positive relationship between board remuneration board size and board independence respectively. Interestingly, in the context of demutualization of stock exchanges, Angulo, Slimane and Alidou (2014) investigated the impact of demutualization of LSE on the remuneration of the executives' remuneration in relation to the exchange's financial performance by calculating the difference in means using the paired t-test 5 years before the demutualization year (i.e. 1996-2000) compared to 5 years after the demutualization year (i.e. 2002-2007). Their findings showed that the executives' compensation increased in parallel with the increase of the financial performance after demutualization, which indicated that the stock exchange after the conversion increased its remuneration level paid to its executives in order to align the interest between the managers and the stockholders of the exchange.

4.5 Internal Corporate Governance Mechanisms and Performance

In the field of corporate governance, the majority of empirical studies dealt with the performance of firms as endogenous variable and the internal governance mechanisms (i.e. board size, board independence and director's remuneration) as exogenous variables in order to investigate its

impact on the performance of firms. Accordingly the following sections will review the related empirical studies concerning this relationship in order to link it with the context of the demutualization of stock exchanges.

4.5.1 Board Size and Performance

In analyzing 452 American corporations in the period from 1984–1991, using different regression models (Ordinary Least Square, fixed effects and random effects), Yermarck (1996) clarified that the relationship between firm's board size and its performance (i.e. Tobin's Q, ROA, return on sales and assets turnover ratio) is a significant negative one. Eisenberg, Sundgren and Wells (1998) examined the correlation between the board size and the profitability position of different size (i.e. small and medium) Finnish firms. The findings of the study gave a proof of negative relationship between the two variables. Gill and Mathur (2011) examined the effect of board size on firms' value (i.e. Tobin's Q) by analyzing manufacturing companies listed on Toronto Stock Exchange. The empirical results showed a negative relationship between the board size and the value of the Canadian firms. Gill and Obradovich (2012) examined the impact of board size on American firms' value (i.e. using Tobin's Q) listed on New York Stock Exchange. The findings exhibited that firms with large board size negatively impacts the firms' value. Furthermore, this negative relationship exists even with the comparison between manufacturing and services firms. Arosa, Iturralde, Maseda (2013) tested the efficiency of board of directors as corporate governance mechanisms related to firm performance (i.e. ROA) by using a sample of Spanish firms with different sizes (i.e. small and medium-sized enterprises (SMEs)) and the findings showed a negative relationship between board size and firm performance. In addition, they concluded that the negative impact of board size is due the worse coordination, inflexibility and communication problems among members in the large boards.

However, exploring the relationship between the board size and corporations performance has been exhibited by numerous empirical studies with diverse discoveries. Shukeri, Shin and Shaari (2012) examined the effect of board size and the performance (i.e. ROE) of Malaysian public listed companies from different sectors. The results showed a positive relationship between board size and firms' performance and they concluded that firms with large board size and proper control and management will help to improve the firm's financial and non-financial performance. Moscu (2013) analyzed 62 firms registered in the Romanian Stock Exchange in order to test the impact of board size and firm performance by using accounting measurements (i.e. ROA and ROE). The findings exhibited a positive but insignificant relationship between board size and the value of the firm.

4.5.2 Board Independence and Performance

In investigating the relationship between the board's independence and firm's performance, various studies have been employed with mixed findings. Some empirical studies have found that there is a negative relationship between independent directors and firm performance (e.g. Zahra and Stanton, 1998; Bhagat and Black, 1999; Shukeri, Shin and Shaari, 2012; Arosa, Iturralde, Maseda, 2013). According to the previous literature, this result is unexpected according to the importance of the independent directors especially, for the monitoring of the executive directors and providing advice to the board of a firm. However, Hermalin and Weisbach (1991) argued that both insider and outsider directors may not succeed in performing their duties toward satisfying the interests of stock holders. Zahra and Stanton (1998) pointed out that the ratio of independent directors had a negative and significantly effect on firm's financial performance by examining data of 100 firms. Bhagat and Black (1999) examined the relationship of board independence and American firms' performance by using several proxies of long-term

performance and growth. The findings revealed a negative relationship between the proportion of independent directors and long-term performance as well as growth. Shukeri, Shin and Shaari (2012) examined the effect of board independence and the performance (i.e. ROE) concerning the Malaysian public listed companies from different sectors. Their findings contradicted the proposed hypotheses, as there is a negative relationship between board independence and firm's performance. Arosa, Iturralde, Maseda (2013) examined the efficiency of board of directors as corporate governance mechanisms related to firm performance by using a sample of 307 Spanish SMEs and the findings showed a negative relationship between the proportion of outside directors and firm performance (i.e. ROA). Accordingly, they concluded that the outside directors do not add value to the firm and recommended that firms must be careful in selecting the outside directors regarding their skills, experiences and knowledge of corporate management. Also other subsequent studies were in align of the previous findings (e.g. Anderson et al., 2000; Bhagat and Black, 2002; Hermalin and Weisbach, 2003; Bhagat and Bolton, 2008).

In opposition to the above findings, other studies have confirmed the positive relationship between the existence of independent directors among board members and firms' performance (e.g. Wagner III, Stimpert and Fubara, 1998; Rouf, 2012; Gordini, 2012; Bahgat and Bolton, 2013). Wagner III, Stimpert and Fubara (1998) conducted a meta-analysis of 63 empirical studies measuring the link between board structure and firm performance. Their findings support the correlation of higher firm performance and the increasing number of independent directors. Rouf (2012) examined the relationship between corporate governance mechanisms (such as board independent directors) and firm's value by using two proxies (ROA and ROE) applied on 93 non-financial firms listed on the Dhaka Stock Exchange (DSE). The findings showed that a

positive and significant relation between board independent directors and ROA and ROE. As for the author, the higher number of independent directors improved the value of the firm.

By analyzing Italian companies (i.e. small family firms), Gordini (2012) examined the impact of outside directors on firm performance (i.e. ROE and return on investment/ROI). The findings exhibited a positive association and he concluded that the increased number of outside directors improved firms' performance and value enhancing through their contributions of experiences, skills and their linkage to external resources. Bahgat and Bolton (2013) studied the impact of the Sarbanes-Oxley Act on the relationship between corporate governance and firm performance during the period 1998-2007 and a total of over 13,000 firm-year observations with selecting the year 2002 as a break-point for 2 sub-periods (pre and post 2002) since Sarbanes-Oxley (SOX) was enacted in 2002. Interestingly, the findings showed that the independence of directors and firm performance (i.e. ROA) has a negative relation during the period 1998-2001 however, this relation shifted to be a significant positive relationship during the period 2003-2007. They concluded that the board of the firm become more independent and this independence become highly correlated with better operating performance in a positive way. Subsequent empirical studies are reassuring this positive relation (e.g. Pearce and Zahra, 1991; Ferris, Jagannathan, and Pritchard 2003; Hillman, 2005; Joh and Jung, 2012).

In addition, the empirical literature incorporated other studies that exhibited no significant relationship between the independent directors and firms performance (e.g. Baysinger and Butler, 1985; Fosberg, 1989; Hermalin and Weisbach, 1991; Duchin, Matsusaka, and Ozbas, 2010). Baysinger and Butler (1985) pointed out that the relationship between the extent of independent directors and firms' profitability did not exist around the same period in 1970s, although there was a weak and lag impact positive correlation when testing the proportion of

independent directors on the board in 1970s and performance in 1980s. Fosberg (1989) conducted an empirical study testing the relationship between firms' performance by using many accounting measures and different proportions of independent directors and found an existence of negative relation between the two variables. In order to control the possibility of endogeneity problem between variables, a panel data model of 142 firms listed on New York Stock Exchange (NYSE) was employed by Hermalin and Weisbach (1991) and clarified that there is no significant relationship between the number of independent directors and the firm's profitability position (i.e. Tobin's Q). Duchin, Matsusaka, and Ozbas (2010) conducted an empirical study that tested the change in firm's board composition, specifically the fraction of outside directors and its impact on firm's performance (i.e. ROA, Tobin's Q and stock return). They also considered the control of the endogeneity problem, as they focused on firms that follow the Sarbanes Oxley Act (SOX) which requires firms to increase the number of outside directors in its board. Generally, their findings indicated a link between the outside directors and firm's performance, but these results changed when conditioned with the change in costs of acquiring information, as the lower the information costs, the higher the effectiveness of outside directors and likewise the firm's performance is improved and vice versa.

4.5.3 Director's Remuneration and Performance

In light of the agency theory, scholars have endeavored to explore the link between the pay structure and firms' performance. Jensen and Murphy (1990) supported the idea of linking the directors' compensations/remunerations and firm performance as board members ought to be better paid for their good performance, though, this relation has been introduced by many scholars with diverse discoveries. Moreover, previous literature on pay structure relied on top level management as some studies focused on CEO pay level and others focused on total

executives remuneration or even remuneration of board of directors. By analyzing the largest public listed American/US firms, Hall and Liebman (1998) investigated the relationship between CEO remuneration and firms' performance and the findings showed a strong positive relationship and mainly this is due to the existence of stock options among the pay level of CEO. Zhou (2000) investigated the relationship between CEO pay level and corporate performance by using accounting measures (i.e. ROA and ROE) in analyzing 755 Canadian firms. He concluded that CEO pay level is positively linked to firms' performance. Kato and Kubo (2005) examined the relationship between CEO pay level (i.e. cash and bonus) and the performance of Japanese firms of the period 1986-1995 (i.e. ROA and Annual stock returns) and the findings exhibited a significant positive relationship especially with the accounting measure (i.e. ROA). However, this was not the case when using the market measure as for Japan the stock options for executive officers were banned till 1997.

Ozkan (2011) examined the relationship between the compensation of CEO by using different proxies; only cash compensation (i.e. cash and bonus) and total compensation (i.e. cash, bonus, long-term incentive plan and stock options) and firm's performance (i.e. stockholders' return) by using the data of non-financial UK firms for the period 1999-2005. The findings revealed that there a positively significant relationship between CEO pay level (i.e. cash compensation or even total compensation) with return of stockholders. Banker et al. (2013) investigated the relationship between CEO pay-level especially the cash compensation (i.e. salary and bonus) with past and future performance (i.e. ROE and stock returns). The findings exhibited a significant and positive relationship between only CEO's salary and past and future performance, however, the CEO's bonus has a negative relationship with past performance and no evidence of an association with future performance. In the context of the Indian market, analyzing all the publicly-listed Indian

companies, Raithatha and Komera (2016) examined the relationship between CEO compensation and firm's performance by using accounting and market measures (i.e. ROA, ROE, Tobin's Q and stock return). The findings showed a positive relationship between CEO compensation and firm's performance using both the accounting and market measures. In addition, previous literature showed a negative relationship between CEO pay-level and firm performance. Core, Holthausen and Larcker (1999) investigated the compensation of CEO and firm's performance (i.e. ROA and stock return). Surprisingly, the findings showed a significant negative relationship between CEO pay level and firm's performance. In addition, the authors tested the impact of corporate governance on CEO compensation. Accordingly they concluded that excess CEO compensation increased with a firm suffers from poor corporate governance structure (i.e. greater agency problems) and so the performance of these firms is worse. Similarly, Brick, Palmon and Wald (2006) investigated the CEO and director compensation and its relation to firm performance. The findings exhibited a negative relation between both excess CEO and director compensations and firm performance. Moreover, other scholars found no evidence of a relationship between CEO compensation and firm's performance. Izan, Sidhu and Taylor (1998) used data of publicly-listed Australian firms to test the relationship between CEO cash compensation (i.e. salary and bonus) and firms' performance (i.e. ROE, sales and stockholders' return) and the findings showed that no evidence of such a relation between the two variables. Similarly, Ozkan (2007) found that there is no significant relationship between CEO pay level (i.e. cash and total compensation) and firm's performance analyzing 414 UK firms for one year period 2003-2004. In a study conducted by Basu et al. (2007) where the relationship between remuneration of top executives and firm performance (measured by ROA and market to-book ratio) was positively significant on a sample of Japanese firms.

From the previous discussion, executive's remuneration (i.e. CEO) had the most attention in literature in contrast to the remuneration of board of directors which had little attention. The job of the board of directors is not confined only to monitoring and giving advice to firm's managers but extends to allocating the resources of a firm and acting on behalf of its stockholders (principals) (Crespi-Cladera and Gispert, 2003). Hassan, Christopher and Evans (2003) argued that a firm's board is considered as the first level of upper management that deals with agency problem. An influential and considered as one of the first papers that exhibited the prominence of the board of directors remuneration of the pay-performance relationship was conducted by Main, Bruce and Buck (1996). They argued that it is better to follow the agency approach of the board of directors collectively rather than focusing on one director (i.e. CEO). In addition, the authors also pointed out that due to the unavailability of data regards the total remuneration of the board, previous literature was focused on executive's remuneration. Crespi-Cladera and Gispert (2003) examined the relationship between board remuneration of Spanish firms and its performance by using accounting (i.e. ROA) and market (i.e. stockholders return) measures. The findings revealed a positive and significant relationship between board remuneration and firm performance though this relation is stronger for accounting measures than for market performance. In the context of Malaysia, a study applied by Abdul-Wahab and Abdul-Rahman (2009) found a positive relationship between firm's performance and the pay level which measured by the remuneration of the total board of directors. A study used a sample of 428 listed firms on the Bursa of Malaysia for the year 2008 was conducted by Yatim (2012) who examined the relationship of total directors' remuneration including all major components of executives and non-executives directors' remuneration and ROA as a proxy for firm's performance. The findings exhibited a positive and statistically significant relationship between the board

remuneration and firm's performance. Similarly, Müller (2014) investigated whether board remuneration characteristics influence the firm's financial performance (i.e. ROA) by using a large sample listed on London Stock Exchange (LSE) between 2010 and 2011. The empirical findings exhibited a statistically positive significant relationship between the two variables.

4.6 Conclusion

The conversion of a stock exchange from the mutual/cooperative structure to demutualize/corporation structure did not stop at changing its primary objective from non-profit organisation to a for-profit corporation but extended to reach the changes in its governance structure associated with decoupling the ownership and trading rights where an elected board of directors is answerable to its stockholders. Accordingly, this chapter started with identifying the corporate governance mechanisms and focused on the importance of the internal mechanisms especially the role of board of directors in solving the potential conflict between the managers (agents) and the stockholders (principles). Despite the assessment of corporate governance mechanisms (i.e. the role of board of directors) in other disciplines, no prior studies examined it within the context of the demutualization of stock exchanges and its performance. Consequently, this chapter reviewed the theoretical background through the agency and resource dependence theories relevant to the functions and characteristics of board of directors (i.e. board size, board independence and director's remuneration). In addition, the chapter also provided the determinants of board size, board independence and director's remuneration dealing with these mechanisms as endogenous variables supported by several empirical studies. Moreover, this chapter provided a link between the internal governance mechanisms and performance where, the performance is the endogenous variable and the mechanisms are exogenous variables, supported by several empirical studies to build the foundation for examining, for the first time,

the relationship between corporate governance mechanisms and demutualization to develop a comprehensive understanding of their impact on the exchanges' structure and performance. Based on the literature review provided in chapters 3 and 4, the conceptual framework will be developed through linking such literature with the research hypotheses in the next chapter.

Chapter Five

Developing the Conceptual Framework

		Page number
5.1	Introduction	127
5.2	Linking the Literature to the Research Hypotheses	129
	5.2.1 Demutualization and Financial Performance	129
	5.2.2 Demutualization and Internal Corporate Governance Mechanisms	138
	5.2.3 Linking the Internal Governance Mechanisms and Exchange's Performance	143
5.3	Conclusion	146

5.1 Introduction

Since the first stock exchange (Stockholm Stock Exchange) took the first step towards demutualization in 1993, many stock exchanges around the world changed their governance structures in order to cope with the external factors/changes surrounding the stock exchange environment such as globalization that led to an increase the competition among stock exchanges alongside the technology development. In particular, the development of technology affects the trading process of stock exchanges, as a traditional stock exchange was a physical location with a trading room where orders of traders executed by brokers through using visual and verbal interactions to match the buyers and sellers of these orders. Thereof, technological improvements as a competitive advantage put stock exchanges in general under pressure and forced them to adopt the electronic (automated) trading system instead of the physical/traditional trading which

gives traders the chance to trade not just at the national level, but at regional and global levels as well associated with reducing the role of brokers as intermediaries and their control over the exchanges' strategic positioning. Technology developments did not stop at this level, but rather open the door toward the rise of MONSTRs - the Alternative Trading Systems (ATSS) - as new competitors to traditional stock exchanges (Lee, 2002). Furthermore, increasing the competition and technology advancements threatened stock exchanges with a decline in their trading volumes and/or in the number of listed firms, hence, to maintain their operating position or in extreme case; surviving, stock exchanges sought to consolidations with other exchanges to avail enormous economies of scale and network externalities for traders (e.g. Pagano, 1989; Pirrong, 1999; Malkamaki, 2000; Pagano and Padilla, 2005; Chesini, 2007; Philips, Faseruk and Glew, 2014).

From the previous illustration, it can be ascertained that traditional stock exchanges (i.e. mutual/cooperative structure) were facing many challenges. In general, the major goals of any business are simply to generate more revenues, increase profits, maximise stockholder wealth and increase customer satisfaction. Accordingly, stock exchanges were looking for new strategies that can capture the environmental changes; globalization, competitive pressures, technology developments coupled with ineffective governance systems and management to foster their performance (e.g. Lee, 2002; Steil, 2002). Stock exchanges under the mutual/cooperative structure were lacking the financial flexibility to deal with the environmental changes, thus, a new strategy was produced and adopted by stock exchanges; the demutualization strategy/process.

5.2 Linking the Literature to the Research Hypotheses

As presented earlier in chapter two, several definitions of the demutualization process were produced by many scholars (see section 2.3.1) where this particular study follows the definition provided by Aggarwal (2002). As a common factor, all the definitions of the demutualization process relied on changing ownership from non-profit/mutually owned organisation to a for-profit/ investor-owned corporation. Adopting the demutualization by stock exchanges as a new strategy changes the ownership structure from mutual/non-profit where the primary objective is to maximise members' interests to demutualized (for-profit) exchanges as the main objective is to increase profit (short-term) and maximising stockholder wealth (long-term). Generally, stockholders as the residual claimants provide the resources to organisations for the longest period and receive their investment's returns against organisational assets after all other claimants (e.g. employees; lenders; government) first satisfied. Increasing the profit of an organisation will give a positive signal to outside investors which may increase the demand on its stock, hence increasing the stock price and maximising stockholder wealth. Therefore, a demutualization strategy allows stock exchanges to operate and compete efficiently, increase its flexibility and transparency and secure an access to capital needed to expand its activities, thus, increasing profit, maximising the wealth of residual claimants (stockholders) and other stakeholders and so enhance the value of stock exchanges itself.

5.2.1 Demutualization and Financial Performance

Generally, previous literature clarified that the importance of financial performance relied on reflecting the financial health of a firm by determining strengths and weaknesses of operating and financial features and evaluate the efficiency of management the business activities (Bhunia, 2010). The major organisational performance measures applied in finance and accounting studies

to assess the financial performance of an organisation are the accounting-based measures/financial ratios which can be presented as values, ratios and percentages (Penman, 2001). In the context of the demutualization of stock exchanges, the analysis of the financial performance presented from different perspectives such as profitability, leverage/capital structure, efficiency and liquidity (e.g. Mendiola and O'Hara, 2003; Otchere, 2006; Otchere and Abou-Zied, 2008; Azzam, 2010; Morsy and Rwegasria, 2010; Oldford and Otchere 2011; Otchere and Mohsni, 2016). However as discussed previously, the different methodological approaches applied by these studies give the motive for this particular study in examining the impact of demutualization on the financial performance of stock exchanges from new perspectives that have not received any significant attention from previous literature.

Liquidity

Dealing with a stock exchange as a firm, especially after the conversion to a for-profit organisation (i.e. demutualized) has opened a new room for examining its liquidity position by determining the excess level of cash (i.e. cash holdings) that a demutualized stock exchange should hold, similar to regular corporations. To the best of this study's knowledge, no empirical study in favour of the context of stock exchange demutualization has examined the impact of such a strategy on the liquidity of exchanges from this perspective, however the field of corporate finance is rich with theories and empirical studies that explore the importance of liquidity through cash holdings to corporations, its determinants and its influence on managers' financial decisions and thus the behavior and the performance of corporations. As presented previously in chapter three, there are different motives such as transaction, precautionary and agency motives (e.g. Keynes, 1936; Miller and Orr 1966; Opler et al., 1999; Bates, Kahle, and Stulz, 2009). Moreover, different theoretical models were developed in order to explain the

firms' characteristics that influence its cash holdings such as the trade-off, pecking order and free cash-flow theories (e.g. Ferreira and Vilela, 2004; Bates, Kahle, and Stulz, 2009) (for more illustration see sections 3.4.1 and 3.4.2). Since the demutualization strategy emphasized on changing the ownership and the governance structure, thus as a primary step in order to link the impact of demutualization on liquidity (i.e. cash holdings) of stock exchanges, this study reviewed some recent studies dealing with changing the ownership of firms and its impact on cash holdings. Xie et al. (2017) examined the impact of changing the ownership of insurance industry (mutual vs. private insurers) on cash holding strategy. Their findings revealed that private/stock insurers hold more cash compared to mutual ones following the managerial discretion hypothesis where mutual insurers are less involved with risky business activities and so the managers of mutual insurers need less discretion. On the other hand, private/stock insurers are more complex and the probability of involving in risky business activities is higher. In addition, they argued that insurers under mutual structure are less exposed to takeover since they do not have transferable shares. Megginson, Ullah, and Wei (2014), argued that privatised Chinese firms (i.e. partially privatised) hold higher level of cash reserves compared to the non-privatised ones as their findings showed that the increase in the level of cash is associated with a decline in firms' state ownership following the soft-budget constraint theory. In addition, previous literature showed that dividends payment is an influential factor of determining corporations' cash holdings. Firms could use their retained cash to pay dividends or they could cut-off their dividend payments and raise the needed funds with lower cost in opposite to firms that do not pay dividends, which have to use costly external funds (e.g. Opler et al., 1999; Ferreira and Vilela, 2004; Ozkan & Ozkan, 2004). In similar vein, members of traditional stock exchanges share the net profit of the venue as it is returned in the form of lower access fees or

trading costs (Akhtar, 2002), however in demutualized stock exchanges, the stockholders are expected to receive dividends as a return to their investments from the generated surplus or net income of exchanges (Baarda, 2006). Furthermore, firms with the higher level of cash reserves could be engaged in acquisition activities as forms of foreign investments (e.g. Harford, 1999; Hanlon, Lester, and Verdi, 2015). In line of this point, after the deal completion of combining the businesses of NASDAQ and OMX AB in February, 2008 creating what is known as NASDAQ OMX Group, Inc., the board of directors clarified that acquisition activity is one of the significant factors needed for the growth of an exchange. Accordingly, an adequate capital is needed for maintaining the level of growth and the development of the exchange's business activities (i.e. current and future acquisitions, partnerships and joint ventures) which can be met mainly from the internal generated funds (i.e. cash and cash equivalent), debts (i.e. borrowings under the current credit facilities) and issuing equity. However, using more debts could notably increase the exchange's level of leverage and that could reduce its liquidity level, affecting its credit rating negatively and facing difficulties in accessing capital markets. On the other hand, issuing additional equity could lead to equity dilution of the current stockholders. The board of directors of NASDAQ OMX clarified that several acquisitions was completed such as the acquisitions of the Philadelphia Stock Exchange, Inc. (PHLX) and the Boston Stock Exchange, Inc. (BSX) in July and August, 2008 respectively. In addition, the acquisitions of SMARTS Group Holdings Pty Ltd (SMARTS) and Glide Technologies Limited (Glide Technologies) in August, 2010 and October, 2011 respectively (NASDAQ OMX annual report, 2011). Another benefit of having a sufficient level of cash is that managers could maintain higher level of financial flexibility to mitigate the underinvestment problem and avoid the costly external sources of funds; however potential costs could be associated with such level of cash through

managers' misuse (Harford, 1999). Moreover, due to the potential information asymmetry between firms' managers and its stockholders, liquidity level (i.e. cash holdings) could be managed as a buffer between firm's internal funds (i.e. retained earnings) and new investments needs, thus increase the value of firms (Myers, 1984); the following hypothesis is proposed:

H1: <i>Demutualization increases the liquidity of a stock exchange</i>
--

Leverage/Capital Structure

Generally, the corporate finance field revealed the importance of the capital needed by corporations to finance its current operations and potential investment opportunities. Capital structure of corporations presents the mixture of debt and equity as financial sources needed for investment (Myers, 2001). In the context of stock exchanges, the development of technology and increasing the competition between stock exchanges from one side and between stock exchanges and electronic communication networks (ECNs) from the other side has motivated many traditional stock exchanges to demutualize in order to raise the capital needed to develop its infrastructure (i.e. trading platforms) to confront such a competitive environment (Otchere, 2006). Raising capital was a problematic issue for the traditional/mutual stock exchanges since under this structure where the members of stock exchanges are the only owners and the shares are not freely tradable. However, by the demutualization of stock exchanges, an initial distribution of shares to exchanges' members is involved. In addition, taking a further step after the demutualization of stock exchanges and become publicly-listed exchanges gives the chance for outside investors to become owners through private placement or initial public offering (IPO) (Mendiola and O'Hara, 2003). Empirically, both Mendiola and O'Hara (2003) and Otchere

(2006) argued that the level of debt of exchanges declined significantly due to the increase of using the equity as another source of funding resulting from the self-listing decision through the initial public offering (IPO). Similarly, Azzam (2010) clarified that demutualization decreased the level of debt used by stock exchanges. However, Morsy and Rwegasira (2010) found the level of debt declined after demutualization of stock exchanges, albeit the findings are insignificant. From the previous illustration, it can be concluded that only a limited number of studies have dealt with the impact of demutualization/self-listing on the capital structure (i.e. leverage /level of debt) of stock exchanges and also from a limited perspective. However, the capital structure topic has been extensively reviewed and clarified in the literature of corporate finance area theoretically and empirically. As previous literature showed that different theories (i.e. trade-off theory, pecking order theory and agency theory) are behind the financial decision of a corporation's capital structure alongside several empirical studies revealed the determinants of such a capital structure. In addition, dealing with the capital structure to determine the levels of debt and equity will not provide the whole picture as debt has different maturities (i.e. short-term and long-term). Custódio, Ferreira and Laureano (2013) clarified that determining the debt maturity structure is a vital factor for a firm as it affects its financial policy and its behaviour especially in the presence of financial shocks (i.e. liquidity and credit). The determinants of capital structure using the total debt only may disguise critical differences between short-term and long-term debts (e.g. Van der Wijst and Thurik, 1993; Titman and Wessels, 1988). To the best of this study's knowledge, no empirical study in favour of demutualization of stock exchanges examined the impact of such a strategy on the debt choice (i.e. short-term and long-term) of exchanges. However, literature in corporate finance area may provide some evidence regard changing ownership structure of firms and its debt choice (i.e. short-term and long-term).

Although the separation between management and ownership is beneficial for a firm but this may raise a potential conflict between a firm's stockholders and its managers due to their different interests and so managers may act for their own/self-interests rather than for the interests of stockholders (e.g. Jensen and Meckling, 1976; Eisenhart, 1989). In line with this point, several studies provided evidence that using short-term debt is a powerful monitoring device as it increases the supervision of lenders as well as rating agencies and investors on a firm's management with little effort (e.g. Rajan and Winton, 1995; Stulz, 2000, Datta, Datta and Raman, 2005). Stulz (2000) argued that if short-term debt (i.e. a bank loan) is not available at a certain point (i.e. banks do not have enough resources), a firm may miss promising investment opportunities. Accordingly, long-term debt will become the alternative source of funding thus; the value of a firm will be lower compared with its value using short-term debt if it is available. In addition, following the scenario where there is a misalignment of interest between managers and stockholders, could lead to sub-optimal choices of debt maturity (i.e. preference of long maturity over short maturity) and so higher agency costs are expected to be noticed (Datta, Datta and Raman, 2005). Moreover, previous literature revealed that state-owned enterprises have severe agency problems compared to private firms (e.g. Jensen and Meckling, 1976) thus in choosing between debt maturities, long-term debt deems more favourable to avoid the extensive monitoring in case of using debt with short maturity (Datta, Datta and Raman, 2005). Although the impact of demutualization on leverage/capital structure of stock exchanges has been examined, still the impact of such a strategy on debt choice (i.e. short-term vs. long-term) is unknown. Accordingly, a primary step in order to link the impact of demutualization on debt choice of stock exchanges, this study reviewed some recent studies dealing with changing the ownership of firms and its impact on debt choice.

Some empirical studies provided evidence of a positive relationship between state-owned enterprises and debt structure maturity; Choi (2015) in using a sample of Chinese firms divided to private and state-owned firms, revealed that there is a positive relationship between state-owned firms and long-term debt and a negative relationship between private firms and long term-debt. Similarly, Mendoza, Yelpeo and Ramos (2019) showed that firms with state ownership structure prefer using long-term debt maturity. In addition, Otchere and Abou-Zied (2008) gives this particular study a hint regard the impact of demutualization on debt maturity, however not tested in their study. They mentioned that the Australian Stock Exchange (ASX) decreased its usage of long-term debt after the demutualization/self-listing year (i.e. 1998) and by the end of the year 2003, almost there was no long-term debt shown in the balance sheet of ASX. Accordingly, the next hypotheses are developed:

H2: *Demutualization decreases the leverage of a stock exchange*

H2a: *Demutualization increases the short-term debt of a stock exchange*

H2b: *Demutualization decreases the long-term debt of a stock exchange*

Profitability

Following the definition of the demutualization process (Aggarwal, 2002), where a stock exchange converts from mutual/non-profit to demutualized/for-profits organisation as the primary objective is to maximise the profit and maximising the stockholder wealth rather than maximising the members' interests. Since the stockholders are the residual claimants as they pledge in providing resources to firms for the longest period (Carton and Hofer, 2007). Accordingly, these stockholders are expecting to receive their return (i.e. dividends) at a certain

time in the future contrary to a stock exchange under the mutual structure (e.g. Bradley, 2001; Akhtar, 2002). For this, Scullion (2001) argued that stock exchanges demutualize when their potential market capitalization is maximised alongside with increasing the value of its shareholders and all other stakeholders. In general, Richard et al. (2009) argued that one of the basic areas in determining the organisational performance is the financial performance that mainly presented by profit and profitability ratios. By reviewing the previous empirical studies regard the impact of the demutualization on the financial performance of stock exchanges, all these studies used the profitability as a core determinant of the financial performance (e.g. Mendiola and O'Hara, 2003; Otchere, 2006; Otchere and Abou-Zied, 2008; Azzam, 2010; Morsy and Rwegasira, 2010; Oldford and Otchere 2011; Otchere and Mohsni, 2016). Some of these studies had a negative impact of demutualization on the financial performance of stock exchanges. Mendiola and O'Hara (2003) revealed that the profitability of stock exchanges did not improve after the decision of self-listing. According to the authors, the study has some limitations, which could lead to such findings. Morsy and Rwegasira (2010) clarified that only four out of six ratios used as proxies of profitability had increased after demutualization, and they argued the that demutualization did not support the financial performance of exchanges. Similarly, Otchere and Mohsni (2016) revealed that the profitability of demutualized stock exchanges decreased significantly compared to mutual stock exchanges. Whereas, other studies exhibited a significant improvement of the profitability of stock exchanges after the conversion (i.e. demutualized and self-listing) (e.g. Otchere, 2006; Otchere and Abou-Zied, 2008; Azzam, 2010; Oldford and Otchere 2011). From the previous discussion, the following hypothesis is developed:

H3: Demutualization increases the profitability of a stock exchange

5.2.2 Demutualization and Internal Corporate Governance Mechanisms

Corporate governance infers the link between the management of the firm and its stakeholders as it incorporates the rules and standards to be followed in order to accomplish the objectives set by a firm and therefore, the performance of the firm is monitored. At this point, Berglof and Von Thadden (1999) pointed out the essential role of good corporate governance where well governed firms largely perform better. Denis and McConnell (2003) clarified that the corporate governance mechanisms according to the studies applied in the US market can be distinguished to internal and external mechanisms. The internal mechanisms include the structure of equity ownership and the board of directors of a firm, while, the external mechanisms includes the legal system and the external market. In corporate governance scope, the majority of research deal with internal issues associated with misalignment between management and owners' objectives, managerial opportunism and misrepresentation of managerial incentives. Accordingly the firm may deploy internal governance mechanisms to deal with such issues. Board monitoring function has been the core element of corporate governance research with board of directors described as *'the apex of the internal control system'* (Jensen, 1993, p. 862). Revealing the importance of the board of directors as an internal governance mechanism in controlling the potential conflict between owners and agents and align the management's behaviour with the owners' interests is supported by literature of both theories; the agency theory and resource dependence theory. In agency theory, relationship comes from delegating some decision making authority to the agent (manager) who is perform some services on behalf of the principal (owner) (Jensen and Meckling, 1976). Thus, agency theory defines this relationship to resolve the potential conflict between the two parties which may arise from the collision of interests, difficulty or expensive cost in assessment of the agent's performance and the different action taken by each party toward

risk (Eisenhart, 1989). Fama and Jensen (1983) showed the importance of having a sufficient monitoring system, which is the board of directors who act as information provider that feeds the stockholders with information on any unacceptable behaviour by the managers.

On the other hand, the resource dependence theory exhibited the interdependence between organisations and their environment, where the organisations rely on the external environment to secure the needed sources for success and survival. At this point, the importance of the board of directors shows up, as appointing members to the board will create links with the external environment in order to lessen the environmental uncertainty and secure a stable stream of resources (Pfeffer and Salancik, 1978). From the foregoing theoretical foundations, both theories succeeded in highlighting many aspects such as the separation of ownership and trading rights due to the changing of firms ownership and governance structure, the vital role of the board of directors and the importance of its characteristics such as the board composition (e.g. board size; board independence) and board remuneration in enhancing the firms performance. Following the definitions of the demutualization presented previously (e.g. Aggarwal, 2002; Elliott, 2002); the key determinant of the demutualization strategy/process is associated with decoupling the ownership and trading rights where outside stockholders are now presented by an elected board of directors. Whilst this separation is an advantage of a demutualized stock exchange, there is a possible conflict of interests between its owners and managers. Therefore, with an effective corporate governance and rigid legal monitoring, stock exchanges can overcome such conflict (Coffee, 1999). In addition, scanning the inner structure of stock exchanges, to analyse ownership structures, power relations and way of decision-making, for instance, its corporate governance will lead up to better understanding of exchanges' behaviors (Grote, 2007).

Board Size

The notion of agency theory supports the idea that firms with small boards are effective in monitoring business activities which could improve the firm's performance (e.g. Yermack, 1996; Jensen, 1993; Hermalin and Weisbach, 2003). In addition, large board size could restrain the coordination and communication among board members which lead to slow the process of decision making and so agency problems could arise such as the free-riding problem (e.g. Lipton and Lorsch, 1992; Jensen, 1993; Eisenberg et al., 1998; Dalton et al., 1999). On the other hand, the resource dependence theory support firms with large boards as they can benefit from creating larger networks and greater access to market information (Zahra and Pearce II, 1989). In general, changing a firm's ownership could affect the board structure/composition (i.e. board size). Some opinions support that cooperatives have large board size which could enhance their performance (e.g. Bond, 2009; Franken and Cook, 2013). In the opposite, investor-owned firms prefer a small board where the CEOs could ease their task in controlling the board and so enhance the firms' performance (e.g. Lipton and Lorsch, 1992; Jensen, 1993). In context of stock exchanges, members of stock exchanges under the mutual/cooperative structure enjoyed rights of ownership, control, and trading where, all decision making was done democratically on a one member, one vote basis (OMOV), so all the mentioned functions are done by the same persons: usually the member firms. In addition, the representatives of the member firms are the key decision-makers who are elected to the board and the senior officers of the stock exchange itself (IOSCO, 2000). Accordingly, by adopting the demutualization strategy, a stock exchange diminished the role of the members on their board of directors involved in corporate decision- making and gives the chance to add new blood to the board of directors that can act in a professional way and hence, deal with the environmental challenges (Angulo, Slimane and Alidou, 2014). Following the

previous literature, Angulo, Slimane and Alidou (2014) tested the impact of the demutualization on the board size of London Stock Exchange (LSE). As for the authors the demutualization decreases the number of members of LSE board of directors. Consequently, the following hypothesis is developed:

H4: <i>Demutualization of a stock exchange decreases the size of the board of directors.</i>
--

Board Independence

Another important internal mechanism that takes much attention in the field of corporate governance of corporate firms is the role of the independent (outside) directors as members of the board of directors. At this point, Fama and Jensen (1983) underlined that the key role of the outside directors among the firm's board members is relied on their effective monitoring towards managers' behavior. As discussed previously, in mutual organisations, ownership rights are not freely transferrable which eliminates the stock-based compensation scheme provided to the directors of the firm and lead to diminish the role of institutions and block-holders in monitoring and prohibitions on takeovers. This indicates that the number of independent directors as members of the board of mutuals will be higher than in corporations. Mayers, Shivdasani and Smith (1997) argued that the conversion of insurance firms from mutual to stock firms made corresponding changes in their board composition, particularly, the number of outside directors in the firms' board of directors. Their findings showed that the mutual insurance firms employ higher number of independent directors compared to stock firms. In addition, these mutual firms have lower expenditures on salaries, wages and rent due to the high fraction of outside directors. Similarly, O'Sullivan and Diacon (2003) exhibited that mutual insurance firms have higher fraction of independent directors in its board in contrast to the stock firms. They concluded that

since the shares of mutual firms are not freely tradable, the managers under this structure are not experienced high external pressure such as pressure from major stockholders and/or the threat of takeover. However, stock insurance firms may suffer from pressure of strong stockholders and higher capital market control and hence have less reliance on independent directors monitoring. On the other hand, as mentioned previously in chapter 4, the majority of the annual reports of the selected stock exchanges used in this current study, highlight the importance of having higher number of independent directors among their board members. As some exchanges clarified that including higher number of independent directors among their board members is enhancing the role of directors to act in the best of the exchange's interests (i.e. ASX, 2002). Others referred to this increase as a step to comply with governance code (i.e. LSE, 2003) or with the rule of SCE in regard to SROs (NASDQ, 2004). Empirically, in context of demutualization of stock exchanges, the findings of Angulo, Slimane and Alidou (2014) revealed an increase in the number of independent directors of LSE after the demutualization. Accordingly, the following hypothesis is developed:

<i>H5: Demutualization of a stock exchange increases the board independence</i>

Director's Remuneration

Beside the importance of the board composition (board size and board independence) another internal mechanism that extensively illustrated in the literature is the board remunerations/managerial incentives. From the agency theory perspective, Mayers and Smith (1981) applied the managerial discretion hypothesis of the insurance industry and found out that multiple ownership structures (e.g. mutual vs. stock) have different set of governance tools to reduce the agency cost. Jensen and Murphy (1990) suggested that managerial

remunerations/incentives could include stock options, equity ownership and performance-related-pay as financial incentives for maximising the firms' value. Based on the fact (discussed previously) where ownership rights of firms under the mutual structure are not freely transferable so, there are no incentive schemes available for board members under such a structure. In contrast, managerial incentives are available to directors of firms under the stock structure as a tool to motivate, retain and align the interests of management and owners. Generally, previous literature focusing on the remuneration of firm's executives – especially CEOs - however the remuneration of board of directors had received little attention. A firm's board considers as the first level of upper management that deals with agency problem (Hassan, Christopher and Evans, 2003). In addition, Main, Bruce and Buck (1996) argued that considering the board collectively is better for a firm rather than focusing on one director (i.e. CEO). In context of the demutualization of stock exchanges, Angulo, Slimane and Alidou (2014) focused on examining the impact of demutualization of LSE on their executives' remunerations as a proxy for managerial incentive and the findings exhibited a significant increase in their remuneration after the conversion. Consequently, the next hypothesis is developed:

H6: <i>Demutualization of a stock exchange increases the board remuneration</i>

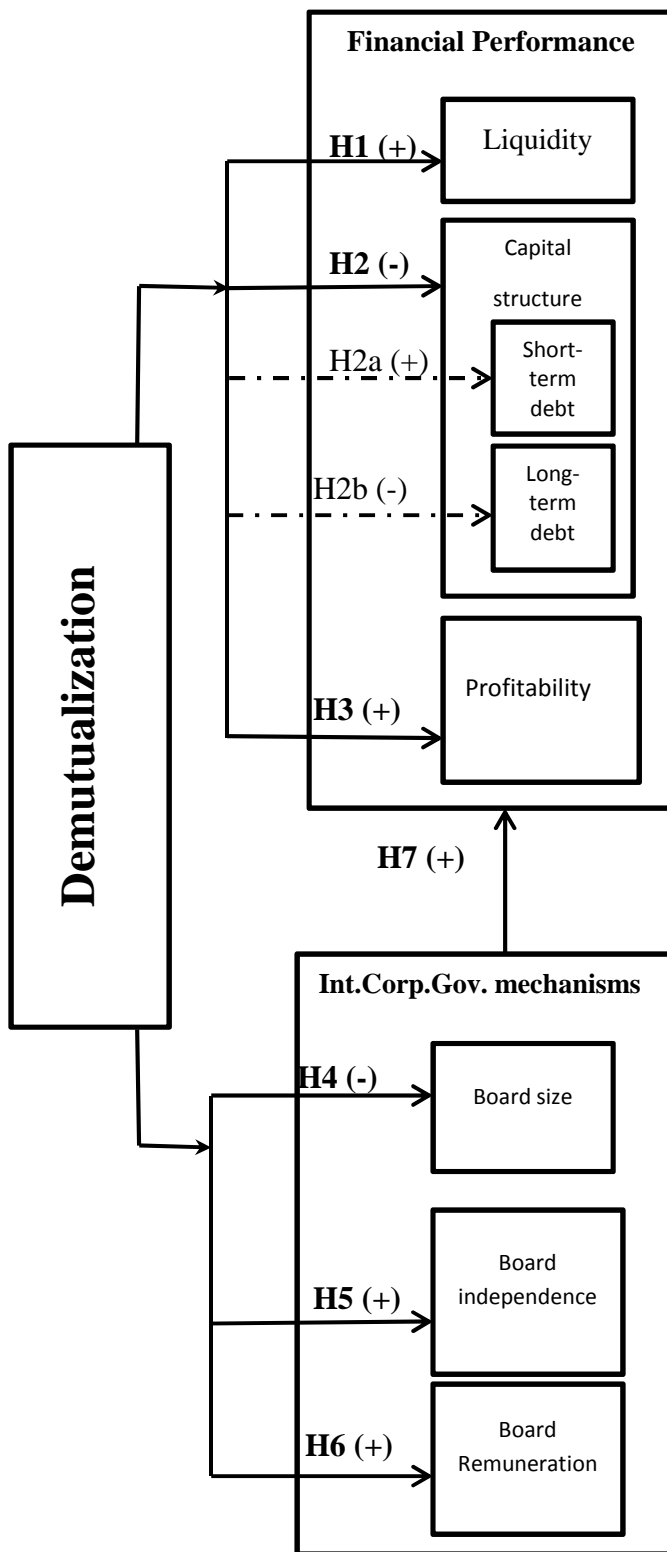
5.2.3 Linking the Internal Governance Mechanisms and Exchange's Performance

The illustration presented earlier (see section 3.2.2) highlights the actions that have been taken by stock exchanges toward the new corporate governance structure, particularly the internal governance mechanisms after adopting the demutualization strategy. In general, previous literature on corporate governance linked the impact of internal corporate governance mechanisms (e.g. board size; board independence; board remuneration) on corporate firms'

performance to describe the characteristics of these mechanisms and its vital role in enhancing the corporations' performance (see section 4.4). Since this study intends to show the impact of the demutualization on a stock exchange's value/performance, so linking the changes of the internal mechanisms derived by the demutualization strategy to its performance will provide a clear picture of the role of internal corporate mechanisms in enhancing the value/performance of stock exchanges. Accordingly, the next hypothesis is developed:

H7: Changes in a stock exchange's internal governance mechanisms derived from the demutualization enhance its financial performance.

Figure 5.1 The Conceptual Framework



Source: Researcher's Design

5.3 Conclusion

In conclusion, the conceptual framework of the current study is developed through linking the following:

- The impact of demutualization on the financial performance of a stock exchange.
- The impact of demutualization on the internal governance mechanisms of a stock exchange.
- The changes in a stock exchange's internal governance mechanisms derived from the demutualization and its financial performance.

After developing the conceptual framework, it is essential to identify the research methodology applied in this study in order to determine the appropriate philosophy, approach and techniques used, which will be illustrated in next chapter.

Chapter Six

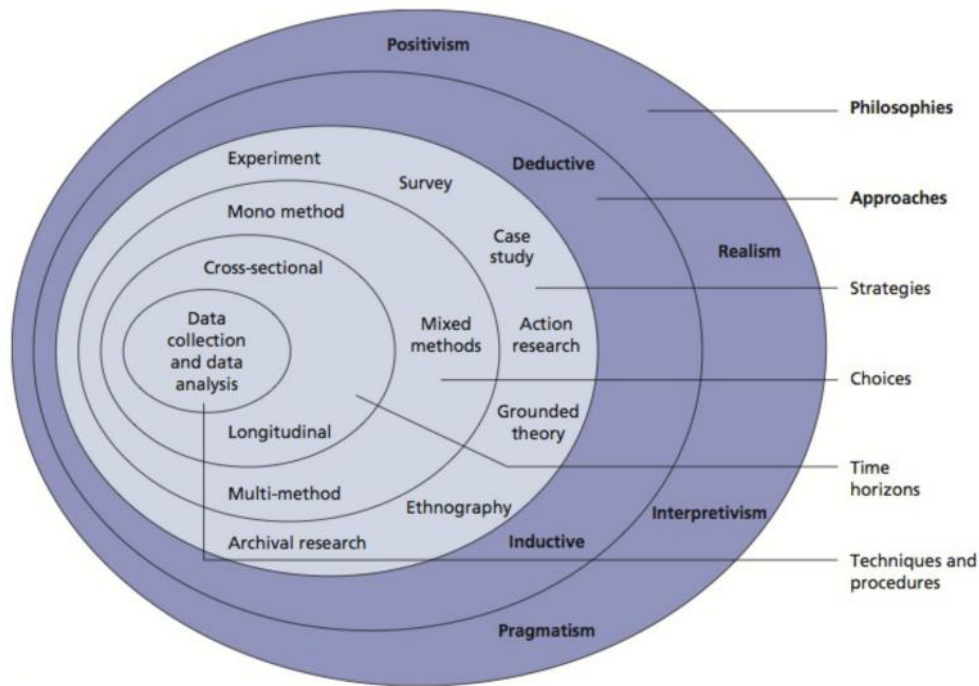
Research Methodology

		Page number
6.1	Introduction	148
6.2	Research Philosophy	154
	6.2.1 The Philosophy of This Research	157
6.3	Research Purpose	158
6.4	Research Approach	162
6.5	Research Strategy	163
	6.5.1 The Selection of Archival Research Strategy	164
6.6	Research Choices	166
6.7	Time Horizons	168
6.8	Data Collection and Data Analysis	169
	6.8.1 Data Type and Collection	169
6.8.2	Sample Size and Period Covered by the Study	171
6.8.3	Selection and Validity of Research Variables	173
	6.8.3.1 Financial Performance	174
	6.8.3.2 Internal Corporate Governance Mechanisms	177
	6.8.3.3 Demutualization Variable	181
6.9	Data Analysis Procedures	183
	6.9.1 Empirical Research Models	194
6.10	Conclusion	200

6.1 Introduction

This chapter will expound the procedures and guidelines followed by this research. This research follows Saunders, Lewis and Thornhill (2009) research approach which depicted the process of conducting a research through using different layers referred to as the “*research onion*” (see figure 6.1). Working outward through the centre, the research onion contains six layers, starting with the research philosophy as the outer layer, followed by the research approaches, the strategies, the choices, the time horizons and the techniques and procedures at the centre. First, this section will represent and elaborate on the research aims and objectives to attest the foundation of the research methodology. Following the research onion approach, the following sections elucidate the research philosophy to provide a clear view of this research’s perspective and the essential research guidelines emulated. Further, this chapter presents the identification of variables, hypotheses, methods of data collection and methods of data analysis utilised to obtain the aims and objectives of the study as proposed in chapter (1).

Figure 6.1: Research Onion



Source: Saunders, Lewis and Thornhill (2009, p 108)

Research Objectives

The introductory chapter identified the aims of this study, which are to quantify the impact of demutualization process on the financial performance, internal corporate governance mechanisms and hence the value of stock exchanges that are members of World Federation of Exchanges. Accordingly, the research proposed three main objectives based on the definition of the demutualization developed by Aggarwal (2002). As for this definition, the demutualization process influences the stock exchanges performance as it separates ownership and trading rights which in turn, converts the exchanges from non-profit organisations to for-profit corporations with the primary objective set to maximise profit/stockholders' wealth rather than maximising its members' interests. The demutualization of stock exchanges has led several researchers to examine its impact on the exchanges' performance. The theoretical background supported the idea that adopting the demutualization strategy is value enhancing for the stock exchange and its

stockholders. Various studies have employed different techniques, methodologies and tools within a diverse context. However, it is still empirically inconspicuous how diverse demutualization influences the stock exchanges performance. The objectives of this research are set to facilitate the identification of this study's contribution and the gap in knowledge that this research aims to emolliate. Thereof, the research objectives are set to assess the impact of the demutualization on stock exchanges' financial performance, internal corporate governance mechanisms and finally, to examine the ability of the changes in corporate governance mechanisms derived by demutualization to enhance the performance of a stock exchange. Converting the exchange's structure to a for-profit organisation and changing its primary organisational objective through demutualization led researchers to examine the changes in the financial performance of a stock exchange. The few existing empirical studies regarding the impact of demutualization on stock exchanges' performance concluded debatable results. Previous studies have assessed the stock exchanges' performance differently and within different contexts yet, the studies mainly focused on evaluating an assortment of financial performance. Accordingly, the first research objective is set to critically review the relevant literature for the impact of demutualization on stock exchanges' financial performance. Examples of studies that found evidence that demutualization had improved the stock exchanges' financial performance such as Otchere and Abou-Zied (2008), Azzam (2010) and Oldford and Otchere (2011). Nevertheless, it is worth mentioning that some of these studies experienced some limitations (as discussed earlier in chapter 3). On the other hand, Mendiola and O'Hara (2003) argued that the findings regard examining the financial performance revealed mixed evidence thus, did not provide clear inferences, as for instance, both profitability and efficiency declined significantly after the decision of self-listing. Similarly, Otchere (2006) showed a decline in profitability of

stock exchanges after listing. In addition, Morsy and Rwegasria (2010) tested the financial performance (i.e. the accounting measures) of stock exchanges pre-post the demutualization and concluded that the demutualization does not improve the financial performance of the stock exchanges. Another critical point was discussed previously; there are different perspectives of financial performance (i.e. profitability, leverage/capital structure, efficiency and liquidity) as all the previous studies engaged in determining the financial performance through the profitability perspective while others, added the leverage/capital structure (e.g. Mendiola and O'Hara, 2003; Otchere, 2006; Azzam, 2010; Morsy and Rwegasira, 2010). None of these studies extend the analysis to include the different maturity of debt (short-term vs. long-term). In addition, regarding the liquidity perspective through examining the impact of demutualization on a stock exchange's cash holdings, no empirical study in context of demutualization of stock exchanges has considered this perspective. However, the literature of corporate field has highlighted these issues extensively through theoretical and empirical backgrounds. In summary, based on the definition of demutualization as proposed by Aggarwal (2002) and the theoretical background, changes in the stock exchanges' structure and goals influence the stock exchanges' performance. As the previous studies showed controversial results, the contribution of the first objective is set to identify the research areas that need to be tackled and possible improvements in the research methodologies that can develop lucid evidence on the impact of demutualization on the stock exchanges' financial performance. On another level, following the demutualization definition by Aggarwal (2002), demutualization of stock exchanges is directly identified by changing its governance structure that necessarily decouples the trading rights from the ownership rights in which, outside shareholders are represented by an elected board of directors who are answerable to the shareholders. Otchere (2006) stated, the demutualized/publicly-listed exchanges provide

managers a free space of flexibility in decision making, tracing profitable opportunities and so can compete in an effective way. However, the separation of trading rights and ownership may raise a potential conflict between the managers and the owners of stock exchanges. Inferred from the previous, the demutualization process follows the identification, associated benefits and risks of a corporate structure. Moreover, theoretical foundations and existing literature of agency theory (Jensen and Meckling, 1976) and resource dependence theory (e.g. Pfeffer, 1972) exhibited the vital role of board of directors (internal mechanism) and the impact of their functions and characteristics on corporate performance.

There is no doubt that the nature of exchanges is different from corporations however, the framework of corporate governance provides an excellent foundation for examining the exchanges governance after demutualization. Nevertheless, examining the governance mechanisms of the demutualized exchanges and identifying its theoretical foundation have not received any significant attention. Accordingly, the second research objective is set to examine the theoretical foundations for the corporate governance mechanisms in relation to the corporations and their performance in order to, develop the association of corporate governance mechanisms with the demutualization and performance of stock exchanges. This particular objective is the first investigation of the characteristics of stock exchanges board of directors and director's pay structure after the demutualization process and their role in enhancing the value of a stock exchange. Despite the assessment of corporate governance mechanisms in other disciplines, no prior studies examined it within the context of the demutualization of stock exchanges and its performance. Therefore, this objective builds the foundation for examining, for the first time, the relationship between corporate governance mechanisms and demutualization to develop a comprehensive understanding of their impact on the exchanges' structure and

performance. The third objective builds on the previous two objectives. Following the first objective, this study will identify the main areas that would improve the empirical examination of the impact of demutualization on the financial performance. In addition, the second objective identifies the framework for empirically examining the internal governance mechanisms of demutualized exchanges exclusively. Accordingly, the third objective is set to construct a comprehensive, valid and reliable means to quantify the impact of demutualization. As for instance, examining the liquidity from a new perspective (i.e. cash holdings) and considering the maturities of debt/leverage in the context of the demutualization of stock exchanges will add new insights to theory and practice. In addition, examining the internal corporate governance mechanisms will introduce the characteristics of the board as vital elements of the corporate governance system of the new structure of an exchange after adopting the demutualization strategy. Moreover, by linking the changes in internal governance mechanisms derived by the demutualization to the performance of stock exchanges will draw a clear picture of such a strategy, as elaborated through the literature and in the previous objectives, the performance of the exchange is directly influenced by the structure of its internal governance mechanisms. In other words, in addition to the changes in financial performance due to demutualization, there is a snowball effect where the changes in governance mechanisms derived by the demutualization could lead to further changes in the financial performance. The third objective as stated is to construct an empirical model to investigate the impact of demutualization on the financial performance of a stock exchange and on its internal corporate governance mechanisms in addition, examine the ability of the changes in internal governance mechanisms derived by demutualization to enhance the performance of the stock exchange.

6.2 Research Philosophy

The term 'research philosophy' refers to the nature and the development of the research (Saunders, Lewis and Thornhill, 2009). Adopting a specific philosophy indicates important assumptions on researcher's views and on the appropriate research strategy and methods used as a part of this strategy. It is vital for business and management researchers to be aware of the adopted research philosophy and the research strategy, to undisputedly understand what the researcher does and what is investigated (Johnson and Clark, 2006; Saunders, Lewis and Thornhill, 2009). This section will briefly explain the different views of a research philosophy and the main research philosophies to provide a clear elaboration and justification for this research philosophy, which is later identified. There are three major views on the research philosophy and hence, influence the research process. The three views are axiology, ontology and epistemology. Axiology is "*a branch of philosophy that studies judgments about value*" hence, the role of values in research choices (Saunders, Lewis and Thornhill, 2009, p. 116). Regarding ontology and epistemology, due to problems that many researchers faced in the research literature that conceptually separated the terms ontology and epistemology, Crotty (1998) explained that these two views tend to emerge together. According to Gill and Johnson (2010, p. 100), ontology is the "*branch of philosophy dealing with the essence of phenomena and the nature of their existence*". In other words, ontology is the study of the nature of reality and research questions. It is concerned with the assumptions on how the world operates and the commitment held to particular views. Accordingly, an ontological study is set to answer, "*whether or not what we take to be reality actually exists 'out there' at all?*" (Gill and Johnson, 2010, p. 200). There are two aspects of ontology, which are objectivism and subjectivism. Objectivism portrays that a social phenomenon exists independently of social actors as for

example, how a law (social phenomenon) influences a group of people (social actors). Whereas, subjectivism recognizes that social actors' perceptions and consequent actions create the social phenomenon therefore, a social phenomenon is dependent on social actors. As for example, a new law (social phenomenon) is the product of group of people (social actors). This philosophy is often associated with the term social constructionism, derived from social construction (Saunders, Lewis and Thornhill, 2009). An alternative philosophical view, usually associated with ontology is epistemology. Epistemology as explained by Saunders, Lewis and Thornhill (2009, p. 112), is "*what constitutes acceptable knowledge in a field of study*", simply the theory of getting the knowledge. While there are several sources of knowledge, the research philosophy is essential in identifying what constitutes acceptable source of knowledge. In addition, a single research study can use all sources of knowledge. Therefore, epistemology aims to answer whether the obtained evidence is valid or not (Gill and Johnson, 2010). There are four main research philosophies, which are, positivism, interpretivism, realism, and pragmatism. Following a positivism research philosophy, the research is identified to be "*working with an observable social reality and that the end product of such research can be law-like generalisations*" (Remenyi et al., 1998 cited Saunders, Lewis and Thornhill, 2009, p.113). Furthermore, the main assumption of this research philosophy is that the research is conducted in a value-free way and the researcher is independent and does not affects or affected by the topic of the research (Remenyi et al. 1998 cited Saunders, Lewis and Thornhill, 2009). Hereof, objectivity boosts this approach rather than subjectivity, the research relies on theories to explain and/or predict social phenomena, where the researchers can provide logical reasoning (Collis and Hussey, 2013). Simply, the researcher uses existing theory to develop research hypotheses and since a variable can be observed or measured (can change/has different values) therefore, is an attribute of a

phenomenon. Hence, studies in social science that follow the positivism philosophy prefer the quantitative methods (e.g. longitudinal experiments; questionnaires) in observing and/or exploring a social phenomenon (Carson et al, 2001). Accordingly, the researcher tests the hypotheses to provide evidence, which can be confirmed or refuted by the accepted knowledge. This in turn, leads to further development of the theory, which can be replicated by other researchers.

The philosophy of realism follows that information and sensations derived from human senses are only part of the ultimate truth; and reality is quite independent of the mind. Saunders, Lewis and Thornhill (2009, p. 114) stated that: “*Realism is a branch of epistemology which is similar to positivism because it assumes a scientific approach to the development of knowledge*”. In contrast to a positivist philosophy, interpretivism philosophy emphasizes the meaningful nature of people’s participation in social and cultural life. Accordingly, an interpretivist researcher focuses on what people (individually or collectively) are feeling and thinking and pays attention to the ways they communicate (verbally or non-verbally). Thus, the researcher needs to highlight the social aspect of research to understand the differences between the individuals as social actors rather than objects (Easterby-Smith, Thorpe and Lowe, 2002). Lastly, pragmatism allows a researcher to view the topic from either or both points-of-view regarding the influence or role of social actors and to use those views to create a practical approach to investigate the research problem. Solving the problem is central to this philosophy. Accordingly, a pragmatic philosophy utilizes a variety of actions to arrive at the desired result where, constructivism and objectivism are valid research approaches.

6.2.1 The Philosophy of This Research

As previously mentioned, the increasing number of the demutualized stock exchanges since the first step toward demutualization in 1993 (Stockholm Stock Exchange) showed the necessity of adopting a new structure (i.e. for-profit corporations). Many scholars from then on investigated the reasons behind the adoption of the demutualization strategy by stock exchanges and its impact on the exchanges' performance. Established from which, this research study is working on an observable social phenomenon over years that is the demutualization process. Studying the motivation and impact of the phenomenon depends on and is tested against the existing theories (e.g. agency theory; trade-off theory; pecking order theory; resource dependence theory). Therefore, logical reasoning can be provided through observing and gathering facts and reliable data on the demutualization process. From the previous discussion, this research is adopting an objectivist perspective, where the process of demutualization influences the stock exchanges and its stakeholders independently of the view of social actors. In addition, the existing empirical literature studying the impact of the demutualization on stock exchanges financial performance followed the positivist philosophy and adopted a deductive approach through formulating hypotheses (presuming relationships between demutualization and various variables). Based on the previous and the nature of this topic, it is believed that there is no room for human experience or perceptions in order to achieve the aims of this research. According to such ontology, this research follows the positivist philosophy, which formulates objective views that are independent of social actors. Although, sometimes the positivist philosophy is criticised for preventing the researcher's self-interactions in producing research findings and conclusions yet, this is more appropriate in pure scientific research (Chiles et al., 2010). The research axiology employs quantitative methods based on statistical analysis to maintain the objectivity of knowledge and

findings of this research and to eliminate the researcher's personal views, subjectivity and intuitive interpretations. Thus, the research depends on testing and analysing historical secondary data of stock exchanges (pre-post the demutualization event) to address the aim and the objectives of this study. In view of that, the research epistemology constitutes authoritarian knowledge obtained from previous studies, logical knowledge obtained from the application of logical reasoning and empirical knowledge obtained from observable and measurable data as acceptable knowledge. The first objective as previously explained, depends on authoritarian knowledge obtained from previous research papers to identify the gap in knowledge and possible improvements in research methodologies for understanding the impact of demutualization on the stock exchanges' financial performance. The second objective depends on logical knowledge obtained from the application of logical reasoning to develop the association of corporate governance mechanisms and corporate performance with the demutualization and performance of stock exchanges. The third objective depends on empirical knowledge obtained from observable and measurable data to empirically test the impact of demutualization on the stock exchanges' value.

6.3 Research Purpose

The means to answer the research questions and meet the research objectives are set in accordance to the research purpose. The research purpose identifies why the research is being conducted and can be classified as exploratory, descriptive or causal (explanatory). Nevertheless, a study can have more than one purpose in relation to its research questions; for instance a research study can be descriptive and explanatory (Saunders, Lewis and Thornhill, 2009). In an exploratory study, the researcher is interested to ask questions about a situation or event but may not have any idea about it and wish to seek new insights or to assess the situation/phenomenon in

a new light (Robson, 2002). The researcher may not know if there is a problem to begin with. In contrast, the purpose of a descriptive study is to have a clear picture about an event or the phenomenon under study to identify and to look for a solution to the research problem. Simply, the objective of descriptive research is to describe an accurate profile of events (Robson 2002 cited Saunders, Lewis and Thornhill, 2009). Finally, explanatory research purpose is when the research is intended to study a certain phenomenon or event in order to explain causal relationships between variables. In many instances, research studies embody more than one purpose. Many researchers are wary of work that is too descriptive (accurate description), thus they tend to develop higher-order skills of evaluating data and synthesising ideas rather than just describing the data of the study (Saunders, Lewis and Thornhill, 2009, p. 591). From the aforesaid and for the purpose of this research to study the phenomenon of demutualization, it is apparent that the purpose of this research study is descripto-explanatory. This research studies the phenomenon of demutualization by examining its impact on stock exchanges value through analysing different aspects; financial performance, and corporate governance mechanisms (i.e. internal mechanisms). Recognising the impact of the demutualization strategy on stock exchanges is very interesting but so what? Therefore, to get a clear picture of this phenomenon, the study needs to explain if there are any causal relationships between the selected variables or not. So far the previous sections elaborated on the research objectives to build the rational of the selection of the positivist philosophy and descripto-explanatory research purpose. Although, the research may tackle several aspects yet, there are three main research questions that would be best addressed using the selected research philosophy and research purpose. Applying the philosophy and purpose on the first and third objectives, which identify the framework to

empirically examine the impact of the demutualization process on the financial performance would address the following question and hypotheses:

1- What are the impacts of demutualization on the financial performance of the stock exchange?

H1: *Demutualization increases the liquidity of a stock exchange.*

H2: *Demutualization decreases the leverage of a stock exchange.*

H2a: *Demutualization increases the short-term debt of a stock exchange.*

H2b: *Demutualization decreases the long-term debt of a stock exchange.*

H3: *Demutualization increases the profitability of a stock exchange.*

As discussed previously, chapter three provided a comprehensive overview of the empirical studies that examined the impact of demutualization on the performance of stock exchanges, more precisely the financial performance. However, the majority of these studies focused mainly on the profitability dimension, others added other dimensions such as leverage/capital structure, and efficiency. Accordingly this study will examine the impact of demutualization on the financial performance of stock exchanges from different perspectives; liquidity, leverage/capital structure considering the debt maturity and profitability. As for instance, the perspectives of liquidity (i.e. cash holdings) and the leverage/capital structure considering the debt maturity will be examined for the first time in context of the demutualization of stock exchanges relying on several theoretical and empirical backgrounds from corporate finance. Accordingly, by answering the first question and testing their associated hypotheses will add new insights to knowledge. In regard to the second objective which will identify the theoretical foundations of corporate governance mechanisms to develop the association of demutualization of stock exchanges with the corporate governance mechanisms. Applying the philosophy and purpose on the second and third objectives, which identify the framework to empirically examine the impact

of demutualization strategy on the internal governance mechanisms of a stock exchange would best address the following question and hypotheses:

2- What are the impacts/effects of demutualization on the internal corporate governance mechanisms of the stock exchange?

H4: Demutualization of a stock exchange decreases the size of the board of directors.

H5: Demutualization of a stock exchange increases the fraction of the independent directors as members of the board.

H6: Demutualization of a stock exchange has a positive impact on the board remuneration.

As discussed previously, chapter four provided several theoretical and empirical backgrounds on the importance of internal corporate governance mechanisms and their impact on a firm's performance relevant to the corporate finance field in order to build the foundation for examining for the first time the relationship between the internal governance mechanisms and the performance a stock exchange. As the third objective builds the foundation for empirically testing the effect of the changes in internal governance mechanisms derived by demutualization on the financial performance of a stock exchange thus, a positivist philosophy and descripto-explanatory purpose would address the following question and hypothesis:

3- What is the impact of the changes in corporate governance mechanisms derived by demutualization on the exchanges' financial performance?

H7: Changes in a stock exchange's internal governance mechanisms derived from the demutualization enhance its financial performance.

The first two questions presented earlier will show the impact of demutualization on the financial performance and internal governance mechanisms. However to draw the entire picture of the impact of demutualization on value of stock exchanges, this study will link the changes in

internal corporate governance mechanisms derived from the demutualization to its performance. Thereof, by answering question three, this study will be able to explore and determine the internal governance mechanisms that enhance the performance of a stock exchange significantly.

6.4 Research Approach

Following the first layer that constituted the selection of the appropriate research philosophy, the second layer entails identifying the research approach, hence, whether a deductive (theory testing) or an inductive (theory building) approach is adopted. In a deductive approach research hypotheses based on pre-existing theory are developed and then an appropriate research approach is selected to test the hypotheses (Silverman, 2013). Kothari (2004) explained this approach as moving from establishing the general theory and then testing the general theory in a specific context. Robson (2002) summarised the stages associated with a deductive approach as follows:

1. Hypotheses are developed from the theory;
2. Hypotheses are expressed in operational terms which indicate how the variables are measured quantitatively;
3. The hypotheses are tested;
4. The results of the inquiry are examined to confirm the theory or show how it needs to be modified;
5. The theory is modified, if needed.

As opposed to a deductive approach, an inductive approach moves from the specific to the general, new theories can be generated or the outcome of the analysed data can fit with an existing theory. Rather than formulating a hypothesis, inductive researchers are expecting any potential results thus collecting data in order to answer the phenomena in question (Sustrina,

2009). Bryman and Bell (2003) argued that qualitative research more commonly adopts this approach whereas; the deductive approach is associated with the quantitative research. In the context of the research purpose and the adopted philosophy (positivism), this study adopts a deductive approach. By reviewing the first two research objectives presented earlier in this chapter, this research relied on the theoretical foundations and analysing the existing literature to explore the contradictions and identify the gaps between existing theories/evidence in regard to the adoption of the demutualization strategy and its impact on a stock exchange's value. Under the circumstances of this study, a variety of hypotheses were developed to establish the relationship (cause and effect) between a demutualization strategy and a stock exchange's value through different aspects; its financial performance and internal corporate governance mechanisms. Finally, after obtaining secondary data on all the selected variables, the hypotheses can be tested and the empirical findings that emerge from several statistical methods will further confirm or reject the study's hypotheses.

6.5 Research Strategy

Robson (2002) pointed out that the key layers that enable a researcher to turn a research question into a research project start from this layer (research strategy), followed by the fourth and fifth layers which are, the consideration of the research choice and the time horizon, respectively. As explained by Saunders, Lewis and Thornhill (2009), the research strategy is practically how the research will be undertaken. Choosing a particular research strategy will help a researcher answer the research questions and meet the objectives of the study. According to the research onion, there are different types of research strategies such as experimental, survey, case study, action research, grounded theory, ethnography and archival research. An experimental strategy investigates cause and effect between two variables while using a control group and a treatment

group. Survey strategy mainly focuses on gathering the most information on people or organisations using different techniques like questionnaires. A case study strategy undertakes an in depth and detailed investigation on a one time phenomenon. Action research investigates certain events within their actual live setting. Grounded theory strategy uses empirical evidence to derive theories. Ethnography strategy focuses on studying people and cultures.

6.5.1 The Selection of Archival Research Strategy

The archival research strategy employs a wide range of tools and procedures to investigate organisations. The administrative records, documents and textual materials produced by and about organisations are the primary source of data for archival research (e.g. Mohr and Ventresca, 2002; Saunders, Lewis and Thornhill, 2009). Researchers investigate documents with narrative description of individuals, organisations and events in the past (Mohr and Ventresca, 2002). Accordingly, archival research presupposes the use of secondary data sources; in which researchers analyse available data such as data in an organisation's archived records (Hageman, 2008). As other research strategies, archival research strategy has its advantages and limitations. The use of archival strategy helps answer research questions addressed to past events and changes over time (Saunders, Lewis and Thornhill, 2009). According to Hageman (2008), researchers adopt archival research strategy is when examining trends in large-scale data that is associated with naturally-occurring events (Hageman, 2008). Furthermore, archival strategy is also adequate for examining micro-level behaviour in the aggregate and examining the macro-level patterns (social trends) over time and therefore many of archival research use econometrics (Hageman, 2008). Despite the advantages, archival research strategy offers, some limitations that remain as the general challenge of this strategy. The limitations of the archival research strategy are mainly related to the use of secondary (numerical) data. Particularly, with cross-sectional

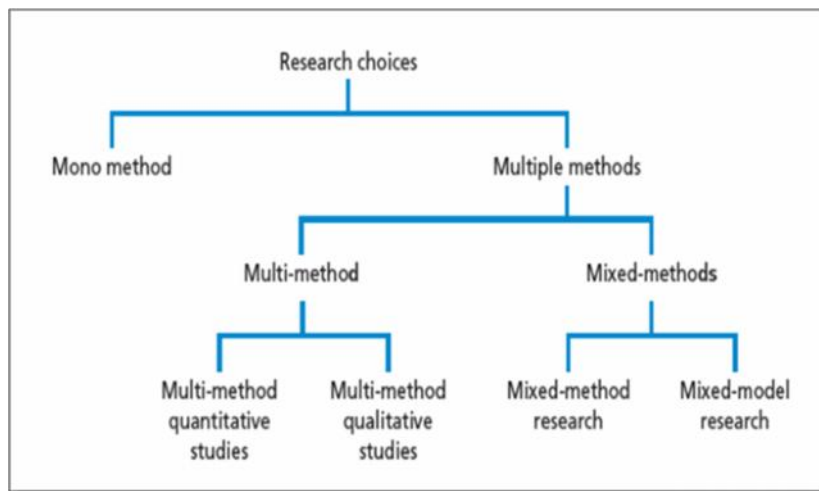
archival research it is very challenging to test causal relationships between variables since it is uncertain if the alleged cause comes before the event (Hageman, 2008). Therefore, it is essential for the researcher to control for alternative explanations, that is, to measure and statistically control for all potential causal variables/factors associated with a well specified model (Shadish, Cook and Campbell, 2002 cited Hageman, 2008). Furthermore, archival research may suffer from difficulties such as the violation of one of the assumptions of multivariate analysis (i.e. linearity, normality and homoscedasticity) (Hair et al., 1998). Accordingly, for eliminating the heteroscedasticity problem, the researcher could transform the data of the study before the analysis process, for instance; take the natural log of a variable (Hageman, 2008). As for this particular study and following the positivist philosophy and the deductive approach; the archival research strategy is appropriate for achieving the aim and objectives of this study. Adopting this strategy will help to answer the questions of this research (see section 1.6) which focus on analysing changes in the value of stock exchanges over time pre-post the demutualization. In order to capture the causal relationships between the demutualization process and the variables used to measure the value of stock exchanges, the research investigates secondary data for all the selected variables. Moreover, Finkel (1995) argued that using a panel is constructed in a manner that permits stronger causal inference since it clearly assembles in the time element of a casual process. Accordingly, this study measures and statistically control for various causal variables other than the demutualization that may affect the performance of stock exchanges such as macroeconomic factors and a stock exchange's characteristics as provided in a wide range of previous literature.

6.6 Research Choices

According to Saunders, Lewis and Thornhill (2009) the research choices layer refers to the choice between qualitative, quantitative or mixed methods. Both terms (qualitative and quantitative) can be used to differentiate between the methods used to collect and analyse data. For the most part, qualitative methods display non-numerical data that are generated from any data collection technique (i.e. an interview) or data analysis procedure (i.e. categorising data). In contrast, quantitative methods predominantly display numerical data generated from any data collection technique (i.e. questionnaire) or data analysis procedure (i.e. statistics) (Saunders, Lewis and Thornhill, 2009). Finally, choosing mixed methods refers to the parallel (at the same time) or sequential (one after the other) usage of both qualitative and quantitative methods in data collection instruments associated with data procedures analysis. In qualitative studies, data are usually in textual or graphical form and are generated from individual/participant's observation, document analysis, focus groups and in-depth interviews therefore; the researcher is expected to report any personal information that may influence data collection procedures, analysis and findings' interpretation (Yilmaz, 2013). On the other hand, in quantitative studies, data include numbers generated from surveys, questionnaires and methodical measurements and use statistics and mathematical models in analysing the data hence, there is no interaction between the researcher and reporting findings (Yilmaz, 2013). Whether a researcher is using qualitative, quantitative or mixed methods, the researcher can employ a single or multiple data collection techniques and data analysis procedures. The mono method uses a single method (quantitative or qualitative) to collect research data with corresponding analysis procedures. In contrast, multiple methods refers to combining data collection techniques and analysis procedures using two different possibilities forms of multiple methods design as when using

mixed methods (i.e. using qualitative and quantitative methods) or multi methods. Multi method presents the combination of more than one data collection technique with their associated analysis techniques when using either qualitative or quantitative methods (Tashakkori and Teddlie 2003 cited Saunders, Lewis and Thornhill, 2009, p. 152). Figure 4.6 depicted the research choices available for a research.

Figure 6.2: Research Choices



Source: Saunders, Lewis and Thornhill (2009, p. 152)

For this particular research, the quantitative mono method is used. The research choice of the quantitative mono method seems to be more appropriate because the main dimensions of this research can be measured and operationalised objectively and thus, may attain higher score of reliability. The research adopts only quantitative methods and a single data collection technique, which is the collection of secondary data for all the selected variables. Following the data collection, the study will perform the appropriate analysis procedures by applying statistical methods using Stata. Quantitative data collection is relatively quick and provides precise numerical data, which allows a research construct that could control or eliminate confounding influence of many other variables, providing credible estimation of cause and effect relationships

(Johnson and Onwuegbuzie, 2004). Respectively, data analysis using statistical software package (e.g. Stata) is less time consuming and the research findings are independent of the researcher (e.g. statistical significance; effect size) (Johnson and Onwuegbuzie, 2004). As for this particular study, using Stata is essential to accomplish objective three. The secondary data of all the selected variables collected from stock exchanges historical records and the statistical (quantitative) analysis procedures will be presented in the following sections.

6.7 Time Horizons

Saunders, Lewis and Thornhill (2009) clarified that there are two types of time horizon which are cross-sectional and longitudinal. In a cross-sectional study, the variables are examined over the same period, whereas in a longitudinal study the same variable are examined continuously over a determined period and so some observations will show a slightly change where others will change considerably (Collis and Hussey, 2013). Repeated observations may reveal a relative stability of the studied phenomena as the researcher can pursue some control over the research variables (Adams and Schvaneveldt, 1991 cited Collis and Hussey, 2013). Longitudinal studies are costly and time consuming. In addition, once the study has started, it must be continued but with high risk of losing subjects during the time of the study (Collis and Hussey, 2013). An advantage of using a longitudinal time horizon in a research study is the ability to study change and development. Furthermore, the longitudinal studies are often associated with positivist methodology and can be conducted using secondary data (Collis and Hussey, 2013). Accordingly, this research is considered a longitudinal study that studies the effect of demutualization process (event) on the stock exchanges' value/performance (change) through a series of snapshots (pre-post demutualization) that lay within the period of time from 1995 to 2012 in order to collect as many observations as possible for each window; pre and post the

demutualization date for each stock exchange. In addition, the year of demutualization will be excluded from the analysis as it includes both mutual and demutualized phases.

6.8 Data Collection and Data Analysis

This section presents the methods of data collection and the procedures applied to analysing the research data in order to answer the research question and meet the objectives of the study.

6.8.1 Data Type and Collection

There are two main types of data, primary data and secondary data. Primary data refer to data collected specifically for the purpose of a research for the first time where the researcher involved in the data collection process. On the other hand, secondary data refer to data previously collected for some other purpose other than the researcher's purpose and reanalysed to address the objectives of a research and answer its questions (Rose, Spinks, and Canhoto, 2014). However, using secondary data can have many advantages and disadvantages. Secondary data have fewer resource requirements and thus allow the researcher to spend more time and effort analysing and interpreting the data. Secondary data also provide an available and permanent source of data that can be easily accessible by others at any point in time (Denscombe, 2007 cited Saunders, Lewis and Thornhill, 2009). Furthermore, the facility of reanalysing secondary data can result in unexpected or unforeseen discoveries (Saunders, Lewis and Thornhill, 2009). On the other hand, it may be difficult or costly to access such type of data. However, there is no real control over data quality, thus the researcher must be careful when obtaining data from the available data sources. According to Saunders, Lewis and Thornhill (2009), the matter of controlling the quality of the secondary data is questionable; although the secondary data collected from governments and data archives have higher quality than data collected by the researcher himself. Moreover, as for the fact that secondary data maybe

collected and aggregated for a specific purpose and therefore, such aggregations are suitable for meeting the requirements of the original work but not necessarily suitable for another research (Saunders, Lewis and Thornhill, 2009). Since, the aim of this particular research is to quantify the impact of the demutualization process on the financial performance, internal corporate governance mechanisms, the study uses secondary data with a belief to achieve the objectives and answering the questions of this research. To the best of this study's knowledge, all the previous studies assessing the impact of the demutualization on stock exchanges financial performance (as discussed earlier in section 3.2.1) relied on the usage of the secondary data without any interference from the author/researcher as they all depended on facts, which is consistent with this research philosophy (positivism). The study uses U.S. dollar currency for all monetary data. In addition, for controlling the quality of secondary data which may be questionable, the study collected and /or calculated all financial data by reviewing and analysing the financial statements of stock exchanges presented in annual reports that are available on their official websites. All the market data were collected from the World Federation of Exchanges (WFE). In addition, this, data for economic factors were collected from the International Monetary Fund (IMF). More importantly, the availability and accessibility of such secondary data made this research possible. The possibility of reanalysing the obtained data can provide significant contribution to knowledge in the field of stock exchanges. For instance, analysing the liquidity of stock exchanges following a new perspective (i.e. cash holdings), considering the different maturities of debt level and including the new factor of internal corporate governance mechanisms in this study may result in unforeseen discoveries on the link between the demutualization of stock exchanges and its performance. In addition, as the study examines a

large number of variables that have different nature and data distribution therefore, the study used unbalanced panel data model.

6.8.2 Sample Size and Period Covered by the Study

The sample of exchanges selected for this research is a sample of exchanges that are members of the World Federation of Exchanges. This study contains large number of variables and therefore, the sample was selected from members of WFE to insure the availability of such data that covers the period from 1995 to 2012. World Federation of Exchanges members represent the majority of the global exchanges (i.e equities and derivatives). The WFE deals with standard-setters, regulators, policy makers and government organisations all over the world to enhance and promote the development of fair, transparent, stable and efficient markets. The WFE is the definitive source of exchange-traded statistics and publishers including over 350 market data indicators. According to the WFE the legal category of stock exchanges (2012) are as follows:

- 1- First; private limited companies which are stock exchanges with paid capital and the intermediaries/members are the only owners where there is no separation between ownership and trading rights.
- 2- Second; stock exchanges that are recorded as private companies with limited liabilities which are demutualized (non-listed for profit organisations) and the ownership is to some extent open.
- 3- Third; stock exchanges that take a further step and become publicly-listed companies where their shares are publicly traded.
- 4- Fourth; mutual stock exchanges with restricted membership and no share capital.
- 5- Fifth, stock exchanges with other legal status such as the ones with state-ownership.

As discussed earlier, the demutualization affect the ownership and governance structure of stock exchanges and for the importance of these two dimensions, the selected sample includes the stock exchanges that went through the different phases of governance structure used by stock exchanges. That is a stock exchange was mutual/cooperative structure then became demutualized or took a step further and became a publicly-listed company. Therefore, to achieve the aim of this study, this research obtained data for demutualized but not publicly-listed exchanges and stock exchanges that are demutualized and then became publicly-listed companies that are members of the World Federation of Exchanges. However the study excluded private limited companies registered as private companies from the selected sample because exchanges with such legal status are owned and controlled by their member who defies the definition of the demutualization process (Aggarwal, 2002) that relies mainly on the decoupling of membership rights and ownership rights. The obtained data included observations pre and post the demutualization (event) for all variables in each stock exchange. At the end of 2012, the WFE reported 32 demutualized/publicly-listed stock exchanges; 23 publicly-listed exchanges and 9 demutualized but not publicly-listed exchanges (see Appendix).

Selection Criteria of tested stock exchanges

Although, the research intended to include all the 32 stock exchanges however, due to the large number of variables in this research it was necessary to set certain criteria to achieve consistency, transparency, reliability and validity. In order to achieve its aim and objectives, the selected stock exchanges must meet the following criteria:

1- For the sake of consistency, the selected stock exchanges are equity markets only. As a derivative market differs in its product lines and economics (Oldford and Otchere, 2011) therefore, the derivatives markets (namely, Chicago Board Options Exchange, CME Group,

Intercontinental Exchange and China Financial Futures Exchange) are excluded from the sample (similar to Azzam, 2010).

2- The study will only include stock exchanges that have their annual reports in English except for Bolsa Mexicana de Valores. However, the study excluded Bolsa de Valores de Colombia and Bolsa de Valores de Lima for limitations in language translation.

3- The study excluded the stock exchanges with no specific demutualization date (namely, Bolsa de Comercio de Santiago, Taiwan Stock Exchange and National Stock Exchange of India). As for instance, Taiwan stock exchange because it has been a company-type exchange since its foundation (IOSCO, 2005). However, as for the case of the National Stock Exchange of India, Treptow (2006) clarified that although the National Stock Exchange of India is operating on for-profit basis yet, its membership is not fully separated from its ownership and its shares are not traded freely, thus it does not meet the criteria of a demutualized stock exchange.

4- The study excluded stock exchanges with missing annual reports, as this was the case in some exchanges particularly for the period before the demutualization when exchanges were operating under a mutual structure (Appendix). In summary, according to the availability of sufficient data, the sample is composed of 15 equity markets of different sizes and in different regions that demutualized at different points in time (Appendix) The sample represents 53% of the total demutualized stock exchanges (i.e. equity markets) for the period from 1995 to 2012.

6.8.3 Selection and Validity of Research Variables

This section provides the variables used in this study and the measures to needed to attain these variables in context of the financial performance, and internal corporate governance mechanisms.

6.8.3.1 Financial Performance

This study will assess the financial performance of stock exchanges from different perspectives (i.e. liquidity, leverage/capital structure, and profitability) by using accounting measures. Generally, accounting-based measures which can be presented by values, ratios and percentages, is considered as one of the main organisational performance measures applied in finance and accounting studies (e.g. Penman, 2001; Carton and Hofer, 2007).

Liquidity

As discussed previously, this study will follow the corporate literature in investigating the liquidity perspective using the cash holdings, since no prior study in context of the demutualization of stock exchanges has examined liquidity from this perspective. The cash item is considered as the most liquid item shown in a corporation's balance sheet and has a significant attention from many parties such as stockholders, investors, financial analysts and companies themselves (Subramaniam et al., 2011). Accordingly, cash management is an inherent part of corporation's financial policy, strategy and maintains its financial flexibility thus, enhancing its value. The core components of cash holdings are the cash and cash equivalent where the cash equivalents are represented by marketable securities. There are different alternative forms, where the traditional and common form is defined as cash and cash equivalents to total assets (e.g. Kim, Mauer and Sherman, 1998; Ozkan and Ozkan, 2004; Bates et al., 2009; Martínez-Sola et al., 2013). Another alternative form is defined as cash and cash equivalents to net assets where the net assets are equal to the total assets minus the cash and cash equivalents (i.e. marketable securities) (e.g. Opler et al., 1999; Ferreira and Vilela, 2004). However, applying this form maybe associated with extreme outliers (Bates et al., 2009). Thus, a new form was produced by Foley et al. (2007) by applying the logarithm of cash and cash equivalents to net assets. This

study will use the common form of cash holdings following Kim, Mauer and Sherman (1998), Ozkan and Ozkan (2004), Bates et al. (2009) and Martínez-Sola et al. (2013).

$$\text{Cash holdings} = \frac{\text{cash and cash equivalents}}{\text{total assets}}$$

Leverage/Capital Structure

The significance of analysing the capital structure/leverage of a stock exchange is to determine the level of debt used as a source of finance especially after the adopting the demutualization strategy. The most frequently accounting measures used to assess the leverage position are the debt ratio and the debt to equity ratio. Previous studies used one or both of these ratios as leverage proxies, like Mendiola and O'Hara (2003) and Otchere (2006) used the debt to equity ratio, where Azzam (2010) used the debt ratio. On the other hand, Morsy and Rwegasira (2010) used both the debt and debt to equity ratios. Accordingly, this research will use the debt to equity ratio as a proxy for leverage. In addition, this study will examine the impact of demutualization on debt maturities (i.e. short and long-term). Custódio, Ferreira and Laureano (2013) clarified that determining the debt maturity structure is a vital factor for a firm as it affects its financial policy as using the total debt only may disguise critical differences between short-term and long-term debts (e.g. Van der Wijst and Thurik, 1993; Titman and Wessels, 1988). Since no prior study in favour of the demutualization of stock exchanges has examined the debt maturity structure, this study will follow the previous studies from the literature of corporate field in measuring the debt maturities (e.g. Titman and Wessels, 1988; Van der Wijst and Thurik, 1993; Frydenberg, 2004; Viviani, 2008).

$$\text{Leverage} = \frac{\text{total debts}}{\text{common equity}}$$

$$\text{Short – term debt Ratio} = \frac{\text{short – term debt}}{\text{total assets}}$$

$$\text{Long – term debt Ratio} = \frac{\text{long – term debt}}{\text{total assets}}$$

Profitability

The accounting/financial ratios used under this perspective present an organisation's earnings relevant to its stockholders' equity, assets and revenues (sales). The most widely-used measures amongst all financial ratios are return on assets (ROA), return on equity (ROE) and net profit margin (Brigham, and Ehrhardt, 2011). In examining the firm's effectiveness in using its assets to generate earnings, the return on assets (ROA) is the appropriate profitability ratio can be applied. The significance of using the ROA ratio is the direct effect of the firm's assets on its expenses and income (e.g. Van Horen, 2007; Kosmidou, Pasiouras, Tsaklanganos, 2007). Another important profitability ratio is the return on equity (ROE). Return on equity reveals the level of firm's earnings generated from the resources of its stockholders (owners). Applying this ratio reflects to what extent the objective of maximising stockholders wealth has been achieved (Arora and Chaudhary, 2016). In context of the demutualization and its effect on the financial performance, especially the profitability perspective of stock exchanges has been examined empirically from several studies. Mendiola and O'Hara (2003), Azzam (2010) and Otchere and Mohsni (2016) used the ROA and ROE. Furthermore, Otchere (2006), Otchere and Abou-Zied (2008), Morsy and Rwegasira (2010), Oldford and Otchere (2011) used the ROA, ROE and net

profit margin as profitability ratios proxies. Accordingly, this study will use the both ratios; return on assets (ROA) and return on equity (ROE); to assess the impact of the demutualization on the profitability position of stock exchanges.

$$ROA = \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{total assets}}$$

$$ROE = \frac{\text{net income}}{\text{common equity}}$$

6.8.3.2 Internal Corporate Governance Mechanisms

This section will explore the variable's measurement of each of the board characteristics that would be affected by the change of stock exchange's governance structure in accordance to the literature review and the theoretical foundations of the agency and resources dependence theories explained in chapter two. The study will examined the effect of stock exchanges' demutualization on the corporate governance internal mechanisms, that is, each variable represents the attribute concerning the stock exchange board of directors like board size, board independence and director's remuneration. Focusing on the role of the board of directors as the main control mechanism in protecting the shareholders' interests against opportunistic management behaviour, many studies essentially tackled the impact of corporate governance on corporation/firm performance. Accordingly, this research will also examine the ability of the changes in the board of director's characteristics derived by demutualization to enhance the value (performance) of the stock exchange. Due to the lack of empirical studies concerning the internal corporate governance mechanisms in the context of the demutualization of stock

exchanges, this study will follow the studies that have tackled the relationship of governance mechanisms and firm performance (i.e. corporate finance field) in identifying the variables measurements; board size, director's independence and director's remuneration.

Board Size

Many scholars tackled the importance of corporation's board size and its effect on its performance as an indicator of monitoring and advisory activities (e.g. Yermack, 1996; Jensen, 1993; Hermalin and Weisbach, 2003). Board size is considered as one of the main configurations of firm's board of directors and to test its effect on firm performance, various research measured board size as the total number of directors (members) presented on the board of a firm (e.g. Eisenberg, Sundgren and Wells, 1998; Mak and Li, 2001; Dalton and Dalton, 2005; Shukeri, Shin and Shaari, 2012; Moscu, 2013). Following these studies, the board size of this research will be measured by the total number of directors (members) on the board of the stock exchange.

Board Independence

Similar to the board size, independence of directors has much attention in corporate governance literature. Hermalin and Weisbach (1988) argued that directors can be classified as inside (i.e. executive) directors who are currently employed by the firm, or are family members of its employees, or are retired employees. However, outside directors who are neither employed by the firm nor have any substantial business relations with the firm. As an effective tool towards manager's monitoring, Fama and Jensen (1983) emphasised the importance of existing outside/independent directors among the firm's board members. To identify the measurement of the outside independent directors variable, this study will follow various studies such as: Zahra and Stanton (1988) Fosberg (1989) Hermalin and Weisbach (1991) Bhagat and Bolton (2008) and Arosa, Iturralde, Maseda (2013) in presenting the outside independent directors. Therefore, the

outside independent directors will be measured as the proportion (ratio) of outside directors to the total number of directors (members) of stock exchange's board.

Director's Remuneration

Board remuneration can be recognised through a proposed contract to firms' directors that contains their compensations aligned with interests of firms' stockholders (Jensen and Murphy 1990). Once performance improved, directors/agents receive additional compensation. Director's remuneration package can be classified to fixed and variable compensations (Reinhard and Escobar, 2016). The fixed compensation mainly comprises the fixed basic salary which the remuneration received by a director in terms of the contract with the firm, so it is not contingent on performance, but rather based on competitive benchmark of specific industries or market peers (Mallin, 2010). In addition to the basic salary, other benefits and allowances such as firm's car, aircrafts, health care and home security are part of the fixed remuneration. On the other hand, the variable compensation is related to firm's performance (Reinhard and Escobar, 2016). The variable compensation can take various forms; bonus, stock options and stock grants. Executives can received bonus in annual basis which are usually attached to accounting-based performance measures (e.g. Mallin, 2010; Kim, Nofsinger and Mohr, 2010). Annual bonus considers as short term incentive as it gives executive directors incentives to achieve higher accounting or stock performance in a short period (Reinhard and Escobar, 2016). Further, executives can received other variable compensation; stock options and stock grants as long-term incentives. In stock options, executives/directors have the right to buy stocks at a specified exercise price (pre-determined price) over a specific number of periods. The benefits from the stock options rely on the difference between the exercise price and the actual market price of the shares. Another long-term incentive received by executives is stock grants which sometimes

refer to restricted share plans as it is conditioned with a certain time of period the executives must spend in the firm (Mallin, 2010). Furthermore, previous studies used different proxies to quantify the pay level in relation to firm's performance, as some examined only the CEO pay level (e.g. Hall and Liebman, 1998; Zhou, 2000) others, like Basu et al. (2007) examined top executives remuneration. Some scholars used the average of directors' remuneration and the remuneration of total directors (e.g. Abdul-Wahab and Abdul-Rahman, 2009; Yatim, 2012; Andreas, Rapp and Wolff, 2012) and the non-executives basic fees and fees paid in shares (Müller, 2014). In the context of stock exchange demutualization, Angulo, Slimane and Alidou (2014) examined the remuneration package of the executive team pre and post the demutualization of the London Stock Exchange (LSE). Choosing the total board remuneration as a proxy rather than executive/top executives in linking the managerial incentives to performance of stock exchanges comes from the early work of Main, Bruce and Buck (1996) followed by other studies. As for Main, Bruce and Buck (1996), the broadening of the usual approach (i.e. executive or CEO remuneration) is justified by directors' powers which are "*conferred upon the board collectively as a board*" (Grown, 1992 cited Main, Bruce and Buck, 1996, p. 1634). From the agency perspective, the board of directors (agent) act on behalf of stockholders (principal) and has the authority in allocating the resources of a firm, hence, it is the board collectively rather than CEO or individual directors. In addition, Main, Bruce and Buck (1996) pointed out that previous studies adopted the usual approach (i.e. executives/CEO pay-level) for the limitations of data availability. From the above illustration, this research will use the natural logarithm of the total board remuneration including all inside (executives) and outside (independent) directors/board members following Abdul-Wahab and Abdul-Rahman (2009) and Yatim (2012).

6.8.3.3 Demutualization Variable

As the aim of this study is to study the impact of demutualization (event) on stock exchanges value; demutualization is a binary variable that takes zeros for years prior the demutualization year and ones for years post the demutualization year, similar to Azzam (2010) and Oldford and Otchere (2011).

Financial Crisis

The recent global financial crisis 2008/2009 had a major impact on financial markets and is considered one of the most destructive crises since the Great Depression of 1929 that mainly originated in the U.S. market and further spread to affect both developed and emerging markets and so the real economy globally. In a broad analysis of the impact of the recent financial crisis on global equity markets, Bartram and Bodnar (2009) argued that the financial sectors were affected greatly compared to non-financial sectors. In the context of the demutualization of stock exchanges, to control the effect of the last financial crisis, Azzam (2010) used the global financial crisis as a dummy control variable in examining the impact of the demutualization on stock exchange's performance. This study will follow Azzam (2010) and control for the effect of the recent global financial crisis which is a binary variable that takes one for the periods of crisis (i.e. 2007, 2008 and 2009) and zero otherwise.

Macroeconomic Variables

In general, previous literature of corporate finance shows the strong impact of macroeconomic variables on firms' performance. Similarly, in context of demutualization of stock exchanges, some studies consider the impact of macroeconomic variables (i.e. GDP growth, inflation rate and interest rate) on the financial performance and product market/sources of revenue of stock

exchanges (e.g. Otchere, 2006; Otchere and Abou-Zied, 2008; Azzam, 2010; Oldford and Otchere, 2011). Following these studies, this study will use macroeconomic variables to control the economic differences between countries (i.e. stock exchanges) especially the GDP growth and the inflation rate.

Size

In general, the size of firms considers one of the main characteristics that have been used in previous literature in many fields. In context of demutualization of stock exchanges, some previous studies revealed the importance of the size of stock exchange and its effect on its performance. Both Azzam (2010) and Oldford and Otchere (2011) used the natural logarithm of stock exchange total assets as a proxy for an exchange's size. In this study, the size of stock exchange is measured as the natural logarithm of its total assets and used as a proxy for its size.

Assets Tangibility

Assets tangibility is considered one of the main determinants of a firm's liquidity and capital structure/leverage which refers mainly to a firm's tangible fixed assets. Accordingly this study will use the most common proxy of assets tangibility following studies such as Rajan and Zingales (1995), Deesomsak, Paudyal and Pescetto (2004), Drobetz and Grüninger (2007), Antoniou et al. (2008) and Frank and Goyal (2009).

$$Assets\ Tangibility = \frac{Fixed\ assets}{Total\ assets}$$

Non- Cash Liquid Assets

This variable is one of the determinants of liquidity/cash holdings, as it refers to the liquid assets other than cash and cash equivalents that can be liquidated and used as substitutes of liquidity in case of a shortage of cash. Previous literature used the ratio net working capital as proxy of non-cash liquid assets, where the net working capital (NWC) is the difference between current assets

and current liabilities. Accordingly, this study will follow previous studies such as Opler et al. (1999), Ozkan and Ozkan (2004) Bates et al. (2009), Gao, Harford, and Li (2013) and Guizani (2017).

$$\text{Non-cash liquid assets} = \frac{\text{NWC} - \text{cash and cash equivalents}}{\text{total assets}}$$

Dividends

Previous literature refers to another determinant of liquidity /cash holdings of a firm; its payment of dividends. Following previous studies, this study will present the dividends as dummy variable that takes one if a stock exchange is paying dividends in a particular year and zero if not (e.g. Opler et al., 1999; Dittmar, Mahrt-Smith and Servaes, 2003; Ozkan and Ozkan, 2004; Ferreira and Vilela, 2004; Bates et al., 2009; Gao, Harford, and Li, 2013).

Growth Opportunities

The importance of this variable has been introduced by many theories and empirical studies especially related to liquidity/cash holdings and leverage. Accordingly, this study will follow Dittmar, Mahrt-Smith and Servaes (2003) in using the change in sales as a proxy for investment opportunities.

$$\text{Growth opportunities} = \frac{\text{revenues } t - \text{revenues } t - 1}{\text{revenues } t - 1}$$

6.9 Data Analysis Procedures

This section will discuss the data analysis procedures through applying different statistical techniques in order to answer the questions and testing the developed hypotheses of this study.

Panel Data

According to Brook (2014), sometimes the financial modeling comprises both cross-sectional and time series elements. Such dataset is known as panel data (longitudinal data). Panel data

includes information of the same individuals (entities). The usage of panel data has many benefits/advantages. Panel data has a better control of individual/entity heterogeneity, more degrees of freedom and less collinearity among variables. Moreover, panel data has better ability for identifying and estimating effects that are noticeable in data of pure time-series or cross-sectional studies. There are two types of panel data; balanced and unbalanced. Simply when the same time periods (number of observations) of a study are similar for each cross sectional units, it is known as balanced panel data. On the other hand, when the time periods differ for each cross sectional units, then this is known as unbalanced panel data (incomplete panel) (Brooks, 2014). Since this study presents stock exchanges that had different number of time series observations due to the differences of the year of the demutualization in each stock exchange covering the period from 1995-2012, the study made use of unbalanced panel.

Different Approaches in Testing the Event Study

Before presenting the statistical techniques applied in this study, it is essential to exhibit the different approaches used to assess an event study. By reviewing the empirical studies on the impact of changing the ownership structure due to adopting a new strategy (e.g. demutualization) on the performance of stock exchanges were mainly followed two approaches. The first approach was preliminary introduced by the methodology applied in the work of Megginson, Nash and Randenborgh (1994) which known as MNR methodology. Particularly, when government of state-owned enterprises (SOEs) converted to private economic enterprises took place and used worldwide in the period of the global shift from “*state socialism*” towards “*entrepreneurial capitalism*” (Megginson, Nash and Randenborgh, 1994, p. 44) through adopting an economic policy called privatisation. The MNR study examined the financial/operating performance of companies from different countries and various industries pre and post privatisation by

comparing two groups; the tested group (i.e. privatised companies) and the control group (i.e. non-privatised companies) thus, any observed differences resulted from comparing the two groups can be largely attributed to the new economic policy applied (i.e. privatisation). Similarly, in the context of demutualization of stock exchanges, some studies (e.g. Mendiola and O'Hara, 2003; Otchere, 2006; Otchere and Abou-Zied, 2008) had followed this approach by comparing two groups of stock exchanges; the tested group which comprised of the demutualized/publicly listed stock exchanges and the control group which comprised of similar stock exchanges of the treatment group but did not demutualize (e.g. mutual stock exchanges) as any changes of the tested variables between the two groups could be attributed to the demutualization strategy. The main advantage of applying the MNR methodology is that the researcher could examine a large sample of different countries, different industries over different periods of time which allow to aggregate multi-national and multi-industry results efficiently using simply the difference in means or medians of the selected variables (i.e. pre-post privatisation) by applying parametric or non-parametric tests (i.e. t-test or Wilcoxon test). However the MNR methodology has some drawbacks; first, the selection bias, specifically towards the largest firms sold during the privatisation program, second, ignoring the changes in macro economy or industry during the time periods of event when computing the performance of pre-post privatisation and third, it is difficult or sometimes impossible to determine the appropriate members of the control group to be compared to members of the treated group (e.g. Galal et al., 1994; Megginson and Netter, 2001). As for instance, the study of Mendiola and O'Hara (2003) suffered from some limitations; as it focused only on the comparison of public stock exchanges (i.e. IPOs) and so the majority of these exchanges were the large ones as the small stock exchanges were still mutual-member owned exchanges. This issue makes it difficult

to apply comparisons over all stock exchanges. On the other hand, the second approach relies on comparing the performance of stock exchanges pre and post the demutualization period, however any significant differences shown in the findings may or may not attributed to the demutualization strategy as there is no benchmark (i.e. control group) to compare the findings with. At this point, an influential study conducted by Galal et al. (1994) suggested that this issue can be sorted out by having sufficient data and applying statistical regression analysis. In extending this discussion, Galal et al. (1994) argued that the first step in the analysis is by comparing the performance of the firms, pre and post divestiture where the main goal at this phase is to determine any changes in firms' performance which at this stage of analysis, these changes may have been caused by the conversion. A methodological problem of this step is that it will not identify how much of any change was attributed to divestiture and how much to exogenous changes related to institutions or markets. To address this problem a regression analysis with sufficient data could be used. Limited studies in the context of demutualization of stock exchanges followed this approach such as Azzam (2010) and Oldford and Otchere (2011). As for this particular study, it is problematic to determine a control group (mutual stock exchanges) as the selected stock exchanges vary in size and also includes the largest stock exchanges of different regions. Accordingly this study will apply the second approach.

Specification Tests for Panel Data

As an initial step, the study will describe and summarise all variables using descriptive statistics. According to Saunders, Lewis and Thornhill (2009) descriptive statistics enable the researcher to describe and compare the study's variables in numeric manner. One of the major types of descriptive statistics is measures of central tendency. Measures of central tendency provides one number presenting the entire set of scores such as the mean that presents the average of all data

values and the median that presents the middle point of data values. Beside the importance of describing the central tendency of variables, the research needs to describe the dispersion of data values around the central tendency. One of the ways that most frequently used is to calculate the standard deviation. As the main purpose of this study is to assess the impact of the demutualization on stock exchanges value by comparing all the related variables pre and post the demutualization, the descriptive statistics will reveal the calculation of the mean, median and standard deviation of the variables separately for the pre and similarly for the post of the demutualization (event).

Hypothesis (Significance) Tests

The importance of using significance (hypothesis) tests relies on comparing the selected data with what would be theoretically expected to happen (Saunders, Lewis and Thornhill, 2009). Hypothesis tests have two main groups: parametric and non-parametric statistics. The parametric statistics considers as of the most powerful with a number of assumptions that must satisfied (Blumberg et al., 2008 as cited in Saunders, Lewis and Thornhill, 2009, p. 449):

- The data of the sample should be independent.
- The data are normally distributed
- The data should have equal variances.
- The data are numerical.

If the above assumptions are not satisfied, the study will use the non-parametric statistics. Both parametric and non-parametric statistics based on the probability (p-value) of the study's test results, as the null hypothesis refers to that there is no significant difference between the variables and the alternative hypothesis refers to that there is a significant difference between the variables. Accordingly, if the p-value of the conducted test is low ($p < 0.05$) then the null

hypothesis will be rejected which means there is a significant difference between the variables. However, the test's p-value is high ($p > 0.05$) then, the null hypothesis is accepted and the alternative one is rejected (Saunders, Lewis and Thornhill, 2009). One of the popular parametric statistics that can be used in case of having two variables (numeric data) measuring the same feature but under different conditions (e.g. pre-post event) is the t-test conditionally with the normality assumption. On the other hand, if the normality assumption is not satisfied (e.g. data are skewed) then the appropriate statistics test to be applied is Wilcoxon Test (Saunders, Lewis and Thornhill, 2009). Accordingly, to select between the parametric and non-parametric statistics, the study will test the normality distribution of the data using a numerical method by applying Shapiro-Wilk/S-W test.

Multivariate Regression Analysis

As discussed earlier, this study will follow the second approach in analysing the impact of the demutualization on stock exchanges' performance. Therefore, applying the parametric or non-parametric statistics will indicate if there are significant differences (changes) between the variables pre and post the demutualization and attributing these changes to this strategy (demutualization). However, since the economic conditions are permanently changing, therefore, any changes in a stock exchange performance could be attributed to the changes in the economic environment rather than by the demutualization strategy itself. Thus, this problem can be sorted out by applying a statistical regression technique (Galal et al., 1994). Generally, ordinary least square (OLS) is a powerful regression technique, particularly for models including continuous variables conjunction with dummy variables which is the case in this study (Hutcheson and Sofroniou, 1999). However, applying OLS regression is coupled with certain conditions that

must not be violated such as linearity, homoscedasticity, no autocorrelation and multicollinearity/ no perfect collinearity (Wooldridge 2012).

Linearity

Testing linearity assumption is required for applying a linear regression model, where simply the relationship between the dependent variable and independent variables has the shape of straight line, however, sometimes this linear relationship may not be met (Brooks, 2014). Accordingly, the issue of linearity versus nonlinearity is addressed and examined as well. A popular test can be applied for testing the assumption of linearity in regression model is Ramsey's RESET (i.e. Regression Equation Specification Error Test) (e.g. Ramsey, 1969; Thursby and Schmidt, 1977; Thursby, 1979; Sapra, 2005; Wooldridge, 2012). This test considers using high order powers of fitted values of y such as \hat{y}_t^2 or \hat{y}_t^3 in order to capture a set of non-linear relationships, where the null hypothesis refers to linearity and the alternative refers to nonlinearity and the F distribution is using to test the hypothesis:

$$\mathbf{H0} = \hat{y}_t^2, \hat{y}_t^3 = 0$$

$$\mathbf{H1} = \hat{y}_t^2, \hat{y}_t^3 \neq 0$$

The F – statistic = $\frac{(SSE_R - SSE_U) \div J}{SSE_U \div (T - K)}$ where SSE_R and SSE_U are the sum squared errors for the

restricted and unrestricted models respectively, J represents the two hypotheses, T refers to the number of observations while K is the number of regressors. If the p value is significant ($p < 0.05$) then the null hypothesis is rejected and a non-linear relationship exists and if p value is non-significant ($p > 0.05$) then the test fails to reject the null hypothesis and a linear relationship exists.

In case of an apparent of non-linear relationship in one or more of the tested models, this study will follow different treatments. One treatment is take the log or natural log to both dependent and independent variables (Allen, 1997). Another treatment of the non-linear transformation is to address a polynomial transformation when variables might be raised to a power either 2 to

address quadratic relationship or 3 to address cubic relationship (Berry and Feldman, 1985; Pindyck and Rubinfeld, 1991; Briand and Carter. 2011).

Homoscedasticity

The assumption of homoscedasticity refers to that the variance of errors is constant, however if the variance of error terms is not constant, that is called heteroscedasticity (Brooks, 2014). A common way to detect the present of heteroscedasticity is the graphical/visual method where the plotted standardised residuals will be examined against the predicted values. If the plotted points have a systematic pattern, that is an evidence of the presence of heteroscedasticity, however following this method will not reveal the cause of heteroscedasticity. Interestingly, one of the popular statistical methods for detecting heteroscedasticity is the Goldfeld-Quandt test (1965, 1972). This method is based on splitting the test sample into two sub-samples/groups by identifying a certain point that can be used to differentiate between the variance of error terms, then running the regression models in each sub-sample/group and calculating a the variance of disturbance for each, as the null hypothesis is that the variances of disturbances: $H_0: \sigma_A^2 = \sigma_B^2$, and the alternative hypothesis: $H_1: \sigma_A^2 \neq \sigma_B^2$, where the σ^2 is the mean square of residual of a sub-sample (i.e. A or B). The Goldfeld-Quandt test statistic (i.e. F static) is the ratio of the two variances of disturbances. If the test statistic is larger than the critical value the null hypothesis is rejected (Brooks, 2014). One of the core reasons for applying this test is that the power of this test relies on the specific point where to split the sample according to theoretical background such as before and after an event which is similar to the case of this particular study; before and after the demutualization. Accordingly if the result of this test is detecting a presence of heteroscedasticity, then it could be concluded that the demutualization may have an attribute to the changes on the tested variables. In addition another test can be used to detect the

heteroscedasticity is White's test (White, 1980) which can be efficient when the errors are not normally distributed or in cases of non-linear forms of heteroscedasticity. If the null hypothesis is rejected ($p < 0.05$) then the tested model suffers from heteroscedasticity. According to Brook (2014), in the presence of heteroscedasticity, the generalized least squares (GLS) can be used as an alternative regression method of OLS.

Autocorrelation

If the observations of the dependent variable are serially correlated, more specifically, the residuals are correlated, that is to called serial correlation problem. The assumption is that the error terms/residuals are uncorrelated with each other. The presence of serial correlation in panel data models will result in biases in the standard error terms and so the outcomes of the model become inefficient (Drukker, 2003). One of the simplest and powerful tests in detecting the autocorrelation in panel data models is Wooldridge test (Wooldridge, 2002). If the null hypothesis is rejected ($p < 0.05$), then the tested model suffers from a first-order serial correlation (autocorrelation). The correction of the autocorrelation problem can be performed by estimating robust standard errors (clustering) which will change only the significance tests and standard errors with no changing in the estimated coefficients provided by the regression.

Multicollinearity

Another assumption that must not be violated is the assumption of no perfect collinearity which refers to that the independent variables are not correlated with each other, however if the independent variables are highly correlated then this is called multicollinearity problem (Brooks, 2014). The most popular method to test the presence of multicollinearity is by applying the Variance Inflation Factor (VIF) and if the VIF of a variable exceeds 5, that is to said that this variable has highly degree of correlation.

Fixed vs. Random Effects Regression Models

From the previous discussion, if the one of the assumptions of OLS is violated, then an alternative regression technique; generalised least squares (GLS) will be used. According to Brooks (2014); two other approaches are available for panel data; “fixed and random effects” models. The fixed effect model could be entity fixed model or time fixed model. The following illustration presents the entity fixed model equation:

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

where Y is the dependent variable, α is the intercept, β is a $k \times 1$ coefficient to be estimated on the explanatory variables, x_{it} is a $1 \times k$ are the observations on the explanatory variables, $t = 1, \dots, T$; $i = 1, \dots, N$, μ_i is an individual specific effect (do not vary over time and v_{it} is the reminder disturbance that vary over time ($\mu_i + v_{it}$ presents the disturbance term U_{it}). In addition, this model can be modified using dummy variables to represent the Least Squares Dummy Variables (LSDV) as follows:

$$y_{it} = \beta x_{it} + \mu_i 1 + \mu_i D2 + \mu_i D3 + \dots + \mu_i D_N + v_{it}$$

Where $D1$ is a dummy variable for that takes one for all observations for the first entity and zero otherwise ($D2$ presents the second entity, $D3$ the third entity, etc.). On the other hand, the time fixed model relies upon the changing of the average value of the dependent variable (y_{it}) over time not cross section. Then the time fixed effect equation is as follows:

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

Where, γ_t (time-varying intercept) captures all the variables that vary over time (not cross section) which may affect the dependent variable. With the same manner the previous equation can be modified using dummy variables presenting the LSDV as follows:

$$y_{it} = \beta x_{it} + \gamma_1 D1t + \gamma_2 D2t + \gamma_3 D3t + \dots + \gamma_T DTt + v_{it}$$

As D_{it} is a dummy variable for the first entity and takes one for the first time period and zero otherwise. Generally, the time fixed model described the changes in the firms' environment through the sample period. In such case, the change of the environment conditions will logically affect the dependent variable and so all the firms will be affected by this change. Whereas, the alternative to the fixed effect model is the random effects model (the error components model). This model presents different intercepts but constant over time for each firm (entity). The main difference with the fixed effect model is that the intercepts in the random effect model of every cross-sectional firm is affected by common intercept (same at all cross-sectional firm and over time) adding a random variable (ϵ) which varies among cross-sectional entities but is constant over time. Under this circumstances the heterogeneity (variation) across firms (entities) will be shown through (ϵ), unlike, the dummy variables in the fixed effect model (LSDV) will capture the heterogeneity across entities. Thus the random effect equation is as follows:

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

Where $\omega_{it} = \epsilon_i + \nu_{it}$

The Hausman Specification Test: Fixed Effects or Random Effects?

From the previous illustration, a question arises; whether to select the fixed or random effects model to treat the individual specific effects. The appropriate test to distinguish and selecting between the two models in panel data model was developed by Hausman (1978). The Hausman specification test (1978) is testing the correlation between the various variables and the unobserved individual (entity)-specific random effects. In case of there is no correlation found, then the random effect model will be more appropriate to be used, however if there is a correlation then the study will apply the fixed effect model (Greene, 2008).

6.9.1 Empirical Research Models

Recalling back the developed hypotheses from chapter three, the impact of the demutualization on the financial performance and internal corporate governance mechanisms will be examined using the following empirical research models:

The Impact of the Demutualization on Exchanges' Financial Performance

Model 1

$$\text{Liquidity} = \beta_0 + \beta_1 \text{CRISIS} + \beta_2 \text{DEMUTUALIZATION} + \beta_3 \text{LEV} + \beta_4 \text{GDPG} + \beta_5 \text{INFLATION}_{it} + \beta_6 \text{SIZE} + \beta_7 \text{GROWOP} + \beta_8 \text{NONLIQ} + \beta_9 \text{PROFIT} + \beta_{10} \text{DIV} + \beta_{11} \text{TANG} + \epsilon$$

H1: *Demutualization increases the liquidity of a stock exchange.*

The dependent variable examined in model 1 is the liquidity which is measured by the cash holding ratio. The independent variable is demutualization which is a dummy variable that takes zeros for years before demutualization year and ones for years after demutualization. The control variables are the determinants of cash holding which are identified by different motives such as the transaction, the precautionary and the agency motives and characterised by three main theories; the trade-off, the pecking order and the free-cash flow theories. These control variables are CRISIS, recent global financial crisis; LEV, leverage; GDPG, GDP growth rate; inflation, inflation rate; size, stock exchange's size; GROWOP, growth opportunities; NONLIQ, non-liquid assets; PROFIT, profitability; DIV, dividend payments; TANG, assets tangibility; ϵ , error term (for more illustration see chapter 3).

Model 2

$$\text{LEVERAGE} = \beta_0 + \beta_1 \text{CRISIS} + \beta_2 \text{DEMUTUALIZATION} + \beta_3 \text{GDPG} + \beta_4 \text{INFLATION} + \beta_5 \text{SIZE} + \beta_6 \text{GROWOP} + \beta_7 \text{PROFIT} + \beta_8 \text{LIQUIDITY} + \beta_9 \text{TANG} + \beta_{10} \text{AGECOST} + \epsilon$$

Model 2-1

$$\text{STDEBT} = 0 + 1 \text{ CRISIS} + 2 \text{ DEMUTUALIZATION} + 3 \text{ GDPG} + 4 \text{ INFLATION} + 5 \text{ SIZE} + 6 \text{ GROWOP} + 7 \text{ PROFIT} + 8 \text{ LIQUIDITY} + 9 \text{ TANG} + 10 \text{ AGECOST} + \epsilon$$

Model 2-2

$$\text{LTDEBT} = 0 + 1 \text{ CRISIS} + 2 \text{ DEMUTUALIZATION} + 3 \text{ GDPG} + 4 \text{ INFLATION} + 5 \text{ SIZE} + 6 \text{ GROWOP} + 7 \text{ PROFIT} + 8 \text{ LIQUIDITY} + 9 \text{ TANG} + 10 \text{ AGECOST} + \epsilon$$

H2a: *Demutualization increases the short-term maturity of debt of a stock exchange.*

H2b: *Demutualization decreases the long-term maturity of debt of a stock exchange.*

The previous three models are related to the leverage and debt maturities of stock exchanges, where the dependent variables are the leverage measured by debt ratio; STDEBT, short-term debt ratio; LTDEBT, long-term debt ratio respectively. The independent variable is demutualization. The control variables are the determinants of leverage/capital structure and debt maturities which are identified from different theories such as trade-off, pecking order and agency theories. these control variables are CRISIS, recent global financial crisis; LEV, leverage; GDPG, GDP growth rate; inflation, inflation rate; size, stock exchange's size; GROWOP, growth opportunities; PROFIT, profitability; LIQUIDITY, cash holding ratio; TANG, tangibility; AGECOST, agency cost; ϵ , error term (for more illustration see chapter 3).

Model 3

$$\text{PROFITABILITY} = 0 + 1 \text{ CRISIS} + 2 \text{ DEMUTUALIZATION} + 3 \text{ LEV} + 4 \text{ GDPG} + 5 \text{ INFLATION} + 6 \text{ SIZE} + 7 \text{ GROWOP} + \epsilon$$

H3: *Demutualization increases the profitability of a stock exchange.*

In this model the dependent variable is profitability which measured by ROA and ROE ratios. The independent variable is the demutualization. The control variables are: CRISIS, recent global financial crisis; LEV, leverage; GDPG, GDP growth rate; inflation, inflation rate; size, stock exchange's size; GROWOP, growth opportunities; ϵ , error term. The variables of this model were examined by Azzam (2010) and Oldford and Otchere (2011).

The Impact of the Demutualization on Exchanges' Internal governance Mechanisms

Model 4

$$\text{BSIZE} = 0 + 1 \text{ DEMUTUALIZATION} + 2 \text{ LEV} + 3 \text{ SIZE} + 4 \text{ PROFIT} + 5 \text{ GROWOP} + \epsilon$$

H4: *Demutualization of a stock exchange decreases the size of the board of directors.*

In this model the dependent variable is BSIZE, board size. The independent variable is the demutualization. The control variables are: LEV, leverage; SIZE, stock exchange's size; PROFIT, profitability; GROWOP, growth opportunities. This study will follow Lasfer (2006) and Guest (2008) in selecting the previous control variables. As for Guest (2008), the use of the level of leverage is presenting the complexity of a firm. In addition, Guest (2008) used ROA (i.e. profitability) as a proxy for CEO influence which implies that CEO with good performance could influence the size of board of directors and used the growth of a firm in order to control for the monitoring costs, where a highly growth firm needs more monitoring activities. Although, Lasfer (2006) and Guest (2008) used Tobin's Q and research and development expenditure to

sales, this study will use the changes in sales/revenues to maintain the consistency of this variable.

Model 5

$$\text{BOARDIND} = \beta_0 + \beta_1 \text{CRISIS} + \beta_2 \text{DEMUTUALIZATION} + \beta_3 \text{LEV} + \beta_4 \text{SIZE} + \beta_5 \text{PROFIT} + \beta_6 \text{GROWOP} + \beta_7 \text{BSIZE} + \epsilon$$

H5: *Demutualization of a stock exchange increases the fraction of the independent directors as members of the board.*

In this model, the dependent variable; is BOARDIND, board independence. The independent variable is demutualization. The control variables are: CRISIS, the latest global financial crisis; LEV, leverage; SIZE, stock exchange's size; PROFIT, profitability; GROWOP, growth opportunities; BSIZE, board size. This study will follow Lasfer (2006), Guest (2008) and Rashid (2018) in selecting the previous control variables. As for Rashid (2018), the independent directors may play a role in facilitating using the debt as a source of finance using their connections (i.e. networking) with creditors (i.e. banks) and so increasing the level of debt is associated with increasing the monitoring functions. The size of a firm is an indicator of complexity, as large firms are more complex compared to small ones and so will attract more outside directors. For the growth opportunities, Rashid (2018) clarified that outside directors will be more attracted to high-growth firms.

Model 6

$$\text{BOARDREM} = \beta_0 + \beta_1 \text{CRISIS} + \beta_2 \text{DEMUTUALIZATION} + \beta_3 \text{INFLATION} + \beta_4 \text{LEV} + \beta_5 \text{SIZE} + \beta_6 \text{PROFIT} + \beta_7 \text{GROWOP} + \beta_8 \text{BSIZE} + \beta_9 \text{BOARDIND} + \epsilon$$

H6: *Demutualization of a stock exchange has a positive impact on the board*

In this model the dependent variable is BOARDREM which presents the total remuneration of all the directors on the board. The independent variable is the demutualization. The control variables are: CRISIS, the latest global financial crisis; LEV, leverage; SIZE, stock exchange's size; PROFIT, profitability; GROWOP, growth opportunities; BSIZE, board size. Following the notion of agency theory where there is a link between the pay-level and a firm's performance. Accordingly, to improve the firm's performance and maximising its stockholders' wealth a sufficient remuneration packages must be paid to its directors as incentives to efficient monitoring. Thereof, profitability variable has been used by many scholars as one of the core determinant of board remuneration (e.g. Andreas, Rapp and Wolff, 2012; Lee and Isa, 2015). Previous literature following the agency theory showed that small board size is more efficient compared to large one which lead to better firms' performance and so higher level of compensation.

Increasing the number of independent directors could improve the board effectiveness through their monitoring functions and so firms would pay sufficient remuneration in order to attract independent directors especially with high degree of competence (Core, Holthausen and Larcker, 1999). It has been argued that large firms have more ability to attract professional independent directors. A firm with potential growth opportunities needs more directors and managers and so this firm should provide higher remuneration packages. Firms with high level of leverage could suffer from increasing its risk which will lead the firm to increase the remuneration paid to its directors and conversely, higher level of debt could lead to increase the monitoring on managers thus decrease the excess amount of remuneration (Duffhues and Kabir, 2008). Also this model is controlling for the impact of the latest global financial crisis as it could have a significant impact on the director's remuneration package.

Changes in Internal Governance Mechanisms and Financial Performance

Model 7

$$\text{PROFITABILITY} = \beta_0 + \beta_1 \text{CRISIS} + \beta_2 \text{DEMUTUALIZATION} + \beta_3 \text{LEV} + \beta_4 \text{GDPG} + \beta_5 \text{INFLATION} + \beta_6 \text{SIZE} + \beta_7 \text{GROWOP} + \beta_8 \text{BSIZE} + \beta_9 \text{BOARDIND} + \beta_{10} \text{DIRECTREM} + \epsilon$$

H7: *Changes in a stock exchange's internal governance mechanisms derived from the demutualization enhance its financial performance.*

The dependent variable is the PROFITABILITY which will be presented by profitability and measured by ROA and ROE. The independent variable is the demutualization. The previous literature of corporate governance field showed the link between the internal corporate governance mechanisms and performance of corporations. In addition, the importance of the internal mechanisms followed the notion of the agency and resource dependence theories. Many empirical studies revealed a relationship between board size and performance (e.g. Yermack, 1996; Eisenberg, Sundgren and Wells, 1998; Shukeri, Shin and Shaari 2012; Arosa, Iturralde, Maseda, 2013; Moscu, 2013), board independence and performance (e.g. Zahra and Stanton, 1988; Bhagat and Black, 1999; Boone et al., 2007; Bhagat and Bolton, 2008; Shukeri, Shin and Shaari, 2012; Arosa, Iturralde, Maseda, 2013) and director's remuneration and performance (e.g. Cladera and Gispert, 2003; Brick, Palmon and Wald, 2006; Abdul-Wahab and Abdul-Rahman, 2009; Yatim, 2012; Müller, 2014). Accordingly this model includes these internal mechanisms as independent variables. In addition, the control variables are recalled from model 4; CRISIS, the latest global financial crisis; GDPG, GDP growth rate; INFLATION, inflation rate; SIZE, size of a stock exchange; GROWOP, growth opportunities following Azzam (2010) and Oldford and Otchere (2011).

6.10 Conclusion

The chapter has explained and justified the research philosophy, approach and methodology adopted in this study. Then, it identified the research models and the statistical techniques applied in testing such models. Accordingly, this chapter is considered as the main ground of the study's findings and discussion which will be explained thoroughly in the following chapter.

Chapter Seven

Analysis and Findings

		Page number
7.1	Introduction	202
7.2	Hypotheses Testing	206
	7.2.1 Results of Non-Parametric Test	206
	7.2.2 Multivariate Regression Analysis	209
	7.2.2.1 Demutualization and financial performance of stock exchanges	214
	- <i>Findings and Discussions for Model 1</i>	215
	- <i>Findings and Discussions for Model 2</i>	221
	• <i>Findings and Discussion for Model 2-1</i>	223
	• <i>Findings and Discussion for Model 2-2</i>	226
	- <i>Findings and Discussions for Model 3</i>	230
	7.2.2.2 Demutualization & Internal Governance Mechanisms of stock exchanges	234
	- <i>Findings and Discussion for Model 4</i>	235
	- <i>Findings and Discussion for Model 5</i>	238
	- <i>Findings and Discussion for Model 6</i>	240
	7.2.2.3 Internal Corporate Governance Mechanisms and Financial Performance	244
	- <i>Findings and Discussions for Model 7</i>	245
7.3	Robustness Check	248
7.4	Conclusion	256

7.1 Introduction

Chapter seven presents the data analysis findings according to the research methodology discussed in chapter six and additionally it discusses the results obtained. Empirical evidence was provided through applying several statistical tests to test the research hypotheses and hence answer its questions, as follows:

1. What are the impacts of demutualization on the financial performance of the stock exchange?

H1: *Demutualization increases the liquidity of a stock exchange.*

H2: *Demutualization decreases the leverage of a stock exchange.*

H2a: *Demutualization increases the short-term debt of a stock exchange.*

H2b: *Demutualization decreases the long-term debt of a stock exchange.*

H3: *Demutualization increases the profitability of a stock exchange.*

2. What are the impacts of demutualization on the internal corporate governance mechanisms of the stock exchange?

H4: *Demutualization of a stock exchange decreases the size of the board of directors.*

H5: *Demutualization of a stock exchange increases the fraction of the independent directors as members of the board.*

H6: *Demutualization of a stock exchange has a positive impact on the board remuneration.*

3. What is the impact of the changes in corporate governance mechanisms derived by demutualization on the exchanges' financial performance?

H7: *Changes in a stock exchange's internal governance mechanisms derived from the demutualization enhance its financial performance.*

As presented previously in the research methodology chapter, for testing the hypotheses, the study will examine the financial performance and internal corporate governance mechanisms of

stock exchanges pre-and post- demutualization using parametric or non-parametric tests (e.g. t-test or Wilcoxon test) where, the selection between these two tests is determined mainly by the normality assumption of data set. Next, the findings of the parametric or the non-parametric statistics are presented and discussed in section 7.2, which shows if there are significant differences in median values of the tested variables pre-and post- demutualization. However, these findings will give preliminary answers for the first two questions which emphasise that these changes may be caused by demutualization, as with no doubt there are changes in macro economy and different characteristics among the selected exchanges, hence other factors could affect the tested variables beside the demutualization. consequently to determine how much of any change of the tested variables (i.e. endogenous) is attributable to demutualization, and how much to changes of exogenous factors such as unexpected events (i.e. the global financial crisis), macroeconomic and characteristics of stock exchanges, the study will apply the statistical regression technique using panel data for several empirical models.

Checking for Outliers

Before testing normality for the data set, a common problem could be associated with such type of data used in this study is the existence of outliers/influential observations which may influence the accuracy and the reliability of its findings. Actually there is no universal way to deal with such outliers, although some scholars prefer to remove these influential observations. According to Field (2009), to follow this way it should be a good reason to consider that such a case is from different population than the target (tested) one. Another common way in accounting and corporate finance studies dealing with outliers is called winsorisation (Leone, Minutti- Meza and Wasley, 2017) which simply means replacing the extreme values (outliers) of a variable with the most extreme value that has not been removed and in common, winsorisation could be done to

each tail at 0.5% or 1% (Frank and Goyal, 2008). From the previous discussion, the study uses the winsorisation at 1% for both tails where the outliers are replaced in the upper/top 1% tail (lower/bottom 1% tail) with the 99th (1st) percentile of the selected variables.

Test of Normality

After cleaning the data, the study tests for the normality assumption for all the selected variables as it is one of the main conditions that determine the appropriateness of the tests used in this study (i.e. parametric or non-parametric test). As discussed earlier, the study uses Shapiro-Wilk test to examine the normality distribution of selected variables. The findings of this test revealed that that all the tested variables are not normally distributed, as the p-value is less than 0.05, then the null hypothesis is rejected as shown in table 7.1. This result is consistent with Azzam (2010) findings.

Table 7.1: Test of Normality

Variable	Obs.	W	p-value
Cash Holdings	180	0.84592	0.00000
Leverage	180	0.90144	0.00000
Short-Term Debt Ratio	180	0.83194	0.00000
Long-Term Debt Ratio	180	0.84615	0.00000
ROA	180	0.96306	0.00011
ROE	180	0.98319	0.02906
Board Size	180	0.97321	0.00153
Board Independence	180	0.92129	0.00000
Director's Remuneration	180	0.95956	0.00005
GDP Growth	180	0.98123	0.01589
Inflation	180	0.96298	0.00011
Size	180	0.96573	0.00021
Assets Tangibility	180	0.93256	0.00000
TATO	180	0.88422	0.00000
Non-Cash liquid assets	180	0.84063	0.00000
Growth Opportunities	180	0.96487	0.00017

7.2 Hypotheses Testing

As for this study, testing hypotheses are achieved through applying two techniques; the first is by applying non-parametric test (i.e. Wilcoxon signed rank test) and the second is the regression analysis for several empirical models.

7.2.1 Results of Non-Parametric Test

Since the results of the normality test showed that the distribution of data is significantly different from a normal distribution/not normally distributed thereof, the study cannot use parametric test (e.g.t-test) as it is restricted .to dataset with normal distribution and alternatively employs the non-parametric test-Wilcoxon signed rank. The findings of the Wilcoxon signed rank test reveals the difference in medians of the variables pre-and post-demutualization, the null hypothesis is that the median difference between pairs of observations (before and after the demutualization) equals zero and the findings of this test is based on the standardised Z statistics and the p-value. If the p-value is equal or less than 0.05, the null hypothesis is rejected. In addition, as a first attempt to show the effect of the demutualization, the current study calculates the mean (median) of each variable two years before demutualization and two years after the demutualization for each stock exchange following Morsy and Rwegasira (2010). Reviewing Table 7.2 which contains 7 columns report the selected variables, observations for each window (30 observations), mean (median) values for the selected variables pre-and post-demutualization, standardised Z-statistics and their significance level (p-value).

Table 7.2: Results of Wilcoxon Signed Rank

Variables	No. of Obs.	Mean Pre- Demutualization (Median)	No. of Obs.	Mean Post- Demutualization (Median)	Z-statistic for Difference in Medians	p-value
Cash Holdings	30	.47534 (.19022)	30	.59570 (.47293)	-1.841 (Based on Negative Ranks)	.066*
Leverage	30	.6123 (.4350)	30	.4240 (.3200)	-1.492 (Based on Positive Ranks)	.136
Short debt ratio	30	.2902 (.2065)	30	.3563 (.2370)	-1.080 (Based on Negative Ranks)	.280
Long debt ratio	30	.12233 (.0900)	30	.0880 (.0550)	-2.112 (Based on Positive Ranks)	.035**
ROA	30	.0646 (.0707)	30	.1090 (.1050)	-2.026 (Based on Negative Ranks)	.043**
ROE	30	.0823 (.0750)	30	.1360 (.1250)	-2.153 (Based on Negative Ranks)	.031**
Board Size	30	2.774 (2.833)	30	2.524 (2.602)	-3.915 (Based on Positive Ranks)	.000***
Board Independence	30	.5623 (.5150)	30	.7067 (.700)	-3.702 (Based on Negative Ranks)	.000***
Board Remuneration	30	14.792 (14.417)	30	15.055 (14.684)	-2.643 (Based on Negative Ranks)	.008***
GDP Growth	30	3.697 (3.550)	30	3.157 (3.200)	-1.151 (Based on Positive Ranks)	.250
Inflation	30	2.411 (3.014)	30	2.728 (2.563)	-.487 (Based on Negative Ranks)	.627
Size	30	19.066 (19.210)	30	19.213 (19.670)	-1.820 (Based on Negative Ranks)	.069*

Table 7.2: Cont'd

Variables	No. of Obs.	Mean Pre-Demutualization (Median)	No. of Obs.	Mean Post-Demutualization (Median)	Z-statistic for Difference in Medians	p-value
Growth Opportunities	30	.1095 (.1134)		.2222 (.1541)	-1.635 (Based on Negative Ranks)	.102
Assets Tangibility	30	.3197 (.2377)	30	.3586 (.2690)	-.936 (Based on Negative Ranks)	.349
Non-liquid assets	30	-.0878 (-.0608)	30	-.1361 (-.0968)	-1.059 (Based on Positive Ranks)	.289
Agency Cost	30	.3197 (.2377)	30	.3587 (.2690)	-.936 (Based on Negative Ranks)	.349

* 10% significance level.

**5% significance level.

***1% significance level.

Negative Ranks: the value of a variable post demutualization is bigger than its value prior demutualization.

Positive Ranks: the value of a variable prior demutualization is bigger than its value post demutualization.

From the findings regard the impact of demutualization on the financial performance of a stock exchange revealed that the mean (median) of cash holdings ratio increases from 0.47534 (0.19022) to 0.59570 (0.47296) post demutualization at 10% level of confidence. The mean (median) of leverage decreases from 0.6123 (0.4350) to 0.4240 (0.320) post demutualization, albeit this decrease is not statistically significant. Considering the debt choice, the mean (median) of short-term debt ratio increases from 0.2902 (0.2065) to 0.3563 (0.2370) post demutualization but this increase is not significant at any level of confidence. However, the mean (median) of long-term debt ratio decreases significantly at 5% level of confidence from 0.1223 (0.090) to 0.0880 (0.0550). As for the profitability of a stock exchange, the means (medians) of ROA and ROE increase significantly at 5% level of confidence from: 0.0646 (0.0707) and

0.0823 (0.0750) to 0.1090 (0.1050) and 0.1360 (0.1250) respectively after demutualization. On the other hand, the Wilcoxon signed-rank test exhibited the differences in medians values pre- and after demutualization. The findings showed that board size decreases significantly from 0.2774 (2.833) to 2.524 (2.602) at 1% level of confidence after demutualization. The board independence increases from 0.5623 (0.5150) to 0.7067 (0.70) after demutualization at 1% level of confidence. The board remuneration increases significantly at 1% level of confidence from 14.792 (14.417) to 15.055 (14.684) post demutualization. From the previous findings, it has been noticed that there are significant differences in medians values (before and after demutualization) for all the tested variables as proposed with exception to leverage and short-term debt ratios. However, at this point of analysis, it can be said that any changes in values of tested variables may be attributed to the demutualization of stock exchanges.

7.2.2 Multivariate Regression Analysis

The second technique used to test the hypotheses of this study is the regression analysis which is one of the most commonly used statistical technique in multivariate analysis. For this particular study, a multiple regression technique is applied for several empirical models as shown earlier in this chapter. As discussed previously in chapter 6, some conditions must be tested before applying the regression technique such as linearity, homoscedasticity, autocorrelation and multicollinearity.

Linearity

The current study uses Ramsey's RESET for testing the assumption of linearity in regression models where the null hypothesis refers to linearity and the alternative hypothesis refers to non-linearity. The data input refers to the following:

- 'J' refers to the number of hypotheses.

- 'T' refers to the number of observations.
- 'K' refers to the number of variables.
- 'SEE' refers to the sum of squared residuals.
- 'Alpha' refers to the significance level (10%, 5% and 1%).

Table 7.3: Calculations and Findings of RESET Test

Models	(1)	(2)	(2-1)	(2-2)	(3)	(3)	(4)	(5)	(6)
Data Input	Cash Holdings	LEV	STD	LTD	ROA	ROE	BSIZE	BIND	BREM
J	2	2	2	2	2	2	2	2	2
T	180	180	180	180	180	180	180	180	180
K	11	10	10	10	7	7	6	7	9
SSE-restricted	14.42	22.03	11.47	4.69	1.17	1.50	16.74	16.74	504.98
SSE-Unrestricted	13.15	20.51	10.65	4.55	1.17	1.49	14.88	14.88	503.39
Alpha (Prob)	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	0.05	0.05	0.05
Computed Values									
df-numerator	2	2	2	2	2	2	2	2	2
df-denominator	169	170	170	170	173	173	174	173	171
F	8.20	6.30	6.57	2.70	0.09	0.33	10.87	10.81	0.27
Right Critical Values	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
Decision	Reject Ho	Reject Ho	Reject Ho	Fail to Reject Ho	Fail to Reject Ho	Fail to Reject Ho	Reject Ho	Reject Ho	Fail to Reject Ho
p-value	0.0004	0.0023	0.0018	0.0700	0.9123	0.7164	0.0000	0.0000	0.7630

The findings shown in table 7.3 revealed that p-values of models 2-2, 3 and 6 are not significant ($p > 0.05$) which means that the result of the test fails to reject the null hypothesis and so a linear relationship exists. However, for the rest of models (i.e. 1, 2, 2-1, 4 and 5), the p-values are significant ($p < 0.05$) which means that the result of the test rejects the null hypothesis and so a non-linear relationship exists. Accordingly, one treatment is to take the log or natural log to both dependent and independent variables. However, this treatment does not work out as many of the variables take negative values as well as many variables are less than one. In case of negative values, the log or natural log do not exist. In cases that the variables are less than one, either the

log or natural log result in negative values which cause distortions to the true relationship between the independent and dependent variables. On the other hand, treatment of the non-linear transformation is used to address a polynomial transformation when variables might be raised to a power either 2 to address quadratic relationship or 3 to address cubic relationship. As for this study, it has been chosen to treat the dependent variable as cubic for avoiding any change to the relationship between dependent and independent variables. Therefore, negative values remain negative in cubic form and the same is true in case of positive values.

Homoscedasticity

As discussed previously in chapter 6, this study uses the Goldfeld-Quandt test for testing the homoscedasticity assumption. The calculation and the findings of this test are presented in table 7.4, where the data input refers to the following:

‘N1’ refers to the number of observations in sub-sample 1; ‘K1’ refers to the number of parameters in sub-sample 1 and ‘MS Residual 1’ refers to the mean of squares for sub-sample 1.

- ‘N2’ refers to the number of observations in sub-sample 2; ‘K2’ refers to the number of parameters in sub-sample 2 and ‘MS Residual 2’ refers to the mean of squares for sub-sample 2.
- M1 refers to the degrees of freedom for sub-sample 1 = $N1 - K1$ and M2 refers to the degrees of freedom for sub-sample 2 = $N2 - K2$.
- F statistic is calculated as $MS\ Residual\ 1 / MS\ Residual\ 2$

Table 7.4: Calculations and Findings of Goldfeld-Quandt Test

Models		(1)	(2)	(2-1)	(2-2)	(3)	(3)	(4)	(5)	(6)
		Cash Holdings	LEV	STD	LTD	ROA	ROE	BSIZE	BIND	BREM
Data Input	N1=	52	52	52	52	52	52	52	52	52
	K1=	11	10	10	10	7	7	6	7	9
	MS Residual 1	1.4334	0.9499	0.0309	0.0191	0.0039	0.0034	45.2966	0.0978	3.5503
	N2=	128	128	128	128	128	128	128	128	128
	K2=	11	10	10	10	7	7	6	7	9
	MS Residual 2	3.9003	0.1604	0.0573	0.0073	0.0022	0.0085	25.9056	0.0638	1.8998
	=	5%	5%	5%	5%	5%	5%	5%	5%	5%
Computed Values	M1	41	42	42	42	45	45	46	45	43
	M2	117	118	118	118	121	121	122	121	119
	F statistic	0.3675	5.9207	0.5396	2.6201	1.7396	0.3976	1.7485	1.5320	1.8687
Goldfeld-Quandt Test										
Right tail	Fc	1.4932	1.4879	1.4879	1.4879	1.4732	1.4732	1.4686	1.4732	1.4829
	Conclusion	Do not reject H0	Reject H0	Do not reject H0	Reject H0	Reject H0	Do not reject H0	Reject H0	Reject H0	Reject H0
Two-tail	F _{LC}	0.5828	0.5864	0.5864	0.5864	0.5966	0.5966	0.5999	0.5966	0.5889
	F _{UC}	1.61165	1.60492	1.60492	1.60492	1.5861	1.5861	1.58021	1.5861	1.59843
	Conclusion	Reject H0	Reject H0	Reject H0	Reject H0	Reject H0	Reject H0	Reject H0	Do not reject H0	Reject H0

By reviewing table 7.4, the findings detected a presence of heteroscedasticity in all models considering the one-tail and two-tail interchangeably. As discussed previously in chapter 6; one of the core benefit from using Goldfeld-Quandt test is that the power of this test is relying on the specific point where to split the sample according to theoretical background such as before and after an event which is similar to the case of this particular study; before and after the demutualization. Consequently, since the previous findings detected an existence of heteroscedasticity in all models, then it could be concluded that the demutualization may have an

attribute to the changes on the tested variables. In addition, for a robust check for heteroscedasticity, the current study also applies the White's test. The findings exhibited from table 7.5 indicated the presence of heteroscedasticity in all models with exception to model 2.

Autocorrelation

The Wooldridge test is conducted to test for autocorrelation and the findings exhibited in table 7.5 confirmed the existence of autocorrelation in all models. The p-values are significant ($p < 0.05$) and so the null hypothesis is rejected.

Table 7.5: Results of Heteroscedasticity and Autocorrelation Tests

Models	White's Test for Heteroscedasticity	Wooldridge Test for Autocorrelation
Model 1	Chi2= 138.24	F= 189.588
	P-Value = 0.0000	P-value= 0.0000
Model 2	Chi2= 66.80	F= 16.797
	P-Value= 0.3477	P-value= 0.0011
Model 2-1	Chi2= 147.10	F= 5.607
	P-Value= 0.0000	P-value= 0.0328
Model 2-2	Chi2= 89.32	F= 14.152
	P-Value= 0.0163	P-value= 0.0021
Model 3 (ROA)	Chi2= 56.51	F=27.406
	P-Value= 0.0066	P-value = 0.0001
Model 3 (ROE)	Chi2=38.02	F= 29.568
	P-Value=0.0461	P-value= 0.0001
Model 4	Chi2= 35.61	F= 69.141
	P-Value= 0.0118	P-value= 0.0000
Model 5	Chi2= 77.18	F= 56.011
	P-Value= 0.0000	P-value= 0.0000
Model 6	Chi2= 89.89	F= 6.116
	P-Value= 0.0009	P-value = 0.0268
Model 7	Chi2= 87.01	F= 21.202
	P-value= 0.0243	P-value=0.0004

Moreover, the multicollinearity has been tested by applying the Variance Inflation Factor (VIF) and the results of all models showed that the VIF values are less than 5. The VIF values will be shown with each regression table. From the previous discussion, since the OLS regression conditions are violated (i.e. normality, heteroscedasticity; autocorrelation), the study adopts the GLS regression technique. In the GLS regression, the study has to choose between the fixed and random effects. Accordingly the Hausman test has been carried out for each model; the result of Hausman test will be shown in each model, as if the p-value is less than 5% the study will choose the fixed effects model (FE) otherwise, if the p-value is greater than 5% the random effects model (RE) will be selected. Finally, the correction of the heteroscedasticity and autocorrelation problems can be done by estimating robust/clustered robust standard errors which keeping the coefficient estimates provided by the regression unchangeable and changing only the standard errors and significance tests. The following section presents the findings and the discussion of each model. All the following regression tables include the coefficients of the tested variables under the fixed and random effects with standard errors, the Hausman test, and robust/clustered robust standard errors for the selected effects (i.e. fixed or random effects depend on the Hausman test).

7.2.2.1 Demutualization and financial performance of stock exchanges

This section exhibits and discusses the findings of the four empirical models that examine the impact of demutualization on a stock exchange's financial performance through different dimensions; liquidity, leverage considering debt choice/maturity and profitability.

Findings and Discussions for Model 1

Table 7.6: GLS Regression Findings of Model 1

Model 1: Liquidity					
Dependent variable: Cash Holdings³					
Variable	Fixed Effects (Standard error)	Random Effects (Standard error)	REvce (robust)	VIF	1/VIF
Crisis	.2009954	.2438723	.2438723	1.24	0.808471
Demutualization	1.374286***	1.282707***	1.282707**	2.49	0.401641
Leverage ³	-.3482248*	-.3844793*	-.3844793**	1.17	0.857289
GDPG	.0777908	.0844933	.0844933	1.64	0.610505
Inflation	-.0370417	-.0529809	-.0529809	1.45	0.690084
Size	.3909994**	.2490051**	.2490051**	1.50	0.667440
Profitability (ROA)	1.370462	.8879107	.8879107	1.43	0.696976
Dividend Payments	-1.545973***	-1.367963***	-1.367963**	2.54	0.394047
Assets Tangibility	-5.351076***	-5.054675***	-5.054675***	1.56	0.640106
Growth Opportunities	-.4342125	-.4034269	-.4034269	1.15	0.866493
Non-liquid assets	-4.022054***	-4.324573***	-4.324573***	1.49	0.671697
Cons	-4.014238	-1.407044	Number of obs. = 180		
Hausman Test chi2(11)=3.92 Prob>chi2= 0.9721		Wald chi2(11)= 134.18 Prob > chi2= 0.0000		Mean VIF 1.61	

* 10% significance level.

**5% significance level.

***1% significance level.

According to hypothesis H1; which states that demutualization increases the liquidity of a stock exchange. In model 1, demutualization (independent variable) and control variables (Crisis, GDP growth, inflation, size, leverage, profitability, dividends, growth opportunities, Non-liquid assets and tangibility) were regressed against the cash holdings ratio. The findings from table 7.6 showed a positive and significant relationship at 5% level of confidence between

demutualization and cash holdings ratio which indicates that a demutualized stock exchange improved its liquidity position by increasing its level of cash and cash equivalents in their assets compared to its mutual structure. To the best of this study's knowledge, no empirical study used this ratio for indicating the impact of demutualization on liquidity- using accounting measurement- of stock exchanges; however other studies (e.g. Morsy and Rwegasira (2010) used the current ratio as an alternative proxy in measuring liquidity and the finding of their study is inconsistent with this study result. In addition, this result is consistent with the evidence provided from the corporate field concerning the impact of changing ownership of firms on their cash holdings strategy such as Xie et al. (2017) in comparing mutual and stock insurers and Megginson, Ullah, and Wei (2014) in comparing non-privatised and privatised Chinese firms. From the previous discussion, H1 is accepted.

Moreover, there is no optimal answer of whether a stock exchange/firm should maintain a low or high level of cash holding as for instance, having a higher level of cash could indicate inefficiency in allocating this resource/cash which leads to bad performance or could be deemed as good performance where excess in cash could be used as an internal source of funds when there are restrictions on external financing (i.e. higher cost). Accordingly, other determinants of cash holdings are included in model 1 to get a clear picture of the impact and the attribute of the demutualization strategy adopted by stock exchanges on its liquidity position. The findings in table 7.6 revealed a significant negative relationship between the level of debt/leverage and cash holdings at 5% level of confidence which implies that a stock exchange hold more cash reserve (i.e. internal source of funds) as a substitute of other external financing sources (i.e. leverage/debt). This relationship could be explained by both theories; the pecking order and the free-cash flow theories, as both theories indicated a negative relationship between cash holdings

and leverage. Following the notion of the pecking order theory, firms prefer using the internal sources of fund (i.e. retained earnings and cash reserves) over external financing (i.e. debt and equity) (Donaldson, 1961). Accordingly, if firms need to finance new investments, they primarily depend on internal funding, however if this source is insufficient (e.g. investment needs are greater than the level of internal sources), the firm will look for using external funding starting by the debt and the equity will be its last resort (Ferreira and Vilela, 2004; Al-Najjar and Belghitar, 2011). Another point of view of this theory is that a firm with higher level of debt is facing higher probability of bankruptcy, thus a sufficient level of cash could be used to pay off/repay its debt (Opler et al., 1999). By following the free-cash flow theory, firms with low level of leverage are less exposed to monitoring by capital market, thus they hold more cash (Ferreira and Vilela, 2004). Evidence from stock exchanges, the annual report of NASDAQ clarified that the indebtedness of the exchange in 2006 reached a significant level of about \$1.5 billion and this level of debt could weaken its ability to have additional financing in the future and could also affect its financial flexibility to react to changing in economic and competitive conditions, its acquisition activities as well as its credit rating (i.e. Standard & Poor's downgraded its credit rating from BB+ to BB in November, 2006). Consequently, NASDAQ emphasised that to meet the requirements of its current capital, the exchange will depend on the generated internal funds (i.e. cash on hand) as borrowing more debts could put the exchange under more restrictive covenants compared to its current debt conditions and its current stockholders may suffer from equity dilution in case of issuing additional equity (NASDAQ, 2006).

Another determinant of cash holdings is the size of a stock exchange, as the findings revealed a significant positive relationship between size and cash holdings at 5% level of confidence which

implies that stock exchanges with large size hold more cash reserves. This result is consistent with the notion of the pecking order theory that predicted a positive relationship between cash holdings and firm size, as large firms regularly tries to reach higher levels of quality in managing its operation activities alongside with investment opportunities which will push firms to hold a higher level of cash compared to small firms (Opler et al., 1999). In addition, large firms rely mainly on self-financing (i.e. retained earnings and cash reserves) in applying their financial policy, where small firms rely on short-term financing (i.e. bank credit and commercial credit) (López-Gracia and Aybar-Arias, 2000). Also this result could be explained by the free-cash flow theory, as large firms are successful in generating high level of cash flows due to its ability to produce and provide large quantities of goods and services and so they can hold more cash reserves (Saddour, 2006). Also, managers of large firms have a little chance being a takeover target as to have such a large target, bidder needs more financial resources (e.g. Opler et al., 1999; Drobetz and Grüninger, 2007). Al-Najjar and Belghitar (2011) argued that large firms have a high degree of information asymmetry between stockholders and managers and due to this, these managers have more flexibility over firms' investments and financial policies, thus these firms hold higher level of cash. In the same vein of this point the demutualized stock exchanges especially, the ones with large size (i.e. NYSE and NASDAQ) confirmed that they hold a higher level of cash and cash equivalents generated from its operations to maintain its financial flexibility (e.g. NYSE annual report, 2007; NASDAQ annual report, 2003).

From the findings shown in table 7.6, a negative relationship has been noticed between cash holdings and dividend payments at a significant level of 1%. Actually this result is not surprising as the members' return of stock exchanges under the cooperative (mutual) structure is distributed in relation to the purchases and usage of the services that each member provides under the

umbrella of the cooperative. Members of traditional stock exchanges share the net profit of the venue which is returned in the form of lower access fees or trading costs and no dividends paid (e.g. Akhtar, 2002; Baarda, 2006), where under the corporation structure, stock exchanges starts to pay dividends to its stockholders like other corporations in the market. Following the trade-off theory and the transaction motive which expect this negative relationship as firms that pay dividends (similar to demutualized stock exchanges) have the option to raise the capital needed for investment with lower cost by cutting back payment of dividends (e.g. Opler et al., 1999; Ferreira and Vilela, 2004; Al-Najjar and Belghitar, 2011).

As for the assets tangibility which shows the proportion of fixed assets to the total assets of a stock exchange. The findings exhibited a significant negative relationship between tangibility and cash holding ratio at 1% level of confidence which implies that a stock exchange which owned a higher proportion of fixed assets can liquidate these assets to generate the cash needed when cash reserves declined. However, this type of assets is not easily converted to liquid cash compared to non-cash liquid assets (i.e. marketable securities). As for John (1993), when firms experienced financial distress which will lead to shortfalls in the level of cash reserves, managers could sell firm's assets whatever the current or the fixed as an attempt to overcome the financial distress. Following the transaction motive and the trade-off theory predictions which predict negative relationship between tangibility and cash holdings, this finding is in line with results provided by John (1993), Drobetz and Grüninger (2007) and Pereira Alves and Morais (2018). The non-liquid assets which was measured by calculating the net working capital (NWC) is considered one of the main determinants of cash holdings, as from the findings, a negative and significant relationship is noticed between NWC and cash holdings at 1% level of confidence. This relationship indicates that a stock exchange can use its non-cash liquid assets as a substitute

source in case of shortfall of cash reserves. This result is compatible with the prediction of the trade-off theory where an inverse relation exists as there is no clear relationship between the two variables according to the pecking order theory (Opler et al., 1999). Based on the trade-off theory, firms with lower cash reserve could liquidate non-cash liquid assets as a substitute for liquid cash to finance investments. The previous finding is consistent with many scholars whom provide empirical evidence of such a relationship like Opler et al. (1999), Ozkan and Ozkan, (2004), Ferreira and Vilella (2004), D'Mello, Krishnaswami and Larkin (2008), Bates, Kahle, and Stulz (2009), Gill and Mathur (2011), Al-Najjar (2013) and Guizani (2017). In summary, it has been noticed that changing the ownership and governance structure of a stock exchange through the demutualization process has a significant impact on the exchange's liquidity as the exchange increased its reserves of cash compared to its traditional/mutual structure. In addition, there are other determinants of liquidity of a stock exchange such as size, leverage, assets tangibility, non-cash liquid assets and dividends.

Findings and Discussions for Model 2

Table 7.7: GLS Regression Findings of Model 2

Model 2: Leverage					
Dependent variable: Debt/Equity ratio³					
Variable	Fixed Effects	Random Effects	RE vce (robust)	VIF	1/VIF
Crisis	.07008	.0122018	.0122018	1.23	0.812092
Demutualization	-.40901***	-.4383718***	-.4383718**	1.42	0.701834
GDPG	.0386967	.024098	.024098	1.75	0.571177
Inflation	.022443	.0046025	.0046025	1.42	0.705155
Size	-.0135317	.0615118*	.0615118	1.48	0.677098
Growth opportunities	-.0645542	-.0268793	-.0268793	1.16	0.865474
Tangibility	-.4029415	-.3552959	-.3552959	2.49	0.401727
Agency cost	.0625319	.269723	.269723	2.20	0.454258
Profitability (ROA)	-.4477167	-.4272609	-.4272609	1.57	0.637088
Liquidity ³	-.0220478	-.0316165	-.0316165	1.83	0.547373
Cons	1.019503	-.4278592	-.4278592	Number of obs. = 180	
Hausman Test Chi2 (10)= 5.15 Prob>chi2= 0.8810		Wald chi2(10)= 22.72 Prob > chi2 = 0.0118		Mean VIF 1.65	

* 10% significance level.

**5% significance level.

***1% significance level.

Hypothesis-H2 states that demutualization decreases the leverage of a stock exchange. Accordingly, demutualization (independent variables) and control variables (i.e. crisis, GDP growth, inflation, size, growth opportunities, agency cost, tangibility, liquidity and profitability) were regressed against debt to equity ratio (dependent variable). The findings of table 7.7 exhibited a negative and significant relationship between leverage and demutualization at 5% level of confidence.

This result implies that demutualization of a stock exchange decreases its usage of leverage /debt as a source of finance and instead, it uses the equity as an alternative source of funds. At this point Mendiola and O'Hara (2003) argued that a stock exchange under the mutual structure has limitations regard raising new capital as it has no option in selling stocks to the public, however by adopting the demutualization strategy the exchange can distribute stocks to their members/owners and in an advanced stage the exchange can sell stocks to outside investors through private placement or initial public offering (IPO). This finding is consistent with the results of Mendiola and O'Hara (2003), Otchere (2006) and Azzam (2010) and inconsistent with Morsy and Rwegasira (2010) who found a decline of leverage ratio after demutualization, albeit not statistically significant. From the previous discussion, H2 is accepted. In addition, the findings showed that the other determinants have no effect on leverage of a stock exchange.

Findings and Discussion for Model 2-1

Table 7.8: GLS Regression Findings of Model 2-1

Model 2-1					
Dependent variable: Short-term debt ratio³					
Variable	Fixed Effects	Random Effects	FE vce (robust)	VIF	1/VIF
Crisis	.0682738***	.0404201	.0682738**	1.23	0.812092
Demutualization	.0822141***	.055789**	.0822141	1.42	0.701834
GDPG	.0164604***	.0118071*	.0164604*	1.75	0.571177
Inflation	-.0002694	-.0068905	-.0002694	1.42	0.705155
Size	-.0488092***	-.0069113	-.0488092	1.48	0.677098
Growth opportunities	-.0610623*	-.0532089	-.0610623	1.16	0.865474
Tangibility	.0782199	.0907667	.0782199	2.49	0.401727
Agency cost	-.2208864***	-.1721705**	-.2208864	2.20	0.454258
Profitability (ROA)	-.0372419	.0972188	-.0372419	1.57	0.637088
Liquidity ³	.0122155**	.0084791	.0122155**	1.83	0.547373
Cons	1.015212***	.1983911	1.015212	Number of obs. = 180	
Hausman Test Chi2 (10) = 24.31 Prob>chi2= 0.0068		F(10,14) = 19.51 Prob > F = 0.0000		Mean VIF 1.65	

* 10% significance level.

**5% significance level.

***1% significance level.

According to hypothesis H2a which states that demutualization increases the short-term debt, demutualization (independent variables) and control variables (i.e. crisis, GDP growth, inflation, size, growth opportunities, agency cost, tangibility, liquidity and profitability) were regressed against the short-term debts to total assets ratio (dependent variable). The findings in Table 7.8 exhibited a positive relationship between the demutualization and short-term debt, albeit it is not statistically significant, which indicates that the demutualization of a stock exchange has explicit

role in determining its usage of short-term debt. From this, it can be said that H2a is rejected. On the other hand, there are other determinants of short-term debt such as crisis, GDP growth and liquidity. As for the crisis, the findings exhibited a positive and significant relationship between the crisis and short-term debt at 5% level of confidence which implies that the choice of debt financing alternatives of a stock exchange in the time span of global financial crisis has been affected, where a stock exchange increases its level of short-term debt. Previous literature revealed the great and severe impact of the global financial crisis which started in the last quarter of 2007 on the performance of financial institutions, capital markets as well as the aggregate economy. Due to the risk and uncertainty associated with the financial crisis which affects the expected return, the choice between different debts maturity (i.e. short-term vs. long-term) was evident. Custódio, Ferreira and Laureano (2013) argued that the financial crisis was responsible for a higher level of information asymmetry and thus many firms increased their usage of short-term debts specially, the firms that suffered from a higher degree of information asymmetry. Fosberg (2013) argued that although the level of short-term debts has increased in the financial crisis period, specifically in 2008, this increase has been changed inversely at the end of the year 2009. Accordingly, many scholars provided evidence of the inverse relationship between crisis and debt maturity such as Krishnamurthy (2010), Almeida et al. (2011), Gürkaynak and Wright (2012), Gourinchas and Obstfeld (2012), Dick, Schmeling and Schrimpf (2013), Gorton, Metrick and Xie (2015) and Demirgüç-Kunt, Martinez-Peria, and Tressel (2015). As for the GDP growth, the findings revealed a positive and statistically significant relationship with a stock exchange's short-term debt at 10% level of confidence which indicates that when the economy grows, a demutualized stock exchange is eager to use short-term debt as a source of finance if needed. GDP growth is one of the most common macroeconomic variables used to explain its

impact as external factor on firms' capital structure. From the perspective of the trade-off theory perspective, when economy grows, stability of cash flow are generated, investment opportunities increased and bankruptcy costs decline which facilitate firm's access to external financing and benefit from tax deductions (Frank and Goyal, 2009).

Another determinant of short-term debt is liquidity, as the findings revealed a positive and significant relationship between short-term debt and liquidity (i.e. cash holdings), which implies that a stock exchange with higher level of liquidity is supporting the usage of short-term debt. At this point, Ozkan (2001) argued that a firm with higher level cash reserves may use more debts due to its ability in pay back its short-term liabilities in due date. This result is consistent with Antoniou, Guney and Paudyal (2008), who argued that liquidity do not support the usage of long-term debt as creditors may be exposed to unexpected shift taken by a firm's managers to risky projects or due to unexpected changes in the enviromental conditions.

Findings and Discussion for Model 2-2

Table 7.9: GLS Regression Results of Model 2-2

Model 2-2					
Dependent variable: Long-term debt ratio					
Variable	Fixed Effects	Random Effects	RE vce (robust)	VIF	1/VIF
Crisis	-.0409242***	-.0379617***	-.0379617***	1.23	0.812092
Demutualization	-.0629343***	-.0617415***	-.0617415**	1.42	0.701834
GDPG	-.0071224***	-.0068109***	-.0068109***	1.75	0.571177
Inflation	.0013623	.0019725	.0019725	1.42	0.705155
Size	.0290892***	.0256173***	.0256173**	1.48	0.677098
Growth opportunities	.008635	.0081214	.0081214	1.16	0.865474
Tangibility	.0500393	.0528521*	.0528521	2.49	0.401727
Agency cost	.1361369***	.1324889***	.1324889***	2.20	0.454258
Profitability (ROA)	-.0952625	-.1087876*	-.1087876	1.57	0.637088
Liquidity^3	.0009374	.0008834	.0008834	1.83	0.547373
Cons	-.4704397***	-.3978222***	-.3978222*	Number of obs. = 180	
Hausman Test Chi2 (10)= 7.71 Prob>chi2= 0.6569		Wald chi2(10) = 43.64 Prob > chi2 = 0.0000		Mean VIF 1.65	

* 10% significance level.

**5% significance level.

***1% significance level.

According to hypothesis H2b; demutualization decreases the long-term debt of a stock exchange. Accordingly, demutualization (independent variables) and control variables (macroeconomic variables, growth opportunities, tangibility, agency cost liquidity, profitability and size of a stock exchange) were regressed against the long-term debt ratio (dependent variable). The findings shown in table 7.9 revealed that there is a negative and significant relationship between demutualization and long-term debt ratio at 5% level of confidence which indicates that a stock

exchange decreases its usage of long-term debt compared to its mutual structure as a source of finance. At this point, Otchere and Abou-Zied (2008) referred in their study that the Australian Stock Exchange abandoned its dependence on using debt especially with the long-term maturity after the conversion as in year 2003 there was no long-term debt shown in the balance sheet of ASX. In addition, the field of corporate finance provided some evidence regard the impact of ownership structure on firm's debt choice. Choi (2015) investigated the relationship between the managerial ownership and debt choice (i.e. long-term debt) comparing a sample of Chinese firms: state-owned and private firms where the findings revealed a direct relationship between state-owned firms and long-term debt and an inverse relationship with private firms. Mendoza, Yelpeo and Ramos (2019) argued that firms with state ownership is using higher level of long-term debt as this type of ownership facilitate using debt with long maturity even with lower level of collaterals. In general, firms may prefer using long-term debt to avoid the extensive monitoring of external financiers as using short-term debt a flexible and an effective device in facilitating the process on monitoring the managers' actions with little effort (e.g. Rajan and Winton, 1995; Stulz, 2000; Datta, Datta and Raman, 2005). Consequently, H2b is accepted.

Interestingly, the findings revealed a significant negative relationship between crisis and long-term debt ratio at 1% level of confidence, which indicates that a stock exchange reduced its dependence of long-term debt as a source of funds within the crisis period. By recalling the outcome of the relationship between crisis and short-term debt which confirmed that the crisis affected the usage of external financial sources of demutualized stock exchanges specifically the shift between the debts maturity (i.e. short-term against long-term). Following the previous literature which showed the association between the global financial crisis and increasing the level of risk and uncertainty which affects the expected return, the choice between different debts

maturity (i.e. short-term vs. long-term) was evident. Fosberg (2013) argued that although the level of short-term debts has been increased in the financial crisis period, specifically in 2008, this increase has been changed inversely at the end of the year 2009. Accordingly, many scholars provided evidence of the inverse relationship between crisis and debt maturity such as Krishnamurthy (2010), Almeida et al. (2011), Gürkaynak and Wright (2012), Gourinchas and Obstfeld (2012), Dick, Schmeling and Schrimpf, 2013, Gorton, Metrick and Xie (2015) and Demirgüç-Kunt, Martinez-Peria, and Tressel (2015).

In addition, the findings exhibited a significant negative relationship between GDP growth and long-term debt ratio at 1% level which implies that a demutualized stock exchange relies on using long-term debt when the economy of a country declines (i.e. recession). In justifying this relationship, Bokpin (2009) argued that firms in countries with higher level of GDP growth rate generate more profit and could maintain higher level of retained earnings which can be used as a funding source instead of using debt consistent with the pecking order theory. This relationship is consistent with several studies from the corporate field such as Demirguc-Kunt and Maksimovic (1996) Gajurel (2006), Bastos, Nakamura and Basso (2009), Dincergok and Yalciner (2011); Camara (2012). Finally, other variables such as inflation rate, size, growth opportunities, assets tangibility, profitability, liquidity and agency cost. As for the size determinant, the findings showed a significant positive relationship at 5% level of confidence, which implies that, a demutualized stock exchange with large size has an easy access to debts especially with the long-term maturity. The trade-off theory predicts a positive relationship between size and leverage. Moreover, large firms are more stable as these firms have diversified business activities, lower cash flow volatility and lower probability of bankruptcy. Consequently, they are less affected by financial distress (Baker and Martin, 2011). This result is consistent

with Rajan and Zingales (1995), Shyam-Sunder and Myers (1999), Goyal, Lehn and Ra i (2002), Fan, Titman and Twite (2003), Uysal (2007), Kayhan and Titman (2007) and Frank and Goyal (2009).

Another determinant of the debt/leverage of a stock exchange is the agency cost which measured by asset utilization ratio where the higher this ratio the lower the agency cost. The findings revealed a significant and positive relationship between long-term debt ratio and agency cost at 5% level of confidence, which implies that, a stock exchange may increase its efficiency in managing its assets in order to acquire more debt. This result can be explained by the hypothesis of free cash flow induced by Jensen (1986) as managers of firms with higher level of debt are committed to obey to the conditions of debt covenant and repay the interest and the principal in a specific period which on the other side by not doing so, this may lead to bankruptcy of the firm. Consequently, this will control the discretion power of managers in spending the available cash flow and encourage them to act in favour of the firms' stockholders and so managing the firms' assets in an efficient and productive way. This finding is consistent with Alipour, Mohammadi and Derakhshan (2015).

Findings and Discussions for Model 3

Table 7.10: GLS Regression Findings for Model 3

Model 3: Profitability					
Dependent variable: ROA					
Variable	Fixed Effects	Random Effects	RE vce (robust)	VIF	1/VIF
Crisis	.0127708	.0030295	.0030295	1.19	0.840142
Demutualization	.0743799***	.0684895***	.0684895**	1.28	0.779368
Leverage^3	-.004215	-.0000773	-.0000773	1.16	0.863286
GDPG	.0078197**	.0067165**	.0067165***	1.53	0.653733
Inflation	.0014736	-.002339	-.002339	1.38	0.726371
Size	-.032134***	-.0166116***	-.0166116**	1.23	0.810749
Growth opportunities	.0287887	.0317456	.0317456	1.13	0.888715
Cons	.657209***	.366218***	.366218**	Number of obs. = 180	
Hausman Test chi2(7) = 12.06 Prob>chi2= 0.0986		Wald chi2(7) = 53.57 Prob > chi2 = 0.0000		Mean VIF 1.27	

* 10% significance level.

**5% significance level.

***1% significance level.

Table 7.11: GLS Regression Findings for Model 3

Model 3: Profitability					
Dependent variable: ROE					
Variable	Fixed Effects	Random Effects	REvce (robust)	VIF	1/VIF
Crisis	.000356	-.0058785	-.0058785	1.19	0.840142
Demutualization	.075885***	.072821***	.072821**	1.28	0.779368
Leverage	.0043827	.0082692	.0082692	1.16	0.863286
GDPG	.005959	.0051503	.0051503	1.53	0.653733
Inflation	.0097818	.0065674	.0065674	1.38	0.726371
Size	-.0233432***	-.0127686**	-.0127686	1.23	0.810749
Growth opportunities	.0428569*	.0449258*	.0449258**	1.13	0.888715
Cons	.4892493***	.2915045***	.2915045*	Number of obs. = 180	
Hausman Test chi2(7)= 6.68 Prob>chi2= 0.4629		Wald chi2(7) = 46.85 Prob > chi2 = 0.0000		Mean VIF 1.27	

* 10% significance level.

**5% significance level.

***1% significance level.

According to hypothesis-H3; which states that demutualization increases the profitability of a stock exchange. Accordingly, demutualization (independent variables) and control variables (i.e. crisis, macroeconomic variables, leverage, size and growth opportunities) were regressed against the proxies of profitability; return on assets (ROA) and return on equity (ROE) interchangeably as dependent variables. The findings shown in tables 7.10 and 7.11 respectively revealed that there is a positive and significant relationship between demutualization and ROA (ROE) at 5% and 5% level of confidence respectively which implies the demutualization improves the profitability of a stock exchange. The importance of this hypothesis lies on the conversion of a stock exchange from mutual/non-profit to demutualized/for-profit exchange which is associated

with changing its primary objective; increasing profit and hence maximising stockholders wealth. Examining the impact of demutualization on profitability of stock exchanges has mixed results. However, the result shown is consistent with previous studies, such as: Otchere and Abou-Zied (2008), Azzam (2010), Morsy and Rwegasira (2010) and Oldford and Otchere (2011) which showed significant improvements in both ratios ROA and ROE for demutualized/listed stock exchanges compared to mutual ones with exception to Morsy and Rwegasira (2010) who found a significant increase only in ROA at 10% level of confidence for the whole sample and 5% level and this was not the case of ROE which was non-significant. On the other hand, this finding is inconsistent with other studies such as Mendiola and O'Hara (2003), Otchere (2006) and Otchere and Mohsni (2016). As for Mendiola and O'Hara (2003) the demutualization is not value-enhancing for stock exchanges, as both ROA were improved only in some of the tested exchanges while the other stock exchanges had opposite trend due to merger and acquisition activities that lead to increase its assets and equity and so decrease these ratios. Similarly, the study of Otchere and Mohsni (2016) provided significant declines in both profitability ratios; ROA and ROE in demutualized stock exchanges compared to mutual exchanges. Accordingly, H3 is accepted. Interestingly, a positive relationship has been determined between GDP growth and both ratios; ROA and ROE. This relationship is significant at 1% for ROA, albeit it is not statistically significant for ROE. This result indicates that economic growth has a significant role in increasing the profitability of a stock exchange. At this point, Otchere and Abou Zied (2008) argued that the improvements of profitability ratios could be a reflection of changes in a country's growth of economy rather than the demutualization strategy adopted by a stock exchange. However, this result is inconsistent with the findings provided by Azzam (2010) where is no significant relationship between profitability and GDP growth. Moreover, the

findings exhibited a negative relationship between ROA (ROE) and the size of a stock exchange, although it is significant for ROA at 5% level of confidence and not significant for ROE which implies that a small stock exchange has higher level of profitability compared to the large one. This result is consistent with the findings of Azzam (2010). Following the justification provided by Azzam (2010), this result can be attributed to the managerial-utility-theory developed by Williamson (1964). This theory assumes that the managers of firms/corporations are interested in maximising their own utilities using their discretionary power over the main objective of corporations; the profit maximisation and this is the case especially in large corporations where there is a separation between ownership and management similar to the case of the demutualized/self-listing stock exchanges. Moreover, the findings revealed a positive relationship between growth opportunities and profitability for both ratios; ROA and ROE, although this relationship is significant only for ROE at 5% level of confidence but not statistically significant for ROA. This result implies that a profitable stock exchange may use its profit to expand its business activities. According to Myers (1984), profitable firms may use their retained earnings as a first source of funds to finance the potential investment opportunities in order to avoid the cost associated with external financing sources. This finding is consistent with Lee (2009) and Asimakopoulou, Samitas and Papadogonas (2009). Finally, other control variables such as crisis, leverage and inflation have no significant impact on the profitability of a stock exchange.

7.2.2.2 Demutualization and Internal Governance Mechanisms of stock exchanges

Extensively, previous literature showed that board of directors is one of the most vital and important internal corporate governance mechanisms that acts as an appliance of stockholders in controlling the behaviour of corporations' managers (e.g. Jensen and Meckling, 1976; Fama and Jensen, 1983). By adopting the demutualization strategy, stock exchanges changed its governance structure from cooperatives to corporations where, stockholders are represented by board of directors. Accordingly, under this section, the study examines the impact of demutualization and other determinants that could have a significant role in determining a board's structure (i.e. board size and board independence) and director's remuneration of a stock exchange. In addition, the previous literature in corporate governance field is concerned mainly by the potential endogeneity problem. Accordingly, this study follows Boone et al. (2007) in controlling the endogeneity problem by using the lag of board independence as an instrumental variable. The following table represents the two-stage least square (2SLS) regression in estimation the model of board size.

Findings and Discussion for Model 4

Table 7.12: Fixed-effects (within) IV Regression of Model 4

Model 4			
Dependent variable: Board Size³			
Variable	Coefficient	Z value	P> z
Demutualization	-3.892761***	-3.27	0.001
Leverage ³	.5369698	0.79	0.432
Size	.7689866*	1.75	0.080
Profitability (ROA)	-4.996451	-1.01	0.312
Growth opportunities	1.538454	1.23	0.219
Board Independence ³ †	-13.4209***	-4.12	0.000
Cons	. 11.93639	1.32	0.188
Wald chi2(6) = 3642.63 Prob > chi2 = 0.0000		No. of observations 150	

†Instrument variable: Board independence lagged for one year

* 10% significance level.

**5% significance level.

***1% significance level.

Board size is one of the main characteristics of corporations' board of directors that has been extensively tested in previous literature. Hypothesis-H4 states that demutualization of a stock exchange decreases the size of the board of directors. Accordingly, demutualization (independent variable) and control variables (size, leverage, profitability, growth opportunities and board independence) were regressed against the board size. The findings from table 7.12 showed a negative relationship between board size and demutualization and statistically significant at 1% level of confidence which implies that a demutualized stock exchange has decreased the number of members in its board of director compared to its mutual structure, as for instance the NYSE under the mutual structure had 27 members on its board and this number decreased to reach only

16 members in 2012. Determining the optimal board size is a difficult task as optimal board size is trade-offs between the value-added in decision making from adding an additional director and the transaction costs associated with increasing the number of board members (Buchannan and Tullock, 1962). In addition, the nature of the industry and the ownership structure (e.g. mutual vs. corporation) are factors affecting firm's board size. Following the agency theory, small board size is more effective in monitoring activities (e.g. Yermack, 1996; Jensen, 1993) as large board size may suffer from communication and coordination problems, especially with the limited time available to express all the ideas which lead to slow decision making and initiate agency problems such as director free-riding (e.g. Lipton and Lorsch, 1992; Jensen, 1993; Dalton, et al., 1999). Beside the previous reasons for preferring corporations to small board size, another point that could contribute to the finding of this study regarding stock exchanges; the majority of board members background of a stock exchange under the mutual/cooperative structure was stockbroking however, after adopting the demutualization strategy along with the separation of ownership and trading rights where the brokers role diminished, these members no longer constitute the majority and instead the current board of a demutualized stock exchange comprises individuals with diverse and complementary skills (i.e. accounting, legal, fund management, information system, auditing, stockbroking and business administration) to deal with external public policy and political environment (ASX annual report, 1999). In context of demutualization of stock exchanges, this result is consistent with the findings of Angulo, Slimane and Alidou (2014) as the board size of London Stock Exchange decreased significantly after the demutualization compared to its mutual structure. From the previous illustration, H4 is accepted. As for the size of a stock exchange, the findings showed that there is a significant positive relationship between the size of a stock exchange and its board size at 10% level of

confidence which implies that a large stock exchange has a large board size. As for the proposition provided by Fama and Jensen (1983) where the organisation of firms is depending on the complexity and scope of its operating/production process. Accordingly, the board of directors which is monitoring the firm's management decisions will need to deal with more requirements generated from more complex operations which in turn need large boards. Moreover, in line with the view of Fama and Jensen (1983), Boone et al. (2007) proposed a positive relationship between the board size and firm's size following the scope of operations hypothesis which indicates that firms could expand its business activities by for instance, introducing new production lines or extending its services to new geographical areas which will increase the demand for adding new members to the firm's board who are specialized in these new growth areas (e.g. Bhagat and Black, 1999; Agrawal and Knoeber, 2001). This finding is consistent with many scholars like Yermack (1996), Denis and Sarin (1999), Boone et al. (2007) Coles, Daniel and Naveen (2008), Lehn, Patro and Zhao (2009), Ting (2011) and Monem (2013). Moreover, the findings revealed that there is a significant and negative relationship between board size and board independence at 1% level of confidence, which implies that the small board of an exchange includes higher number of independent directors. Following Jensen (1993), where both small board and higher number of independent directors enhance the corporate governance of firms as both considered as complementary mechanisms. Finally, other variables such as crisis, leverage and profitability have no significant impact on determining the board independence.

Findings and Discussions for Model 5

Table 7.13: G2SLS Random-Effects IV Regression Findings of Model 5

Model 5			
Dependent variable: Board Independence³			
Variable	Coefficient	Z value	P> z
Crisis	.0018842	0.07	0.941
Demutualization	.1436722***	3.59	0.000
Leverage ³	.0089461	0.39	0.693
Size	-.0208762	-1.56	0.118
Profitability (ROA)	-.0983444	-0.61	0.543
Growth opportunities	.0682822*	1.66	0.097
Board Size ^{3†}	-.0105312***	-2.87	0.004
Cons	.9020161***	3.58	0.000
Wald chi2(7) = 77.48 Prob > chi2 = 0.0000		No. of observations 150	

†Instrument variable: Board Size lagged for one year

* 10% significance level.

**5% significance level.

***1% significance level.

Hypothesis-H5 states that the demutualization increases the fraction of the independent directors as members of the board. Accordingly, demutualization (independent variable) and control variables (i.e. crisis, leverage, size, profitability, investment opportunities and board size) were regressed against the fraction of independent directors. The findings shown from table 7.13 revealed a positive and significant relationship between demutualization and fraction of independent directors as member of boards at 1% level of confidence which implies that demutualization of a stock exchange has increased the independent directors among its board

members compared to its mutual structure. By reviewing the annual reports for the selected stock exchanges; all exchanges confirmed that after the demutualization, the number of independent directors increased in order to attract more individuals with the right mix of experience and skills. One of the major threats to a demutualized stock exchange is the potential conflict between managers and stockholders. Accordingly, agency and resource dependence theories highlighted the importance of the board independence/external resources to corporations as a monitoring mechanism to control management actions, limiting opportunistic behaviour and lessen the environmental uncertainty (e.g. Jensen and Meckling, 1976; Fama and Jensen, 1983; Pfeffer, 1972; Johnson et al., 1996). Accordingly, H5 is accepted. In context of the demutualization of stock exchanges, this result is consistent with a study conducted by Angulo, Slimane and Alidou (2014) who confirmed that the number of independent directors increased among the board member of the London Stock Exchange after the demutualization compared to its mutual structure. In addition, the findings revealed a negative and significant relationship between board independence and growth opportunities at 10% level of confidence which implies that a stock exchange with higher growth opportunities has lower number of independent directors among its board members. At this point, Lehn, Patro and Zhao (2009) argued that firms with high growth opportunities may need more monitoring activates, however, this also could lead to an increase in monitoring cost and so firms will decrease the number of independent directors. Moreover, the findings showed a negative and statistically significant relationship between the fraction of independent directors and the board size at 1% level of confidence. Following Jensen (1993), where both small board and higher number of independent directors enhance the corporate governance of firms as both considered as complementary mechanisms. This negative relationship between board independence and board size is consistent

with the findings of Li (1994) and Mak and Li (2001). Finally, other variables such as crisis, leverage and profitability have no significant impact on determining the board independence.

Findings and Discussions for Model 6

Table 7.14: GLS Regression Findings of Model 6

Model 6: Director's Remuneration					
Dependent variable: Total Board Remuneration					
Variable	Fixed Effects	Random Effects	Re vce (robust)	VIF	1/VIF
Crisis	.0184583	.0217192	.0217192	1.09	0.916751
Demutualization	.330342***	.354851***	.354851*	1.51	0.660676
Inflation	.0444558	.0471995*	.0471995**	1.17	0.857536
Size	.2911454***	.2787118***	.2787118***	1.60	0.624628
Leverage^3	-.0711983	-.0751494	-.0751494	1.21	0.828410
Profitability (ROA)	.675422	.6065959	.6065959	1.33	0.752656
Growth Opportunities	-.052437	-.0490281	-.0490281	1.08	0.924901
Board Size^3	-.0061571	-.0055298	-.0055298	2.05	0.488333
Board Independence^3	.2618603	.1940587	.1940587	1.43	0.701737
Cons	9.05708***	9.402366***	9.402366***	No. of Obs. 180	
Hausman Test Chi2(9)= 10.43 Prob>chi2= 0.3171		Wald chi2(9) = 464.02 Prob > chi2 = 0.0000		Mean VIF 1.38	

* 10% significance level.

**5% significance level.

***1% significance level.

Hypothesis-H6 states that demutualization increases board remuneration. In model 6, demutualization (independent variable) and control variables (i.e. crisis, leverage, Inflation, profitability, growth opportunities, and board size and board independence) were regressed

against board total remuneration. The findings shown in table 7.14 exhibited a positive and significant relationship between demutualization and board remuneration at 10% level of confidence which implies that demutualized stock exchanges revise and improve their director's pay structure compared to exchanges under the mutual structure where there is no room for incentive schemes, and consequently H6 is accepted. This result is consistent with the findings of Angulo, Slimane and Alidou (2014), although using different proxy to quantify the pay-level (i.e. executives remuneration) applied in a single case (i.e. London Stock Exchange) and concluded that after demutualization the remuneration package of the executives team increased. In addition, the findings also exhibited a positive and significant relationship between the size of a stock exchange and its board total remuneration at 1% level of confidence which implies that relatively large stock exchange has more operation activities compared to small one and so it has higher level of complexity. Accordingly, a large stock exchange will need more monitoring activities and thus, will hire more independent directors. At this point the findings above showed a positive relationship between board remuneration and the proportion of independent directors, albeit it is not statistically significant. In supporting the previous discussion, previous literature in the corporate field concerning the relationship between directors' pay-level and corporation's size revealed a statistically significant relationship between the two variables. Previous studies considered that size of a firm is a proxy of its complexity. As large corporations are likely have large number of directors (i.e. independent directors) due to the complexity of its organisational structure and hence, paying higher level of remuneration. This result is consistent with several studies concerning financial and non-financial institutions, such as Ryan and Wiggins (2004), Linn and Park (2005) and Brick, Palmon and Wald (2006), Farrell, Friesen and Hersch (2008), Adams and Ferreira (2009), Andreas, Rapp and Wolff (2012) and Lee and Isa (2015). Moreover,

in assessing the impact of the inflation rate on board remuneration, a significant positive relationship at 5% level of confidence has been determined. Reviewing the annual reports of the tested stock exchanges, it has been noticed that staff costs (i.e. salaries and stock option plan) are subjected to changes in inflation and partially to development in stock exchange's stock price (e.g. Australian Stock Exchange, 2005; Deutsche Stock Exchange, 2008). Accordingly, it can be argued that part of the increase in an exchange's board remuneration is due to increases in a country's inflation rate. Finally, other variables such as crisis, leverage, profitability (ROA), growth opportunities, board size and board independence have no significant role in determining the board remuneration. In addition, previous literature argued that a firm's past performance could have a significant impact on its board remuneration. According to this assumption, the remuneration received by the directors in the current year is depending on the firm's performance on the previous year (e.g. Crespi-Cladera and Gispert, 2003; Yermack 2004; Lee and Isa, 2015; Raithatha and Komera, 2016). Consequently, the current study re-analyzes model 6 with using a one lagged year of ROA and the findings are shown in table 7.15.

Table 7.15: GLS Regression Findings of Model 6 with ROA lagged for One Year

Model 6: Director's Remuneration					
Dependent variable: Total Board Remuneration					
Variable	Fixed Effects	Random Effects	Re vce (robust)	VIF	1/VIF
Crisis	-.0404631	-.036101	-.036101	1.08	0.924434
Demutualization	.5595247***	.5875192***	.5875192***	1.45	0.691599
Inflation	.0397887	.0431295	.0431295*	1.17	0.853106
Size	.2595601***	.2467175***	.2467175***	1.66	0.603253
Leverage^3	-.0046883	-.0092974	-.0092974	1.18	0.844195
Profitability (ROA)†	.2695023	.2144099	.2144099	1.22	0.817690
Growth Opportunities	-.0101795	-.0066236	-.0066236	1.03	0.971162
Board Size^3	-.0005414	.000279	.000279	2.04	0.490160
Board Independence^3	.1698664	.0930154	.0930154	1.48	0.677296
Cons	9.497469***	9.863316***	9.863316***	No. of Obs. 150	
Hausman Test Chi2(9)= 1.30 Prob>chi2= 0.9984		Wald chi2(9) = 179.85 Prob > chi2 = 0.0000		Mean VIF	

†ROA is lagged for one year

* 10% significance level.

**5% significance level.

***1% significance level.

Interestingly, from the above findings, there are no significant changes especially for the determinants of board remuneration of a stock exchange (i.e. demutualization, inflation rate and size). However the level of significance of the demutualization increases from 10% to 1% , the inflation rate decreases from 5% to 10% and the size remain constant at 1% level of confidence. This result implies that both; the contemporaneous performance of a stock exchange as well as its past performance does not influence the board remuneration.

7.2.2.3 Internal Corporate Governance Mechanisms and Financial Performance

In this section, the study links the changes in internal corporate governance mechanisms derived from demutualization and their impact of the financial performance of a stock exchange. Previous literature in the field of corporate governance has provided evidence on the crucial role of internal governance mechanisms in enhancing the performance of a corporation especially, from profitability perspective.

Findings and Discussions for Model 7

Table 7.16: GLS Regression Findings of ROA and Internal Governance Mechanisms

Model 7					
Dependent variable: ROA					
Variable	Fixed Effects	Random Effects	FEvce (robust)	VIF	1/VIF
Crisis	.0130459	-.0000275	.0130459	1.20	0.834245
Demutualization	.0645082***	.0543926***	.0645082*	1.61	0.621957
Leverage^3	.0002131	.001884	.0002131	1.25	0.799117
GDPG	.0080011**	.0058067*	.0080011***	1.61	0.622510
Inflation	.0027223	-.0040693	.0027223	1.40	0.712615
Size	-.027533***	-.0059637*	-.027533**	1.52	0.657620
Growth opportunities	.0258158	.0336591	.0258158	1.15	0.872598
Board size^3	-.0031186**	-.00274**	-.0031186**	1.82	0.550842
Board independence^3	-.0686874	-.0014649	-.0686874*	1.56	0.642477
Board Remuneration	.0182415	-.0071507	.0182415	1.38	0.722767
Cons	.3888375**	.3373972***	.3888375	Number of obs. = 180	
Hausman Test chi2(10)= 29.64 Prob>chi2= 0.0010		F(10,14)= 90.53 Prob > chi2 = 0.0000		Mean VIF 1.45	

* 10% significance level.

**5% significance level.

***1% significance level

Table 7.17: GLS Regression Findings of ROE and Internal Governance Mechanisms

Model 3: Profitability					
Dependent variable: ROE					
Variable	Fixed Effects	Random Effects	FEvce (robust)	VIF	1/VIF
Crisis	.002912	-.004321	.002912	1.20	0.834245
Demutualization	.0648387***	.0672538***	.0648387*	1.61	0.621957
Leverage^3	.0094447	.0108025	.0094447	1.25	0.799117
GDPG	.0055822	.0047507	.0055822	1.61	0.622510
Inflation	.0108925**	.0065349	.0108925	1.40	0.712615
Size	-.0289384***	-.010288**	-.0289384***	1.52	0.657620
Growth opportunities	.040769*	.0449236*	.040769*	1.15	0.872598
Board size^3	-.0030995**	-.0023202*	-.0030995	1.82	0.550842
Board independence^3	-.078458	-.0158655	-.078458*	1.56	0.642477
Board Remuneration	.0326912**	-.0029403	.0326912	1.38	0.722767
Cons	.2089723	.3445703**	.2089723	Number of obs. = 180	
Hausman Test chi2(10)= 19.60 Prob>chi2= 0.0333		F(10,14)= 17.40 Prob > chi2 = 0.0000		Mean VIF 1.45	

* 10% significance level.

**5% significance level.

***1% significance level

Hypothesis-H7 states that changes in a stock exchange's internal corporate governance mechanisms derived from demutualization enhances its financial performance. Accordingly, demutualization and internal corporate governance mechanisms (independent variables) and control variables (crisis, leverage, GDP growth, inflation, size and growth opportunities) were regressed against the profitability ratios (dependent variables) - using ROA and ROE interchangeably. By recalling the findings revealed previously (tables 7.11 and 7.12); the relationships between demutualization, leverage, GDP growth, inflation, size and growth

opportunities and profitability measured by both ROA and ROE ratios are consistent with the findings shown in tables 7.16 and 7.17 however, by adding the internal governance mechanisms, the findings exhibited a negative relationship between the board size and both ratios; ROA at 5% level of confidence, albeit not statistically significant with ROE. This result implies that small board size enhances the profitability of a stock exchange. Following the notion of the agency theory, small boards are effective in monitoring business activities compared to large boards that may hinder the coordination and communication between board members especially with the limited time available for expressing their ideas and opinions which lead to slow the process of decision making and could initiate agency problems such as free-riding problem. As mentioned previously no empirical study in the context of the demutualization of stock exchanges examined the impact of internal governance mechanisms on the performance of a stock exchange, however, this result is consistent with several empirical studies in the field of corporate finance such as Lipton and Lorsch (1992), Jensen (1993), Yermack (1996), Eisenberg, et al. (1998), Gill and Mathur (2011) and Arosa, Iturralde, Maseda (2013). Moreover, the findings showed a significant and negative relationship between board independence for both ratios; ROA and ROE at 10% level of confidence. This result implies the higher proportion of independent directors has a negative impact on the performance of a stock exchange. Surprisingly, this result is not expected as previous literature clarified the importance of the independent directors especially for the monitoring of the executives and providing advices to the board of a firm. At this point, Hermalin and Weisbach (1991) argued that there is a probability that both insider and outsider directors do not succeed in performing their duties toward satisfying the interests of stockholders. Similarly, Bhagat and Black (1999) argued that using board performance in evaluating the role of the independent directors especially, in detached events is somehow

problematic as that independence may be useful and valuable in some cases and may not in others. This result is consistent with several empirical studies like Zahra and Stanton, 1998; Bhagat and Black, 1999; Shukeri, Shin and Shaari, 2012; Arosa, Iturralde, Maseda (2013). Finally, the findings exhibited a positive relationship between the board remuneration and both profitability ratios; ROA and ROE, albeit not statistically significant. This result refers that the board remuneration is not linked to the performance of a stock exchange.

7.3 Robustness Check

This section will provide the findings of the regression models using other proxies for some of the determinants included in each model such as size, profitability, leverage and growth opportunities for checking the robust of original findings. Accordingly, the study uses the natural logarithm of sales as a proxy for size, ROE as proxy for profitability and the change in total assets as a proxy for growth opportunities.

Table 7.18: GLS Regression Results for Model 1(Robust)

Model 1 (Robust); Dependent variable: Cash Holdings³					
Panel A		Panel B		Panel C	
Variable	REvce (robust)	Variable	REvce (robust)	Variables	REvce (robust)
Crisis	.25585	Crisis	.2076765	Crisis	.1952923
Demutualization	1.064608*	Demutualization	1.147393*	Demutualization	1.173293**
Leverage ³	-.4080097**	Short-term debt ³	1.44076	Long-term debt	-1.73762
GDPG	.0684831	GDPG	.0374072	GDPG	.0426601
Inflation	-.0695236	Inflation	-.0671383	Inflation	-.0671798
Size	.1430187*	Size	.0753097	Size	.1441086**
Profitability (ROE)	1.439851	Profitability (ROE)	1.286284	Profitability (ROE)	1.313587
Dividend Payments	-1.217152**	Dividend Payments	-1.081978**	Dividend Payments	-1.21062**
Assets Tangibility	-4.592449***	Assets Tangibility	-4.623645***	Assets Tangibility	-4.462899***
Growth Opportunities	-.0540776	Growth Opportunities	-.0354927	Growth Opportunities	-.045203
Non-liquid assets	-4.705472	Non-liquid assets	-4.521098***	Non-liquid assets	-4.582663***
Cons	.5870537	Cons	1.483062	Cons	.5572304
Wald chi2(11)= 69.69 Prob > chi2= 0.0000		Wald chi2(11)= 48.49 Prob > chi2= 0.0000		Wald chi2(11)= 34.67 Prob > chi2= 0.0003	

Table 7.13 includes three panels; A, B and C. The findings revealed from panel A are consistent with the findings presented previously in table 7.6. In addition, the reasons behind developing both panels B and C; firstly, to use other proxies for leverage which are short-term and long-term debts and secondly, to control for the endogeneity between cash holdings and leverage (D'Mello, Krishnaswami and Larkin, 2008) especially with short-term debt. The findings exhibited similar results for all the determinants and there is no significant relationship between cash holdings and short-term debt.

Table 7.19: GLS Regression Results for Models 2, 2-1 and 2-2(Robust)

Model 2		Model 2-1	Model 2-2
Panel A Leverage ³		Panel B Short-term debt ³	Panel C Long-term debt
Variable	REvce (robust)	FEvce(robust)	REvce (robust)
Crisis	-.0005391	.0549667**	-.0323422**
Demutualization	-.5048211***	.0568695	-.0642095*
GDPG	.0133179	.0173385*	-.0079564***
Inflation	.0057433	-.0006403	.0036263
Size	.0749655	-.0049957	.0160343***
Growth opportunities	-.0056663	-.0100466	.0020816
Tangibility	-.3774115	.0651665	.0552285
Agency cost	.0130385	-.0798711	.0818003*
Profitability (ROE)	.4194498	-.0542524	-.0821903
Liquidity ³	-.040177	.0109707**	.0013689
Cons	-.5092506	.1313918	-.1773642*
Wald chi2(10) = 35.48 Prob > chi2 = 0.0001		F(10,14) = 23.19 Prob > F = 0.0000	Wald chi2(10) = 237.02 Prob > chi2 = 0.0000

Table 7.19 includes three panels; A, B and C. As for panel A, the findings are consistent with the findings presented previously in table 7.7. Similarly, for both panels B and C, the findings are similar to the results provided in tables 7.8 and 7.9.

Table 7.20: GLS Regression Results for Model 3(Robust)

Model 3		
Panel A: ROA		Panel B: ROE
Variable	REvce (robust)	REvce (robust)
Crisis	-.0026511	-.0098399
Demutualization	.0608377**	.0686645**
Leverage ³	-.0018429	.0075607
GDPG	.007883***	.0062549
Inflation	-.0024869	.0059366
Size	-.0031269	-.00213
Growth opportunities	.0061492*	.0075515**
Cons	.1012937	.0830479
Wald chi2(7) = 61.01 Prob > chi2 = 0.0000		Wald chi2(7) = 56.13 Prob > chi2 = 0.0000

Table 7.20 includes two panels; A and B. As for panel A, the findings are consistent with the previous results provided in table 7.10. However, using the change in total assets as a proxy for growth opportunities has provided a significant relationship with ROA. Moreover, using the natural logarithm of sales as a proxy for size generates a negative relationship, although not significant. On the other hand, panel B, provided similar findings of the previous results shown in table 7.11.

Table 7.21: Fixed-effects (within) IV Regression for Model 4(Robust)

Model 6: Board Size			
Dependent variable: Board Size			
Variable	Coefficient	Z value	P> z
Demutualization	-4.250935**	-2.55	0.011
Leverage^3	.5369698	0.21	0.832
Size	.4629644	0.60	0.551
Profitability	5.951562	0.62	0.535
Growth opportunities	.6143251	0.52	0.604
Board Independence^3†	-14.66382***	-4.36	0.000
Cons	18.28349	1.27	0.205
Wald chi2(6) = 3194.74		No. of observations 150	
Prob > chi2 = 0.0000			

†Instrument variable: Board Independence lagged for one year

In this model, the natural logarithm of sales was used as a proxy for size and the change in total assets was used as a proxy for growth opportunities. The findings from table 7.21 are consistent with the results shown in table 7.12 however, the relationship between size and board size becomes insignificant.

Table 7.22: G2SLS Random-Effects IV Regression for Model 5(Robust)

Model 6: Board Independence			
Dependent variable: proportion of Independent directors			
Variable	Coefficient	Z value	P> z
Crisis	.0010241	0.04	0.968
Demutualization	.1221468***	3.08	0.002
Leverage^3	.007265	0.31	0.753
Size	-.0086893	-0.52	0.603
Profitability (ROE)	.050703	0.36	0.721
Growth opportunities	.0130795*	1.75	0.079
Board Size^3†	-.0113924***	-3.21	0.001
Cons	.6647128*	2.21	0.027
Wald chi2(7) = 74.18		No. of observations 150	
Prob > chi2 = 0.0000			

† Instrument variable: Board Size lagged for one year

In this model, the natural logarithm of sales was used as a proxy for size and the change in total assets was used as a proxy for growth opportunities. The findings shown in table one Table 7.21 are consistent with the results provided previously in table 7.13.

Table 7.23: GLS Regression Results for Model 6 (Robust)

Model 6: Director's Remuneration				
Dependent variable: Average of Total Board Remuneration				
Variable	Fixed Effects	Random Effects	FE vce (robust)	
Crisis	-.0669021	-.0623313	-.0669021	
Demutualization	.4484188***	.4808978***	.4484188***	
Inflation	.0510945*	.0547798*	.0510945*	
Size	.2432187***	.2294541***	.2432187***	
Leverage^3	-.0710237	-.0759555	-.0710237	
Profitability (ROA)†	.2117667	.1502577	.2117667	
Growth Opportunities	.0600948	.0642064	.0600948	
Board Size^3	-.0354562***	-.0344224***	-.0354562	
Board Independence^3	-.0154633	-.1035395	-.0154633	
Cons	8.004498***	8.372609***	8.004498***	No. of Obs. 150
Hausman Test Chi2(9)= 21.50 Prob>chi2= 0.0106		F(9,14) = 16.19 Prob > F = 0.0000 Mean VIF		

†ROA is lagged for one year

In this model, the study uses an alternative proxy of board remuneration which is the average of total board remuneration. This variable is calculated by dividing the total board remuneration by the board size similar to Lee and Isa (2015). In addition the model included the same variables used in table 7.15. The findings provided by this model are consistent with the results shown in table 7.15.

Table 7.24: GLS Regression Results for Model 7 (Robust)

Model 3: Profitability			
Dependent variables: ROA and ROE			
Panel A: ROA		Panel B: ROE	
Variable	Random Effects (robust)	Random Effects (robust)	
Crisis	-.0052375	-.0077759	
Demutualization	.0459535*	.0596118*	
Leverage^3	.0002872	.0098437	
GDPG	.0047565**	.0057868	
Inflation	-.005927	.0051094	
Size	-.0002688	-.0003292	
Growth opportunities	.0072226**	.0078954**	
Board size^3	-.0037484***	-.0027464*	
Board independence^3	-.010729	-.0141565	
Board Remuneration	.0082051	.0082207	
Cons	.2776027***	.2286227	Number of obs. = 180
Wald chi2(10) = 281.66 Prob > chi2 = 0.0000		Prob > chi2 = 0.0000	

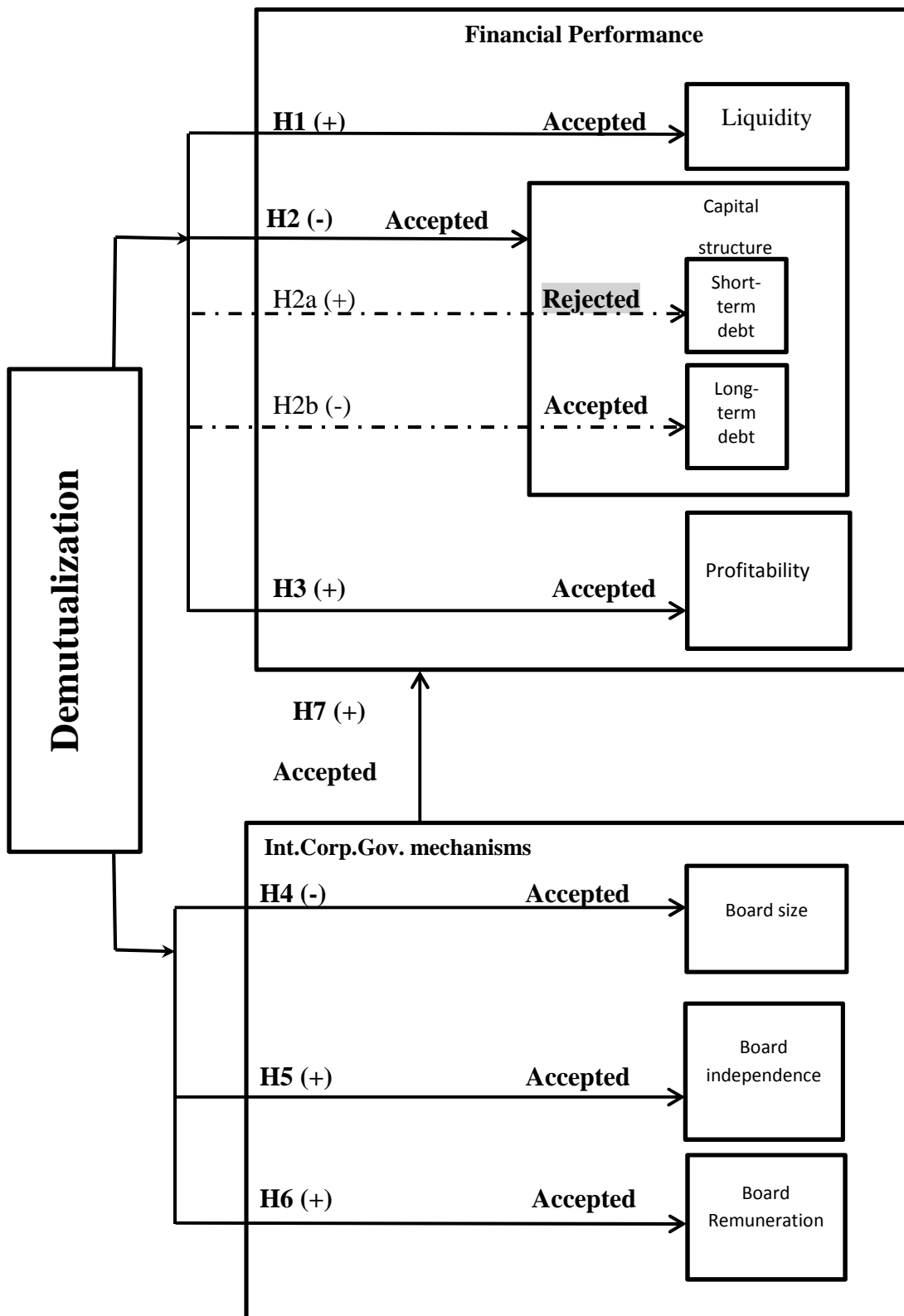
Table 7.24 presents the relationship between changes in internal corporate governance mechanisms and financial performance (i.e. profitability) of a stock exchange. The study uses alternative proxies for size (natural logarithm of sales), growth opportunities (change in total

assets). The findings revealed a negative and significant relationship between board size and both ratios; ROA and ROE in panel A and Panel B, respectively. In addition, there is a negative and insignificant relationship between board independence and both ratios; ROA and ROE. However, the findings exhibited a positive relationship between board remuneration and both ratios; ROA and ROE, albeit are insignificant, that is similar to previous results (Tables; 7.16 and 7.17).

7.4 Conclusion

The main purpose of this chapter is to examine the impact of demutualization of a stock exchange on its financial performance and internal corporate governance mechanisms. In testing the hypotheses of this study, this chapter provided the findings of several statistical tests; the Wilcoxon signed rank test and multivariate regression analysis for several models. By applying the Wilcoxon signed rank test, the findings revealed that there are significant changes in the tested variables through comparing their median values before and after the demutualization. However, to determine how much of any change was attributed to demutualization and how much are related to other exogenous changes, a multivariate regression analysis for several empirical models was applied. Then, findings and discussions were provided in order to accept or reject the stated hypotheses which can be illustrated in figure 7.1.

Figure 7.1 Summary Of The Research Findings



Overall, the findings of model 1 showed that demutualization has a significant positive impact on cash holdings of a stock exchange. In addition, there are other determinants that have significant impact on cash holdings such as leverage, size, dividend payments, assets tangibility and non-liquid assets. As for model 2, it was found that demutualization has a significant negative impact on the level of leverage of a stock exchange. The models 2-1 and 2-2 present the impact of demutualization on short-term and long-term debts. Their findings revealed that demutualization has a significant negative impact on long-term debt, albeit there is no significant effect on short-term debt. In model 3, it was found that demutualization of a stock exchange improved its profitability significantly. On another level, demutualization has a crucial impact on its internal corporate governance mechanisms. The findings of models 4, 5 and 6 exhibited a significant negative impact of demutualization on exchange's board size. However, it has increased the proportion of independent directors among its board members and improves the pay structure of its directors. Finally, model 7 linked the changes in internal corporate governance mechanisms derived from demutualization on its financial performance especially from its profitability perspective. Interestingly, the findings clarified that a small board size enhances the performance of a stock exchange, although this was not the case for board independence. It seems that the higher number of independent directors does not support the performance of a stock exchange. Moreover, although demutualization increased the pay structure of exchange's directors, such increase has no significant impact on its performance. Then, the following chapter will provide a review of conclusion, limitations and recommendations of the current study.

Chapter Eight

Conclusion, Limitations and Recommendations

		Page Number
8.1	Introduction	259
8.2	Review of Objectives and Research Questions	260
8.3	Research Findings	263
8.4	Contributions of The Study	270
	8.4.1 Contributions to Theory	271
	8.4.2 Contributions to Practice	272
	8.4.3 Contribution to Methodology	274
8.5	Limitations of the Study	275
8.6	Opportunities for Future Research	276

8.1 Introduction

This chapter concludes the current study, summarises its findings and presents the answer of the research questions. The chapter provides a review of the research objectives and questions in section 8.2. The research findings are presented in section 8.3. Section 8.4 provides the contribution of this study. The limitations of this study are discussed in section 8.5. Section 8.6 will provide the opportunities for future research. Finally, this chapter will provide some reflections of this study.

8.2 Review of Objectives and Research Questions

This section provides a review of the research objectives and questions. In addition, it provides the methodological approach taken to achieve the objectives and answers the question of this research.

Objective one: to critically review the relevant literature for the impact of demutualization on stock exchanges' financial performance.

Previous literature showed that determining the impact of changing the ownership through adopting the demutualization strategy on the performance of stock exchanges has three basic areas; financial performance, product market/sources of revenue and stockholders return. In addition, examining the impact of demutualization on a stock exchange's financial performance is the common area among all the empirical studies in this field, although the findings revealed mixed evidence. Moreover, the financial performance in general has different perspectives such as profitability, capital structure/leverage, efficiency and liquidity. Since this particular study is considered as an event study, previous literature showed that there are two different methodological approaches; MNR methodology approach, where there are two groups; a tested group against a control group (e.g. Mendiola and O'Hara, 2003; Otchere, 2006; Otchere and Abou-Zied, 2008) however, the second approach includes only one group (i.e. tested group) as to address this with sufficient data and applying statistical regression analysis (e.g. Azzam, 2010). Accordingly, fulfilling this objective is twofold; exploring the different areas of financial performance that have been covered in previous literature and determining the appropriate methodology for this study.

Objective two: Examine the theoretical foundations for the corporate governance mechanisms in regard to the corporations and their performance in order to develop the association of demutualization of stock exchanges with the corporate governance mechanisms.

Adopting the demutualization strategy changes the ownership of a stock exchange as well as its governance structure associated with decoupling the trading rights from the ownership rights in which, outside shareholders are represented by elected board of directors whom are answerable to the shareholders. Although, the separation between trading rights from the ownership rights provide the directors/managers of a stock exchange under the new structure a free space of flexibility in decision making, tracing profitable opportunities and so can compete in an effective way, however, a potential conflict may raise between the managers and owners of stock exchanges. Nevertheless, examining the impact of demutualization on the governance mechanisms and identifying its theoretical foundation has not received any significant attention. Accordingly, by achieving this objective, this study has developed the association of demutualization of stock exchanges with the corporate governance mechanisms especially the internal governance mechanisms.

Objective three: Construct an empirical model to investigate the impact of demutualization on the financial performance (i.e. profitability) of a stock exchange and on its internal corporate governance mechanisms in addition, examine the ability of the changes in internal governance mechanisms derived by demutualization to enhance the performance of the stock exchange.

This objective addressed the following research questions:

1- What are the impacts/effects of demutualization on the financial performance of the stock exchange?

2- What are the impacts/effects of demutualization on the internal corporate governance mechanisms of the stock exchange?

3- What is the impact of the changes in internal corporate governance mechanisms derived by demutualization on the exchange's financial performance?

This objective relies mainly on the fulfillment of the two objectives discussed above. Accordingly, the current study was able to determine the gap in previous literature regarding the impact of changing the ownership and governance structure of a stock exchange by adopting the demutualization strategy in two main areas; the financial performance and corporate governance mechanisms. At this point, this study established the conceptual framework highlighting the following:

First, the impact of demutualization of a stock exchange on its financial performance from different perspectives; the liquidity, capital structure and debt choice and profitability thus, three hypotheses were developed and justified for three perspectives, taking into consideration that the hypothesis of the capital structure has two sub-hypotheses regard the debt choice/maturities (i.e. short-term and long-term).

Second, the impact of demutualization of a stock exchange on the internal governance mechanisms, especially the board of director's structure; board size and board independence and the director's remuneration, thus three hypotheses were developed and justified.

Third, previous literature in the field of corporate governance emphasized on the potential impact of internal corporate governance mechanisms on a firm's performance, thus this study has developed and justified another hypothesis that linked the changes in internal governance mechanisms derived from the demutualization and the financial performance of a stock exchange. The above three research questions were then answered through testing the established

seven hypotheses and two sub-hypotheses. As a preliminary step for testing the hypotheses, the current study used the Wilcoxon signed-rank test to test the difference in median values of the tested variables before and after demutualization. Second, the seven hypotheses and two sub-hypotheses were examined by nine regression models which were tested using GLS regression, although two regression models were retested using 2SLS to control for the endogeneity problem. The following section will summarise the findings generated by this study.

8.3 Research Findings

As indicated in chapters three and four, the current study used wider theoretical and empirical backgrounds to answer the research questions and to fill the gap in the literature. The study used a sample of 15 stock exchanges that are members of World Federation of Exchanges of different sizes and in different regions that demutualized at different points in time. The findings of the Wilcoxon signed rank test showed that there are significant differences in values of most of the tested variables pre and post demutualization. As for the variables that present the financial performance, the cash holdings and profitability ratios increased significantly after the demutualization. The leverage and short-term debt ratios decreased (increased) after the demutualization respectively, albeit the differences are not statistically significant. However, long-term debt ratio declined significantly after demutualization. On the other hand, as for the variables that present the internal governance mechanisms, the board size declined significantly after the demutualization of stock exchanges. The board independence and director's remuneration (i.e. total directors' remuneration) increased significantly after the conversion. As presented previously, the findings of the Wilcoxon signed rank test has provided this study with a primary conclusion that the changes in the values of the tested variables may be attributed the demutualization strategy adopted by the stock exchanges. Accordingly, to sort out this issue, the

study applied a statistical regression technique using several empirical models that include the demutualization (i.e. independent variable) and other determinants (i.e. control variables) to decide how much any change in the tested variables was attributed to the demutualization and how much to the exogenous changes in other determinants (i.e. characteristics of a stock exchange, macroeconomic factors, etc.) that could have an impact on the tested variables.

According to model 1, the findings revealed that the demutualization has a positive and significant relationship between demutualization and liquidity of a stock exchange which measured by the cash holdings ratio at 5% level. This result indicates that a demutualization of a stock exchange increase its level of cash reserves. On the other hand, other determinants of liquidity/cash holdings have been added to the model following different theories such as trading-off, pecking order and free cash-flow theories. The findings showed that leverage/debt, size, dividends, assets tangibility and non-liquid assets have significant impact on the level of cash holdings by a stock exchange. As for the leverage/debt variable, the findings revealed a negative and significant association with the level of cash holdings, which according to the pecking order theory; a stock exchange can use its reserves of cash as an internal source of funds rather than using external funding (i.e. leverage/debt) or this level of liquid assets can be used to pay off its debts (i.e. principal and interest) thus decrease the bankruptcy cost associated with higher level of debt. Similarly, the size of a stock exchange has a positive and significant relationship with its level of cash reserves which implies that a large stock exchange holds more level of cash. This relationship could be explained by the pecking order theory, where large firms rely mainly on self-financing in applying their financial policies while small firms rely on short-term financing. In addition, large firms hold higher level of cash in order to reach and maintain higher level of quality in managing its operating activities. As for the payment of dividends, the

findings exhibited a significant negative relationship with the cash holdings of a stock exchange, which indicates that a stock exchange that pays dividends-similar to the demutualized stock exchange-has the option to raise its capital with lower cost by cutting back its payment of dividends and this result is consistent with the trade-off theory. Moreover, another determinant of an exchange's cash holdings is the assets tangibility. The findings revealed a negative and significant relationship between cash holdings and assets tangibility, which refers that a stock exchange owned higher portion of fixed assets that can be liquidated to generate the cash needed in case of a shortage of cash reserves. This relationship can be explained following the notion of the trade-off theory, as a firm may suffer from financial distress which leads to a shortfall in its reserves of cash, could sell a portion of its fixed assets in an attempt to overcome the issue of the financial distress. Finally, the last determinant that has a significant impact on the level of cash of a stock exchange is the level of its non-liquid assets, as the findings revealed a negative relationship between the two variables which is compatible with the prediction of the trade-off theory. This result indicates that a stock exchange can use its non-liquid assets as a substitute source in case of a shortfall in its cash reserves.

According to model 2, the findings revealed a negative and significant relationship between demutualization and an exchange's leverage/debt which measured by debt to equity ratio. This result implies that demutualization of a stock exchange decreases its usage of leverage /debt as a source of finance and instead, it uses the equity as an alternative source of funds or by recalling the results from model 1, a stock exchange may use an internal source of funds (i.e. cash and cash equivalent/cash holdings). Reviewing the previous literature, a traditional stock exchange (i.e. mutual structure), has limitations regarding raising new capital as it has no option in selling stocks to the public, however by adopting the demutualization strategy the exchange can

distribute stocks to their members/owners and in an advanced stage the exchange can sell stocks to outside investors through private placement or initial public offering (IPO). This result is consistent with prior empirical studies in the context of demutualization of stock exchanges. On the other hand, other determinants have been added to the model following different theories such as trading-off, pecking order and agency cost theories, however none of these variables/determinants have any significant impact on the level of debt/leverage of a stock exchange.

In model 2-1, the findings exhibited a positive relationship between demutualization and short-term debt ratio, albeit it is not statistically significant. Similarly, the study added the same determinants to examine their impact on the short-term debt of an exchange. Moreover, the findings revealed that there are positive and significant relationships between the global financial crisis, GDP growth, and liquidity as control variables and short-term debt.

According to model 2-2, the findings exhibited a significant negative relationship between demutualization and long-term debt of a stock exchange, which implies that demutualization of a stock exchange, decreases its usage of long-term debt and so it may use an alternative external source of funds (i.e. equity) or an internal source of funds (i.e. cash holdings) for its financing activities. Similarly to the previous models, there are other determinants of long-term debt, as the findings revealed significant and negative relationships between global financial crisis and GDP growth and long-term debt of a stock exchange. On the other hand, there are significant and positive relationships between the size of a stock exchange and its agency cost and long-term debt.

According to model 3, the study examined the impact of demutualization on the profitability of a stock exchange. Thus, both ratios ROA and ROE were used respectively. The findings of this

model exhibited a positive and significant relationship between demutualization and ROA (ROE), which implies that demutualization improves the profitability of a stock exchange. This result is aligned with the definition of demutualization where the primary objective of a mutual exchange changed from enhancing its members' interests to maximise a stock exchange's profit and its stockholders' wealth. This result is consistent with prior empirical studies. As for the macroeconomic variables, especially the GDP growth, the findings revealed a positive relationship has been determined between GDP growth and both ratios; ROA (ROE). This relationship is significant for ROA, albeit it is not statistically significant for ROE. Another determinant of the profitability is the size of a stock exchange. The findings exhibited a negative relationship between ROA (ROE) and the size of a stock exchange, although it is significant for ROA and not significant for ROE which implies that a small stock exchange has higher level of profitability compared to the large one. This result can be attributed to the managerial-utility-theory developed by Williamson (1964), where the managers of firms/corporations, especially the large ones are interested in maximising their own utilities using their discretionary power over the main objective of corporations - the profit maximisation. Moreover, the findings revealed a positive relationship between growth opportunities and profitability for both ratios; ROA and ROE, although this relationship is significant only for ROE but not statistically significant for ROA which implies that a profitable stock exchange may use its profit to expand its business activities. According to Myers (1984), profitable firms may use their retained earnings as a first source of funds to finance the potential investment opportunities in order to avoid the cost associated with external financing sources. For the following two models, model 4 and model 5 which examining the impact of demutualization on the board structure of an exchange (i.e. board size and board independence), previous literature in corporate governance

field concerned mainly by the potential endogeneity problem. Accordingly, the current study used the lag of board independence as an instrumental variable in model 4 and the lag of board size as an instrumental variable in model 5 and applied the two-stage least square (2SLS) regression to control for the potential endogeneity problem.

As for model 4, the findings revealed a significant and negative relationship between demutualization and the board size of a stock exchange which implies that demutualization of a stock exchange decreases the number of members in its board of director compared to its board size under the mutual structure. This result can be explained following the agency theory, where small board size is more effective in monitoring activities than large board size that may suffer from communication and coordination problems which lead to slow decision making and initiate agency problem such as director free-riding. Beside the impact of changing the ownership of a stock exchange (i.e. demutualization), other determinants could have significant influence on board size. As for the size of a stock exchange, the findings showed that there is a positive and significant association between the size of an exchange and board size, which indicates that a large stock exchange, needs large board to manage its operating activities efficiently. Previous literature in the corporate finance field showed that large corporations are always seek to expand its activities, thus will need more members to deal with such expansion. Moreover, a negative and significant relationship between board independence and board size, which indicates that the smaller the board the higher number of independent directors among its members. As for this result, both small board and higher number of independent directors enhance the corporate governance of firms as both considered as complementary mechanisms (Jensen, 1993).

According to model 5, the findings exhibited a positive and significant relationship between demutualization and the fraction of independent directors as member of boards which indicates

that demutualization of a stock exchange increases the number of independent directors compared to its mutual structure. According to both theories; agency and resource dependence theories emphasized on the importance of independent directors as monitoring mechanism in controlling management actions and limiting opportunistic behaviour. Another determinant of board independence is growth opportunities, as the findings showed a negative and significant relationship between growth opportunities and board independence. Although, increasing the growth opportunities need more independent directors for monitoring activities; however this may lead to increase the monitoring costs thus, firms could decrease the number of independent directors. Moreover, the findings revealed a negative and significant relationship between board size and board independence. As for this result, both higher number of independent directors and small board enhance the corporate governance of firms as both are considered as complementary mechanisms (Jensen, 1993).

According to model 6, the findings exhibited a positive and significant relationship between demutualization and total directors' remuneration which implies that demutualization of a stock exchange improves the pay structure of its directors compared to its mutual structure as there was no room for incentive schemes. In addition, the findings revealed a significant positive relationship between the size of a stock exchange and total directors' remuneration. As for this result, previous literature indicated that size of corporation is a proxy of its complexity, so large corporations have more complexity of its organisational structure compared to small firms and so hire more directors, thus pay more remuneration. Another determinant of director's remuneration is the inflation rate. The findings exhibited a positive and significant relationship between inflation rate and total board remuneration. The majority of the annual reports of the selected

stock exchanges refer to the significant influence of inflation on the pay-level of all the staff of a stock exchange (i.e. salaries and stock option plan).

In model 7, the study examined the impact of the internal governance mechanisms derived from the demutualization on the financial performance by using the profitability ratios (i.e. ROA and ROE) of a stock exchange respectively. Accordingly, the findings showed a negative relationship between board size and ROA (ROE) respectively, albeit the relationship is significant for ROA and not statistically significant for ROE. This result is justified by the agency theory where the small board size is more effective in monitoring a firm activities compared to large board that may hinder the coordination and communication between board members which may lead to slow the process of decision making and could initiate agency problems such as free-riding problem. Surprisingly, the findings revealed a negative and significant relationship between board independence and both profitability ratios; ROA and ROE respectively. This result indicates that a higher proportion of independent directors among an exchange's board members lead to a poor performance. Moreover, the findings showed there is a positive relationship between board remuneration and both ratios ROA and ROE respectively, albeit not statistically significant. This result implies that board remuneration is not linked to a stock exchange performance.

8.4 Contributions of the Study

The contributions of this particular study will be classified from different perspectives. Section 8.4.1 summarises the contribution of this study to theories. Section 8.4.2 summarises the contribution of this study empirically. Section 8.4.3 summarises the contribution of this study methodologically.

8.4.1 Contributions to Theory

This study deals with the stock exchange as a firm which opens the door toward examining the impact of demutualization on the financial performance from different perspectives; liquidity through cash holdings, capital structure considering the different choices of debt maturity and profitability. In order to explain the impact of demutualization on financial performance previous literature focused mainly on examining its impact on the profitability perspective. However due to the mixed evidence, few studies examined a new perspective; the capital structure of stock exchanges to clarify the changes in its profitability. It has been noticed that these empirical studies examined only the impact of the demutualization on the external financial sources of fund (i.e. debt and equity) nonetheless, they neglected the internal funding (i.e. cash holdings) as an alternative source. This means that they ignored the core of capital structure and cash holdings theories. One of these theories is the “pecking order theory” which explains the financial hierarchy that a stock exchange can follow in its financing decisions starting by the internal source of funds (i.e. cash and cash equivalent), then the debt and the equity financing as a last resort. Although, the literature of corporate field is rich with theoretical and empirical backgrounds concerning the importance of the liquidity (i.e. cash holdings) and the leverage/capital structure and their influence on corporation’s financial performance however, it did not focus on the stock exchange industry. Therefore, this study contributes to providing evidence of the applicability of cash holdings theories, especially the “pecking order theory”, in explaining the impact of changing the ownership and governance structure through adopting the demutualization strategy on cash holdings in the stock exchange industry. The findings of this study showed that the stock exchange retained sufficient level of cash and decreased its usage of debt after the demutualization. Consequently, the stock exchange relies on the first alternative;

the level of cash reserves as an internal source of finance. Such alternative is needed to maintain its level of growth and the development of its business activities rather than using external funding (i.e. debt) which could be associated with financial restrictions (i.e. high cost) or used to pay off the debt of an exchange and so decrease the bankruptcy cost. This perspective adds new insights to knowledge as it exhibits the internal financial policies and procedures that a stock exchange would opt after the decision of conversion in order to increase its profitability and so improving its financial performance especially in such competitive environment.

8.4.2 Contributions to Practice

The current study contributes to the empirical studies from different perspectives which can be summarised as follows:

Firstly, dealing with stock exchanges from the firm point of view contributes to extending the literature pertaining to the financial performance from different perspectives. As for the financial performance, this is the first study that considered the impact of demutualization on the liquidity of stock exchanges from the cash holdings perspective. In addition, the current study provided evidence of other determinants that have significant impact on the cash holdings (i.e. leverage, size, dividend payments, assets tangibility and non-liquid assets) which were extensively examined in the field of corporate finance (i.e. corporations) in different industries but not on the stock exchange industry through the different motives and theories mentioned above. Moreover, the current study sheds light on the importance of managing the cash holdings of a stock exchange as it has a crucial impact on its financial performance. Consequently, by having a sufficient level of cash reserves, stock exchanges can maintain their financial flexibility especially within the instability of economic and competitive conditions, as in some cases the higher level of exchange's indebtedness could weaken its ability to have additional financing in

the future and so will be subjected to financial restrictions which also could affect its credit rating compared to other exchanges. On the other hand, issuing new equity could have harmful impact on the exchange's current stockholders who may suffer from equity dilution.

In addition, the current study contributes to extending the literature pertaining to the impact of demutualization of stock exchanges on the capital structure and the choice of debt maturity (i.e. short-term and long-term). As for the best of this study knowledge, there is no empirical study considered the impact of demutualization on the capital structure and especially the choice between debt maturities of stock exchanges, taking into consideration that previous literature examined the impact of demutualization/self-listing of stock exchanges on the capital structure, however, none of these empirical studies considered the determinants of capital structure or even debt choices using the mentioned above theories. Moreover, the findings provided by this study regard the impact of demutualization and other determinants of debt maturities showed the importance of the characteristics of a stock exchange (i.e. size, agency cost and liquidity), country specific variables, especially the macroeconomic variables (i.e. GDP growth) and the global financial crisis. Accordingly, the current study showed the importance of considering the debt maturity has twofold; it provided deep insights when analysing the capital structure of a stock exchange as well as showing how an exchange may react toward the changes in the economic conditions and the unexpected financial shocks, thus exploring the impact of its behavior and its financial policy.

As for the profitability, the current study provides evidence that support the changing of ownership and governance structure of a stock exchange as it improves its profitability. In addition, this study showed the importance of other determinants and its crucial impact of the profitability of a stock exchange such as size and growth opportunities.

Secondly, the current study contributes to the empirical studies pertaining to field of corporate governance especially, the internal governance mechanisms. The findings provided by this study revealed the significant impact of changing the ownership and governance structure of a stock exchange through adopting the demutualization strategy on its board structure (i.e. board size and board independence) and on the pay structure of its directors. In addition, the findings also exhibited other determinants beside the demutualization that have significant impact on board size, board independence and director's remuneration such the size of a stock exchange and the changes in economic conditions (i.e. inflation rate). As for the best of knowledge of this study, no empirical study examined the impact of demutualization of stock exchanges on internal governance mechanisms using these mechanisms as endogenous variables regressed against demutualization and potential determinants following previous literature of the corporate finance filed, however not examined in the stock exchange industry. Taking into consideration that only one study in context of demutualization of stock exchanges examined the impact of demutualization on internal mechanisms, although with core limitations such as using only one case study and the analysis applied just used the difference of the tested variables before and after the demutualization ignoring to control for other determinants that could have an impact on these variables, so the changes may or may not be attributed to the demutualization. From the previous discussion it can be concluded that demutualization enhances the value of a stock exchange.

8.4.3 Contribution to Methodology

This current study considers as an event study, and the approach applied in this study to examine the impact of demutualization on the tested variables is the regression technique and control for sufficient data. Consequently this approach enables this study to examine the impact of

demutualization on the financial performance of stock exchanges from different perspectives such as liquidity/cash holdings and capital structure considering the different maturities of debt following different theoretical and empirical foundations that applied extensively in the field of corporate finance but not on the stock exchange industry. In addition, this approach enables this study to consider the changes between countries specific variables (i.e. macroeconomic variables) and uncertainty of specific events/conditions (i.e. global financial crisis). Moreover, this approach enables this study to utilise different stock exchanges with different sizes. Similarly, concerning the impact of demutualization on the internal governance mechanisms, this approach enables this study to treat the variables of internal mechanisms (i.e. board size, board independence and director's remuneration) as endogenous variables rather than using them only as exogenous variables like the majority of empirical studies concerning the corporate governance mechanisms in the field of corporate finance.

8.5 Limitations of the Study

The current study has some limitations that need to be acknowledged as follows:

First, the empirical part of this study covered the period from 1995 to 2012. Second, the unavailability of some annual reports has prevented this study from having a sufficient number of years especially in the period before the demutualization (i.e. mutual structure). Such limitation prevents this study from splitting the sample to subsamples according to size criteria or to demutualized and publicly-listed exchanges and also makes the “Wilcoxon signed rank” test applied only for two years before and after the demutualization. Third, although the nature of the topic relates to this study generates a small number of observations, still this study consider the sample size is relatively small. In addition, the sample used on this study is considered only the equity markets and excluded the derivatives markets. Fourth, this study used only the accounting

measures to calculate the tested variables. However, previous literature, especially in the field of corporate finance included the market measures. Fifth, the nature of the annual reports of stock exchanges under the mutual structures has prevented this study for adding more variables especially for the corporate governance mechanisms such as director's ownership, audit committee characteristics, remuneration committee characteristics, CEO tenure, CEO duality, board meetings and gender diversity.

8.6 Opportunities for Future Research

The limitations of this study provide several opportunities for future research. This section provides some suggestions for further research.

First, as mentioned previously that dealing with a stock exchange as a firm opens the door toward this study to examine different perspectives regard its financial policies that could influence its financial performance such as the analysis of cash holdings and capital structure considering the debt maturities considering the associated theories mentioned previously. Accordingly, future research examined these financial policies especially, on the period post the demutualization.

Second, the current study clarified that there are different governance structure of stock exchanges, thus for instance future studies could compare the financial polices (i.e. cash holdings and capital structure considering the debt maturities) comparing two groups of stock exchanges; demutualized against self-listing exchanges.

Third, the findings of the current study provided evidence on the significant impact of changing the ownership and governance structure on the corporate governance mechanisms. Accordingly, future studies have the opportunity to examine the impact of demutualization/ self-listing on other internal governance mechanisms and their impact on the performance of stock exchanges,

such as director ownership, CEO tenure, CEO duality, board meetings, audit committee characteristics, remuneration committee characteristics and gender diversity.

Fourth, the current study showed the significant impact of demutualization of stock exchanges on the pay structure of its directors, however the previous literature in the field of corporate governance clarified that director's remuneration can be classified to fixed and variable compensations. The fixed compensation refers to the basic salary, however the variable compensation can take various forms; bonus, stock options and stock grants, thus future research could examine the impact of demutualization on these forms of compensation separately and link it to the performance of a stock exchange.

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Appendix

Demutualized exchanges with transferable ownership but not listed (9 exchanges)

Malta Stock Exchange	Borsa Istanbul
National Stock Exchange of India	BSE Limited
Oslo Børs	Budapest Stock Exchange
Taiwan Stock Exchange	China Financial Futures Exchange
Korea Exchange	

Source: WFE Cost and Revenue Survey (2013)

Publicly-listed company (23 exchanges)

Athens Exchange	Hong Kong Exchanges and Clearing
Australian Securities Exchange	Intercontinental Exchange
BM&FBOVESPA	Japan Exchange Group
BME Spanish Exchanges	Johannesburg Stock Exchanges
Bolsa de Comercio de Santiago	London Stock Exchange Group
Bolsa de Valores de Colombia	NASDAQ OMX Group
Bolsa de Valores de Lima	NYSE Euronext
Bolsa Mexicana de Valores	Singapore Exchange
Bursa Malaysia	TMX Group Inc.
Chicago Board Options Exchange	Warsaw Stock Exchange
CME Group	Deutsche Börse
Philippine Stock Exchange	

Source: WFE Cost and Revenue Survey (2013)

The Excluded Stock Exchanges

Stock Exchange	Year of Demutualization	Annual Reports Availability	Annual reports with English version	Derivatives Market
Athens Exchange	1999	Available reports only from the year 2000		
BM&FBOVESPA	2007	Available reports only from 2008		
BME Spanish Exchanges	2001	Available reports only from 2003		
Bolsa de Comercio de Santiago	NA	Available reports only from 2004		
Bolsa de Valores de Colombia	2001	Available reports only from 2004	NA	.
Bolsa de Valores de Lima	2002	NA	NA	
Chicago Board Options Exchange	2006			Derivative Market
CME Group	2002			Derivative Market
Intercontinental Exchange				Derivative Market
Singapore Exchange	1999	Available reports only from 2000		
TMX Group Inc.	2000	Available reports only from 2005		
National Stock Exchange of India	1993	NA		
Taiwan Stock Exchange	NA	NA		
Borsa Istanbul	2012	No sufficient years after Demutualization		
Budapest Stock Exchange	2002	Insufficient data before Demutualization		
China Financial Futures Exchange	NA			Derivative Market
Hong Kong Stock Exchange	2000	Available reports only from 1999		

Source: WFE Cost and Revenue Survey (2013)

The Selected Stock Exchanges and Period Covered by the study

<i>No.</i>	<i>Stock Exchange</i>	<i>Covering Period</i>	<i>Demutualization Year</i>	<i>Status</i>	<i>Region</i>
1	Johannesburg Stock Exchange	2001-2012	2005	Publicly-listed	Africa
2	Kuala Lumpur Stock Exchange	1999-2012	2004	Publicly-listed	Asia
3	Malta Stock Exchange	2002-2012	2007	Demutualized- not listed	Europe
4	Australia Stock Exchange	1997-2012	1999	Publicly-listed	Australia
5	Korea Stock Exchange	2002-2012	2005	Demutualized- not listed	Asia
6	New York Stock Exchange	2003-2012	2006	publicly listed	North America
7	NASDAQ	1997-2012	2001	Publicly-listed	North America
8	Bombay Stock Exchange	2002-2012	2005	Demutualized- not listed	Asia
9	London Stock Exchange	1995-2012	2000	Publicly-listed	Europe
10	Oslo Stock Exchange	1999-2012	2001	Demutualized- not listed	Europe
11	Deutsche Stock Exchange	1998-2012	2000	Publicly-listed	Europe
12	Tokyo Stock Exchange	1997-2012	2001	Publicly-listed	Asia
13	Philippine Stock Exchange	1997-2012	2001	Publicly-listed	Asia
14	Mexican Stock Exchange	2005-2012	2008	Publicly-listed	North America
15	Warsaw Stock Exchange	2007-2012	2010	Publicly-listed	Europe