EMPIRICAL STUDIES ON SHARE ISSUANCE AND REPURCHASE DECISIONS

Daniel Gyimah
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Adam Smith Business School
College of Social Sciences
University of Glasgow

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ABSTRACT

Financial constraints influence corporate policies of firms, including both investment decisions and external financing policies. The relevance of this phenomenon has become more pronounced during and after the recent financial crisis in 2007/2008. In addition to raising costs of external financing, the effects of financial crisis limited the availability of external financing which had implications for employment, investment, sale of assets, and tech spending. This thesis provides a comprehensive analysis of the effects of financial constraints on share issuance and repurchases decisions. Financial constraints comprise both internal constraints reflecting the demand for external financing and external financial constraints that relate to the supply of external financing. The study also examines both operating performance and stock market reactions associated with equity issuance methods.

The first empirical chapter explores the simultaneous effects of financial constraints and market timing on share issuance decisions. Internal financing constraints limit firms' ability to issue overvalued equity. On the other hand, financial crisis and low market liquidity (external financial constraints) restrict availability of equity financing and consequently increase the costs of external financing. Therefore, the study explores the extent to which internal and external financing constraints limit market timing of equity issues. This study finds that financial constraints play a significant role in whether firms time their equity issues when the shares are overvalued. The conclusion is that financially constrained firms issue overvalued equity when the external equity market or the general economic conditions are favourable. During recessionary periods, costs of external finance increase such that financially constrained firms are less likely to issue overvalued equity. Only unconstrained firms are more likely to issue overvalued equity even during crisis. Similarly, small firms that need cash flows to finance growth projects are less likely to access external equity financing during period of significant economic recessions. Moreover, constrained firms have low average stock returns compared to unconstrained firms, especially when they issue overvalued equity.

The second chapter examines the operating performance and stock returns associated with equity issuance methods. Firms in the UK can issue equity through rights issues, open offers, and private placement. This study argues that alternative equity issuance methods are associated with a different level of operating performance and long-term stock returns. Firms using private placement are associated with poor operating performance. However, rights issues are found empirically to be associated with higher operating performance and less negative long-term stock returns after issuance in comparison to counterpart firms that issue private placements and open offers. Thus, rights issuing firms perform better than open offers and private placement because the favourable operating performance at the time of issuance generates subsequent positive long-run stock price response. Right issuing firms are of better quality and outperform firms that adopt open offers and private placement.

In the third empirical chapter, the study explores the levered share repurchase of internally financially unconstrained firms. Unconstrained firms are expected to repurchase their shares using internal funds rather than through external borrowings. However, evidence shows that levered share repurchases are common among unconstrained firms. These firms display this repurchase behaviour when they have bond ratings or investment grade ratings that allow them to obtain cheap external debt financing. It is found that internally financially unconstrained firms borrow to finance their share repurchase when they invest more. Levered repurchase firms are associated with less positive abnormal returns than unlevered repurchase firms. For the levered repurchase sample, high investing firms are associated with more positive long-run abnormal stock returns than low investing firms. It appears the market underreact to the levered repurchase in the short-run regardless of the level of investments. These findings indicate that market reactions reflect both undervaluation and signaling hypotheses of positive information associated with share repurchase. As the firms undertake capital investments, they generate future cash flows, limit the effects of leverage on financial distress and ultimately reduce the risk of the equity capital.

TABLE OF CONTENTS

LIST OF TABLES

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AUTHOR'S DECLARATION

"I declare that, except where explicit reference is made to the contribution of others, that this thesis is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Signature _____

Printed name: Daniel Gyimah"

Chapter 1
INTRODUCTION

1.1. Introduction

Corporate financing policy is an integral part of the operations of companies. Its importance underpins several decisions and affects both investing and financing decisions of the firm. Policies relating to investments in capital projects including research and development, cash distribution to shareholders in the form of dividend payments, and share repurchase decisions among others, have overarching effects on both the short term and long-term prospects of the company. On the basis of these decisions, investors determine whether or not to provide money to the company. The recent financial crisis of 2007/2008 highlighted the significant effects of financial constraints on corporate financial decisions including employment, tech spending, and capital spending (Campello et al. 2010). This thesis explores the effects of financial constraints on share issuance decisions and share repurchase programmes of firms. Specifically, the thesis explores the choice between share issuance and non-issuance when firms are financially constrained. Further analysis of share issuance examines the differential long-term stock returns associated with share issuance methods.

The first empirical chapter explores the effects of financial constraints (both internal and external) on share issuance decisions. Specifically, this chapter examines the simultaneous effects of mispricing and financial constraints on share issuance. Thus, it describes whether firms time their share issues even when they face extreme internal and external financial constraints. Further, it focuses on the type of firms, in terms of size and the time period when market timing of share issues is more plausible to limit the adverse stock price reactions. In the second empirical chapter, the thesis investigates whether the different long-term stock returns associated with equity issuance methods is driven by the level of firm operating performance. The literature on equity issuance methods asserts that stock returns differ according to the issuance method used. This chapter uses long-term operating performance to explain the

choice of equity issuance methods and the associated long-term stock returns. The third empirical chapter explores the motivation for unconstrained firms to borrow to repurchase their shares.

The aim of this chapter is to introduce the thesis. Section 1.2 presents the background and motivation for the study. Section 1.3 discusses the study dataset and the reasons for the choice of both UK and US sample firms. Section 1.4 sets out the research questions and provides the key findings of the thesis. Section 1.5 discusses the contribution of the study. Finally, section 1.6 provides the organisation of the thesis and briefly presents the content within each chapter.

1.2. Background and Motivation

There is an extant literature on securities issuance and repurchase and the effects on other corporate decisions have been extensively explored (for example Baker and Wurgler, 2002; Campello et al, 2010; Dong et al, 2012). In particular, corporate share issues are related to investments where firms with significant growth opportunities need external financing to undertake them. Moreover, share issues and repurchase alter the capital structure of the firm. The effects of corporate financing on capital structure began with the seminal paper by Modigliani and Miller (1958) where they argued, among others, that whether or not firm is made up of equity or debt does not matter, under the assumptions of perfect information, homogenous firms, no discriminating taxes and transaction costs of financing. However, several subsequent studies have challenged these assumptions and proved that in fact the source of financing has significant effects on capital structure, including the value of the firm and the costs of financing. Again, the effects on the firm of share issues and repurchase are reflected in the stock prices of the issuing or repurchasing firms. These stock price reactions are consistent across several jurisdictions and have informed corporate financing and investing policies.

Several theories have been postulated to explain equity issues and the stock price effects including information asymmetry (Akerlof, 1970; Myers and Majluf, 1984; Bayless and Chaplinsky, 1991), pecking order (Helwege and

Liang, 1996; Frank and Goyal, 2003), market timing (Baker and Wurgler, 2002; DeAngelo, DeAngelo, and Stulz, 2010; Dong, Loncarski, ter Horst, and Veld, 2012), agency (Jensen and Meckling, 1976; Jensen, 1986), and static trade-off (Shyam-Sunder and Myers, 1999). Equity issues are generally associated with negative abnormal stock returns that has commonly attributed to market underreaction to the information (Spiess and Affleck-Graves, 1995; Loughran and Ritter, 1997). Firms also repurchase their shares in response to undervaluation (Ikenberry and Vermaelen, 1996; Stephens and Weisbach, 1998), information signalling effects (Vermaelen, 1981; Comment and Jarrell, 1991), and free cash flow (Jensen, 1986; Dittmar, 2000; Grullon and Michaely, 2004), among others. These motivations are consistent with divulging positive information about the prospects of the firms and hence stock returns associated with share repurchase announcements are positive.

The first empirical chapter explores the effects of financial constraints on share issuance decisions. Since the work by Modigliani and Miller, corporate financing decisions have evolved over the years, even though the theoretical explanations for stock returns still remain consistent. An important factor related to equity issues is transactions costs in the form of investment banking fees that depends on both the characteristics of the issuing firms and the overall capital market conditions. For example, Butler et al. (2005) find that firms reduce the costs of equity financing by improving the market liquidity of their stock. In other words, more liquid stocks are associated with lower investment banking fees. This cost of raising equity is important because it impacts market timing tendencies. Stated differently, internal (related to available cash and the friction to obtain external cash) and external financial constraints (mostly related to macroeconomic conditions and the overall capital market conditions) play a vital role in equity issuance decisions. Hence, this study explores the influence of financial constraints on share issuance decisions. Financial constraints involve both internal cash availability and the speed at which firms obtain equity financing in the equity capital market. It also captures market liquidity and the effects of financial crisis at the time of issuing equity to highlight the external financial constraints associated with equity issues.

This chapter, therefore, extends the literature on market timing by examining the effects of financial constraints on share issuance decisions. If firms time their equity issues and also incur costs of issuing equity, then I argue that internally financially unconstrained firms should be more likely to issue overvalued equity than constrained firms. Less internally financially constrained firms are more likely to time their equity issues (Dong et al, 2012) to coincide with periods of favourable macroeconomic conditions (Korajczyk and Levy, 2003). Taken together, firms that are internally financially constrained face high finance costs when there are simultaneously unfavourable market conditions. During financial crisis, with low market liquidity, issuance costs increase. Therefore, consistent with the financial constraints hypothesis, prospects of equity market timing by issuing firms are limited. These firms generate more free cash flow that would allow them to take advantage of issuing overpriced equity.

The second empirical chapter examines the different method of equity issuance in the UK. Firms in the UK issue equity through three dominant methods namely rights issues, open offers, and private placement. Since the deregulation in 1986, the preference for rights issue method has reduced and the recent evidence shows that firms use more private placements than rights issues (Armitage, 2007). The issuance methods are also associated with different stock price returns (Slovin et al. 2000; Barnes and Walker, 2006). Therefore, theories such as the information asymmetry (Myers and Majluf, 1984), window of opportunity hypothesis (Choe et al. 1993; Bayless and Chaplinsky, 1996), investor over-optimism (Loughran and Ritter, 1997; Hertzel et al. 2002) explain the choice of issuance method and the stock price reactions. For example, Hertzel et al. (2002) find that public firms that place their shares privately are associated with positive announcement returns suggesting that investors are over-optimistic about the future prospects of the issuing firms. Thus, firms deliberately choose the method based on the firm characteristics and the market responds according to the information that the issue provides to the market.

Furthermore, the research also explains the long-term stock returns associated with equity issuance methods. Prior studies attribute the different stock returns associated with each equity issuance method on the basis of both firm and issues characteristics that relate to market-to-book ratio, prior stock returns, firm size, and issue discount. Overall, these characteristics measure the degree of information asymmetry associated with the issuance method. For example, since rights issues are made to existing shareholders, it is less likely that firm will exploit any asymmetric information effects. Thus, issues involving external investors, such as private placement, allow the firm to exploit asymmetric information effects. This study asserts that operating performance determined by firms' operations have more long-term effects on long-term stock returns than alternative measures of information asymmetry. Therefore, the research explores the effects of long-term operating performance on the choice of issuance method and the subsequent long-term stock returns. Unlike Levis (2005), Abhyankar and Ho (2007), Capstaff and Fletcher (2011), who provide evidence about long term stock returns, this study focuses on how operating performance determines the choice of equity issuance method and explain the long term stock returns associated with equity issuance methods.

The third empirical chapter focuses on share repurchases policies of firms. Share repurchase programs form an integral part of firm payout policy. US firms continue to repurchase their shares and actually repurchase transactions have increased beyond the pre-crisis levels in 2007. According to an article in The Economist, companies in the S&P 500 index repurchased a record $500 billion in 2013 financed by 33 cents of every dollar of cash flow.[1] Prior research and empirical evidence is consistent with firm cash distribution in the form of share repurchase or in excess of dividend payments to avoid investment in value-destroying projects (Jensen, 1986; Bhargava, 2010). It follows that share repurchase are more likely to be conducted by firms with substantial amount of free cash and which have limited growth opportunities. Moreover, the undervaluation hypothesis contends that firms repurchase in order to buy their own cheap shares and also signal to the market about the favourable future prospects (Ikenberry and Vermaelen, 1996; Stephens and

[1] Share buy-backs: The repurchase revolution, The Economist, September 13, 2014.

Weisbach, 1998; Dittmar, 2000). In sum, firms that are less internally financially constrained and have cash slack will repurchase their shares. Chen and Wang (2012) find evidence that financially constrained firms repurchase their shares due to managerial hubris. Other studies find that firms borrow at the time of share repurchase announcements (Minnick and Zhao, 2007; de Jong, Dutordoir, and Verwijmeren, 2011).

Recent corporate financing policies reveal that it has become a commonplace for firms to simultaneously issue new convertible bond and repurchase their shares (see de Jong et al., 2011). These firms utilise the cash from debt issuance to finance their share repurchase transactions. During the last decades, share repurchases have become very popular as a means to return cash to shareholders. In 2007, share repurchases peaked at more than $700 billion near the market top.[2] A large number of these repurchases were funded with debt issues. In 2009 alone, 37 companies announced plans to spend $39 billion on these levered repurchases.[3] It may be understandable for internally financially constrained firms to repurchase their shares by borrowing due to limited financial resources available, but it seems puzzling for internally financially unconstrained firms to borrow money in order to repurchase shares. A recent example is Apple that announced in April 2013 that they would return $100 billion to shareholders in the form of a repurchase by the end of 2013. Apple borrowed part of the money for this repurchase, despite having a huge cash stockpile.[4] This repurchase trend evokes the following question: why would internally financially unconstrained firms borrow to finance share repurchase? This debt-financed share repurchase could be determined by the extent of investment undertaken by these firms. The study further explores the stock price implications for these debt-financed repurchase firms.

[2]See Michael Milken: "Why capital structure matters", The Wall Street Journal, April 21, 2009.
[3]Source: research by JP Morgan cited by Herb Greenbert in: "Debt to buy back stock", CNBC, November 8, 2011. See: http://www.cnbc.com/id/45209702 (retrieved on March 30, 2015).
[4]See Katy Burne and Mike Cherney: "Apple's record plunge into debt pool", The Wall Street Journal, April 30, 2013. Apple's case may be different from other companies, because much of its money is overseas; raising cash in the bond markets helps the company to reduce its large tax bill that would hit the company if it would bring back the cash to the U.S.

Unlike Chen and Wang (2012), this chapter of the thesis examines the share repurchase financing of unconstrained firms. For constrained firms, the incentive of buying back cheap or undervalued shares will motivate them to borrow to repurchase. However, Chen and Wang (2012) explicitly assert that managers of constrained firms repurchase due to overconfidence about the future prospects of the firms and managerial hubris. In respect of debt-financed repurchase, studies, such as Minnick and Zhao (2007) find that firms borrow to finance their share repurchase programs. Due to the effect of share repurchase on distress risk, these debt-financed repurchase firms report less positive announcement date abnormal returns. Bond returns associated with debt-financed repurchases are also negative or less than an otherwise cash-financed share repurchase. Thus, share repurchase generates wealth transfer from bondholders to stockholders (Maxwell and Stephens, 2003). Also, another wealth transfer occurs between debt-financed share repurchase and cash-financed share repurchase (Minnick and Zhao, 2007). However, de Jong et al. (2011) do not find that convertible debt issues are necessarily used to finance share repurchase. They contend that convertible arbitrage strategies explain the size and speed of share repurchase transactions. These previous studies highlight the share repurchase programs of constrained firms and the general evidence that firms systematically issue new debt during share repurchase announcements. Therefore, the present research revisits this phenomenon and examines the share repurchase financing of internally financially unconstrained firms.

The third empirical chapter, therefore, investigates the factors that drive unconstrained firms to conduct levered share repurchase. The intuition for this phenomenon, as argued in current study, is that even though unconstrained firms can use internal cash flows to buy-back their shares, these firms can take advantage of low interest rates to raise debt financing and together with the internal cash flows undertake investments when they also repurchase their shares. Internally financially unconstrained firms are more likely to conduct levered share repurchase when they also invest in capital projects. In addition, it examines the initial stock returns subsequent to share repurchase announcements. It also highlights the stock returns for debt-financed and cash-

financed share repurchase of both internally financially unconstrained and constrained firms.

1.3. The choice of datasets

The thesis uses dataset from both UK and US for important reasons. The first empirical chapter focuses on the effects of financial constraints on share issuance of UK listed firms and the second chapter notes the marked stock returns differences associated with different equity issuance methods. There is a limited empirical literature on UK equity market timing and especially the study about the effects of financial constraints on UK equity issues is unexplored. Indeed, most of the internal financial constraints studies use US dataset (For example, Fazzari, Hubbard, and Petersen, 1988; Kaplan and Zingales, 1997; Whited and Wu, 2006; Korajczyk and Levy, 2003). Dong et al. (2012) investigate financial constraints effects on equity issues for Canadian listed firms. Equity mispricing studies that focus on the UK include Marsh (1982), and Mahajan and Tartaroglu (2008). Unlike the previous studies, I explore the simultaneous effects of internal financial constraints and the financial crisis on share issuance decisions of UK firms. Therefore, UK presents an ideal setting to contribute to the general empirical literature on equity issuance decisions and delineates how financial constraints impact such corporate financing policies.

Another important reason to study UK equity issues is the presence of different equity issuance method as explored in the Chapter two of the thesis. UK deregulation of 1986 allowed firms to issue equity through means other than rights offerings. Since the deregulation, several changes have occurred from gradual recession of the rights issues dominance to near demise of rights issues. Armitage (2007) finds that the demise of rights issues is more pronounced that reflects the notion that placing better facilitates block selling than rights issues (Armitage, 1998; 2010).[5] Again, placement saves time and money compared with rights issue and open offers and cost less than rights

[5] Placing is an equity issuance method by which firms place new share issues by private negotiation or through accelerated bookbuilding in which investing institutions are publicly invited to bid for shares. Extensive discussion of methods of equity issuance is provided in Section 3.1.1 of Chapter 3.

issues (Wu, 2004). Using UK data, the study then captures the periodic changes in the choice of issuance method and the implications for stock return reactions. Stated differently, UK provides an ideal setting to explore how investor, firm, and regulatory changes have altered preference for private placement over rights offerings. The findings shed more light on equity issuance methods and provide new insights into equity issuance decisions.

Note that this unique feature of equity issues is uncommon in international markets. Only one or two dominant issuance approaches exist such as firm commitment in the US (Eckbo and Masulis, 1992)[6], rights issues in the Netherlands (Kabir and Roosenboom, 2003), rights offering by family controlled businesses in Sweden (Cronqvist and Nilsson, 2005), rights offerings and private placement in Australia (Brown and Chan, 2004) and rights issues in most European countries (Tsangarakis, 1996; Bohren, Eckbo, and Michalsen, 1997; Gajewski and Ginglinger, 2002; Pastor-Llorca and Martin-Ugedo, 2004). In an environment where choice of equity issuance prevails, firms are able to tailor their issues to specific motivations. For example, in an attempt to restrict ownership dilution, firms will prefer to issue shares to existing shareholders through rights offerings (Cronqvist and Nilsson, 2005). On the other hand, private placements, while diluting ownership by allowing new investors to subscribe to the shares, encourage monitoring (Wruck, 1989) and promote credible certification of the issue (Hertzel and Smith, 1993).

With regard to the third empirical chapter, the dataset on U.S. share repurchase is used. Despite the extensive research on share repurchase announcements in the US, the evolution of corporate actions and events reflects the changing dynamics in corporate financing policy. During the last few decades, share repurchases have become popular as a means to return cash to shareholders. In 2007 alone, US share repurchases peaked at more than $700 billion near the market top (Milken, 2009). A large number of these repurchases were funded

[6] Eckbo and Masulis (1995) report that U.S. companies have switched from uninsured rights to standbys and to firm commitment underwriting method. The firm commitment flotation method accounts for 99% of all issues. Under firm commitment, an underwriter commits to buy the entire equity issue and tries to resell it to investors.

with debt issues. In 2009 for instance, 37 US companies announced plans to spend $39 billion on these levered repurchases.[7] Unlike most European countries, share repurchase programs in the US are authorized by the board of directors and hence do not need shareholder approval. The apparent flexibility associated with share repurchase differs markedly from those of other jurisdictions. Until 1998, share repurchases were illegal in some European countries such as France and Germany (Rau and Vermaelen, 2002; Andriosopoulos and Lasfer, 2015). Also in the UK, share repurchase programs are limited due to regulatory restrictions and undermine companies' ability to take advantage of undervaluation (Rau and Vermaelen, 2002; Oswald and Young, 2004). For example, UK companies are not allowed to buy back their shares in periods when managers are most likely to have superior information about future earnings. Whereas the regulatory limitations provide sufficient grounds to study UK share repurchase, the new trend of debt-financed repurchase motivates the use of US data. The regulatory environment in the US allows firms to exploit undervaluation and pursue other motivations that apparently benefit the firm. The study therefore uses US data to explore the reasons why US firms that are less financially constrained issue debt during share repurchase programs.

1.4. Research questions and key findings

The main research questions of the thesis are as follows:

1. ***How do internal and external financial constraints affect equity issuance decisions?***

The extant literature provides evidence for equity market timing and posits that subsequent stock returns associated with equity issues are significantly negative. This study extends the market timing theory by incorporating the effects of both internal and external financial constraints on equity issuance decisions. The study uses a sample of 1257 equity issues by UK listed firms to test the simultaneous of effects of mispricing and internal financial constraints on share issuance decisions. The total sample spans over a period of 17 years

[7] see footnote 3 in Section 1.2

between 1994 and 2010. The study uses both univariate and multivariate analysis to establish the effects of financial constraints on share issuance decision. It uses logit regression analysis to show the probability of equity issuance based on both internal and external financial constraints. Moreover, it highlights the stock returns associated with equity issues conditional on financial constraints.

Consistent with the literature (Baker and Wurgler, 2002; DeAngelo et al., 2010; Dong et al., 2012), the results provide strong support for the market timing theory, showing that UK firms time their equity issues. The second proposition of the thesis contends that internally financially constrained firms could still issue overvalued equity provided the equity market and/or the general economic conditions are favourable. Similar to related evidence, the findings show that internally financially constrained firms are more likely to issue overvalued equity similar to unconstrained firms during non-crisis period. However, as costs of external financing become high during economic downturn, internally financially constrained firms are less likely to issue equity even if the equity is highly overvalued. The study further finds that during period of financial crisis or when there is low market liquidity, small firms are less likely to issue overvalued equity. It also shows that large firms with limited growth opportunities and substantial amount of free cash flow can afford transaction costs of issuing overvalued equity even during significant financial crisis.

2. ***Does the long-term operating performance reflect the choice of equity issuance methods?***

The deregulation in 1986[8] introduced alternative issuance methods in the UK - rights issues, open offers and private placements – and subsequent equity issues reflect certain firm characteristics. Firms are expected to select issuance method for which they have more prospects for timing their overvalued issues. Rights issuing firms have less incentive to sell equity with poor prospects,

[8] In October 1986, the event known as the "Big Bang" took place, marking significant changes to the structure of UK financial markets. Among other consequences, an electronic trading system was introduced.

since existing shareholders sell shares to themselves in comparison to counterpart private placements and open offers. Equity issuance methods account for different short-term stock returns (Slovin et al., 2000; Barnes and Walker, 2006) and long-term stock returns (Ho, 2005; Andrikopoulos, 2009; Capstaff and Fletcher, 2011). However, most of these studies attribute the different stock returns to firm and issue characteristics that have short-term effects on stock returns. This study argues that differential information asymmetry allows firms to use the inside information to select the issuance method. [9] Since operating performance may vary after the issuance of alternative methods, the long-term stock returns would vary accordingly. In testing the hypothesis, the research uses UK equity issuance data from 1996 to 2010 to explore stock returns and contemporaneous operating firm performance for each of the subsequent three years after equity issuance.

Consistent with the developed hypothesis, the empirical results show that firms with better operating performance are more likely to conduct rights issues and are associated with the less negative long-term stock returns after rights issues than private placements and open offers. These results hold within a number of robustness tests, indicating that managers select an issuance method in line with their expectations of a firm's future operating performance. Moreover, firms are more likely to select private placement because less favourable contemporaneous operating performance information is not available to the market at the time of the equity issues. Stated differently, firms are less likely to issue overvalued equity to existing shareholders through rights issues. Long-term stock returns associated with equity issuance method are consistent with the long-term operating performance. These results suggest that over the long term, operating performance explains long-term stock returns beyond firm and issue characteristics such as market-to-book ratio, firm size, issue discount, prior stock returns, and institutional share ownership, among others.

3. Why do internally financially unconstrained firms borrow to repurchase their shares?

[9] Cronqvist and Nilsson (2005) theoretically and empirically support the hypothesis that information asymmetry influences managers' decisions of whether to select rights issues or private placements within Swedish firms.

Since the effects of internal financial constraints transcend all corporate decisions, the study also focuses on the share repurchase implications. Specifically, the study investigates the factors that drive unconstrained firms to conduct levered share repurchase. The intuition for this phenomenon is that unconstrained firms, which have sufficient internal cash flows, would not need external financing to repurchase their shares. However, these firms can take advantage of low interest rates to raise debt financing and together with the internal cash flows undertake investments when they also repurchase their shares. Denis and Sibilkov (2010) assert that low cash holdings of internally financially constrained firms does not allow them to build cash reserves when they spend all available cash on investments. The study, therefore, hypothesises that unconstrained firms with bond ratings obtain debt financing at relatively low transaction costs in terms of interest payments. Consequently, internally financially unconstrained firms are more likely to conduct levered share repurchase when they also invest in capital projects.

Share repurchases are defined as levered or unlevered on whether there is an increase in debt capital a year prior to and after the date of repurchase. Unconstrained firms are defined using the *KZ* index.[10] First analysis estimates logit regressions to investigate the probability of levered share repurchase based on internal financial constraints and the interaction between internal financial constraints and investments. The results are consistent with the hypothesis that internally financially unconstrained firms borrow to finance their share repurchase. But more importantly, they are more likely to conduct levered share repurchase when they also undertake investments. These findings imply that unconstrained firms even though they can repurchase with internal cash flows, the additional cash from the debt issuance allows the firms to undertake more investments. Using bond ratings as a proxy for internal financial constraints, the study finds that levered share repurchase is related to firms with bond ratings and/or investment-grade firms.

[10] Kaplan and Zingales (1997) constructed the KZ index in their study of the financial constraints characteristics of 49 low-dividend paying manufacturing firms. Using observable characteristics, Kaplan Zingales run an ordered logit to rank the firms. A firm with high KZ index is considered more financially constrained.

Additional analysis shows that the initial stock returns associated with share repurchase depend on the level of internal financial constraints and the financing of the share repurchase. Levered repurchase firms are associated with less positive abnormal returns than unlevered repurchase firms. In relation to unconstrained firms, high investing firms are associated with more positive abnormal stock returns than low investing firms. The implications of these findings are that market reactions reflect both undervaluation and signaling hypotheses of positive information associated with share repurchase. As the firms undertake capital investments, they generate future cash flows, limit the effects of leverage on financial distress and ultimately reduce the risk of the equity capital.

1.5. Contributions of the study

This thesis extends and complements the extant literature on share issuance and share repurchase announcements.

First, this study complements the existing literature on share issuance decisions. Studies such as Kaplan and Zingales (1997), Almeida et al. (2004) and Whited and Wu (2006) provide extensive explanations for the effects of financial constraints on corporate decisions, enumerating important characteristics that distinguish financially constrained firms from unconstrained ones. This study emphasises the extent to which the level of financial constraints affects the decision to time the issuance of shares. Financial constraints have significant impact on corporate decisions relating to employment, cuts in tech spending and capital spending (Campello, et al., 2010) and the costs of equity issues (Korajczyk and Levy, 2003; Dong et al., 2012; McLean and Zhao, 2014). This thesis argues that both internal and external financial constraints determine the equity market timing of firms. This financial constraints variable relates both to the internal cash flow limitations and the costs of external equity issues when there is low market liquidity and/or during periods of financial crisis. In other words, the issue of overvalued equity in the equity marketplace reflects both the degree of internal cash flows and external costs associated with such issues.

For example, during the financial crisis or periods of low market liquidity, financially unconstrained firms could issue overvalued equity due to both the ability to finance the issues and lower adverse selection costs associated with unconstrained firms compared to constrained firms. Given low market liquidity and/or during financial crisis – high costs of issuing equity – financially constrained firms are less likely to issue equity even if they are significantly overvalued (Korajczyk and Levy, 2003; Dong et al., 2012). Financially constrained firms, not only are find equity issues costly compared to unconstrained firms, but they also potentially are associated with higher adverse selection costs. Only unconstrained firms would have the financial resources to conduct equity issues and are therefore more likely to issue overvalued equity. Unlike previous studies, this thesis performs analysis of equity issues for simultaneous effects of internal and external financial constraints. Finally, stock price underperformance subsequent to equity issues is more severe for constrained than unconstrained firms, especially for issuance during financial crisis or low market liquidity. Overall, this study demonstrates that the effects of internal financial constraints on equity market timing is more pronounced when there is a concurrent external financing constraints, especially during periods of the financial crisis and/or low market liquidity. Simultaneous effects of internal and external financial constraints also determine subsequent stock price reactions following equity issues.

Second, the thesis provides evidence about the effects of operating performance on the choice of equity issuance method and the subsequent long run stock returns associated with equity issues in the United Kingdom. For the UK in particular, several equity issuance methods are available to firms and each method is associated with different level of asymmetric information effects. Different equity issuance methods induce different types and degree of market reactions. Theoretical models developed in the literature attribute these different market reactions to quality signalling that are associated with each issuance method (Eckbo and Masulis, 1992; Balachandran et al., 2008). Factors that signal firm quality include the issue price discount, volatility of returns and earnings management (Dissanaike et al., 2014). The extant literature shows that stock returns, especially short-term returns, are a function of both firm and

issue characteristics (Slovin et al., 2000; Barnes and Walker, 2006; Armitage, 2010). While these characteristics are transient and relate to the short term, operating performance will have more explanatory power in the long run than other firm characteristics that existing research used to explain the stock price performance following equity issues. Since operating performance is a long term performance metric it is better aligned to the changes in stock price performance than alternative factors that explain stock returns following equity issues. This thesis asserts that long run operating performance provide more explanatory power for the long run stock price performance following equity issues. Moreover, long run price performance also differs markedly among equity issues through rights issues, open offers and private placement. Operating performance explain firms inside information about their performance beyond the equity issuance period.

The study departs from most previous studies that look at the choice of equity issuance method on the basis of the post-issue stock returns. This study asserts that operating performance not only determines the choice of issuance methods but it also explains the post-issue long run stock returns associated with each equity issuance method. Operating performance explains better the firm quality theory over the long term. Subsequent to equity issues, firms conducting rights issues report better operating performance than open offers and private placement. Thus, firms associated with better operating performance seem more likely to conduct rights issues rather than open offers and private placements. Consistent with Capstaff and Fletcher (2011), the study further finds that rights issuing firms outperform open offers and private placement in the long run. Unlike Slovin et al. (2000) and Barnes and Walker (2006), rights issuing firms are associated with quality information signalling since it is unlikely that firms would issue overvalued equity to exploit existing shareholders. The study also finds that long run operating performance explains stock price underperformance associated with equity issues (Loughran and Ritter, 1997; Kabir and Roosenboom, 2003). This research argues that operating performance better explains the choice of equity issuance than firm and issue characteristics such as market-to-book ratio, stock returns volatility, issue discount, among others. In effect, the study asserts and finds strong

support for the effects of long-term operating performance on both the choice of equity issuance and long-term stock returns associated with UK equity issues.

Third, this study provides empirical evidence about levered share repurchase. According to conventional wisdom, firms repurchase their shares when they are undervalued (Ikenberry and Vermaelen, 1996; Stephens and Weisbach, 1998), have free cash flows (Jensen, 1986; Grullon and Michaely, 2004; Bozanic, 2010) and produce quality information signaling (Vermaelen, 1981, 1984; Grullon and Michaely, 2004; Baker et al. (2003)). Consistent with the free cash flow theory, it is less likely for internally financially constrained firms to conduct share repurchases unless they obtain external financing to support this program (Chen and Wang, 2012). It is equally puzzling for firms with high free cash flows or excess cash flows to borrow during share repurchase programs. The study provides evidence that internally financially unconstrained firms borrow to finance share repurchase programs. Payout policies make the implicit assumption that firms with significant financial resources do not necessarily require external financing in order to distribute cash to existing shareholders. Share repurchasing firms invest less in capital projects as more cash is distributed to shareholders (Jensen, 1986; Hahn and Lee, 2009). However, the study argues that the additional external financing acts as cash buffer for investments. Given that payout limits subsequent investments, I explore whether unconstrained firms issue debt capital at the time of share repurchase announcements and find evidence that unconstrained firms issue debt at the time of share repurchase announcements. The findings also support the hypothesis that internally financially unconstrained firms undertake more capital investments.

The study contributes to the share repurchase literature and in particular the financing of share repurchases by internally financially unconstrained firms. Firms do not only utilise internal cash flows to finance share repurchase but also a significant number of firms borrow to finance share repurchase (Chen and Wang, 2012; Lei and Zhang, 2015; Farre-Mensa et al., 2015). Whereas Chen and Wang (2012) assert that internally financially constrained firms

conduct share repurchases due to managerial overconfidence and hubris, this study highlights that internally financially unconstrained firms also borrow during share repurchase programs. For instance, unconstrained firms are more likely to be rated firms with investment grade ratings which allows them to obtain debt financing at low interest rates compared to an otherwise financially constrained firms. Stated differently, the degree of internal financial constraints influences the costs of debt financing and the ensuing effects of additional leverage on the costs of financial distress magnifies the overall costs of equity capital for constrained firms. Finally, Farre-Mensa et al. (2015) report that firms finance their payouts through debt and equity to both manage their capital structure and cash holdings. Their evidence shows that these firms could not have funded the payout without external financing. This result implies some of the firms are potentially financially constrained such that they could only finance their payouts using external financing. I find evidence similar to Farre-Mensa et al. (2015). Firms undertaking share repurchases obtain external debt-financing. In particular, I find that unconstrained firms borrow during share repurchase announcements and potentially utilize the additional cash buffers to finance investment expenditure. Overall, this study provides empirical evidence about levered share repurchases and show that investment expenditure explains levered share repurchase programs.

1.6. Organisation of the study

The thesis is organised into nine chapters.

Chapter 2 reviews the literature related to the effects of financial constraints on equity market timing. The chapter begins with the review of market timing theory and the other alternative theories that explain equity issuance decisions. It discusses the stock returns associated with equity issues and presents the theories that explain such stock price effects. Further, the chapter presents literature on internal and external financial constraints and discusses the impact on share issuance decisions. Finally, the chapter presents the testable hypotheses based on the theoretical and empirical evidence.

Chapter 3 provides literature review of equity issuance methods in UK. The chapter presents an overview of equity issuance methods in the UK and discusses the three main issuance methods available to UK firms. It then reviews the literature on short and long-term stock returns associated with equity issues and examines the theories that explain the returns. Finally, the chapter presents the testable hypotheses based on the literature.

Chapter 4 reviews the literature on share repurchase programs in the US. The chapter discusses the share repurchase regulations in the US and presents the types of share repurchasing programs. It further reviews the factors that drive share repurchase and the theories that explain the stock returns associated with share repurchase announcements. The chapter discusses the empirical evidence of internal financial constraints effects on share repurchase and highlights debt-financed share repurchase programs. Finally, the chapter presents the testable hypotheses based on the theoretical and empirical evidence.

Chapter 5 discusses the data and methodology used to test the hypotheses and answer the research questions. It, specifically, presents the dataset and how it was collected, the econometric estimations and the variables for the empirical chapters. In addition, it discusses the justifications for the proxies used in the models.

Chapter 6 investigates the simultaneous effects of market timing and financial constraints on share issuance decisions. The chapter presents the descriptive statistics of the variables and the regression analysis of the models explained in chapter 5. It also discusses the robustness tests conducted to corroborate the results of the main model.

Chapter 7 provides the empirical testing of the asymmetric information effects on long-term stock returns associated with equity issuance methods. It provides the descriptive statistics of the variables, the univariate analysis and the multivariate analysis of the choice of equity issuance methods. In addition, the chapter presents the regression analysis of the long-run stock returns associated with equity issuance methods and presents the robustness tests of the main model.

Chapter 8 examines the share repurchase financing of unconstrained firms and explores the factors that drive unconstrained firms to borrow during the share repurchase announcements date. This chapter presents the descriptive statistics of the repurchase sample, the regression analysis of the models explained in chapter 5, and outlines the robustness tests for the results of the main model.

Chapter 9 concludes the thesis by summarising the key findings, discussing the limitations of the study and proposing recommendations for future research.

Chapter 2
LITERATURE REVIEW: SHARE ISSUANCE DECISIONS

2.1. Introduction

Share issuance decisions have implications for changes in capital structure and firm value. These decisions also determine availability of financing for investment projects and can affect the overall risk exposure of the firm. However, the level of internal financial constraints could affect issue of external equity. The effect of the financial crisis in 2007/2008 highlights the importance of external financial constraints in equity issues. This chapter reviews the theories that underlie share issuance decisions. It further examines the literature on the effects of both internal and external financial constraints on shares issuance and discusses the stock returns associated with equity issues. The chapter also develops testable hypotheses that set out the focus of the empirical chapter 6 of the thesis.

The chapter has four sections. Section 2.2 reviews theories of share issuance. It discusses theories such as asymmetric information/pecking order theory, market timing, agency theory, and trade-off theory, among others. Section 2.3 focuses on the effects of mispricing and internal financial constraints on equity issues. The section examines the effects valuation and financing decisions, share issuance and internal as well external financial constraints. Section 2.4 explains the empirical evidence of stock returns associated with equity issues and the theories that explain the stock returns' behaviour. Section 2.5 develops the testable hypotheses and section 2.6 concludes the chapter.

2.2. Review of Theories of Share Issuance

Through corporate financing policies, firms obtain funds in the external capital market for varied reasons. For example, firms need financing to undertake new investments, to pay dividends, to maintain capital structure, among others. The most popular financing sources include debt and equity, as well as convertible debt. Several theories have been developed to explain in part the reasoning behind financing decisions and the subsequent security issuance. Several

theories explain the motivations for share issuance decisions. The study provides here a brief theoretical framework of some of the theories documented in the finance text. In the empirical analysis, various proxies are used to control for the effects of these competing theories that determine the issuance of equity.

2.2.1. Pecking Order and Asymmetric Information Hypotheses

Two related theories that explain security issuance decisions are the pecking order and the asymmetric information hypothesis. According to the pecking order theory, firms follow a hierarchical order of financing preferences; internal financing is preferred to external financing. Myers (1984) and Myers and Majluf (1984) explain that high costs of adverse selection associated with external financing means firms will only use retained earnings unless external financing is needed in which case debt is preferred to equity issues (debt attracts low adverse selection costs than equity financing). In a rational setting, undertaking valuable investment opportunities requires firms to have readily available internal cash flows without necessarily going to the external capital market. It is only after exhausting internal funds firms are encouraged to obtain financing from outside in order of debt followed by equity (Myers and Majluf, 1984). In an asymmetric information environment, financing choices that reveal positive information to the market are more likely to be preferred by managers. Firms that have expected high cash flows are in a better position to enter the capital market but high asymmetric information effects hugely affect such prospects. Thus, high valued firms are more likely to issue debt capital to signal substantially positive financial position than low valued firms, despite significantly high asymmetric information. The overriding intuition is that debt signals firm quality.

Unlike equity issues, debt financing is associated with low asymmetric information effects. As debt issues are made with the supposition of providing positive information about the firm's quality, price reactions should be positive. Thus, leverage increasing transactions such as debt issue and equity repurchase are highly correlated with positive stock price returns. Equity issue reduces any positive impact of the positive financial and operating effects due

to its associated adverse selection costs. The conjecture is that at high (low) asymmetric information, firms issue debt (equity). While equity issue costs much in terms of issue costs and asymmetric information effects, debt can be issued cheap and with relative rapidity; despite the subsequent increase in costs of financial distress. Myers (2001) explains that large debt financing is a major support for the pecking order theory. The empirical support is mixed but generally pecking order has some predictive power of financing decisions.

Studies such as Shyam-Sunder and Myers (1999) and Lemmon and Zender (2010) test the pecking order theory. For example, Lemmon and Zender (2010) use dataset from 1971 to 2001 and confirm how the pecking order influences financing choices. Firms that enter the debt market have debt capacity to support additional leverage, stable cash flows with large pool of collateral. Information transparency enables firms to borrow at the equilibrium interest rate and increases their ability to access capital from the external debt market. With debt capacity, additional debt financing will have limited impact on costs of financial distress, while indirectly rebalancing the capital structure. Such debt-issuing firms are supported by high levels of tangible assets and relatively stable profitability to guarantee stable cash flows.

However, it is possible for firms to obtain financing without necessarily going to the external market. Transactions such as employee options are unrelated to adverse selection costs; therefore, equity issues are not constrained by asymmetric information effects. If firms consistently pursue these issues, then the pecking order breaks down and is unable to determine which security-financing firms adopt. Again, studies show that financial deficits have limited predictive control of financing choice. According to the pecking order theory, equity issues are made as last resort (due to adverse selection costs) in a state of significant debt capacity concerns that restricts access to the debt market. Thus, consequent financial distress costs discourage additional debt financing. This theoretical explanation has been challenged in several studies citing different motivations for equity issues contrary to predictions of the pecking order hypothesis.

In the spirit of asymmetric information effects, firms with substantial cash stockpile should avoid the external capital market and finance investment using internal cash flows. Helwege and Liang (1996) confirm this theory that firms with greater cash surpluses avoid external funding, but their results do not imply that cash deficit forces firms into the external finance market. Interestingly, asymmetric information also does little to explain the pecking order theory as significant asymmetric information fails to trigger equity finance. Equity issuers dominate external security financing that, as emphasised by Fama and French (2005), is not due to duress or cash deficit as theory posits. Again, firms that have previously obtained external financing are highly probable of obtaining additional funding subsequently. Again, Frank and Goyal (2003) use broad cross sections of 768 publicly traded American firms from 1971 to 1998, similar to Shyam-Sunder and Myers (1999), and find that equity dominates debt issues unrelated to financial distress.[11]

From the above discourse, firms willing to make equity offering should be prepared to manipulate the market prior to the financing decisions in order to reduce the information asymmetry. But Korajczyk et al. (1991) assert that information releases precede equity issues. Asymmetric information effects represent immense bane on equity offerings due to the tendency for rational investors to discount the stock prices as a result of a lack of symmetry in information between managers and investors. Arguing for dominating equity issues, they offer evidence that dispels the general notion of unattractive equity issuance decisions. They find a clustering of equity issues around information release dates. To obtain favourable response to security issuance, especially equity, firms are more inclined to, as a matter of timing philosophy, release 'good' information prior to equity offerings. The effect is to discount the tendency for stock price depression on issuing the security. Instructively, equity issues preceding positive information releases are associated with significant price premium. However, other systematic events can trigger price reaction in either direction.

[11] Also Fama and French (2005) highlight the limited impact financial distress and asymmetric information has on financing decisions.

2.2.2. Market Timing

A relatively new theory that builds on the predictions of the information asymmetry hypothesis is the market timing theory. Market timing is one of the financing theories that have been tested to influence corporate financing decisions. It emphasises managers' efforts at issuing securities, especially equity, at a time in the market where they perceive benefits in the form of high stock prices and/or leave the market at low stock prices. Baker and Wurgler (2002) define market timing as the tendency for firms to issue equity at high prices (when stock is overvalued) and repurchase at low prices (when stock is undervalued). Temporary fluctuations in the cost of equity relative to other sources of capital guarantee the prospects of market timing. Not only does market timing persists in theory but it has also received much attention in empirical studies. Nonetheless, the evidence is mixed and fails to provide a convincing argument about its dominance in security issuance decisions. Managers are optimistic when market conditions favour their financing decisions and that drives the opportunistic attitudes of firms that form the foundation of market timing. Survey evidence provides converging position of CFOs across countries and different economic environments. For example, Graham and Harvey (2001) survey 392 US CFOs and find that securities issues reflect the timing potentials of firms.[12]

Furthermore, the theory of market timing relates to the effects of adverse selection costs associated with security issues with variations across both time and firms. This version of market timing reflects the asymmetric information theory of capital structure and explains that equity market timing depends on the degree of asymmetric information. According to Myers and Majluf (1984), the high costs of adverse selection due to information asymmetry constrain firms to issue equity. Several studies explore time-varying adverse selection costs (Lucas and McDonald, 1990; Korajczyk et al.1992) and adverse selection that varies across firms (Choe et al.1993). Information releases prior to equity

[12] Bancel and Mittoo (2004) studies 87 CFOs from 16 European countries while Brounen et al. (2006) provides findings on 313 CFOs from 4 European countries. Both evidence including Graham and Harvey (2001) suggests that managers actually time the market before security issues are made.

issues reduce the effects of information asymmetry and increase investor optimism (Korajczyk et al. 1991; Rajan and Servaes, 1997). By extension, the changing adverse selection costs should also reflect the variations in market-to-book ratio (Baker and Wurgler, 2002). Generally, firms prefer debt capital because it conveys information about firm quality and it avoids the asymmetric information effects associated with equity financing. However, beyond the tax advantages and the power of debt to reduce the agency costs of free cash flows, debt issues increase costs of financial distress and other agency costs, the prospects of debt overhang crowd (Myers and Majluf, 1984). Thus, in the presence of asymmetric information, and given the excessive restrictions debt places on undertaking growth options, equity issues can only be made to support investment for overvalued stock.

Another explanation to the market timing theory concerns the presence of irrational investors and/or managers and time-varying mispricing. An interpretation of mispricing is that investors are irrational and therefore make systematic errors in forming expectations about stock prices and hence the value of the firm. These perceptions mean that stocks can become significantly over or under-valued at particular points in time. Mispricing relates to overvaluation of equity and undervaluation of repurchase where overvalued equity are issued to profit from high stock prices and undervalued equity are repurchased because they are cheap. Survey evidence by Graham and Harvey (2001) and capital budgeting model by Stein (1996) both support managers' attempt to time their equity issues. Moreover, Baker and Wurgler (2002) assert that past changes in market-to-book ratio actually explain equity issues and subsequent changes in capital structure. The above findings suggest that firms systematically time their equity issues when their shares are overvalued.

Taken together, mispricing should coincide with low asymmetric information. Conversely, the high mispricing can neutralise the adverse selection costs of asymmetric information to motivate firms to issue overvalued equity. Therefore, mispricing has substantial predictive power for equity market timing because the total gains exceed the adverse announcement effects (Baker and Wurgler, 2000). The empirical analysis offers new dimensions to the market

timing theory by looking at how internal financial constraints affect the issue of overvalued equity and the subsequent stock price reactions.

2.2.3. Trade off Theory

Since security issues can affect capital structure and firm value, theory of static trade off holds that there is a target leverage ratio that triggers security issuance decisions when there is a deviation of the current ratio. Debt and equity issuance are dependent on the conditions of the capital mix at a point in time such that debt is issued when leverage is low and equity at high leverage ratio. By maintaining target leverage firms balance the benefits of debt capital from tax advantages and control of free cash flow problems and costs emanating from bankruptcy costs and other agency costs. Moreover, managers with high levels of free cash flow under their control can engage in inefficient investments. Leverage restricts managerial hubris through fixed interest commitments and limit managerial discretion (Jung et al. 1996).

Hovakimian et al. (2001) test the trade-off theory using debt-equity model and contend that results on trade off are statistically significant. Firms possess both assets in place evidenced by the value of tangible assets in the business and growth options represented by the level of intangible assets available. The interactions between these two alternatives inform firms about the choice of financing to access. Whereas tangible assets expressly provide collateral, they support debt financing more than equity and growth opportunities track equity financing. Hovakimian et al. (2001) find that more profitable firms have a relatively low leverage ratio that eventually triggers more debt financing to move the leverage ratio to target. On the other hand, since valuable growth opportunities reflect positively in the stock prices, firms are motivated to issue equity rather than debt to rebalance their leverage to target ratio. Specifically, they highlight the impact of repurchase on rebalancing the leverage.

It is noteworthy to understand the short run impact of market timing in the context of trade off theory. Timing security issues result in temporary distortion of the capital structure. Equity creates under leverage while debt and repurchase are leverage increasing transactions. Firms that consistently adjust

their capital mix to reflect the target ratio rebalance their leverage subsequent to timing activities. Thus, leverage adjustment curtails the effects of M/B on capital structure. Kayhan and Titman (2007) as well as Marsh (1982) emphasise that when all market timing opportunities disappear financing choices move the leverage towards optimum level. The studies by Shyam-Sunder and Myers (1999), using the partial adjustment technique, summarises the degree of explanatory power between trade-off and pecking order theories. Relying on the effects of tax advantages and financial deficits they find that pecking order can be rejected when firms follow static trade off but fail to reject static trade off in the event of pecking order. Despite the apparent bias in the sample towards larger firms, it is still intuitive to generate further investigation. A model which incorporates the effects of stock valuation and asymmetric information will be interesting to appreciate how this theory accommodates other factors other than tax advantages and costs of financial distress.

2.2.4. Agency Theory

The agency theory emphasises that organisations are characterised by principal-agency relation where shareholders (principal) entrust to managers (agents) the control of the business affairs. This separation of ownership from control creates conflict of interest due to the tendency for managers to pursue acts that benefit them at the expense of the shareholders. Jensen (1986) asserts that financing decisions only reflect the interest of the agents not the principal. Agency costs consideration forces firms to depart from pecking order in their financing decisions. High agency costs of debt reflect increased equity financing to support investment projects and managerial discretion forces firms to issue equity when there is no viable investment opportunity to pursue.

Firms with valuable investment opportunities that seek to grow issue equity or those without investment opportunities but are constrained to issue debt due to debt capacity concerns issue equity. The agency model confirms that such equity financing only benefits management at the expense of shareholders. Excessive leverage reduces managerial discretion. Management losses control over free cash flows due to fixed commitments of interest payment to creditors

and monitoring mechanisms inserted in debt covenants to limit potential managerial hubris. Increasing leverage imposes financial discipline on management. This in part works to curtail any opportunistic activities management would have otherwise had the leeway to undertake at the expense of shareholders. The agency theory underlies both the information asymmetry and market timing theories in such a way as to define the issuance of equity. Invariably, the empirical analysis undertaken in this study captures the effects of agency theory on the issuance of overvalued equity.

2.2.5. Managerial Ownership

Security issuance decisions to a large extent depend on the level of managerial interest attached to the firm. The impact of asset substitution can be allayed to a significant extent when managers have interest in the debt structure of the firm. Increased leverage exposes the firm to costly financial distress but managers in acting in the interest of shareholders can pursue risky investments that can yield high returns. However, in the event of failed projects much of the fixed payments to debt holders could be greatly affected. Managers with pension benefits and compensation packages have incentive to act in ways that protect the business from uncertain bankruptcy. Therefore, with a meaningful managerial investment in the debt capital of the firm, they seek to act in the interest of other outside debt holders and invariably fail to advance wealth-enhancing programmes that benefit shareholders (Cassell et al. 2012). Managers tend to forfeit risky investments to preserve the financial health of the company. This reduces the agency costs of debt between managers and debt holders. For example, Jensen and Meckling (1976) emphasise that CEOs with inside debt holdings make investments and pursue financial policies that mitigate agency costs of debt. Since debt reveals positive information about the earnings of a company, it follows that CEO debt holdings should offer stock price premium. The above explanations indicate that managerial ownership can be a source of information asymmetry and hence affect the issuance of equity.

2.2.6. Managerial Entrenchment

In the context of Jensen's (1986) free cash flow theory, debt constrains managers from undertaking suboptimal investment decisions with the available cash that fosters managerial empire building objectives. To limit these tendencies, Jensen advocates for high levels of debt capital to disgorge cash to outsiders in the form of increased fixed interest payments. The real disadvantage associated with the agency costs of free cash flow theory is that it equally works to undermine investments in good projects, as do bad ones. However, as a corollary to this explanation, Zwiebel (1996) offers a new dimension to the power of debt in restraining managerial hubris.

While managers typically act in manner that tend to promote their personal interest, excessive debt levels presents a credible avenue for managers to restrict bad investment projects. Under managerial entrenchment theory, debt financing provides a moderating influence on managerial actions that invariably protects firm value. Takeover threats coupled with bankruptcy costs and loss of managerial entrenchment encourages managers to pay out dividends from increased debt financing. This, in effect, deactivates potential investments in bad projects. Thus, the power of debt in protecting against undertaking bad projects should be accompanied by a contemporaneous dividend payment of the available cash flow.

2.2.7. Earnings Management

As an accounting anomaly, firms manage earnings using revenues and/or expenses. Accounting earnings comprise both cash component that represents transactions for which corresponding cash payments/receipts have been made and accrual component where payments or receipts are deferred beyond the current accounting period. In order to portray a healthy earnings structure, firms can deliberately defer expenses and recognize immediately revenues in the books to shore up the earnings for the period. Thus, earnings management occurs when the discretionary accruals component of the earnings has been unjustifiably inflated. The effect is that subsequent earnings must reflect this

short term trend leading to further abnormal accruals in the reported financial statements.

The extant empirical evidence suggests that firms engaged in earnings management also undertake significant corporate financing decisions. For example, initial public offerings (IPO) (Teoh et al., 1998) and seasoned equity offerings (SEO) (Rangan, 1998; Teoh et al. 1998) follow periods of earnings management. While Teoh et al. (1998) propose that investors act naively to incidence of earnings management, Shivakumar (2000) emphasises the concept of 'managerial response' to investors anticipation of managers earnings management practices. The managers in turn rationally overstate earnings prior to offering announcements at least to the extent anticipated by the market. This perceived earnings manipulation causes the share prices to rise above the market expected valuation; the market response by discounting the share price to normal levels. Jensen (2005) provides theoretical underpinnings as the antecedent to the earnings management phenomenon.

As in the case of market timing, overvaluation can be linked to earnings management. The tendencies for information to filter through the market and investors opinions about the value of firms to converge over time stifle sustaining overvaluation in the long run. Since overvaluation is a temporary phenomenon, firms and managers readily attempt to benefit from this anomaly in the short run with dire consequences for shareholder value in the long run. Chi and Gupta (2009) test the hypothesis that relates overvaluation to earnings management previously theorised by Jensen (2005). Consistent with their predictions, overvalued equity engages in earnings management. The motivation is to justify that overvalued firms also report high operating performance. However, the effect of managing earnings in support of overvaluation excites market reactions. Chi and Gupta (2009) find negative stock returns and poor operating performance associated with overvalued firms, especially those that simultaneously manage their earnings. Information asymmetry relates to earnings management and the addition of appropriate proxy controls for the effects of earnings management on share issuance decisions.

2.3. Mispricing and the Effects of Internal Financial Constraints

This section reviews relevant literature about market timing and share issuance decisions. It also discusses the effects of financial constraints and establishes how the level of financial constraints can potentially undermine prospects of equity market timing. The section is divided into three subsections. Subsection 2.2.1 discusses the effects of valuation on financing decisions. Subsection 2.2.2 examines the influence of internal financial constraints on equity issues while subsection 2.2.3 reviews the effects of external financial constraints on share issuance decisions.

2.3.1. Valuation and Financing Decisions

Extant empirical evidence such as Akerlof (1970), Myers and Majluf (1984), Bayless and Chaplinsky (1991), (Helwege and Liang (1996), Frank and Goyal (2003), Baker and Wurgler (2002) DeAngelo et al. (2010) assert that capital structure changes have significant impact on firm value, contrary to the capital structure irrelevance proposition by Modigliani and Miller (1958). This notion implies that it is necessary that managers take financing decisions with the view to improve the overall shareholder value. Thus, the degree of mispricing enables firms to issue securities that enhance this value. Not only does mispricing encourage equity offering but other evidence also suggest that mispricing is the result of available growth opportunities. Firms with substantial investment options have the edge to source financing from external capital market. In the spirit of market timing, firms issue equity at high valuation (high M/B) and repurchase equity/issue debt at low valuation (low M/B). With increasing levels of equity (at high M/B), the capital mix tilts more towards low leverage and corresponding leverage increasing transactions (repurchase/debt issue) result in high leverage. Conclusively, firms that time the market in their issues have low leverage for equity issues and improve their leverage levels at low valuations.

Consequently, changes in valuation should trigger specific financing decisions in line with equity market timing proposition. If analysts are optimistic about the earnings of the company, there is the tendency for the market value to

deviate markedly from the fundamental value. This encourages opportunistic managers to issue equity to profit from the temporary price divergence. Baker and Wurgler (2002) emphasise that companies do not only make equity financing at high valuation and repurchase at low valuation but also capitalise on analyst favourable opinion about the company. In testing the persistence of market timing on capital structure, they study a sample of firms in IPO time and develop subsamples over a ten-year period to determine the changing patterns of capital structure as market valuation changes. Their results reveal that there is a persistent impact of market valuation changes on the capital structure on a long run basis. Capital structure reflects the past valuation movements. The net effects of high market-to-book values are to lower leverage independent of increased retained earnings and decreased debt.

Moreover, the degree of responsiveness to valuation effects relates to the level of available cash flow to conduct the appropriate security issuance. Internally financially sound firm will be better able to react to mispricing than an otherwise internally financially constrained entity. The intuition is that high transaction costs can impede the ability and the speed with which firms make issues in accordance with equity market timing hypothesis. Dong et al. (2012) highlight the influence of internal financial constraints on valuation effects. They study securities issue on the Toronto Stock Exchange and find that companies that have substantial timing opportunities will be inclined to issue equity only when they are internally financially unconstrained. Any issue of additional debt increases the leverage that is associated with costly financial distress. Similarly, the deduction from their findings is not too remote from the pecking order hypothesis. However, as they emphasise, equity issue is highly valuation dependent even when there are internal financial constraints.

However, other evidence suggests that M/B is related to growth opportunities rather than mispricing. High M/B reflects available growth options that firms can undertake. Investor optimism about future earnings underscores the potential for firms to turn the valuable investments into assets in place that is positive information to the market. This effect, coupled with other information released to the market, reinforces favourable market valuation of the company

stocks. Hovakimian (2006), for example, documents result consistent with the hypothesis that historical M/B tracks current expenditure and R&D such that high M/B drives higher current capital expenditure and research and expenditure, a proxy for growth opportunities. The effects of market timing on leverage disappear and growth opportunities dominate financing decisions. These findings cast doubt on the market timing persistent effects on leverage. The study explores the effects of internal financial constraints on the market timing of equity issues. Unlike previous studies, this study seeks to provide new understanding of the factors that determine the issuance of overvalued equity. Thus, in addition to the traditional idea of market timing dependent on mispricing or overvaluation, the focus of this research is an attempt to offer new insights into equity market timing phenomenon.

2.3.2. Internal Financial Constraints and Corporate Financial Policy

Firms are internally financially constrained if they face funding constraints that may restrict their ability to finance new or on-going projects. Internal financial constraints also mean the frictions or restrictions that impede access to external financing either through borrowings or equity issues (Fazzari et al. 1988; Kaplan and Zingales, 1997; Lamont et al. 2001; Almeida et al. 2004; Whited and Wu, 2006; Chen and Chen, 2012). Fazzari et al (1988) assert that in a perfect market where firms have unlimited access to capital market, investment decisions are independent of a firm's financial position. However, in an imperfect market and with limited internal financing firms that rely on external financing incur substantial cost to access both equity and debt capital. Low cost external financing implies firms are able to smooth their investments when there is insufficient internal financing. Firms are classified as internally financially constrained using a priori conditions such as size, dividend payments and leverage. Investment is driven by cash flow fluctuations when firms face significant costs of external financing. Firms are internally financially constrained if they are restricted in accessing external financing either through borrowings or equity issues. In other words, there is a wedge between internal and external costs of financing. By this definition, Kaplan and Zingales (1997) – hereafter KZ index - conclude that all firms are likely to be

classified as internally financially constrained when they incur transaction costs in securing external financing.

Firms are internally financially constrained if they are restricted in accessing external financing either through borrowings or equity issues. In other words, there is a wedge between internal and external costs of financing. By this definition, Kaplan and Zingales (1997) conclude that all firms are likely to be classified as internally financially constrained when they incur transaction costs in securing external financing. The appropriate differentiation of firms in terms of internal financial constraints depends on the degree of the costs between internal and external financing. Their findings contrast that of Fazzari et al. (1988) and raises concern about the link between investment-cash flow sensitivity and financing constraints. Using sample of 49 low dividend paying firms (identified by Fazzari et al. (1988) as constrained firms), they find that less financially constrained firms exhibit greater sensitivity than more constrained firms. The underlying assumption of monotonicity of investment-cash flow sensitivity with the degree of financial constraints is challenged. However, data snooping issues might be raised against the sample size and period.

Lamont et al. (2001) define financial constraints as frictions (in an imperfect market) that prevent firms from obtaining external financing to undertake investments. Financial constraints imply credit constraints or inability to borrow, dependence on bank loans, inability to issue equity and illiquidity of assets. However, Alti (2003) argues that financing constraints is not unique to only markets with frictions because the information signalling effects of cash flows will still hold in a model without market imperfections (Fazzari et al., 1988; Gomes, 2001). For instance, Campello et al. (2010) use survey measure of financial constraints where CFOs determine whether their firms are facing financial constraints due to unavailability and cost of credit. Consistent with the literature, they find that constrained firms planned cut in capital spending, employment and tech spending. In events where they anticipate restrictions in borrowings they would sell assets. Despite the apparent limitation on financial policy for constrained firms, Chen and Wang (2012) provide evidence to

suggest that a number of constrained firms repurchase equity. Firms rely on financial resources to undertake investment projects, make dividend payments, decide on security issuance or repurchase transactions, among other issues. Thus, the capacity to meet opportunities in terms of investments and other corporate financial policies is defined by whether or not the firm is financially unconstrained.

Moyen (2004) offers an explanation to why some inconsistencies exist between the different financial constraints measures, especially between FHP index and KZ index. Debt financing in a frictionless market and for firms less financially constrained affect internal cash flow and the level of investment likely to be undertaken. Unconstrained firms with access to the capital market can easily obtain debt financing to supplement the internal cash flows and consequently increase their investment spending when there are more favourable investment opportunities. Moreover, whereas unconstrained firms with more cash flow can afford to increase investment and dividends simultaneously, constrained firms can only choose to invest or pay dividends. Thus, in support of Kaplan and Zingales (1997), constrained firms have lower cash flow sensitivity than unconstrained firms. Again, using low dividends to proxy for financial constraints and consistent with the predictions of Fazzari et al (1988), she concludes that the unconstrained firms rather pay low dividends and have higher cash flow sensitivity. The ability of these firms to issue more debt means that equity holders of unconstrained firms receive lower dividends.

Whether or not firms anticipate and face financing constraints has implications for liquidity management, especially cash flow decisions. Almeida et al. (2004) develop a different measure of financial constraints which underlies the relevance of liquidity management. Kaplan and Zingales (1997), Almeida et al. (2004) and Chen and Chen (2012) all argue that investment-cash flow sensitivity is flawed as a measure of financial constraints. They assert that the ability to predict investment demand influences the explanatory power of the index. Liquidity is an important factor that affects the financial policies of firms. Chen and Chen (2012) contend that there has been a significant decline in investment-cash flow sensitivity over the years, including the period of the

credit crunch. For example, Almeida et al (2004) predict that firms with uncertain cash flows will save more to avert situation of forgoing anticipated investment projects in future or cut dividends, among others. The cash flow sensitivity of cash defines the propensity for firms to save out of cash flows. Similar to investment sensitivity to cash flow index, they find that constrained firms with uncertain cash flows have positive cash flow sensitivity of cash. Unconstrained firms do not rely solely on savings to undertake financial policies; their savings are not related to cash flows.

2.3.3. Share Issuance and Internal Financial Constraints

This study demonstrates the effects of financial constraints on equity issues beyond overvaluation and mispricing. A supplementary factor to mispricing is how the level of financial constraints could influence firms' equity issuing decisions. It should be noted that financing decisions incur substantial costs. Comparatively, transactions costs incidental to equity issues are normally higher than that of debt capital, consistent with the adverse selection costs theory (Myers, 1984 and Myers and Majluf, 1984). Therefore, firms that are financially sound stand a better chance to issue equity when market conditions are favourable. Internal financial constraints determine the firm's demand for external financing (McLean and Zhao, 2014). Ceteris paribus, constrained firms cannot issue equity at high costs given the supply of external funding provided by investors. At high valuations, low asymmetric information with financial deficit and over leverage, firms prefer to issue equity capital than debt financing. Extant empirical evidence supports this trend yet most studies fail to account for the effect of financial constraints on the latitude of firms to pursue their financing objectives. Thus, financial flexibility relates to the ability to enter the external capital market. Firms that are substantially financially constrained rarely enter the capital market. However, studies show disparate results.

Theoretically, security issuance decisions depend on the need to achieve target leverage ratio, level of debt capacity and asymmetric information effects and mispricing. The speed of adjusting to optimum leverage, especially using equity, increases with financial flexibility. Korajczyk and Levy (2003) stress

that financially constrained firms find it impossible and expensive to issue securities that quickly restore the optimum debt ratio.[13] In the study of security issuance decisions of Canadian firms, Dong et al (2012) emphasise the influence of financial constraints on the choice and speed of issuance in relation to high valuation. They contend that less financially constrained firms have high probability to issue equity when they are overvalued. This is suggestive that market timing is enhanced with cash availability.

However, if firms issue equity at a time when there is the need for adequate cash flow to support investment then this weakens equity market timing opportunities. DeAngelo et al. (2010) find that market timing and life cycle play significant roles in financing decisions. Yet, at high valuation the need for "near term" cash for future investments drives equity financing. That is, not all firms take advantage of timing opportunities. With substantial financial slack or high cash balance, there is limited motivation to obtain additional external financing regardless of the level of stock price. It is only at high financial constraints will firms be forced to access outside financing. They find that close to 62.6% and 81.1% of equity issuers would have run out of cash or would have had subnormal cash balances respectively in the year after the issue.

Firms that are financially constrained rarely enter the external capital market. But these firms are more likely to absorb any cash flow shocks internally. Adequate internal funds provide buffer for investments expenditure with fewer tendencies to contact outsiders for financing. Financial deficit/surplus is the overriding factor in deciding to enter the external market. Firms are likely to relegate cost of financial distress from excessive debt capital to increase/decrease debt with substantial deficit/surplus. They adjust capital structure either in the face of above target debt or below target debt ratio. Byoun (2008) finds, in contrast to Kayhan and Titman (2007), that capital structure adjustment is more above-target ratio dependent than it is for below-target ratio. Financial surplus is used to retire debt capital for excessive debt

[13] Faulkender, Flannery, Hankins and Smith (2012) find that financial constraints have, in terms of magnitude, larger effect on leverage rebalancing than market timing considerations.

but the tendency to issue more debt/repurchase equity in financial deficit is less pronounced.

2.3.4. Share Issuance and External Financial Constraints

Whereas internal financial constraints occur within the firm due to policy changes and decisions, external financial constraints is an economy-wide effect on the overall capital market. This study synthesises the effects of internal and external financial constraints in explaining equity market timing. The financial crisis of 2008 and the European debt crisis of 2011 demonstrate how external financing conditions impact corporate policies. Recent studies highlight changes in firms' investment and payout decisions during the financial crisis. For example, Campello et al. (2010) and Campello et al. (2011) and McLean and Zhao (2014) document the effects of financial crisis on firm investment, payout polices, employment and assets sales to finance investments. Ivashina and Scharfstein (2010) also show constraints on bank lending during the crisis. These findings are consistent with external financing constraints effects on corporate decisions. The financing conditions have direct impact on the costs of issuing equity as reflected in investment banking fees. For example, Lee et al. (1996) report that investment banking fees represent about 7% of the total proceeds from equity financing.[14] Thus, there is a direct correlation between low market liquidity and high investment banking fees, emanating from unfavourable external financing conditions (Corwin, 2003; Butler et al. 2005). Butler et al. (2005) show that difference in investment banking fees between most liquid and least liquid stock is about 21%.

That security issuance decisions occur contemporaneously with favourable market conditions is fundamental underlying factor of the market timing theory. If firms do not issue equity to undertake investments now then it is expected that the firms will stockpile cash subsequent to issuance. The apparent demand for cash to undertake future investments impel firms to obtain external financing with the aim to building cash flow as precaution, especially

[14] Market liquidity depends on how ease firms can sell their shares and as the liquidity becomes low due to unfavourable conditions, investment banking fees increase to compensate for the extra effort and time to sell the shares.

during good times. Akin to market timing, this period represents high stock prices when firms can cash in on mispricing. A combination of low transactions costs, availability of valuable future investments, cash flow volatility and high liquidity typifies periods of favourable market and firm level conditions. Bolton et al. (2013) assert that improved financing conditions raises stock prices. Conversely, higher probability of a crisis and the adverse effects on stock prices and costs of issuance motivate firms to invest conservatively and build cash buffers now through significant cash savings. Firms are also more likely to issue equity now prior to the downturn in financing conditions. However, firms are unable to anticipate when external financing conditions will deteriorate which means firms can only respond to the ex post financing conditions.

Thus, equity market timing activities should be expressive during good market conditions compared to a recessionary period. Alti (2006) offers a new dimension to timing opportunities by looking at the market conditions under which equity issues are made, especially IPOs. He notes that since market conditions are orthogonal (statistically independent) of other factors affecting financing decisions, those conditions better isolate the timing behaviour. Particularly, financial distress and growth characteristics do not influence external financing. “Hot market” firms effectively time the market and issue more equity than cold market firms. The short run impact of market timing on capital structure explains the subsequent attempts to rebalance leverage levels after the equity issues. The less equity issues after IPO could be due to long run stock underperformance that makes equity significantly undesirable giving preference to debt financing.

With limited adverse selection costs, the overall market reactions to financing choice should reflect moderate effects on stock prices. Alti and Sulaeman (2012) draw distinctive effects of both high and low institutional investor demand for firms’ equity and find a strong support for the increased likelihood for overvalued firms to issue equity when there is perceived institutional demand for the stock. The need for financing is wide ranging and could enforce issuance decisions that are suboptimal to the purposes for which they are

sought in the capital market. Market conditions are subject to the vagaries in the general economic environment with both good times and bad times. A key incentive for stock market transactions is liquidity that greatly fluctuates overtime. The extant literature on market timing provides evidence that firms could time their equity issues during favourable market conditions even when there is no immediate need for external equity financing (Baker and Wurgler, 2002; Huang and Ritter, 2009; Fama and French, 2005; DeAngelo et al. 2010)

By inference, firms that systematically time their security issues should, regardless of investment options, possess substantial financial slack, especially for equity financing. Market conditions that enhance equity offerings improve the cash position when there are no potentially viable investments to undertake. McLean (2011) studies these features as drivers of equity issuance to meet firm's precautionary motives. Discounting market timing as reflecting the cash savings following equity financing, he reports that issuers' do not record substantial low returns. A significant fall in cash flow over the years has made firms resort to equity issuance as source of cash to meet future investments commitments. Specifically, he finds that about 60% of recent decade share issuance proceeds are saved. There is increasingly less dependence on internal cash flow as firms have resorted to external financing as source for cash flow (Pontiff and Irvine, 2009; Bolton et al. 2013). As precautionary motive, firms maintain target cash-to-assets ratio that they adjust through share issuance decisions. In essence, the study focuses on how external financial constraints interact with internal financial constraints to determine the issuance of overvalued equity.

2.4. Share Issuance and Stock Returns

The empirical literature provides evidence of stock underperformance following the issue of equity (Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995). Stocks that trade in efficient markets respond instantaneously to new information that the market receives. Such information includes, among others, earnings announcements, corporate takeover and merger news, change in management. Security issuance likewise has signalling effects and rational market participants react accordingly. Post issue stock returns fall for equity

and rise with equity repurchase/debt issues. This section discusses the underreaction hypothesis of stock returns in subsection 2.3.1. Subsection 2.3.2 explains rational discount rate theory of stock returns whereas subsection 2.3.3 examines the investment-based explanation. Finally, subsection 2.3.4 explores the economic perspective underlying stock returns response to equity issues.

2.4.1. Underreaction Hypothesis

Equity issues convey "bad" news that triggers rational market response. Repurchase and debt financing signal good information about the prospects of the business and highlight earnings quality. Given the perceptions of the market concerning the financing choice, equity financing attracts low returns whereas repurchase/debt earns high returns. The extant empirical findings attribute this trend to market timing determined solely by the level of mispricing regardless of investment opportunities. Decisions to issue securities reflect managers' opportunistic behaviour to profit from the lack of symmetry between stock market value and the intrinsic or fundamental value.

Stock market reactions to security issuance are not immediate which suggests that investors are irrational and are conservative in receiving new information in the market. Loughran and Ritter (1995) posit that long run stock performance is explained by the underreaction hypothesis. Other studies that also allude to this explanation include Bilinski and Strong (2009), Spiess and Affleck-Graves (1995) and Womack (1996). All of this evidence suggests that long run performance reflects investor partial processing of information signaled by managers at announcement date with partial effect on prices. The remaining effects of the information accounts for the long run lower returns. Full signaling effects take time to be totally absorbed in the security prices.[15]

[15] Bilinski and Strong (2012) hold that the correction last for 17 months as opposed to 5 year period reported by Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) and only 6 months by Womack (1996). Ikenberry et al. (1995) find substantial post- repurchase abnormal four year buy and hold returns of 12.2%

2.4.2. Rational Discount Rate

An alternative reason for the behaviour of post-issue stock performance is the rational discount rate. The level of investor rationality is evident in the long run since conservative attitude to new information preclude immediate stock price reaction. After the effects of underreaction are subsided the market reverts back to the position prior to the issue. M/B and size impact diminishes with the correction period so that stock returns reflect discount rate. Generally, reduced leverage is associated with low risk that translates into low stock returns. Eckbo et al (2000) find that reduced risk associated with equity issue and reduced leverage compared to size and valuation effects accounts for the underperformance. Discount rate indicates a lower post issue risk that leads to adverse post issue performance.

2.4.3. Investment-Based Explanation

Long run returns subsequent to equity offering, as documented widely in the literature, exhibit price discounts. According to the market timing explanation, investors bid down the price in response to the issue to neutralise the initial missvaluation. Investment-based theory offers similar argument but presents a different reason to the price discount that follows equity offering. In this alternative orientation, the response of the stock prices relates to the change in risk profile that follows equity issues. As more equity financing is made to the investing public managers convert growth options into real assets. Butler et al. (2005) argue that in a time series study the amount of net financing (real investment-based), not the composition of the capital (market timing), has a more predictive power of long run abnormal stock performance. Thus, the level of capital inflows from both equity and debt issues decreases firm's required rate of returns due to conversion of risky growth options into less risky real assets. Lyandres et al. (2008) contend that equity issue converts risky growth options into fixed assets that reduce risks.

2.4.4. Economic Perspective

The economic argument to stock returns states that in the event of increased equity issues or massive buybacks/debt issues, there is the interplay of demand and supply forces, all other things being equal. Leverage increasing transactions reduce the supply of equity whereas transactions that generate additional equity into the market increases supply. That is, post issue price is affected by the size of the offering at a given market. Given the demand curve, any equity issue at high valuations causes a downward pressure on prices (Scholes, 1972). This is because the increased supply creates surplus that forces the price down. Similarly, in a situation of constant demand for the shares of the firm, repurchase/debt generate shortage from the reduced supply that compels a consequent rise in the stock prices. However, in an efficient market change in the size of the offering should rule out any possibility of change in price in response to the financing decisions.

Studies that propagate post-issuance underperformance ascribe the effects to only equity offerings. Thus, firms issue equity at high price ex ante and record low returns ex post. This is fundamentally the underlying phenomenon upon which market timing hinges. But, it is difficult to concede that only equity issuance takes place at a particular security issuance period. Firms that issue equity may as well issue other kinds of security concurrently, for example bank loans, private equity, and public debt among others. Billet et al. (2011) reveal a serious omitted variable bias that characterise prior studies. Using US data between 1980 and 2005 on issues of IPO, SEO, public debt, public equity and bank loans, they highlight the potential impact of multiple issues on stock price performance. The abnormal returns from Fama-Macbeth, Fama and French with augmented Carhart as well as BHAR all yield similar results.

Consistent with prior studies such as Baker and Wurgler (2002), stock price returns fall subsequent to equity issuance. Specifically, they find that firms perform worse when they engage in multiple security issues. Issue of three securities earns -4.9% annual returns compared with issuance of four security types return of -16.9% per year. However, the reason for this trend is not well articulated. Whether that is a new dimension to market timing, pecking order as

well as the impact of specific characteristics is not clear. In effect, multiple security type issues are rife and this study provides a new insight into the stock price performance following financing decisions.

2.5. Testable Hypotheses

This section develops the testable hypotheses from the literature reviewed in the preceding sections. This section consists of four subsections related to each developed hypothesis that are tested in Chapter 6 of the thesis. Subsection 2.5.1 discusses the hypothesis about share issuance and internal financial constraints while subsection 2.5.2 explains the hypothesis about share issuance and external financial constraints. In subsection 2.5.3, the hypothesis that share issuance and financial constraints depends on firm size is developed. Finally, subsection 2.5.4 explains the hypothesis that share issuance decisions affect stock returns.

2.5.1. Share Issuance and Internal Financial Constraints

The extant literature provides strong support for equity issues that precede periods of stock overvaluation or prior stock price run-ups (Graham and Harvey, 2001; Baker and Wurgler, 2002). As explained in Section 2.2, equity issues depend on factors such as costs of adverse selection associated with equity issues (Myers and Majluf, 1984; Lucas and McDonald, 1990; Korajczyk et al., 1992). Again, the empirical evidence reveals that equity issues are associated with negative asymmetric information effects when they need external equity financing. Therefore, consistent with a pecking order theory, firms avoid this cost by utilising internal cash or issue debt when they require additional financing (Myers and Majluf, 1984; Shyam-Sunder and Myers, 1999; Lemmon and Zender, 2010). Baker and Wurgler (2002) explain that the effects of asymmetric information correlate with overvalued equity or mispricing. Thus, the issue of overvalued equity coincides with high asymmetric information effects. This implies even when firms face significantly high asymmetric information effects associated with equity issues, the motivation to issue overvalued equity for market price exploitation

overrules the convention that firms issue equity during periods of low information asymmetry.

According to the trade-off theory, firms attempt to maintain a balanced capital structure based on a target debt-equity ratio (Shyam-Sunder and Myers, 1999; Hovakimian et al., 2001). Financial deficit is crucial in determining when firms issue securities. Given the high costs of adverse selection equity issues only enable firms to balance its excessive leverage position. Thus, at high leverage any additional debt issues will potentially drag the firm into costly financial distress and bankruptcy, even though debt issues produce tax advantage. This means the combination of potential discounting of the stock price and relatively high transaction costs does not encourage firms to undertake equity offerings. At high stock prices, firms are motivated to make equity offerings, but they must also possess the financial capacity to pay the high ancillary costs of issue. Opportunistic managers that issue/repurchase securities on the basis of the stock price must have the financial strength to also deal with costs (especially for equity issues) incidental to accessing the external capital market.

The direct costs such as gross fees paid to investment banks in conducting seasoned equity offering could be considerably high (Butler, Grullon, and Weston, 2005). For example, Lee et al. (1996) find that the average firm pays around 7% of the total proceeds to raise capital through an SEO. If firms only time their issues, then it is expected that they have substantial financial slack, especially for equity issuers. Without adequate investment opportunities cash-strapped entities are less inclined to access equity financing. Growth options dominate the demand for cash, and hence the need to obtain external financing when there is internal deficit. DeAngelo et al. (2010) stress that it is only the need for "near term" cash for future investments that motivates equity issue at high valuations. Firms that require cash for identified projects contact the outside investing public for financing without regard for market timing activities. It presupposes that rate of investment should increase with equity issues.

Moreover, Fama and French (2005) and Dong et al. (2012) contend that equity issuing firms are actually cash-rich. These firms do not necessarily require external financing. So following the argument by Baker and Wurgler (2002), and the evidence from Fama and French (2005) and Dong et al. (2012) and the high costs of equity issuance, one can conclude that timing the issue of overvalued equity should be more pronounced for cash-rich firms than it would be for cash-poor ones. Thus, for market timing to hold, equity issues must track financial surplus. This means managers that time the market should not be financially constrained. The only motivation for any equity offering should be occasioned by high stock prices with substantial financial slack such that high transaction costs do not impair the ability to conduct the issue. Firms are typically opportunistic and will issue equity/repurchase at high/low valuations. Fama and French (2005) highlight this proposition and find that equity issuers are not constrained with cash rather these entities hold significant cash balances prior to the issue. While this lends credence to market timing theory, it weakens the position of the pecking order phenomenon. Issue of overvalued equity under the market timing theory undermines the effects of pecking order theory. Stated differently, financial constraints do not curtail equity issue when firms with timing prospects issue equity. Therefore, equity issuers are less financially constrained and M/B suppresses factors that support pecking order (Dong et al, 2012).

The hypothesis following the above discussions is stated as follows:

> ***H_1: There is high probability for less internally financially constrained firms to issue overvalued equity***

2.5.2. Share Issuance and External Financial Constraints

According to McLean and Zhao (2014), internal financing constraints affect the demand for external financing. However, the supply of the funding will depend on the overall external financing conditions. Investors buy shares when they are more liquid such that they can freely trade them on the secondary market. Thus, market liquidity influences the supply or the availability of external funding, regardless of whether firms are internally financially

unconstrained to pay the transaction costs. External financing constraints – the degree of market liquidity or economic conditions (e.g. financial crisis) - not only affect the supply of funding but it also increases the transactions costs associated with equity issuance. Speculative securities such as equity attract significant sentiments that affect the supply and costs of equity issuance (Stein, 1996; Baker and Wurgler, 2006, 2007; Baker, 2009). Therefore, firms' market timing of equity issues is dependent on the external financing constraints as well. The degree of internal financial constraints should also affect the likelihood that firm issues overvalued equity during periods of high external financial constraints.

The financial crisis of 2008 and the European debt crisis of 2011 have both emphasised the effects of external financing constraints on corporate decisions. During crisis periods, market liquidity dampens and increases the costs of raising external equity financing (Corwin, 2003; Butler et al., 2005; McLean and Zhao, 2014). For instance, Naes et al. (2011) show that U.S. stock market liquidity is countercyclical, and argues that during recessions there is a "flight to quality" in equities. This is because during recessions investors sell stocks, especially riskier stocks, in favour of safer securities. Therefore, external financial constraints should limit equity market timing. Studies such as Korajczyk and Levy (2003) and Alti (2006) find equity-issuing effects of market conditions. Specifically, firms find it cheap to issue equity when there are favourable overall market conditions. Favourable market conditions enhance supply of funding and also reduce the costs of obtaining the external financing. Thus, firms are more likely to issue overvalued equity during periods of favourable market conditions. Less external financial constraints and high market liquidity should increase the probability of issuing overvalued equity. The likelihood of a firm issuing overvalued equity during periods financial crisis should be higher for firms with low internal financial constraints than for those with high internal financial constraints.

> ***H_2: Firms are more likely to issue overvalued equity when external financial constraints are low (non-financial crisis period or periods of high market liquidity)***

H_3: The probability of issuing overvalued equity during periods of high external financial constraints increases for firms with low internal financially constraints than those with high internal financial constraints

2.5.3. Share Issuance and Stock Returns

In markets where security issues depend on prevailing conditions, investors are expected to act in response to issuers' decisions. Generally, capital market transactions reflect favourable information either to the seller or the buyer. There is always the lack of symmetry between the two parties in terms of the information that encourage the party to act in the market. Therefore, rational investors discount stock prices to indicate situations of asymmetric information. Market timing theory asserts that managers issue equity at high stock prices and repurchase at low valuations. If investors are rational, then the immediate response following announcement of equity (at high prices) and repurchase/debt issue (at low prices) is to bid down prices or up respectively. Equity issues are associated with significant stock underperformance (Fama and French, 1993; Loughran and Ritter, 1995, 1997; Baker and Wurgler, 2002; Dong et al. 2012).

Several theories underlie the gradual stock price reaction to security issuance decisions. Loughran and Ritter (1995) propose that investors' reaction take time to reflect in the stock price. Largely, irrational attitude of investors ensure that stock prices do not immediately fall following equity and rise with repurchase/debt issues. Opportunistic managers, therefore, take advantage of high and low valuations to make equity offering and repurchase/debt issues respectively. The combination of high adverse selection costs and transaction costs suggest that managers only exploit investors when they issue equity. According to the underreaction theory, overvalued/undervalued firms that issue equity/repurchase record low/high long run returns. The degree of financial constraints has significant impact on the level of stock returns. Lamont et al. (2001) find evidence that the stock returns of financially constrained firms move together because they are subject to common shocks. But more

importantly, their findings are consistent with low stock returns associated with constrained firms.

Financial constraints and the consequence on investment decisions and other signalling financial policies such as dividend payments should reflect in the stock returns. Firms that are limited in their ability to undertake investment opportunities and pay dividends will have negative stock market reactions compared to those that undertake investments and pay dividends. Using KZ index as internal financial constraints proxy, Lamont et al (2001) and Chan et al (2010) find that stock returns of internally financially constrained firms move together indicating that they have common shocks. On the other hand, they find that unconstrained firms earn significantly higher stock returns than constrained firms. The degree to which issuing firms underperform depends on the level of internal financial constraints. Consistent with Lamont et al. (2001), internally financially unconstrained firms should report less negative stock returns than more constrained firms. Also, faced with high external financial constraints and high costs of issuing equity, the level of stock price underperformance should also be less negative for unconstrained firms than constrained firms. The hypotheses are stated as follows:"

> ***H_4: Issuance of overvalued equity is associated with more negative short-term abnormal returns, especially for firms with high internal financial constraints***
>
> ***H_5: Issuance of overvalued equity is associated with more negative short-term abnormal returns, especially for firms with high internal financial constraints and during periods of high external financial constraints***

2.6. Conclusion

This chapter has reviewed the theoretical as well as the empirical evidence of share issuance decisions. The aim of the chapter was to establish that not only mispricing but also the level of both internal and external financial constraints affects the share issuance decisions of firms. The chapter also discussed the

theories that explain stock returns associated with equity issues. Empirical evidence suggests that equity issues are associated with negative announcement date abnormal returns. This finding fails to account for the level of financial constraints. Hence, firms' decisions relating to equity issuance are likely to be influenced by mispricing as well as the level of financial constraints.

Chapter 3
LITERATURE REVIEW: SHARE ISSUANCE METHODS

3.1. Introduction

Firms in the UK are allowed to issue equity through rights issues, open offers, and private placement. This apparent choice of issuance method was affected by the deregulation in 1986. In deciding on the method, firms take into account several factors including the level of information asymmetry, the ownership structure of the firm, and whether equity issue can be timed. In view of that, the market also responds differently to the issuance methods. This chapter provides overview of the equity issuance method in the UK. It also reviews the theories that underlie the choice of each method and provides empirical evidence of the stock returns associated with each method. The chapter also develops testable hypotheses that set out the focus of the empirical chapter 7 of the thesis.

The chapter has five sections. Section 3.2 presents the general overview of share issuance methods in the UK. It discusses the flotation methods, UK issues, the costs and demise of rights issues. Section 3.3 explains the theories that underlie the choice of issuance method. This section examines firm characteristics that determine whether a firm selects rights issues, open offers, or private placement in issuing equity. Section 3.4 provides empirical evidence of stock returns as well as the operating performance associated with each equity issuance method. Section 3.5 develops the testable hypotheses and section 3.6 concludes the chapter.

3.2. Overview of Share Issuance Methods

Equity issues can be undertaken through a number of methods. The application of a particular method is influenced by a number of firm factors and managerial motivations for the transaction. For instance, a small firm that prefers a more concentrated ownership structure would opt for rights issues approach to avoid ownership dilution. Without issuing shares to new investors, the existing shareholders are able to control the affairs of the company without much external influence and monitoring. Similarly, the cost of conducting

equity issues affects the choice, all other things being equal. Thus, shareholder characteristics, direct cost of flotation and asymmetric information, among other factors, determine the equity issuance approach adopted by firms. This section discusses the flotation methods in subsection 3.2.1, UK issues in 3.2.2, the cost of rights issues in 3.2.3, and the demise of rights issues in 3.2.4.

3.2.1. Flotation Methods

Rights issues: Issues through rights issues, otherwise known as uninsured rights issues, ensure that new shares are offered to existing shareholders for subscription on pro rata basis. Shares offered to current shareholders attract price discount to the market price to encourage take-up. This implies that the shareholders to whom the shares are offered have the right to forfeit or sell their rights subsequent to taking up the offer. Rights issues are organised on pro rata basis to assure that all shareholders retain the degree of control they enjoyed prior to the offer. Therefore, shareholders who opt to reject the offer tend to be worse off after the transaction because they lose percentage of control and subsequent dividends payments. Again, any forfeited shares cannot be issued to external investors with firm losing on the amount that would accrue had they been issued to outsiders. Given that firms act in the interest of current shareholders, rights issues are more likely offered when the shares are undervalued (Capstaff and Fletcher, 2011).

Open offers: Open offers: Open offer is an offer of new shares usually at a discount to existing shareholders on a pre-emptive basis. The usual practice is to invite shareholders to apply for any number of shares. The terms of an open offer are similar to rights issues except that offers that are not taken up cannot be sold by the shareholders (Armitage, 2000). Unlike a rights issue, application forms are used (instead of *provisional allotment letters*) which cannot be traded *nil paid* and no arrangements are made for the sale of shares not taken up by shareholders. Thus, entitlements from an open offer are not tradable and therefore an open offer is only available to existing shareholders. The principle of *pre-emption* is usually achieved by providing for a guaranteed "minimum entitlement". If any shareholder declines his minimal entitlement, the excess shares are allocated to those applying for shares in excess of their minimum

entitlements. If excess applications cannot be met in full, applications are scaled down.

Private Placement (Placings): An issue where the entire offer is placed with one or more investors without issuing pro rata to existing shareholders is private placement. Firms normally target these few investors. The only distinguishing feature of private placement from both rights issues and open offers is that private placement is not made on pro rata basis. However, it is made under similar terms and conditions as the rights issues.

3.2.2. UK issues

Factors that motivate a choice of flotation method are varied and wide. Rights issues, until deregulation in 1986, were the only method used in the UK. Subsequent to the deregulation, firms had the option to issue using rights issues, placement, and open offers among others. Korteweg and Renneboog (2002) and Barnes and Walker (2006) both find open offer and placing firms are smaller with higher asymmetric information than rights issuers. The high asymmetric information is attributed to the high proportion of director ownership in such firms. However, placings that involve new and external investors allow the firm to divulge information to the market. Thus, placings are associated with information releases that reduce information asymmetry. This information release improves liquidity of the shares and reduces issue costs for the shares. Quality firms would also choose placement over rights issues to attract new investors and explore other financing avenues. The above features, coupled with the certification credibility, contribute to a positive price reaction to placement with negative price effects to rights issues (Slovin et al, 2000; Armitage and Snell, 2004; and Barnes and Walker, 2006; Levis, 1995).

3.2.3. Costs of Issue Approach

An important element in the choice of issuance method is the cost associated with each method. Earlier empirical evidence in the US documents that uninsured right issues are the cheapest flotation method. Smith (1977) finds that the average cost of conducting rights issues is 1.8% and 0.5% of gross

proceeds for industrial and utilities, respectively. Firm commitment costs 6.1% and 4.2% of gross proceeds respectively. These costs comprise underwriting fees and other direct expenses. The discount provided on the offer encourages subscription and the amount earmarked to raise from the issue. Firms that choose rights offerings maintain the number of shareholders and consequently the dividend. For anti-dilution reasons, rights offerings do not diminish earnings per share. Rights issues are much cheaper than placement in the UK yet firms prefer private placement to rights issues. Recent equity issues show that a surge in private placement and open offers at the expense of rights issues. Factors that account for this changing trend are unrelated to the costs of issuance.

3.2.4. Demise of Rights Issues

The demise of rights issues relates to the changing preference for placings and open offers since early 1990s following the deregulation of 1986. Changing firm characteristics explain in part the apparent lack of preference for rights issues. For instance, Eckbo and Masulis (1992) attribute the demise of rights issues in the US during 1980 to increased use of dividend reinvestment plans (DRIPs). DRIPs allow shareholders could choose to receive common stock in lieu of cash dividends. However, the introduction of DRIPs does not necessary explain the disappearance of rights issues for firm commitment. A number of factors explain the demise of rights issues or the increased preference for private placement in the UK.

Firstly, capital gains taxes affect the choice of rights issues (Smith, 1977). Since rights issues are conducted to benefit equally all the existing shareholders, those who do not subscribe to their rights become worse off. To forestall this anomaly, shareholders can elect to sell their rights or subscribe and sell them subsequently. This ensures that the value of the shareholding is not reduced and also takes advantage of the price discount. Smith finds that the incidence of capital gains tax on the discount discourages substantial discounts making rights offerings unpopular. Further, he asserts that investment banks effectively influence firms to adopt firm commitment regardless of the higher fees. Secondly, rights issues are made to only existing shareholders unless the

rights are subsequently sold to outside investors. Given this phenomenon, price effects and trading in shares are limited. The lack of external or new investors' involvement in the rights issues lowers the liquidity of the shares (Kothare, 1997).

Another reason for the demise is that shareholders that opt to sell their rights bear the responsibility and the cost of selling them. Unlike underwriting where the sale of shares rests with underwriters, shareholders can only sell on organised exchanges that require dealers and brokers. Hansen (1989) finds a high dealer and brokerage fees associated with the sale. Lastly, rights issues that are unsubscribed attract negative market reactions. Eckbo and Masulis (1992) find that low participation in the issue increases asymmetric information about the firm. Thus, market response to rights issues is more negative than firm commitment. It implies announcement price run-up is low for rights issues and high for firm commitment issues. Barnes and Walker (2006) assert that placements are preferred for firms with high asymmetric information.

Other empirical evidence attributes the demise of rights issues to the need for block selling of shares. Armitage (2007) finds that the price discount of between 15% and 20% of the market price is least attractive to maintain the preference for rights issues. Nevertheless, the demise of rights issues reflects the notion that placings better facilitate block selling than rights issues (Armitage, 1998; 2010). Again, placement saves time and money compared with rights issue and open offers. Placement also invites new investors and provides insurance as to the certainty of the offer taken up. Substantial resources are committed to placement to assure the right value of the firm that reduces adverse selection effects. Therefore, high quality firms prefer placement to rights issues.

Again, Eckbo and Masulis (1992) further describe adverse selection costs as a function of current shareholder take-up of rights issues. By inference, high adverse selection costs are associated with rights issues with low take-up whereas high take-up effectively offset any asymmetric information effects. Thus, in the definition of market reaction to rights issues, Eckbo and Masulis (1992) rely on the degree of current shareholder take-up of the offering.

Absolute take-up of the issue signifies quality information that eventually translates into positive market reaction. This intuition reflects the tendency for firms to advance shareholder value by not inviting new investors to participate in the distribution of the wealth.

However, the incidental low take-up by current shareholders could force managers to issue to new shareholders. Undervalued firms are successful with rights issues whereas firms that are relatively overvalued prefer firm commitment. The above suggests a more negative market reaction with firm commitment and a near zero stock returns associated with rights issues. On the average current shareholders are more informed about the firm than the outside/prospective investors thus by participating in new shares convey quality information to the market. Eckbo and Masulis (1992) assert that subscription pre-commitments reveal the success of the issues and the perception of the existing shareholders about the quality of the firm. This effect potentially attenuates negative reaction occasioned by stock issues.

3.3. Theories of Share Issuance Choice

In addition to the theories that affect equity issues as discussed in Chapter 2, this section discusses specific theories that explain the choice of issuance method. The section is made up of four subsections discussing different theories. Subsection 3.2.1 explains the quality signalling theory, 3.2.2 the monitoring and certification hypothesis, 3.2.3 he managerial entrenchment hypothesis, and 3.2.4 the investor relationship phenomenon.

3.3.1. Quality Signalling

In line with the asymmetric information hypothesis[16], firms attempt to signal their quality through equity issuing transactions. Factors which define quality include, among others, lower discount, low information asymmetry, higher liquidity, undervaluation. In particular, the extant evidence suggests that price discount is an important gauge of firm quality (Hertzel and Smith, 1993; Slovin et al, 2000; Barclay et al, 2007; Balachandran et al. 2008). Quality firms are

[16] Refer to Chapter 2 for discussion on information asymmetry hypothesis

more likely to preserve ownership control by issuing equity to existing shareholders (Balachandran et al. 2013). On the one hand, quality firms will issue equity to existing shareholders because they have no motivation to reduce shareholder wealth. It also suggests that it allows firms to retain control of the quality firm and not dilute ownership concentration. However, firms use private placement to signal undervaluation through investor certification of the issue (Hertzel and Smith, 1993). This evidence indicates that for low quality firms, private placement allows them to obtain approval for the issue in exchange for significantly large price discounts.

In the study of equity offering methods using a sample of 967 UK equity issues from1996 to 2005, Balachandran et al. (2013) assert that quality firms are more likely to issue equity to existing shareholders. These firms have lower idiosyncratic risk, higher liquidity, and lower information asymmetry. Since private placements constitute few investors who can be targeted, low quality firms choose private placement. Larger price discount compensates for the costs of obtaining information about the firms and the issue. Moreover, the firms in turn obtain credible certification for the issue that in turn dampens adverse effects of perceived adverse selection associated with issuance to external investors. The above differences have significant implications for subsequent stock price reactions. Their study emphasises that, all else equal, firms will more likely signal their quality through private placement than rights issues when the price discount is low. However, for larger discount, shareholder wealth is more protected using rights issues.

3.3.2. Monitoring and Certification Hypothesis

Two related theories that underlie share issuance choice are monitoring and certification hypothesis. Monitoring means the ability and capacity with which investors assert their authority and control over corporate strategies and preserve firm resources. A well monitored firm pressures management to act in the overall interest of the shareholders. It ultimately reduces the agency costs associated with management of corporate entities. Wruck (1989) contends that active investors purchase private placements to increase managerial monitoring which ensures that corporate resources are utilised more efficiently and also

increase the probability of value-increasing takeovers. Wruck (1989) further asserts that the monitoring effects is different between private and public equity issues because public issues are made to the general public with purchasers not necessarily willing to actively involve themselves in the management of the firm. On the other hand, private placement mitigates the asymmetric information problem because private placement allows managers to negotiate with the purchasers to address any concerns about the firm.

Consistent with the information asymmetry hypothesis, private placement promotes credible investor certification of the equity issue. Hertzel and Smith (1993) contend that informed investors who purchase the equity in private placement certify the credibility of the market value of the issue. The implication of the certification is that it dispels market suspicion about firms' attempts to issue overvalued equity and also decreases the adverse selection associated with information asymmetry. Hertzel and Smith (1993) study the certification hypothesis using a sample of 106 private placement announcements from January 1, 1980 through May 31, 1987. The substantial discounts associated with private placement compensates for the costs incurred by investors in obtaining information about the equity issue and the firm. Thus, the discounts represent the price paid by the firm in exchange for the value certification. By certification, information asymmetry problem is resolved and it also highlights the equity undervaluation.

3.3.3. Managerial Entrenchment

The activities and interests of corporate managers could also influence the choice of issuance. Corporate managers are under huge pressure to meet shareholder objectives of maintaining shareholder wealth and creating value through investments. These managers are expected to manage the financial resources in a way consistent with the objectives of the firm. Through monitoring, labour market pressures, among other factors, managers are constrained from making value-destroying activities and paying substantial perquisites at the expense of the firm. Managerial entrenchment is the attempt by managers to make themselves valuable to shareholders and costly to replace (Shleifer and Vishny, 1989). Entrenched managers have control over corporate

resources and strategy. All else equal, entrenched managers are more likely to act in a way that is inconsistent with shareholder value creation. This effect manifests through excessive perquisite payments and the investments in value-destroying projects that undermines the long-term growth potential of the firm.

In the context of share issuance, private placement attracts new investors to encourage monitoring (Wruck, 1989). However, Barclay et al. (2007) assert that private placements are often made to passive investors. By placing equity with passive investors, managers undermine the effects of monitoring. Rather, the managers are able to strengthen their control over the firm. Barclay et al (2007) also stress that initial positive stock returns may suggest evidence of monitoring and certification. Over the long term, these purchasers of private placement do not actively involve themselves in the management of the firm. Thus, the passive investors do not become directors, CEOs, and do not acquire the firms or act in any capacity that demonstrates their active involvement in the management of the firm. The inactivity of the investors in the management of the firm solidifies managers' control of the firm. Managerial entrenchment hypothesis is consistent with managerial behaviour and the post-placement activities of the firm.

Barclay et al find significant price discount for private placements. Of the total 594 issues between 1979 and 1997, only 12% were active placements. The criterion for designating as active and passive is crude with serious limitations. For instance, the kind of interaction that would qualify placement as active is arbitrary. They further assert that the discount compensates for the subsequent stock price decline. Passive placements means management chooses uninformed investors who do not provide the monitoring (Wruck, 1989) and certification (Hertzel and Smith, 1993) for the issue. Thus, the lack of monitoring and active involvement of the new investors in the activities of the firm allows management to entrench itself. Therefore, management entrenchment motivation influences the choice of passive investors, accounts for the price discount and the long-term negative post-issue stock returns associated with private placement.

3.3.4. Private Placement and Investor Relationship

Another feature of private placement is the tendency to target few investors without selling the shares to the wider investor public. The absence of a wide public demand is beneficial to existing shareholders in a sense as to preserve their ownership interest without significant dilution. It is also consistent with targeting investors who provide certification (Hertzel and Smith, 1993) and adequate monitoring (Wruck, 1989) to justify the value of the share issues transaction. The effects of both certification and monitoring constitute positive information about the firm that enhance the credibility of the issue and increase firm value. However, a large number of private placements are associated with significant issue discount and negative post-issue stock returns (Armitage, 2007; Wruck and Wu, 2009; Armitage et al. 2014). In effect, this brings into focus the ability of the active investors that participate in the issue to determine the true value of the firm at the time of the issuance decision.

Wruck and Wu (2009) note that in the process of the private placements, issuing firms form relationships with investors. When new relationships are created it evokes positive signal to assure the market of adequate monitoring and credible certification that accompany the transaction. The positive announcement stock returns support this hypothesis. They study a total of 1976 private placements spanning years 1980 to 1999 of US public companies. Placements where new relationships are formed generate significant CAR (-3, 0) of 3.15% compared to insignificant returns of 0.63% for no relationships. They argue that subsequent improvement in operating performance and long run stock returns are the result of strong governance and increased monitoring occasioned by the new relationships. By extension, the subsequent performance of the firm depends on the degree and effectiveness of the governance invoked by the private placement transaction. Thus, private placement accompanied by good governance is anticipated to generate improved performance than an otherwise private placement that fails to generate improved governance. Also, governance should also address the extent of the new investors' involvement in the corporate affairs of the firm.

3.4. Stock Price Reactions to Share Issuance Choice

The stock price and operating performance associated with equity issues are discussed in this section. Subsection 3.4.1 provides evidence of short-run stock returns associated with each equity issuance method whereas 3.4.2 offers insights into the long-run stock performance of the different equity issuance methods. Finally, 3.4.3 focuses on the level of operating performance to each method.

3.4.1. Initial Abnormal Stock Returns

Consistent with theories of share issuance (Slovin et al., 2000; Barnes and Walker, 2006; Baker and Wurgler, 2002; Armitage, 2010; Dong et al. 2012), firms choose equity issuance to exploit either overvaluation or in response to low information asymmetry.[17] For example, market timing of equity issues is associated with overvaluation. If different valuation can be attributed to each equity issuance method, then firms can time their issuance choice on the basis of the overvaluation. Stated differently, different level of information asymmetry should also explain the choice of issuance method. This approach follows that initial stock returns associated with equity issues should be different for each issuance method. Empirical literature provides significant evidence of the differential stock price reactions dependent on the equity issuance method. Thus, if firms choose issuance method on the basis of overvaluation, market reactions should be negative for the issuance method that is associated with overvaluation. Moreover, for method with significant information asymmetry, market reactions would be negative.

Seasoned equity offerings generally attract negative market reactions due to the inherent asymmetric information costs associated with them. Empirical evidence in the US is unanimous. For instance, Hansen (1988) finds AAR underwritten rights -2.61% for industrials and -1.21% for utilities whereas Eckbo and Masulis (1992) report AAR -1.39% for industrials and 0.23% for utilities. Similarly, for UK Armitage (2007) find that renounced rights issues are sold at significant discounts of about 8% but they argue this is more to do

[17] See chapter 2 for overview of theories that explain share issuance decisions.

with issuer value uncertainty than overvaluation concerns. The extant literature asserts that rights issues attract low costs. However, as Armitage reports, when the rights issues are subsequently renounced and sold at discount to new investors the cost could potentially exceed that which would otherwise be incurred for open offers and private placement. On this evidence, take up of rights issues define the success of such transactions.

Firms wishing to signal quality, disperse ownership and reduce asymmetric information between insiders and outsiders adopted Placings. Moreover, placings effectively enhance ownership dispersion, enhance external monitoring and promote corporate control. Again, given that an underwriter buys the entire offerings and makes gains from bid-ask spread, thorough investigation about the value of the firm would be conducted before an underwriter accepts the placings. Slovin et al (2000) and Barnes and Walker (2006) contend, in consonance with Myers and Majluf's (1984) information asymmetry theory, that underwriting certification, ownership dispersion, increased external monitoring, and corporate control embodied in placings eliminate/reduce asymmetric information effects associated with equity financing.

Another explanation to the stock price reactions to equity issuance method is mispricing. Stock price underperformance associated with SEO in the US and UK has been attributed to the effects of market timing. All else equal, regardless of equity issuance method, post-issue abnormal stock returns is likely to be negative due to possible overvaluation; but the more firms are able to exploit the overvaluation through a specific issue approach, the more negative the market reactions to stock returns. The argument that managers aim to improve shareholder value supports the idea that they will be unwilling to issue overvalued equity to existing shareholders. Following this reasoning, firms would be more likely to issue overvalued stock to new investors due to information asymmetry and these investors can only obtain information by incurring substantial costs. This is similar to a case where ownership is concentrated at family level. With aversion to control dilution and increased monitoring following private placement, such firms would prefer rights

offerings (Cronqvist and Nilsson, 2005). Burch et al (2004) and Capstaff and Fletcher (2011) assert that firms are less likely to time their equity through rights issues than placings. Capstaff and Fletcher (2011) and Balachandran et al (2013) assert that rights issues firms are not of lower quality compared to placings and open offer firms.

3.4.2. Long Run Stock Returns

Theories such as asymmetric information, monitoring and certification, managerial entrenchment and mispricing underlie the long run price reactions associated with the choice of equity issuance methods. Following the asymmetric information hypothesis, long run performance of rights offerings and placings are akin to SEO. Several empirical studies confirm that firms that conduct both rights issues and placings record substantial negative abnormal returns. This evidence is consistent with findings in the US about market reactions subsequent to seasoned equity offerings. Prior to the deregulation, firms could exploit overvaluation, as they deemed profitable using rights offerings. With the introduction of different approaches to issuing equity, firms can distinguish themselves from others and communicate information to investors using a more appropriate technique. Ngatuni et al. (2007) review the differential long run performance of equity offering for rights issues and open offers at different time periods.

In the period between 1986 and 1995, rights issues were the dominant issue approach. Open offers and placings had been introduced but were yet to be more pronounced in the UK. Using a sample of 818 rights issues spanning a period from 1986 to 1995, Ngatuni, et al (2007) report a 5-year average BHAR of -41.80%. It is both statistically and economically significant. When disintegrated between different time periods, rights issues made between 1991 and 1995 recorded a reduction in the abnormal returns. Generally, the intuition is consistent with evidence from the US (e.g. Spiess and Affleck-Graves, 1995; Loughran and Ritter, 1995) that find negative abnormal returns following SEO. As open offers increases with rights issues gradually less preferred, the negative reaction to rights issues diminishes and open offers earn positive abnormal returns.

Also, using a sample of 670 UK rights issues and 391 placings from 1989 to 1997, Ho (2005) and Abhyankar and Ho (2007) conduct event study that focuses on the relative long run performance of equal and value-weighted portfolios. It would have been interesting to note the performance of both rights issues and placings given that prior studies have enumerated many different features that potentially yield different market reactions. They find significant negative abnormal returns over a three-year period. Specifically, rights issues earn equal-weighted BHAR and value-weighted BHAR which are respectively -19.50% and -8.53%. While consistent with other UK evidence, there is stark difference in terms of magnitude of the returns. For example, Levis (2005) find three year BHAR of -30.20% in UK.

The equity issuance decisions of public firms also determine the long-term stock performance. Public firms can issue equity securities to the public for subscription through firm commitment method of flotation. While this approach is commonly adopted in the US, a number of public firms also place equity private with investors. These issues are limited to specific investor or investor group without public involvement. If equity market timing hypothesis causes the market to penalize firms that conduct public issues due to perceived exploitation of overvaluation, then private placings of equity should at least cause limited negative market reactions. Hertzel et al. (2002) study 619 private placements over the period 1980 to 1996 for firms listed on the NYSE/AMEX/Nasdaq exchanges. They estimate both the stock returns and operating performance after the private placement to check for a consistent behavior of stock returns and firm operating performance.

Hertzel et al. (2002) generate positive stock price reactions to announcement of private equity of 2.4% in variant to the negative returns associated with public issues. The long run returns, however, compares with the negative returns recorded for public issues. For example, they find mean there-year buy-and-hold abnormal return for size-and-industry matched control firms of -38.18%. Spiess and Affleck-Graves (1995) report abnormal returns relative to size-and-industry-matched benchmark of about -22.84% for public issues of equity. This evidence contradicts the underreaction hypothesis that has been advanced in

explaining the stock market reactions following the announcement of equity issues. In effect, the long run returns lend support to investor over-optimism associated with 'windows of opportunity' at the announcement of both private and public equity issues. Again, and more strikingly, they find that private issues follow period of relatively poor operating performance that divorces the predictions of investor over-extrapolation of firm performance to the announcement of the issuance decisions.

According to the managerial entrenchment hypothesis, the long run stock returns associated with private placement differs from the initial stock returns. Barclay et al. (2007) emphasise that whereas the initial positive abnormal returns reflects the effects of monitoring and certification, over the long term the effects of managerial entrenchment become apparent. Firms make private placement to passive investors who do not intend to engage in the management of the firm. The inactivity of the new investors enhances the managerial control of the existing management on corporate resources, increases perquisite payments and ultimately decreases shareholder wealth. Thus, private placement promotes managerial entrenchment and hence results in unfavourable long-term stock price reactions.

Capstaff and Fletcher (2011) also contend that UK managers are less motivated to use rights offerings to exploit equity overvaluation. Rights issues of equity made to existing shareholders present limited scope for information asymmetry and mispricing and the potential for exploitation. Consistent with the quality-signalling hypothesis, rights issues are less overvalued and the market least anticipates firms to time their issues through rights offerings. This incidence of mispricing explains the long-term stock performance. Capstaff and Fletcher (2011) assert that rights offering firms perform better in the long run than other alternative issuance methods. The study of 772 equity issues from January 1996 to December 2007 computes cumulative abnormal returns (CAR), buy-and-hold abnormal returns (BHAR) as well as calendar time portfolio returns for equity.

Rights issuing firms perform significantly better over the long term than placings. With similarly positive prior issuance performance for all methods, the subsequent underperformance is an indication of an attempt by firms to time their issues. The firm quality argument is consistent with rights issues because firms are less likely to time issues to existing shareholders with low information asymmetry. In line with the asymmetric information hypothesis, and consistent with equity market timing, placings are more likely to be timed even though recent evidence by Dionysiou (2015) suggests otherwise. In fact, she finds that placings are associated with high earnings quality and growth opportunities at the announcements. The effects of mispricing and information asymmetry manifests in the long term and define the stock price underperformance. This evidence supports the managerial entrenchment phenomenon (Barclay et al. 2007) and cast doubts on the findings by Slovin et al. (2000) and Barnes and Walker (2006). Again, these findings suggest that any positive stock returns associated with placings can only be transient; the monitoring and certification hypotheses explain these short-term returns (Wruck, 1989; Hertzel and Smith, 1993). Tables 3.1 and 3.2 summarise the empirical evidence of long run stock returns associated with equity issues.

Table 3.1: Summary of Empirical Evidence of US Long Run Abnormal Returns Post Equity Issues

Authors	Period	Size	Post-issue Period	Returns
Spiess and Affleck-Graves (1995)	1975-1989	1116	3-Year CAR	-18.67%
Loghran and Ritter (1995)	1970-1990	3702	3-Year BHAR	-33.0%
Brav et al. (2000)	1975-1992	3775	5-Year BHAR	-24.0%
Eckbo et al. (2000)	1964-1995	3315	5-Year BHAR	-23.20%

Table 3.2: Summary of Empirical Evidence of UK Long Run Abnormal Returns Post Equity Issues					
Authors	Period	Equity Method	Sample Size	Event Window	Returns
Levis (1995)	1980-1988	Rights Issues	158	36-month BHAR	30.20%
Ho (2005)	1989-1997	Rights Issues	562	36-month BHAR	-19.92%
		Placings	252	36-month BHAR	-25.38%
Abhyankar and Ho (2007)	1989-1997	Rights Issues	670	36-month BHAR	-19.92%
Ngatuni et al. (2007)	1990-1995	Open Offers	132	36-month BHAR	15.60%
	1991-1995	Rights Issues	421	36-month BHAR	-25.75%
	1986-1990	Rights Issues	397	36-month BHAR	-34.45%
Iqbal et al. (2009)	1991-1995	Open Offers	181	36-month BHAR	-21.65%
Andrikopoulos (2009)	1988-1998	Rights Issues	1542	36-month BHAR	-24.39%
Capstaff and Fletcher (2011)	1996-2007	Rights Offerings	168	36-month BHAR	-7.1%[a]
		Placings	185	36-month BHAR	-15.21%
		Open Offers	95	36-month BHAR	-2.62%[a]
		Placings plus Open Offers	76	36-month BHAR	-25.50%
Iqbal et al. (2013)	1988-2008	Rights Issues	1146		-30.67%

[a] *means the value is statistically insignificant*

3.4.3. Operating Performance

Theoretically, the stock returns should correlate positively with operating performance. Poor performing firms are expected to have depressed stock prices. Thus, operating performance explains the stock performance of the firm. A number of studies have shown the stock market response to the issue of seasoned equity. The evidence is unanimous across several economic environments that there is a negative stock returns following equity issuance transactions. However, our understanding of the level of operating performance at the time and subsequent to equity issues is limited. Anecdotally, negative stock returns are expected to reflect deteriorating operating performance of the firms. Thus, from market timing standpoint, high operating performance should reflect the stock price run-up and high market-to-book ratio of equity issuing firms. Similarly, as stock price declines after the equity issuance transactions, operating performance is expected to equally deteriorate to give support to the underlying reasons for the adverse market reactions. In the context of issuance method, it can be argued that issuance method that mimics the market timing or information asymmetry theory should demonstrate similar reactions and effects as the equity offerings. Thus, high market-to-book ratio, stock price run-up and high operating performance should precede the announcement of the equity issues.

Empirical research covering this thesis include but not limited to Healy and Palepu (1990) who find no earnings effects following equity issues. They contend that SEO do not convey new information about earnings. However, Loughran and Ritter (1997) demonstrate that operating performance of equity issuing firms is significantly high prior to the issuance date. These firms subsequently report deteriorating performance that reflects the decline in stock returns. Teoh et al. (1998) as well as Rangan (1998) also assert that the activities of firms 'managing their earnings' in the lead up to the issuance decision underperform. Similar effects can be investigated when equity issues are disintegrated into the different issuance methods available to firms, especially in the UK. Kabir and Roosenboom (2003) study rights issues in the Netherlands and find that firms experience significant stock price decline at the

announcement of rights offerings. Rights offerings are the dominant flotation method in the Netherlands unlike UK where firms have choice among rights issues, open offers and private placement including variants of these methods. This compares well with the US where firm commitment is the only method adopted for equity issuing transactions. This study differs markedly from Kabir and Roosenboom (2003) since it considers three equity issuance methods that are available to UK firms. I explore the effects of differential operating performance on the choice of equity issuance methods among UK firms.

Their study covers the period from 1984 to 1995 for a total 67 rights issues (final sample of 58 issues) conducted by 62 different companies listed on the Amsterdam Stock Exchange. Rights issuing firms record announcement date abnormal return of -2.0% which decreases further to -2.8% in the next two days. Consistent with the stock price decline, operating performance subsequently deteriorates. This shows that negative stock return is not an anomaly but indicate market perception of the adverse operating performance after the issuance activity. Using return on assets measures such as net income to total assets, EBITDA to total assets as well as return on sales metrics like net income to sales and EBITDA to sales, they find consistent negative operating performance over 5-years after the equity issues. Information asymmetry between firms and shareholders explain this trend but they find no evidence of rights issues in response to favourable market conditions.

Also, differences in type of firms can account for the post-issue performance of firms conducting private placement. The equity issuance literature is replete with evidence that overvalued firms underperform the market subsequent to the issuance decisions. The work by Baker and Wurgler (2002) highlights the long run effects of mispricing on capital structure. Other studies such as Dong et al (2012), also find evidence in support of the overvaluation-performance relationship. As noted earlier Hertzel et al (2002), provide consistent relationship between stock returns and operating performance following equity issues. Chi and Gupta (2009) also assert that overvalued firms are more likely to engage in earnings management that explains the subsequent underperformance. However, differences such as the degree of overvaluation

and/or the level of growth opportunities can distinguish firms in terms of the level of underperformance.

Using a sample of 371 private placements between the period 1980 and 2000, Chou et al. (2009) explain the post-issue performance of private placements in relation to growth opportunities. High growth firms are more likely to manage earnings (Skinner and Sloan, 2002; McNichols, 2002). Thus, the perception for firms to engage in earnings management stimulates the adverse effects of private placements on stock returns. Market reactions reflect the notion that firms cannot maintain the high reported earnings prior to the equity issues. High growth opportunities evoke both management and investor optimism about the prospects of the firm (Hertzel et al, 2002; Marciukaityte et al, 2005). Overall, they find that high growth firms record negative 3-year abnormal stock returns between -15% and -37% that is consistent with the poor operating performance within the same time period. However, the cross-sectional regression of the abnormal returns is too simplistic since it does not capture the effects of factors such as issue discount, the level of demand and the other corporate governance factors.

Moreover, firms that manage earnings always struggle to maintain the same level of performance. Earnings that are backed by actual revenue generating activities are likely to be repeated in subsequent years. However, managed earnings are not consistent with the underlying business prospects. Chen et al. (2010) find evidence that firms that conduct private placement overstate their earnings prior to the announcement. Investors are unable to detect the excessive accruals in the earnings but subsequent earnings reversal causes the stock price to decline. These earnings reversals imply the firm is unable to sustain or justify the prior period earnings because the core business and revenue generating activities deviate from the reported figures. This phenomenon is consistent with the poor operating performance that occurs in the long run after the announcement of the private placement.

3.5. Testable Hypotheses

The evidence on financing decisions in the literature is varied and wide. Evidence in support of market timing asserts the overriding effects of valuation in determining the decision to issue equity or repurchase at specific times. For instance, Baker and Wurgler (2002) affirm that market timing enables companies to issue equity at high prices and repurchase at low prices. Hence, a coherent understanding of market timing prospects should occur at the point where at high (low) stock prices firms are also significantly overvalued (undervalued) to force equity issue (repurchase). Consequently, in a perfect and rational economic environment, market timing should generate immediate negative (positive) market reactions for equity issues (repurchase). Differences in the level of anticipated operating performance should explain the choice of equity issuance method.

3.5.1. Equity Issues and Operating Performance

As explained in Section 3.3, theories such as monitoring hypothesis (Wruck, 1989), certification hypothesis (Hertzel and Smith, 1993), and managerial entrenchment hypothesis (Barclay et al., 2007)) define the decision to conduct private placements. For instance, the monitoring hypothesis emphasise that private placements enhance firm value because active investors that purchase the shares monitor and ensure efficient use of corporate resources. Under the certification hypothesis (Hertzel and Smith, 1993), private placements create value since the shares are purchased by informed investors with considerable credibility for the market value. Finally, managerial entrenchment hypothesis assert that management places stock with friendly or passive investors who do not play active role in the managing the company thereby strengthening the position of existing management.

A number of characteristics define firms that choose rights issues compared with firms that conduct open offers and placings. Korteweg and Renneboog (2002) and Barnes and Walker (2006) find evidence smaller firms whose shares are less liquid and have a higher degree of information asymmetry are more likely to choose open offers and placings. A higher proportion of the

equity of these firms is also owned by directors. Given that placings are made to external investors it has the tendency to improve external monitoring of the firm and the liquidity of its shares (Slovin et al., 2000). Cronqvist and Nilsson (2005) explain that rights issues are used to retain family control (prevents dilution of ownership), whereas placements are used to issue shares to a strategic partner whose interests are aligned to that of the issuer. Placing process via negotiation with investors facilitates the purchase of large blocks better than the alternative method of selling rights on the market (Armitage, 2010). Unlike Slovin et al. (2000) and Barnes and Walker (2006), Capstaff and Fletcher (2011) argue that quality firms prefer rights issues to open offers and private placements.

The effect of operating performance subsequent to equity issues has been documented in the literature. Loughran and Ritter (1997) assert that firms that issue equity normally report substantial deterioration of operating performance. This means that the negative post-issue stock returns only reflects the poor operating outlook of the firm. Firms timing their equity issues when there is a priori improvement in operating performance are more likely to generate negative market reactions when the operating performance is not sustained. In studying private placements, Hertzel et al (2002) find that private issues of equity follow periods of poor operating performance. Kabir and Roosenboom (2003) also establish that Dutch rights issues also exhibit decline in operating performance. In the context of issuance choice, negative stock returns should correlate with operating performance. If overvaluation drives the issuance of equity using private placement and generates negative stock returns, one would expect deteriorating operating performance for private placement than rights issues and open offers. Factors that signal firm quality include the issue price discount, volatility of returns and earnings management (Dissanaike et al., 2014). However, operating performance should determine the choice of equity issuance method beyond these factors that have relatively short-term impact on subsequent stock performance of equity issuing firms.

H_6: Firms that anticipate positive operating performance are more likely to conduct rights issues than open offers or private placement

3.5.2. Long-run Stock Returns and Equity Issuance Methods

Market reactions to equity issues on the average are negative following market timing-informed issuance. Empirical evidence in the literature in relation to equity issues in the UK contends that different issuance methods attract different market effects. Slovin et al. (2000) and Barnes and Walker (2006) both find that rights issues attract more negative reactions that open offers and placement. This is the result of less asymmetric information effects associated with placement where firms increase external monitoring and dilute ownership. However, Capstaff and Fletcher (2011) in a recent study find, similar to Burch et al. (2004), that firms are less likely to time their equity through rights issues than placings. Thus, firms that conduct rights offerings do not potentially exploit overvaluation as do those that conduct equity issues through placings. If quality firms choose rights issues, then it follows that these firms are also more likely to outperform counterpart firms that choose open offers and private placement. In other words, the level of operating performance at the time of equity issuance has explanatory power for the subsequent stock returns associated with the equity issues. Firms that choose rights issues should report less negative stock returns than those that choose open offers and private placement."

> ***H_7: Equity issues through private placement generate more negative abnormal returns than rights issues***

3.6. Conclusion

This chapter provided a comprehensive review of equity issuance methods in the UK. It has also discussed the historical background to the equity issues and the changing trends in the choice of equity methods. The chapter also discussed the specific theories that explain the choice of each method and the stock returns associated with each issuance method. The discourse about the stock returns included both the short-run and the long-run price reactions to equity issues and also the level of operating performance associated with each issuance method. It appears the contemporaneous level of operating performance subsequent to the issuance decisions could influence the choice of

method. Based on the reviewed literature, the chapter also discussed the testable hypotheses that are analysed in Chapter 7 of the thesis.

Chapter 4
LITERATURE REVIEW: SHARE REPURCHASE PROGRAMS

4.1. Introduction

Share repurchase programs remain one of the main avenue by which firms distribute cash flows to existing shareholders. Corporate payout policies have changed over the world and in particular the US where different tax codes have shifted preference for dividend payments to share repurchase. In addition to tax, the incidence of stock options as part of corporate compensation programs as well as the prevalence of takeovers, has further allowed firms more preference for share repurchase. Moreover, the recent financial crisis and the debt financing of unconstrained firms present a new dimension to the share repurchase policy. The present study, therefore, explores the share repurchase behaviour of financially unconstrained firms. Apart from the general overview of share repurchase programs and the theories that underlie repurchase transactions, the focus of this chapter is to establish the empirical underpinnings of debt-financed repurchase of firms. In this light, the chapter develops testable hypotheses that set out the focus of the empirical chapter 8 of the thesis.

The chapter has four sections. Section 4.2 presents overview of share repurchase programs. It discusses the methods of and the regulations of share repurchase programs in the US. Section 4.3 focuses on the theories that explain repurchase transactions. Section 4.4 explains the empirical evidence of share repurchase. Section 4.5 discusses the testable hypotheses and section 4.5 concludes the chapter.

4.2. Overview of share repurchase

This chapter briefly lays out the general overview of share repurchase programs. The section consists of two subsections. Subsection 4.2.1 presents the different methods of conducting share repurchase as explained in the literature and adopted by firms, while 4.2.2 the share repurchases regulations in the US.

4.2.1. Methods of Share Repurchase

Open market share repurchase (OMR): OMR is the mode of share repurchase in which a company enters the open market, usually through a broker, to purchase its own shares. The average percentage of shares sought is approximately 7%.[18] OMR remains the most common method by which firms acquire their own shares. OMR accounts for a total of about 90% of total share repurchase transactions in the US (Stephens and Weisbach, 1998). In fact, between 1994-1999, OMRs accounted for between 95% and 98% of repurchase activity (Grullon and Ikenberry, 2000). Open market repurchases represent an option rather than an obligation for the firm to acquire shares announced. Thus, firms are flexible to decide when and how much to repurchase. This flexibility implies announced shares can remain unpurchased over a period of time. In fact, Stephens and Weisbach (1998) show that between 74 and 82% of announced repurchases are completed whereas Kahle et al. 2005) show a completion rate of 90% among repurchase conducted by Fortune 500 firms. Also, Bhattacharya and Dittmar (2004) contend that open market repurchases afford managers the opportunity to engage in cheap talk. Thus, the mere announcement of a repurchase does not constitute the intention to actually repurchase the shares. This thesis analyses only OMRs given the high percentage of repurchase activity that constitute OMRs.

Tender offer: This method of repurchase involves the purchase of specified amount of shares at fixed price, normally above the market price. This transaction occurs until the expiration date of the offer. In a tender offer, the firm can set limit in terms of both the maximum or minimum amount that intends to buy from the shareholders. The premium associated with tender offer motivates shareholders to tender their shares and conveys quality information about the prospects of the firms. If a small number of shares is tendered the firm can withdraw the offer. However, for an excessively large tender, the firm can choose to buy pro rata or buy greater than the anticipated number of shares

[18] Ikenberry et al. (1995) report that the average percentage of outstanding shares sought in all of the OMRs announced between January 1980 and December 1990 by firms listed on the American Stock Exchange, New York Stock Exchange, and NASDAQ was 6.6%.

initially specified. One peculiar feature of tender offer is that the shareholders know about the intentions of the firm to buy back the shares.

Dutch-auction tender offers: These repurchases are similar to fixed price tender offers in the way they are organised. Like fixed price tender offers, they also constitute management's attempt to buy back specified number of shares and with a real commitment to purchase such shares. However, firms set price range at which it is willing to purchase the shares from the shareholders. Comment and Jarrell (1991) report abnormal returns for fixed price tender offers, dutch-auction tender offers and open market repurchase of 11%, 8% and 2.3% respectively. The intuition is that whereas tender offers represent commitment to repurchase, OMR affords management flexibility without actual commitment to follow through with the announced repurchase.

Accelerated share repurchase or synthetic repurchases: These repurchases are combined with derivative securities such as put options, collars and forward contracts. The repurchase transaction is only consummated when the underlying derivative instrument is exercised. For example, the sale of a put option enables a firm to buy the underlying stock at a specified exercise price. The put option allows the firm to exercise the option and buy the share at or below the exercise price. Thus, the firm commits to buy specific number of shares on expiration of the put option. Firms with undervalued shares but have large growth opportunities and face high costs of financial distress prefer these contracts (Vermaelen, 2005). For example, in a forward contract, the company will receive cash when the stock price ends up above the forward price on maturity. In the event that stock price is below the forward price, the company has the option to issue shares to settle the price difference.

Privately negotiated or targeted share repurchase: Share repurchase organised through direct or private negotiations constitute efforts to buy back specified amount of shares from specific shareholders. This normally entails buying block of shares from a large holder. Either the shareholder(s) or the management of the firm can initiate the agreement for the transfer of shares. Sellers proactively make contacts with firms of their intentions to sell their shares back to the firms. This mode of repurchase is normally prevalent where

stocks are thinly traded such that sellers do not favour open market repurchase transactions (Peyer and Vermaelen, 2005). Large investors involved in target repurchase are well informed about the prospects of the firms. By initiating the sale of their shares to the company, it is unlikely that such repurchase will be motivated by undervaluation or signal private information about the firm. Moreover, reductions in cash flow might not reflect decrease in agency costs.

4.2.2. US Share Repurchases Regulations

This section discusses the US regulations as they apply to share repurchase. It lays out this regulatory framework to provide perspective since the thesis uses US data on share repurchase. A number of rules are instituted in the US Securities and Exchange Commission (SEC) regulations to control the share repurchase transactions of corporations. The initial motivation for the regulation of share repurchase is to ensure that corporations do not engage in excessive repurchase that will deplete the assets of the company. For instance, assets depletion affects debt repayment and accrued interests. Unlike open market repurchase, stringent reporting and disclosure requirements must be adhered to in respect of tender offer repurchases, insider trading and equity offerings.

Prior to 1982, open market repurchase in the US were regulated under the provisions of Sections 9(a) (2) and 10(b) and Rule 10b-5 of the Securities and Exchange Act of 1934. However, firms were liable to a charge for illegal price manipulation as result of the uncertainties inherent in the provisions. Price manipulation determines the price of future acquisitions and new issue of shares. However, firms can also have genuine business reasons for engaging in open market repurchase other than simply repurchasing shares to inflate the share prices. The SEC Rule 10(b)-18 of 1982 addresses this concern by giving firms safe harbour in respect of open market repurchase programs. A significant component of this rule is that compliance with the conditions of the rule and the disclosures are voluntary. The safe harbour rule explains the surge in US share repurchase transactions (Grullon and Michaely, 2002).

SEC Rule 10(b)-18 provides immunity from the anti-manipulation provisions of the Securities and Exchange Act of 1934. However, firms must meet four conditions to enjoy the immunity. First, repurchases are made through only one broker or dealer on a given day (Manner of purchase). Second, no repurchase is made as an opening transaction or during the last half hour of trading day (Timing condition). Third, no repurchase is made at a price exceeding the highest current independent bid price or the last independent sale price, whichever is higher (Price condition). Finally, non-block repurchase volume does not exceed the higher of (A) one round lot or (B) the number of round lots closest to 25% of the average daily trading volume of the preceding four calendar weeks.

Under the SEC Rule 10(b)-18 paragraph (d), a firm is not subject to legal liability for non-compliance if it does not abide by the conditions. The implication for non-compliance is that the firm ceases to enjoy protection or immunity under the safe harbour rule. Kim and Varaiya (2004) posit that there is likely conflict of interests between inside and outside shareholders due to the non-mandatory reporting and disclosure issues that characterise open market repurchases in the US. In the same way that firms are buying back shares insiders can also be selling their holdings to profit from the increased in the share price caused by the buyback activities. Amendments to the Rule 10(b)-18 were proposed on 26th January 2010 due to improved trading strategies and the automation of trading systems and technology that have contributed to trading speed. In the event of market-wide trading suspension, the issuer is allowed to purchase up to 100% of the average daily trading volume. Also, the time of purchase condition is relaxed at the reopening of trading on the day of the market-wide trading suspension or on the opening of trading on the day preceding the day of the market-wide trading suspension. The amendments also challenge the safe harbour rule in the event that issuers' insiders are involved in the sale of issuers' shares concurrent with the issuer buyback activity.

4.3. Theories of Share Repurchase

As with various corporate policies, several theories have been developed in the literature to explain the motivations for share repurchase programs. Firms conduct repurchase based on some firm characteristics that underlie various theories and hypotheses with empirical evidence. This section provides description of the theories that explain share repurchase programs. This section is divided into four subsections. Subsection 4.2.1 discusses the undervaluation hypothesis, 4.2.2 the information signalling theory, 4.2.3 the free cash flow hypothesis, and 4.2.4 the market timing theory.

4.3.1. Undervaluation Hypothesis

A firm is undervalued if the intrinsic or the fundamental value is higher than the market price. In other words, undervalued shares are cheaper in the market than their worth. The undervaluation hypothesis therefore posits that firms are more likely to repurchase their own shares in the market when they are cheap in comparison to their fundamental values. This phenomenon of share undervaluation stems from the information asymmetry between managers-insiders- and the external investors. Firms that are undervalued can inform the market about it through corporate transactions such as repurchase, acquisitions and dividend payments. Thus, firms or managers attempt to profit from the private information about the true value of the firm by buying back shares that are cheaper. Since this undervaluation contains information relevant for stock prices, investors are inclined to revise upwards their valuation upon the release of the private information. Moreover, in a share repurchase, managerial behavioural changes in terms to purchase or sale of ownership rights indicate the extent of the quality of the private information (Lee et al. 1992). This hypothesis underlines the financial management goal of maximising shareholder value; any attempt to buy back shares at a price higher than the undervalued price will destroy shareholder value. With significant manager share ownership in the firm, such repurchase transactions align the interests of managers with that of the shareholders.

Repurchase of undervalued shares at low stock prices stimulate high or improved stock price. This is because buyback of shares represents favourable information signal to the market about the future prospects of the firm. Stephens and Weisbach (1998) assert that repurchase is negatively related to the prior stock price performance. In other words, undervalued shares perform better subsequent to a share repurchase announcements. In a study of 450 open market repurchases from 1981 to 1990, Stephens and Weisbach find significant effects of low stock price on increasing the number of shares repurchased. Consistent with free cash flow hypothesis and liquidity argument, they further find evidence of levels of cash flows driving the repurchases (Jensen, 1986; Nohel and Tarhan, 1998; Dittmar, 2000; Grullon and Michaely, 2004). The timing of repurchase of undervalued shares is more effective in relation to open market operations that contain significant flexibility. Managers determine the when and how much of announced shares to repurchase which allows them to make actual repurchase when there is significant undervaluation (Ikenberry and Vermaelen, 1996; Stephens and Weisbach, 1998). According to Ikenberry and Vermaelen (1996), the flexibility feature allows managers to expand their investment opportunity set. This flexibility constitutes exchange option that affects the stock prices at the announcement date. In the long term, the option value increases the stock value of the long-term shareholders. In the empirical analysis discussed in Chapter 8, I control for prior stock stock returns.

Undervaluation can also be inferred from the level of analysts' forecasts of earnings that are related to the information asymmetry. However, since consensus analysts' estimate of earnings is public information, a more refined way of looking at undervaluation from information asymmetry perspective is to consider the anticipated future earnings prospects of firms rather than analyst estimates. D'Mello and Shroff (2000) compute an ex ante economic value from the manager's perspective. The difference between the estimated economic value and the market value constitutes undervaluation. However, the caveat is that the estimate of the economic value will be impacted by the assumptions about the future earnings and the cost of equity. They report that 74% of firms that repurchase via tender offers are undervalued. The positive information signal associated with share repurchase and managerial opportunism means

that managers/insiders are likely to buy more of the undervalued shares and profit from the subsequent price appreciation (Lee et al. 1992; D'Mello and Shroff, 2000). This affirms the expectations of private information associated with share repurchase.

4.3.2. Information Signalling Theory

A related theory to the undervaluation hypothesis is the information signalling that posits that share repurchase is a mechanism for information releases. The information-signalling hypothesis assumes asymmetric information between managers/insiders and investors. Therefore, share repurchase is one tool by which companies convey quality and credible information about the prospects of the firm to the market. Baker et al. (2003) survey managers and find that signalling is the most cited reason for share repurchase. Managers as insiders within the firm are likely to possess information that is yet to be released to the market. In a market where investors do not have complete information about a company, actions and decisions of managers have greater impact on the economic decisions of investors. Market reactions reflect the nature of the information and the magnitude of the 'positiveness' or the 'negativeness' of such information. Information that can be divulged to the market through corporate actions include among other things, the value of the firm, the future cash flow prospects of the firm including the earnings potentials from available growth opportunities. Undervalued shares reflect these positive characteristics such that the market attaches positive information to share repurchase announcements.

Several factors about the firm indicate information signalling associated with share repurchase. These conditions are likely to achieve the signalling effects that accompany repurchase and other forms of cash distributions. Firstly, since repurchase involve cash distribution, only cash-rich firms are more likely to conduct share repurchase programs. Repurchase allows the firm to disgorge excess cash flows to the shareholders in a way consistent with reducing the agency costs of free cash flow (Jensen, 1986). Moreover, undervalued shares signify highly probability that firms anticipate improved earnings in the long-run. Thus, the predictions of the signalling hypothesis resonate with perceived

improved earnings and cash flows subsequent to repurchase transactions. The firms, through repurchase releases information about both the current and future cash flows. This should be associated with improved operating performance and positive stock returns (Nohel and Tarhan, 1998; Grullon and Michaely; 2004). Firms signal quality information to the market and the outside investors through repurchase. If firms distribute free cash flows to reduce agency costs, that should be preclude the availability of growth opportunities.

Secondly, the decision of firms to acquire part of its outstanding shares by paying premium for them indicates anticipated future prospects in terms of enhanced operating performance. Investor positive reactions to repurchase are consistent with this anticipated improved performance. Vermaelen (1981; 1984) formalises the signalling theory of share repurchase to explain the stock price reactions associated with share repurchase. In this model, the effects of information hypothesis depend on the premium paid for the shares, the target fraction of shares acquired and the fraction of insider holdings in the company. The information signalling theory has more predictive explanation for the post-repurchase abnormal returns. Repurchase at a premium using tender offers signifies that the future prospects of the future are more likely to improve. This is because insiders will lose much of their stakes in the event of failure. Vermaelen (1981) finds that insiders do not tender their shares but rather increase the target fraction to signal to the market of quality information. The stock price reactions reflect the premium paid, the increase target fraction, and the high amount of insider shareholding in the firm (Vermaelen, 1984). He finds this to be true for also open market repurchase where signalling is the most plausible explanation for the abnormal returns.

Comment and Jarrell (1991) extend the information-signalling hypothesis of Vermaelen (1981; 1984) using three repurchase methods. They emphasise that, even though repurchase is associated with positive abnormal returns, the level of stock impact depends on how much information signals the repurchase sends to the market. Relative signalling effects of fixed price tender offers, dutch-auction tender offer and open market repurchase yield different stock

price reactions. The level of premium determines the risk of loss of managerial wealth; quality of signals increases with insider loss of false signals. Comment and Jarrell (1991) study the stock price effects of three repurchase methods using over the period between 1984 and 1988. They find that firms pay premium of 20.6% and 12.8% for fixed price tender offers and dutch auction respectively. Open market repurchase does not normally involve premium and as such have a limited information signal effects than the tender offers. However, open market repurchase constitute high volume of share repurchase to signal undervaluation. The average stock returns at announcement are 11% for fixed price tender offer and 8% for dutch-auction tender offer. Open market repurchase is associated with average stock returns of about 2%.

A third factor that explains the information signalling effects of share repurchase is the volume of repurchased shares. The level of information signalling is positively correlated with the volume of open market share repurchase. The number of shares bought in an open market repurchase determines the risk exposure of the insiders. Market interprets that as information signal that motivates insiders to assume the high risk of ownership. By using internal cash flow in a leverage increasing repurchase transaction, the riskiness of the firm increases due to reduced cash holdings and increased leverage. Also, the exposure to earnings volatility and other macroeconomic dynamics impact on the value of ownership. For an insider-owner, transactions that increase utility is preferred and pursued. Open market repurchase has signalling effects unrelated to premium payment such that stock price increases are related to the number of shares bought in open market repurchase (Comment and Jarrel, 1991; Ikenberry and Vermaelen, 1996). McNally (1999) posits that higher expected earnings compensates for the risk exposure associated with increased insider shareholdings. Insiders generate utility from open market repurchase due to signals of greater expected earnings. Like previous findings, the model predicts high market value (high stock prices) in relation to quantity of shares repurchased the number of insider holdings and the riskiness of the expected earnings.

All the above discussion assumes high costs for low value firms which signal false information about the quality of the firm. This high cost discourages mimicking of share repurchase programs (Massa et al, 2007). The inherent flexibility and lack of commitment in open market repurchase has the tendency for managers intending to shore up low stock prices to announce repurchase without significantly making actual purchase of the shares (Vermaelen, 1984; Stephens and Weisbach, 1998). If repurchase is inspired by the objective to send 'false' signals-where earnings improvement are not actually expected in the long run-the long run stock performance should reflect this anomaly. Thus, the market reactions after the initial announcement period are expected to reverse once investors process the actions of managers to mislead them. Once the repurchase is announcement more information is released to the market in a way as to reduce the level of asymmetric information. At this point the market gathers more information and obtains the actual value of the firm. Studies such as Fried (2004) and Chan et al. (2010) report that some managers announce open market repurchase with the view to mislead investors just to increase stock prices. For suspect cases, the immediate market reaction to a buyback announcement does not differ from that generally observed. However, over longer horizons, suspect firms do not experience improvement in their economic performance.

4.3.3. Free Cash Flow Hypothesis

Another factor that may define the share repurchase behaviour of firms is the free cash flow hypothesis. According to the free cash flow hypothesis, firms with excess cash flows distribute it to shareholders rather than investing in value-destroying projects. In other words, share repurchases preserve shareholder value more than sub-optimal investments for firms with excess cash flows. The separation of ownership creates two kinds of conflict: conflicts between management and shareholders on one hand, and conflicts between shareholders and bondholders on the other hand (Jensen and Meckling, 1976). The conflict between managers and owners creates agency problem because managers are more likely to pursue their interests at the expense of the owners. Therefore, managers may commit firm's resources into activities that benefit

such as extensive perquisites, empire building, and investment in value-destroying activities. Repurchase limits available cash and restricts the overinvestment projects (Jensen, 1986).

Unlike the undervaluation and the information signalling models, the positive investor reactions to repurchase are unrelated to perceived improved performance that is associated with payout policies. Repurchase under free cash flow hypothesis does not predict improved operating performance but lead to reduced agency costs of free cash flow. Under the free cash flow model, repurchase and other corporate payouts should increase with low growth opportunities or negative NPV projects. Lang and Litzenberger (1989) support this conjecture and report that high positive market reactions are associated with low-q firms than high-q firms subsequent to dividends payments. The source of the cash flow expended in the payout could be generated from sources other than cash reserves. Firms can undertake asset sales and/or issue debt financing prior to the corporate payout decisions. For example, as part of restructuring, loss-making assets could be sold and cash proceeds spent in more efficient projects or paid out to shareholders.

Nohel and Tarhan (1998) also argue that asset sales-performance improvement is related to free cash flow hypothesis. Significant asset sales prior to repurchase transactions generate increase in operating performance. Performance increase reflects the deployment of proceeds from sales of poorly performing assets as part of restructuring programme. Again, the performance effects resonate with low-growth firms without any increases in investment opportunities. Market reactions occur at the announcement date and do not extend over the long run. These firms also record significant reduction in systematic risk. Thus, the positive stock returns associated with repurchase are explained by the downward revision of firm risk perception and corresponding rise in investor expectations about the prospects of the firms.

The predictions of the free cash flow hypothesis also assert that managers forgo capital expenditures and disgorge excess cash flows to shareholders. This effect discounts the conflicts of interest that persist between managers and shareholders. The agency theory demonstrates an inherent motivation for

managers to seek to enhance their benefits at the expense of shareholders. Firms with limited growth opportunities should reduce agency costs of free cash flows by paying out excess cash flows to shareholders (Grullon and Michaely, 2004; Bozanic, 2010). In this spirit, share repurchase should correlate negatively with capital expenditure and research and development expenditure. The reduction in capital expenditure, R&D expenses, and subsequent decline in cash reserves is a feature of mature firms. Growth firms on the hand, have unlimited growth opportunities and are more likely to conduct repurchase in line with the signalling model (Liang et al. 2013). Repurchasing firms record reduction in systematic risk and cost of capital (Nohel and Tarhan, 1998) and inform market about reduction in both the agency costs and risks that stimulates positive market reactions.

4.3.4. Market Timing

According to Baker and Wurgler (2002), firms issue overvalued equity and repurchase undervalued equity in keeping with market timing phenomenon. This theory suggests that managerial behaviour also sheds lights on the stock market performance of share repurchase. Consistent with the undervaluation hypothesis, managers with timing ability should only repurchase when the share price is lower. Empirical evidence suggests that few or no shares are actually bought following repurchase announcements (Ikenberry and Vermaelen, 1996; Stephens and Weisbach, 1998). If managers truly have timing ability they will increase actual purchase of shares already announced when the prices are low. Thus, Chan et al. (2007) relate mispricing with the actual buyback activity and long run stock performance. There is only pseudo-market timing if stock performance depends on repurchase announcement behaviour (Schultz, 2003). Chan et al. (2007) find that different portfolio technique yields similar returns and that past stock performance do not have a negative relationship with repurchase announcements. However, they find significant evidence for the increased actual buy back activity when the past stock prices fall. This is consistent with the managerial timing ability that open market repurchases are actually bought when managers perceive stocks are undervalued.

4.4. Empirical Evidence of Share Repurchases

Recent corporate decisions concerning share repurchase provides evidence about alternative financing for share repurchase programs. Firms do not necessarily utilise internal cash flows to buy back their shares. In fact, both constrained and unconstrained firms borrow to finance share repurchase. This section, therefore, provides insights into levered share repurchase. Subsection 4.4.1 discusses levered share repurchase whereas 4.4.2 examines repurchase and investment expenditure. Subsection 4.4.3 provides empirical evidence of stock returns associated with repurchase announcements.

4.4.1. Levered Share Repurchase

The argument from the free cash flow hypothesis is consistent with share repurchase financing through excess cash flows. In order to restrict investment in value-destroying projects and the payment of excessive perquisites, firms with free cash flows are expected to distribute same to the existing shareholders. Thus, cash-rich firms utilise their internal cash to pay for the purchase of their own shares. Stated differently, cash-rich firms are unlikely to borrow to finance their share repurchase transactions. The potential reduction in agency costs as result of distributing excess cash flow to shareholders through share repurchase transactions is positive news to the shareholders (Jensen, 1986). Following from the above, cash-poor firms with excess debt capacity will tend to use debt financed repurchases (Minnick and Zhao, 2007). However, cash-poor firms incur huge costs of financial distress from simultaneous debt issues and share repurchase, especially if they do not have excess debt capacity. Thus, the effects of increasing debt through borrowings might limit cash-poor firms from conducting debt-financed share repurchase.

Debt issues during periods of share repurchase has become commonplace in recent corporate events. In fact, significant amount of levered share repurchases occurred in the period prior to the financial crisis in 2008. The amount of such debt-financed repurchases peaked at more than $700 billion in

2007 (Milken, 2009).[19] This trend has continued during and after the financial crisis. The incidence of debt-financed repurchase of unconstrained firms during the crisis period has been attributed to tax costs. For instance, Foley et al. (2007) assert that the consequence of tax costs associated with repatriation of foreign income to the US has resulted in huge amount of cash holdings by firms. This evidence suggests that cash-rich firms are multinationals with significant oversees presence. A significant amount of these cash holdings are domiciled in these oversees operations. Accordingly, it is unlikely that these firms will distribute excess cash flows to finance share repurchase. However, few large firms account for a significant amount of this foreign cash. Therefore, the incidence of levered share repurchase is not defined by only the cash-rich multinationals that do not want to repatriate their foreign earnings for tax purposes.

According to the precautionary motive for holding cash, future uncertainties in the capital market motivates firms to build cash buffers which will allow them to undertake future investments (Opler et al. 1999; Bates et al. 2006). This motive also holds for debt issues when interest rates are at a record low. More significant, it also relates to the asymmetric information effects of external financing. High information asymmetry causes an increase in the costs of external financing. Myers and Majluf (1984) posit that firms should obtain external financing during periods of low information asymmetry. It also predicts that debt issues are less information sensitive and as such involves low costs of issuing them. Moreover, the level of information asymmetry reflects the degree of firm internal financial constraints. All else equal, unconstrained firms are likely to have low information asymmetry compared to an otherwise constrained firm. Therefore, the costs of debt financing should be low for unconstrained firms.

[19] See Michael Milken, "Why Capital Structure Matters: Companies that repurchased stock two years ago are in a world of hurt, *"The Wall Street Journal*, April 21, 2009. He states that companies such as General Electric, AIG, Motorola, and Home Depot all used new debt to finance stock buybacks prior to the year 2007.

The agency cost of debt[20] is an important factor that affects debt financing by firms. Due to agency costs of debt firms are unable to issue significant amount of debt capital. Highly leveraged firms face default and bankruptcy risks that prevent them from obtaining debt financing that will allow them to undertake investment projects. Thus, agency costs of debt results in underinvestment (Myers, 1977) and asset substitution (Jensen and Meckling, 1976). The prospect of agency costs of debt implies the degree of internal financial constraints will determine the financing of share repurchase. Constrained firms are more likely to face high agency costs of debt because of limited cash flow and the associated high costs of external financing. Conversely, internally financially unconstrained firms with excess debt capacity are able to increase their debt ratios without significant agency costs. Therefore, one would expect unconstrained firms with valuable investments opportunities to engage in debt-financed share repurchase.

4.4.2. Share Repurchase and Investment Expenditure

The predictions of the free cash flow hypothesis suggest that repurchase significantly reduces cash, cash flows and investment. It also assumes that firms with limited growth opportunities undertake repurchase in order to distribute excess cash flow to shareholders instead of spending on value-destroying activities. In that sense firms are able to reduce risk and costs of capital because repurchase is less risky than the assets in place (Grullon and Michaely, 2004). Conversely, the undervaluation and signalling hypotheses do not necessarily imply limited growth options for firms, even though under-valued firms are more likely to have low growth options. What these theories suggest is that repurchase signals quality information about the future prospects about the firm. By inference, therefore, undervaluation and signalling do not anticipate significant reduction in investment.

From the foregoing, it can be stated that firm lifecycle determines whether free cash flow or the information signalling motivates repurchase announcements.

[20] Agency costs of debt arise when the interests of shareholders differ from that of debtholders, and also among different classes of debtholders.

Hence, it is anticipated that growth firms would repurchase based on information signalling and mature firms would be motivated by the free cash flow hypothesis (Grullon and Michaely, 2004; Liang et al., 2013). Generally, repurchase reduce cash flow and liquidity in a way that would limit investment expenditure. Thus, share repurchasing firms should invest less in capital projects as more cash are distributed to shareholders (Jensen, 1986; Hahn and Lee, 2009). But, firms could still invest insofar as cash flow is not significantly depleted subsequent to the repurchase announcements. Moreover, through levered repurchase firms would be able to maintain sufficient cash flows to allow for investment activities. Stated differently, the benefits of investing in capital projects could explain the levered share repurchase transactions of unconstrained firms. Market to book ratio is a control variable in the empirical analysis since it captures the effects of growth opportunities.

The financial crisis of 2008 showed dramatic changes in firm's financing and investment behaviours. Internally financially constrained firms are more likely to be hugely affected by financial crisis in terms of investment activities. Campello et al. (2010) and Campello et al. (2011) show that constrained firms planned deeper cuts in investments during the financial crisis. Chen and Wang (2012) provide evidence about share repurchase effects on cash, cash flow, leverage, and investments. They find that constrained firms generally experience significant declines in cash, cash flow, investments, and significant increases in leverage after repurchase activity. Likewise, unconstrained firms also experience declines in cash and increases in leverage but no changes in cash flow and investment. This evidence suggests that leverage is more likely undertaken to finance repurchase program by constrained firms. Conversely, for unconstrained firms the additional leverage provides cash buffer to maintain investment expenditure. Overall, investment has significant influence on repurchase programs, especially for unconstrained. Given the effects of the financial crisis, I control for crisis in the empirical analysis as discussed in Chapter 8.

4.4.3. Share Repurchase and Stock Returns

Share repurchase, according to the undervaluation, free cash flow and information signalling theories, provides positive information to the market. This information includes favourable future financial prospects and growth about the firm, the reduction of the costs of free cash flows not invested in value-destroying activities. In response to the positive information, stock prices increase over the pre-announcement levels. Thus, share repurchase announcements are associated with positive initial abnormal returns. This returns characteristics indicate that repurchasing firms outperform non-repurchasing firms. Prior research attributes the positive returns to the undervaluation hypothesis (Stephens and Weisbach (1998); D'Mello and Shroff (2000); Comment and Jarrell (1991)), the free cash flow theory (Grullon et al., 2002; Grullon and Michaely, 2004; Bozanic, 2010), and the information-signalling hypothesis (Vermaelen, 1981, 1984; Comment and Jarrell, 1991; Ikenberry and Vermaelen, 1996).

The overall evidence find average 3-day abnormal returns of about 3% for US repurchase announcements. Table 4.1 summarises the evidence of abnormal stock returns associated with repurchase announcements. This figure compares well with returns for repurchase in Canada However, the returns are lower for countries with regulatory restrictions to repurchase announcements (Rau and Vermaelen, 2002; Andriosopoulos and Lasfer, 2011). For example, Rau and Vermaelen (2002) find 11-day average abnormal returns of 1.14% and Oswald and Young (2004) 3-day abnormal returns of 1.24%; Andriosopoulos and Lasfer (2015) find 1.68% all in UK, 2.32% in Germany, and 0.80% in France.

Moreover, the long run returns similarly reflect the positive information that accompany repurchase announcements. Market reactions seem to follow the initial returns. Table 4.2 presents empirical evidence of long run returns associated with repurchase announcements which shows that over the period between 2 to 4 years after repurchase, stock returns are significantly positive. This return pattern implies the market initial underreact to the repurchase announcements until sufficient information is released to the market. Grullon

and Michaely (2004) explain market underreacts to repurchase because they underestimate the decline in the cost of capital.

Three hypotheses provide reasons for the market underreaction to repurchase announcements and hence the positive returns associated with share repurchase. First, risk-change hypothesis emphasise that repurchase results in decline in firm risk. According to Grullon and Michaely (2004), firms with limited growth opportunities are more likely to conduct share repurchase. As these firms buyback their shares, they return cash which otherwise would have been wasted on value-destroying investments to reduce the costs of free cash flows. Thus, the repurchase is less risky than assets in place. Grullon and Michaely further explain that repurchasing firms experience significant reduction in systematic risk and cost of capital compared to non-repurchasing firms.

Second, the liquidity hypothesis asserts that the abnormal returns could be caused by an omitted priced factor. The evidence on the liquidity hypothesis is mixed. For example, Barclay and Smith (1988), Brockman and Chung (2001), and Pastor and Stambaugh (2003) find that repurchase reduces liquidity and the abnormal returns reflect price for the reduced liquidity. However, repurchase could increase depth of the sell side market by supporting market makes and adding downside liquidity to falling stock markets (Grullon and Michaely, 2002). These effects of repurchase improve liquidity.

Finally, the long run returns could be explained by the overreaction hypothesis. According to this hypothesis, management belief about market overreaction to recent publicly available information influences repurchases decisions. Thus, prior events determine the long run returns such that management buys back to correct market reaction to bad news. What this hypothesis predicts is consistent with the undervaluation hypothesis because under-valued stocks are priced cheap in the market. All three hypotheses provide better understanding to the positive stock returns associated with repurchase announcements.

Table 4.1: Summary of Empirical Evidence of US Announcement Date Abnormal Returns following Share Repurchase				
Authors	Sample Period	Sample Size	Event Window	Abnormal Returns
Comment and Jarrell (1991)	1984-1989	1,197	CAR (-1,1)	2.3%
Peyer and Vermaelen (2005)	1984-2001	6,470	CAR (-1,1)	2.39%
Peyer and Vermaelen (2009)	1991-2001	3,481	CAR (-1,1)	2.39%
Grullon and Micahely (2002)	1972-2000	15,843	CAR (-1,1)	2.57%
Grullon and Micahely (2004)	1980-1997	4,443	CAR (-1,1)	2.71%
Stephens and Weisbach (1998)	1981-1992	450	CAR (-1,1)	2.69%
Vermaelen (1981)	1970-1978	243	CAR(-1,0)	3.37%
Chen and Wang (2012)	1990-2007	4,710	BHAR(-2,0)	1.17%
Chan et al. (2004)	1980-1996	5508	AR(-2,2)	2.18%
Chan et al. (2010)	1980-2000	7628	AR(-2,2)	1.80%
Ikenberry et al. (1995)	1980-1990	1239	CAR(-2,2)	3.54%
Maxwell and Stephens (2003)	1980-1997	6541	CAR(-1,1)	1.49%

Table 4.2: Summary of Empirical Evidence of Long Run Abnormal Returns following Share Repurchases				
Authors	Sample Period	Sample Size	Holding Period	Abnormal Returns
Chan et al. (2010)	1980-2000	7628	2-year BHAR	8.6%
Ikenberry et al. (1995)	1980-1990	1239	4-year HPR	12.14%
Ikenberry et al. (2000)	1989-1997	1060	3-year CAR	21.40%
Chan et al. (2004)	1980-1996	5508	4-year BHAR	23.56%
Peyer and Vermaelen (2009)	1991-2001	3481	4-year F&F CAR	24.25%

4.5. Testable Hypotheses

This section discusses the testable hypotheses.

4.5.1. Internal Financial Constraints and Levered Share Repurchase

In the information signalling framework, firms repurchase to convey quality and credible information about the prospects of the firm to the market in terms of both the current and future cash flows (Baker et al., 2003; Grullon and

Michaely, 2004). The undervaluation hypothesis posits that firms repurchase when their stock prices are undervalued or cheap (Ikenberry and Vermaelen, 1996; Stephens and Weisbach, 1998). The free cash flow hypothesis asserts that firms repurchase in order to disgorge excess cash flows to shareholders (Jensen, 1986; Stephens and Weisbach, 1998). Therefore, firms with limited growth opportunities would rather distribute cash instead of investing in value-destroying projects. This evidence is in the spirit of maximising shareholder value even though it undermines the pursuit of personal interests of the managers. Stock returns response reflects the decrease in agency costs associated with free cash flow, when managers engage in cash distribution, including share repurchase. Nohel and Tarhan (1998), Dittmar (2000), and Grullon and Michaely (2004), all find support for the free cash flow hypothesis. This theory assumes that share repurchase transactions reflect cash distribution of firms with considerable excess cash reserves. Anecdotal evidence suggests that internally financially unconstrained firms are more likely to repurchase their shares than firms with significant cash constraints.

This chapter addresses two broad arguments related to share repurchase transactions. Firstly, the study asserts that firms borrow to finance their share repurchase transactions. Secondly, Chen and Wang (2012) emphasise that internally financially constrained firms also conduct share repurchases. Grullon and Michaely (2004) as well as Denis and Sibilkov (2009) show that a firm may reduce their investments after share repurchase activities due to limited available cash flows. Moreover, Campello et al. (2010) and Campello et al. (2011) show that constrained firms planned deeper cuts in investments during the financial crisis. Thus, share repurchasing firms should invest less in capital projects as more cash is distributed to shareholders (Jensen, 1986; Hahn and Lee, 2009). However, borrowings should allow firms to build cash balances that support both investment expenditure and share repurchase. Firms that hold high cash balances are likely to preserve their cash balances and conduct debt issuance and use the proceeds to support investment expenditure and repurchase shares.

Therefore, the research further argues that unconstrained firms borrow to finance share repurchases insofar as they engage in more capital investments. The motivation for this conjecture is that unconstrained firms with debt rating and/or investment grade ratings are able to obtain cheap and available debt financing than constrained firms (Kaplan and Zingales, 1997; Almeida and Campello, 2007). This idea follows that while constrained firms need debt financing to repurchase their shares, the high costs of external debt limit the amount they can obtain to finance both the repurchase and investments. Consequently, unconstrained firms are likely to build cash reserves sufficient to undertake both share repurchase and investments. Again, the above discourse is consistent with the conjecture that the level of internal financial constraints determines the probability of levered share repurchase. More significantly, the financing of the repurchase transaction differs according to the level of cash flow available to the firm. Thus, the need for cash to finance investment expenditure at the time of repurchasing shares motivates firms to borrow in order to have sufficient cash reserves to invest while at the same returning cash to shareholders. The following hypotheses are thus tested:

H_8: Internally financially constrained firms are more likely to conduct debt-financed repurchase than unconstrained firms

H_9: Internally financially unconstrained firms borrow to repurchase especially when they also undertake investments

4.5.2. Internal Financial Constraints, Levered Share Repurchase and Stock Returns

In terms of stock returns, the study tests the hypothesis that the announcement date abnormal returns associated with share repurchase reflect the level of firm internal financial constraints and financing of the share repurchase programme. The extant literature find support for stock price outperformance following share repurchase programs both announcement date (Vermaelen, 1981; Stephens and Weisbach, 1998; Grullon and Micahely, 2004; Peyer and Vermaelen, 2009) and long run (Ikenberry et al., 1995; Chan et al., 2010). However, whether internal cash flow or borrowings are used to finance the

share repurchase program should produce different stock price reactions, both at the announcement date and over the long run. Cash-financed repurchase indicates a more likely positive outlook for the firm; this evidence is highlighted in the information-signalling model. Moreover, the free cash flow hypothesis shows that share repurchase using cash reserves decreases agency costs of free cash flow. Debt-financed repurchase increases leverage and financial distress more than cash-financed repurchase (Jensen and Meckling, 1976; Myers, 1977; Chen and Wang, 2012). The leverage increases cause a fall in the value of the equity capital.

Stated differently, unconstrained firms that borrow to finance share repurchase should have less increases in leverage and hence financial distress costs than constrained firms. To the extent that unconstrained firms borrow to both conduct share repurchase and invest more in capital projects (given that projects are value-increasing), these firms should be associated with more positive abnormal returns than low investing firms and /or constrained levered repurchase firms. In addition to the announcement date abnormal returns, the risk hypothesis and liquidity hypothesis explanations to the long run stock returns suggest that unconstrained firms which invest should be associated with more positive long run returns, especially for the levered repurchase firms."

> ***H_{10}: Cash-financed repurchase is associated with more positive abnormal returns than debt-financed repurchase, especially when the firm is internally financially unconstrained.***
>
> ***H_{11}: All else equal, internally financially unconstrained firms which conduct levered share repurchase should be associated with more positive returns for high investing firms than low investing firms.***

4.6. Conclusion

This chapter has presented the overview of share repurchase and provided empirical support for share repurchases announcements. The aim of the chapter was to establish that repurchase financing is changing with firms using borrowings to finance share repurchase. However, for internally financially

unconstrained firms, which do not necessarily need external financing to conduct repurchase, the additional borrowings allow them to invest more. The chapter also discussed the stock returns associated with repurchase announcements. Empirical evidence suggests that share repurchase announcements are associated with positive announcement date abnormal returns. This finding fails to account for the level of financial constraints and the source of financing of the repurchase program that can affect the stock returns. Therefore, firms are likely to take into account these factors and the stock price implications when undertaking share repurchase programs. The study examines the repurchase behaviour of unconstrained firms, especially when they borrow to finance their repurchase transactions.

Chapter 5
DATA AND METHODOLOGY

5.1. Introduction

This chapter discusses the data and methodology applied to carry out the empirical analysis. The objective of this chapter is to explain the data selection procedure and criteria and also to present the empirical models used in testing the hypotheses. The rationale for the research design is discussed in this chapter. The chapter consists of three sections: Section 5.2 examines the sample selection criteria and the design of the study, Section 5.3 the empirical models and estimation techniques including the measurements of the variables used. Section 5.4 concludes.

5.2. Data

This section discusses the sample period, sources of the data used and how the final sample is derived. The section is divided into four sections. Section 5.2.1 presents the criteria for the sample period selection. Section 5.2.2 focuses on the data for the equity issues, whereas Section 5.2.3 the data for the equity issuance methods. Finally, Section 5.2.4 examines the data for share repurchase programs.

5.2.1. Sample Period

The thesis uses two datasets for the entire analysis and the testing of the hypotheses. Data on UK equity issues are collected from Securities Data Company (SDC) and accounting data from Datastream over the period 1st January 1994 to 31st December 2010. These equity issues are then divided into the type of equity issuance method that is the focus of the second empirical chapter (Chapter 7). Since the deregulation of 1986, UK listed firms are allowed to issue equity through rights issues, open offers, and private placement. Hence, the initial year of the sample period is chosen due to the preference for open offers and private placement. The final data comprise 1257

equity issuance announcements. This represents a comprehensive dataset compared to previous studies.[21]

The second dataset comprises open market share repurchases of US firms between January 1, 1990 and December 31, 2012 and is collected from the (SDC) US Mergers and Acquisitions database. Financial statement data are extracted from the Compustat database while market and stock returns data are collected from the Center for Research in Security Prices (CRSP) database. Share repurchases announcements data from SDC is relatively more complete after 1985 and from the 1990 it became readily available and more comprehensive. The final data consists of 5874 share repurchase announcements over the 23-year period. The choice of US data is important since US firms make significant debt-financed repurchase.[22] This dataset compares favourably with data used in prior studies both in terms of length of time period and the sample size. For example, Stephens and Weisbach (1998) used a sample of 450 repurchase announcements from 1981 to 1990, Grullon and Michaely (2004) used data of 4443 repurchase announcements from 1980 to 1997, and Chen and Wang (2012) used a sample of 4710 repurchase announcements between 1990 to 2007.

The study uses datasets for equity issues (including the equity issuance methods) and share repurchase programs. While the equity issues are for UK listed firms, the share repurchase sample is derived from US listed firms. The aim of the UK equity issues is to explore the effects of market timing and financial constraints on equity issuance decisions (H1, H_2, H_3, H_4, and H_5) as discussed in Section 2.5 of Chapter 2. Moreover, the UK equity issues are split into the issuance methods - rights issues, open offers, and private placement - to investigate the long run operating and stock performance associated with each issuance method (H_7 and H_8) as discussed in Section 3.5 of Chapter 3. For the purpose of examining why unconstrained firms conduct levered share

[21] Prior studies such as Slovin et al., (2000) used 296 equity issues (made up of 220 rights offerings and 76 open offers), Armitage (2000) used a sample of 928 rights issues and 450 open offers from 1985 to 1996, Barnes and Walker (2006) used 868 equity issues consisting of 600 rights offers and 268 placings from 1989 to 1998, and Capstaff and Fletcher (2011) used a sample of 772 equity issues made up of 229 rights issues, 129 open offers, 299 placings, and 115 placings with open offers from January, 1996 to December, 2007.

[22] The choice of datasets is discussed in Section 1.3 of Chapter 1.

repurchase ($H_{9,}$ $H_{10,}$ $H_{11,}$ $H_{12,}$ and H_{13}), a total of 5874 share repurchase announcements are used as discussed in Section 4.5 of Chapter 4. In the subsections that follow, the sample procedure for the equity issues and repurchase announcements as well as the sample statistics are discussed.

5.2.2. Data for Equity Issues

The data on the security issues obtained from the Securities Data Company (SDC) are matched using datastream codes (see subsection 5.2.3 below), with the corresponding accounting, stock market prices and valuation data from Datastream. Data on analyst forecast earnings are obtained from the Institutional Brokers Estimate System (IBES). Financial firms are excluded from the sample in line with most research due to volatility of data variables and in regard to regulatory factors that affect financial firms. Examples of studies that exclude financial firms include; Hovakimian, Opler and Titman (2001); Dittmar and Thakor (2007); Oswald and Young (2008); Cook and Tang (2010); DeAngelo et al. (2010). In addition to regulatory differences, financial firms also have a different capital structure from non-financial firms. For example, banks equity issuance decisions may be affected by the minimum capital requirements.

Data are sorted first using sedol number since that represents the code for listed companies on the London Stock Exchange. After applying this initial screening criterion, about 88% of the companies with sedol numbers are found which are then used together with the company ticker symbols to identify the corresponding datastream codes. In cases where a firm has both sedol and ticker symbols further check that the datastream codes provided by sedol and ticker are the same. Where sedol numbers are missing (about 12%), both the ticker and the company names are used to find the datastream codes. Also, further checks with the proceeds resulted in the exclusion of companies without figures for proceeds. This also resulted in the deletion of a further 0.18% of the data to arrive at the final sample for the equity issues.

Data restrictions are as follows:

i. Issues from SDC must have corresponding accounting data from datastream

ii. Issues must have relevant sedol codes, datastream codes and ticker symbols

iii. Firms without any of the codes are deleted

iv. If the codes do not match with the appropriate corresponding codes in datastream, the firm is eliminated. Thus, both the sedol and datastream codes must match with the codes extracted from datastream

v. Where feasible, ticker and company names are used to reconcile the disparities. These are just few instances where three of the four criteria are inconsistent.

vi. Only firms that made any security issues are considered. Therefore, firms without any issues are ignored.

vii. Following Byoun (2011), only firms with positive market-to-book ratios are included in the final sample. Negative market to book ratios is difficult to interpret since they imply a sustained level of negative earnings by the firm.

Final sample comprises 1257 equity issues over the sample period 1994 to 2010 as reported in Table 5.1.

Table 5.1: Annual Equit Issues	
Year	**No. of issues**
1994	63
1995	63
1996	83
1997	51
1998	49
1999	58
2000	126
2001	104
2002	51
2003	77
2004	65
2005	44
2006	47
2007	83
2008	54
2009	159
2010	80
Total	**1257**

Notes: This table shows the annual equity issues across the sample period.

5.2.4. Selection of matching firms/control firms

The procedure for selecting matching firms is similar to Capstaff and Fletcher (2011), Spiess and Affleck-Graves (1995), Loughran and Ritter (1997) and Hertzel et al (2002). A control firm for each sampled firm is extracted from the listed firms on the London Stock Exchange. At any year-end, firms that previously issued equity are excluded from the list of potential control firms to avoid confounding results. In each of the year-end prior to the security issuance date, one control firm for each sample firm that satisfies certain conditions is identified. A control firm must belong to the same industry group as the sample firm and must be of comparable size in terms of specified range of market value compared to the sample firm.

Once selected, a two-year time lag is imposed before a previously selected control firm is allowed to re-enter the pool of potential control firms. This allows to measure operating performance for the three years to compare with the performance of the sampled firms. Furthermore, a three-year stock return is

estimated to reflect the level of operating performance following the decision to issue equity through three issuance methods. In addition to the cumulative abnormal returns, buy and hold abnormal returns (BHAR) for sampled firms and control firms over three years post-issue are estimated. Following Hertzel et al (2002), the size-matched benchmark ensures that the control firm has market value larger than, but closest to, the sample firm. The matching is done 12 months prior to the announcement date of the issuing firms to better compare the prior issue abnormal returns.

5.2.3. Data for Share Issuance Methods

The final data collected for equity issues as described above are split into the equity issuance methods. Annual operating and monthly stock market returns are collected from Datastream. Since stock returns are estimated for each firm up to three years after the issuance of equity; therefore, stock returns are collected until December 2013. Again, the data is restricted to non-financial firms with at least one-year return data available after the issuance.[23] Panel A of Table 5.2 outlines the procedure for constructing the final sample; Panel B shows the annual number of equity issuances during the sample period. The final sample consists of 328 rights issues, 321 open offers, and 608 private placements. The number of issues over the sample period shows the high frequency use of rights issues during the 1990s, and a significant increase in usage for alternative private placements and open offers within recent years. This decline in usage of rights issues and the increase in private placements and open offers have been reported in prior UK studies (Barnes and Walker, 2006; Armitage, 2010).

[23] The *TIME* datatype is used to explore whether a firm is delisted after the issuance (zero returns in the month of delisting), and firms are not required to have all three-year returns after issuance to avoid look-ahead biased.

Table 5.2: Construction of Equity Issues by Method and the Distribution across the Sample Period

Panel A: Construction of Final Sample of Equity Issues	
Initial Thomson One Banker sample (follow-on equity issues of UK listed firms from 1994 to 2010)	5986
Exclude issues not on London Main Market	(3785)
Exclude issues which are not either ordinary and/or common shares	(53)
Exclude VCTs and investment trusts	(891)
Final sample	**1257**
Made up of:	
Rights issues	328
Open offers	321
Placings	608
Total	**1257**

Panel B: Annual Equity Issues by Issuance Method

Year	Rights Issues (RI)	Open Offers (OO)	Private Placement PP	Total
1994	42	0	21	63
1995	39	0	24	63
1996	48	0	35	83
1997	29	10	12	51
1998	17	27	5	49
1999	16	26	16	58
2000	18	47	61	126
2001	19	44	41	104
2002	13	29	9	51
2003	11	41	25	77
2004	11	29	25	65
2005	19	4	21	44
2006	11	4	32	47
2007	2	10	71	83
2008	7	8	39	54
2009	24	29	106	159
2010	2	13	65	80
Total	**328**	**321**	**608**	**1257**

Notes: Panel A shows the procedure for the construction of the equity issues by method whereas Panel B gives the annual equity issues by issuance method.

5.2.4. Data Share Repurchase

The second dataset consist of 5874 share repurchase announcements of US firms. Following Maxwell and Stephens (2003) and Minnick and Zhao (2007), this study identifies the announcements of open market repurchases program from the Securities Data Company (SDC). Fama and French (2001) and Grullon and Michaely (2002) calculate repurchase using the balance sheet which give similar results.[24] According to Grullon and Michaely (2002) the correlation between the two measures is 0.97 and the dollar amounts are also similar. However, the announced repurchase from SDC gives the specific dates to help compute the returns prior to the announcement. Using Compustat measure of repurchase is also problematic. For example, Stephens and Weisbach (1998) indicate that since Compustat reports repurchase in value terms and the price at which shares are repurchased is assumed. Moreover, Compustat measure is likely to overstate repurchase since it is an aggregation of all security repurchases and retirements during the quarter or year.

Hence, data on open market share repurchases are collected of US firms between January 1, 1990 and December 31, 2012 from the Securities Data Company (SDC) US Mergers and Acquisitions database. Financial statement data are extracted from the Compustat database while market and stock returns data are collected from the CRSP database. Financial firms (SIC codes between 6000 and 6999) are excluded due to the stringent regulatory oversight under which they operate and their different capital structure (e.g. Denis and Sibilkov, 2010; Chen and Wang, 2012). Finally, following Stephens and Weisbach (1998), repurchase made by the same firm within three years of the previous announcements are excluded to eliminate repeated repurchase announcements (in line with Ikenberry and Vermaelen, 1996; and Lie, 2005). The final sample is made up of 5874 repurchase announcements as reported in Table 5.3.

[24] Jagannathan et al (2000); Fama and French (2001) and Grullon and Michaely (2002) define repurchase as the total expenditure on common and preferred stocks (Compustat #115) minus reduction in the number of preferred stocks outstanding (Compustat #56).

Table 5.3: Construction of Final Sample of Share Repurchase Announcements	
Initial Thomson One Banker sample	12296
Exclude issues without corresponding Compustat code for matching (permno, gvkey or 6cusip codes)	(5191)
Exclude announcements without share repurchase value/amount	(959)
Exclude sample with negative MB or no stock returns data	(272)
Final Sample	**5874**

Notes: This table shows construction of the final sample of share repurchase. It indicates the initial sample and the restrictions and exclusions that resulted in the final sample.

Consistent with the research the third objective the sample is defined as levered or unlevered depending on the source of financing. The idea is to test the hypothesis that drives firms to either commit internally generated funds to conduct repurchases or borrow with the goal of using the proceeds to finance equity repurchase. Levered share repurchase occurs when debt issues finance the repurchase. Following Minnick and Zhao (2007), share repurchase is levered if there is a positive change in the debt capital either one year prior to or within two years after the repurchase announcement. The sample is further classified according to the level of internal financial constraints.[25] Table 5.4 Panel A reports the number of share repurchase for unconstrained firms during the sample period. Out of 5874 share repurchase announcements, a total of 4700 repurchases are made by unconstrained firms of which 3359 unlevered and 1341 levered repurchases. There seems no particular pattern at the total share repurchases and the distribution between unlevered and levered repurchases during the sample period. A significant number of share repurchases is therefore financed through borrowings, even though the particular firms are unconstrained.

[25] The measure of financial constraints is discussed in section 5.2.1.2

Table 5.4: Number of Annual Share Repurchase Announcements

	Panel A: Full sample			*Panel B: Unconstrained*			*Panel C: Constrained*		
Year	0	1	Total	0	1	Total	0	1	Total
1990	195	38	233	159	32	191	36	6	42
1991	94	19	113	86	18	104	8	1	9
1992	162	32	194	150	24	174	12	8	20
1993	124	46	170	114	39	153	10	7	17
1994	179	74	253	147	57	204	32	17	49
1995	222	86	308	181	65	246	41	21	62
1996	289	153	442	253	113	366	36	40	76
1997	271	145	416	230	103	333	41	42	83
1998	453	189	642	346	123	469	107	66	173
1999	341	127	468	254	76	330	87	51	138
2000	164	92	256	126	60	186	38	32	70
2001	126	29	155	111	19	130	15	10	25
2002	90	33	123	80	21	101	10	12	22
2003	73	27	100	61	18	79	12	9	21
2004	107	46	153	89	31	120	18	15	33
2005	130	99	229	112	77	189	18	22	40
2006	92	101	193	80	86	166	12	15	27
2007	157	141	298	132	100	232	25	41	66
2008	302	92	394	258	62	320	44	30	74
2009	95	40	135	82	27	109	13	13	26
2010	116	72	188	99	58	157	17	14	31
2011	135	129	264	117	103	220	18	26	44
2012	103	44	147	92	29	121	11	15	26
Total	**4020**	**1854**	**5874**	**3359**	**1341**	**4700**	**661**	**513**	**1174**

Notes: This table shows the annual share repurchase announcements. Panel A provides the annual share repurchase announcements for the full sample; Panel B gives the annual repurchase announcements for unconstrained firms and Panel C shows the annual repurchase announcements for the constrained firms subsample.

.3. Variable Definitions and Model Specification

This section justifies the research approach used in the study. Variables used are defined including how they are measured. The model used is also specified. The section is further divided into three subsections. Subsection 5.3.1 defines the dependent, explanatory, and control variables for exploring the effects of mispricing and financial constraints on equity issues. It also discusses the model used to test the hypotheses related to equity issues. Subsection 5.3.2 presents the dependent, explanatory, and control variables used to examine the

long run operating and stock performance associated with equity issuance methods. Again, model for the analysis is explained in this subsection. Finally, subsection 5.3.3 explains the variables and models used to examine the levered share repurchase behaviour of internally financially unconstrained firms. The variables used are consistent with prior literature (see for example Grullon and Michaely, 2002; Chen and Wang, 2012) which has shown that these variables theoretically and empirically have significant effects on share issuance and repurchase decisions of firms as discussed further in the subsections that follow.

5.3.1. The Effects of Mispricing and Financial Constraints on Equity Issuance Decisions

The first part of the thesis examines the equity issuance decisions of firms given the degree of financial constraints. This section discusses the dependent variables, the explanatory, and control variables. It also specifies the model for the empirical testing of the hypotheses.

5.3.1.1. Dependent Variables

The dependent variables are discussed in the sections below.

i. Indicator Variable: Equity Issuance

The study explores the propensity for firms to issue equity given the degree of financial constraints. It also controls for other firm characteristics that have been explored in the empirical literature to determine equity issuance decisions. Given that the research examines probability of equity issues, the dependent variable therefore is a dummy variable; 1 for equity issues and 0 for non-equity issuance.

ii. Abnormal Stock Returns

The second dependent variable is the abnormal stock returns associated with equity issues, Event studies methodology is used to measure the stock price impact of corporate events. The early work by Fama et al. (1969) laid the foundation for other intriguing event studies in respect of corporate events.

Their study focused on stock split and market reactions but since then other corporate events such as seasoned equity offerings (SEO), initial public offerings (IPO), mergers and acquisitions (M&A), repurchase, among others have received considerable attention in event studies in the empirical corporate finance literature. Brown and Warner (1980) explore event studies using monthly data and subsequently use daily data when they became available (Brown and Warner, 1985).

Abnormal stock returns are estimated using the market model where daily return of a particular security is compared with the daily return of the benchmark to compute daily excess or abnormal returns.[26] For UK data, the benchmark is the FTSE ALL SHARE INDEX. The market model calculates abnormal returns as the difference between the actual returns and the OLS fitted returns. Thus, the residuals or regression errors represent the abnormal returns of the market model. The market model therefore adjusts for both market-wide factors and systematic risk of each security.

Abnormal returns are computed using the market model as follows:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

Where:

AR_{it} *is the abnormal returns*

R_{it} *is the actual stock returns*

$\alpha_i + \beta_i R_{mt}$ *is the fitted or predicted returns from the OLS regressions with* α_i *and* β_i *as regression coefficients*

R_{mt} *is the market index returns*.

Cumulative abnormal returns, *CAR* is estimated from the abnormal returns using the market model.

[26] Studies which have used the market model to estimate abnormal returns include Dong et al. (2012),

5.3.1.2. Explanatory Variables

The proxies used to measure the effects of mispricing and financial constraints on equity issuance decisions are discussed in the following subsections. In addition to their definitions, limitations of each proxy are also explained.

i. Mispricing: Market-to-book ratio (MB)

According to proponents of market timing theory, misvaluation of firm value represents mispricing that motivates managers to issue overvalued equity and repurchase undervalued. Market-to-book ratio *(MB)* by definition encompasses firm value from market perspective as well as the fundamental or intrinsic value as determined by the companies' fundamentals. Given this background, any difference between what the market perceives as firm value and the firm's valuation results in mispricing. Summarily, higher market value than the book value generates high *MB* whereas lower market value than the book value generates lower *MB*. Thus, *MB* defines stock mispricing (Fama and French, 1992; Rhodes-Kropf et al., 2005; Elliot et al., 2008). Consistent with the literature on equity issues, overvalued firms are more likely to issue equity whereas undervalued firms prefer to buy back their shares (Baker and Wurgler, 2002; Dong et al., 2012). The degree of mispricing defined as the ratio of market price to fundamental value also explains firm stock returns (Fama and French, 1992; Daniel et al. 2001; Barberis and Huang, 2001).[27]

Consistent with prior studies, *MB* is the proxy for mispricing. Accordingly, high *MB* is expected to have a positive relationship with share issuance decisions. The effects of mispricing also indicate that *MB* has an ex post negative relationship with stock returns. Mispricing or misvaluation is defined as *MB* and computed as follows:

$$MB_{it} = \frac{BVA_{it} - BVE_{it} + MVE_{it}}{BVA_{it}}$$

Where:

BVA_{it} *is the book value of total assets*

[27] Further evidence of the effects of mispricing on share issuance decisions and subsequent stock returns is discussed in chapter 2.

BVE_{it} is the book value of equity

MVE_{it} is the market value of equity

ii. Internal Financial Constraints (KZ index)

The main proxy for internal financial constraints is the Kaplan and Zingales' (1997) index (hereafter KZ index).[28] Kaplan and Zingales (1997) constructed this index in their study of the financial constraints characteristics of 49 low-dividend paying manufacturing firms. The sample of 49 firms over 15-year period (from 1970-1984) replicates that of Fazzari et al. (1988). Low-dividend paying firms exhibit strong relation between investment and cash flow. Using observable firm characteristics, Kaplan and Zingales (1997) rank these firms on ordinal scale form least to most constrained and run ordered logit model. This is an objective measure that has gained substantial currency in the empirical literature as an indicator of financial constraints (Baker et al. 2003). It is hypothesised that internally financially constrained firms will be impeded in responding to high valuations to issue equity. This implies less internally financially constrained firms quickly take advantage of mispricing; therefore, there is a negative correlation between valuation and degree of internal financial constraints.

Following studies such as Baker et al., (2003) and Dong et al., (2012), the proxy for internal financial constraints used in this study is computed below.

KZ index is defined as follows:

$$KZ = \ 1.002\left(CF/TA\right)+3.139\,LEV \quad 39.368\left(DIV/TA\right) \quad 1.315\left(CASH/TA\right)$$

Where:

CF is the cash flow measured as net income plus depreciation

[28] Lemmon and Zender (2010); Almeida et al. (2004) use dividend payment and debt capacity as proxy for financial constraints which the KZ-index captures in addition to other factors that affect the level of financial flexibility. Again, Helwege and Liang (1996); Lemmon and Zender (2010); DeAngelo et al (2010) adopt Altman's Z-score which define financial distress as evidenced by excessive leverage rather than the lack of financial surplus.

TA is total assets LEV is leverage defined as the long term debt over lagged total assets
CASH is defined as cash and cash equivalents

A higher *KZ-index* represents highly constrained firms that have debt capacity concerns, have low cash balance (limited financial slack) and pay no dividends. According to the pecking order theory, firms with high *KZ-index* issue equity. Similarly, less financially constrained are better placed to respond to both valuation effects and the need to adjust the leverage to achieve target debt ratio.

iii. Internal Financial Constraints (WW index)

For robustness of results, an alternative proxy for financial constraints is used to analyse the effects of internal financial constraints on share issuance decisions. This proxy for financial constraints is the Whited and Wu (2006) index hereafter the WW index calculated as follows:

$$WW = -0.091\left(CF/TA\right) - 0.062\left(DIVDUM\right) + 0.021\left(LTD/TA\right) \\ -0.044\log TA + 0.102 INDSG - 0.035 SG$$

Where:

CF is cash flow; *TA* is total assets; *LTD* is long-term debt; *INDSG* is the firm's three-digit industry sales growth; *SG* is the firm's sales growth; and *DIVDUM* is a dummy variable that takes a value of 1 if a firm pays cash dividends and 0 otherwise. A high WW-index denotes that the firm is more internally financially constrained. In line with the KZ-measure, firms in the 5th quintile are classified as internally financially constrained and unconstrained otherwise.

iv. Financial Distress (Taffler's Z score)

Financial distress (used for UK data) measure is used as alternative proxy for financial constraints measure. The degree of financial distress supports the pecking order theory. In the context of this hypothesis, firms that are potentially liable to financial distress prefer equity financing to debt. Financial distress, as explained in theoretical finance, is the inability of company to meet its financial obligations, especially to creditors. Factors such as excessive debt giving rise to fixed interest payments, lack of profitability particularly in

situations where sales levels slump in response to economic downturns and the lack of liquid assets that could be sold to defray the obligations. Firms plagued with costly financial distress correlate with severe debt capacity concerns which limit external debt financing. Again, there is a lack of financial slack such that inadequate internal funds result in financial deficit.

For example, Helwege and Liang (1996), Lemmon and Zender (2010), DeAngelo et al. (2010) state that Z-score correlates with excessive leverage rather than the lack of financial surplus. Thus, financial distress explains financial constraints due to the high leverage associated with distressed firms. The effects of debt capacity concerns, lack of internal funds and profitability restrict any attempts to access the external debt market. Effectively, financially distressed firms are more likely to enter the external equity market for financing in order to undertake investments projects. The correlation with internal financial constraints also suggests that financially distressed firms are less likely to issue equity due to high costs of equity issuance.

Financial distress, though correlates with internal financial constraints, also have partial effects of financing decisions and in particular determining the leverage levels. The trade-off theory emphasises the costs associated with excessive leverage. Here financial distress, rather than internal financial constraints, is used to account for the effects of potential bankruptcy costs on equity financing. Therefore, Taffler's Z-score (a measure of business failure for UK firms) is used as a measure of financial distress. By using multiple discriminant analysis, Taffler's (1983) provides a Z-score measure that is computed as four weighted ratios. He used stepwise linear discriminant analysis to develop a model that was able to discriminate effectively between failed and healthy companies between the beginning of 1969 and the end of 1976. The model is described as follows:

$$Z = 3.20 + 12.18 * PROF + 2.50 * WCAP - 10.68 * FRISK + 0.0289 * LIQD$$

Where:

PROF is the ratio of profit before tax to average current liabilities WCAP is ratio of current assets to total liabilities

FRISK is current liabilities divided by total assets LIQD refers to number of credit interval that is defined as [(Current assets-Inventory-Current liabilities) / (Sales-Profit before tax +Depreciation)]

Negative *Z score* represents financially distressed companies that are in danger of failure; whereas those with positive *Z score* are solvent companies.

v. Financial Crisis (CRISIS) and Market Liquidity (LIQD)

The extant literature offers evidence of the effects of financial crisis and market liquidity on corporate decisions.[29] Campello et al. (2010), Ivashina and Scharfstein (2010), Campello et al. (2011), and McLean and Zhao (2014) indicate that external financial constraints, evidenced by the financial crisis, affect investment, employment, and cash holdings of firms. Financial crisis (*CRISIS)* is a dummy variable that is 1 for the period after 2007 and 0 otherwise. Market Liquidity (*LIQD)*, on the other hand, measures the ease of raising capital that is related to the costs of external financing. Internally financially constrained firms are less likely to issue overvalued equity when market liquidity is low. Market liquidity is computed as the difference between 12-month London Interbank Offer Rate *(LIBOR)* and the Bank of England Base Rate *(BOEBR)*. This is as similar measure of market liquidity used by Harford (2005) for US equity market.

$$LIQD_t = LIBOR_t \quad BOEBR_t$$

Where:

$LIBOR_t$ is the 12-month London Interbank Offer Rate

$BOEBR_t$ is the Bank of England Base Rate

5.3.1.3. Control Variables

In addition to the key parameters that have been defined as affecting financing decisions, the study incorporates a number of additional variables that have partial effects on security issuance decisions. Rajan and Zingales (1995) identify four firm characteristics that have significant impact on financing

[29] See Chapter 2 for discussion of the effects of external financial constraints on corporate financing policies.

decisions. Particularly, leverage levels correlate with each of these variables that in turn determine financing decisions as a result of the leverage levels. The four Rajan and Zingales (1995) leverage determining factors include firm size, profitability, and asset tangibility and growth opportunities. However, growth opportunities are already captured in the measure of mispricing given as *MB*.

The following control variables are included.

i. Profitability (PROF)

Profitability is defined in the model as the earnings before interest, taxes and depreciation (EBITDA) divided by total assets and expressed as a percentage (in other words as the return on assets). Jensen (1986) asserts that free cash flow problems associated with profitable firms force them to issue debt capital. Again, evidence attests that profitable firms have high levels of internal funds and as such are unlikely to be financially distressed. Moreover, profitability translates into growth opportunities in subsequent periods. That is, profitable firms are more likely to investment in research and development that produces opportunities for growth. Thus, with growth options firms issue equity more than debt financing and hence record low leverage levels. Following from that, and according to the pecking order theory, these firms are unlikely to access the capital debt market for financing. Therefore, profitable firms have a low leverage. It is defined accordingly as:

$$PROF_{it} = \frac{INC_{it}}{CE_{it}}$$

Where:
INC_{it} *is net income before extraordinary items*
CE is common equity of the firm i at time t

ii. Firm size (SIZE)

Firm size is measured as the log of net sales/market capitalisation has a positive relationship with leverage. This is due to the ability of large firms to shield against financial distress and access capital debt market. Empirical

evidence asserts that small firms possess considerable growth opportunities, low leverage yet greater uncertainty due to information asymmetry. Large firms, on the other hand, are mostly matured entities that have exhausted growth options but are highly followed by analysts. The effects of analysts' coverage limit asymmetric information effects. Again, large firms have substantial tangible assets which provide collateral facilities to access debt financing. Intuitively, small firms are less likely to follow the pecking order, even though this argument is sternly challenged in the literature (Lemmon and Zender, 2010). In terms of leverage levels, the collateral facility from the high degree of asset tangibility ensures that large firms have high leverage than small entities. The conclusion from this analysis reflects the positive relationship between firm size and leverage.

Using Rajan and Zingales' (1995) definition, firm size is calculated as the natural logarithm of book value of total assets (also Barclay and Smith, 1995; Dong et al., 2012). Other studies such as Antoniou et al. (2006) use log of sales. The reasoning for scaling with natural logarithm is to curtail the bias associated with outliers and errors. Residuals get bigger with bigger values for the dependent variable. This apparent anomaly is inevitable because error or change in the value of an outcome variable is often a percent of the value rather than an absolute value. The natural logarithm of a variable neutralises the residuals for the bigger value. Moreover, the difference in size among small and large firms is controlled using logarithm rather than the "raw" values. This eliminates potential skewness associated with large values. There is neutrality with firm size and the effects on financing choice or leverage removes any bias.

$$SIZE_{it} = LogTA_{it}$$

Where:

$LogMV_{it}$ is the natural logarithm of book value of total assets

iii. Earnings Deviation (ED)

Earnings deviation and accrual quality demonstrate information gap between managers and investors. This measure captures the effects of information asymmetry associated with equity issues as discussed in Chapter 2. Dittmar and Thakor (2007) use earnings deviation as an agreement parameter where high value represents higher agreement between managers and investors. Dong et al (2012), however, argue that absolute value of earnings deviation better defines the degree of disagreement between managers and investors. Lee and Masulis (2009) and Billet et al. (2013) assert that accrual quality is an alternative proxy for asymmetric information that is more related to earnings management. Whereas investors rely on financial statements to take economic decisions, insiders own the source of such information reported on the financial statements. A lower quality of such information therefore represents a source of asymmetric information.

To proxy for asymmetric information, in line with the pecking order theory, an estimate of the earnings deviation, showing the absolute deviation of actual earnings from analysts' consensus forecast is given as:

$$ED_{it} = \left| \frac{EPS_{actual} - EPS_{forecast}}{EPS_{actual}} \right| .$$

Where:

EPS_{actual} is the earnings per share reported by the firm i at time t $EPS_{forecast}$ is the consensus analysts' average forecast of earnings per share for the firm i at time t

iv. Capital Expenditure (CAPX)

Investment is used to represent capital expenditure. Firms with valuable investments are more likely to obtain external financing. For example, firms issue additional debt to undertake investment (DeAngelo et al. 2011; Dudley, 2012). Also given debt capacity concerns, firms would obtain equity financing to provide cash flow for investment. Thus, mispricing drives investment. Firms

undertake investment when the stock is overpriced through the issuance of equity financing to support the capital or cash required for the investment project. This view relates closely with the market timing phenomenon. Polk and Sapienza (2009) assert that mispriced firms undertake abnormal investment and are associated with post-investment adverse returns. This implies mispriced firms are more likely to issue equity because of investment opportunities. Investment tracks mispricing more when the firms are dominated with high R&D and also possess short-term horizon investors.

It is defined by the capital expenditure over the prior period divided by total assets and is given as:

$$CAPX_{it} = \frac{CAPX_{it\ 1}}{TA_{it}} \quad [?]$$

Where:

$CAPEX_{it-1}$ *is capital expenditure for the prior period* TA_{it} *is total assets*

5.3.1.4. Model Specification and Estimation Technique

This section discusses the econometric model for testing the effects of mispricing and financial constraints on equity issues and the associated stock returns. The first part tests the following hypotheses (H_1, H_2, and H_3) as discussed in Section 2.5 of Chapter 2:

> ***H_1: There is high probability for less internally financially constrained firms to issue overvalued equity***
>
> ***H_2: Firms are more likely to issue overvalued equity when external financial constraints are low (non-financial crisis period or periods of high market liquidity)***
>
> ***H_3: The probability of issuing overvalued equity during periods of high external financial constraints increases for firms with low internal financially constraints than those with high internal financial constraints***

The hypotheses specifications are related to a binary dependent variable. This is because the study tests the probability or the likelihood of equity issues in the presence of a set of firm characteristics. For the binary dependent variable, OLS estimation technique is not an appropriate model. For example, OLS estimation of the linear probability model (LPM) violates certain assumptions. LPM has the defect that the conditional probability is not constrained to lie between zero and one (Aldrich and Nelson, 1984; Cameron and Trivedi, 2005; Wooldridge, 2010). Thus, the predictions of the conditional probability can be greater than one or less than zero. Moreover, the errors are inherently heteroscedastic. Unlike LPM, logistic regression estimated under maximum likelihood estimation (MLE) restricts the predicted probability within the range 1 and 0 and also corrects for heteroscedastic errors. Studies such as Cox, (1970) Tennant (1977), Silvapulle (1981), Scott and Wild (1986 and 1991) are apply the MLE to various research. Therefore, logistic regression model is an appropriate model for binary dependent variable.

The logistic regression model is stated as follows:

$$\Pr(y_i = 1|x_i) = \frac{e^{x_i\beta}}{1+e^{x_i\beta}} \text{.....(1)}$$

$$\Pr(y_i = 1|x_i) = \beta_0 + \beta_1 KZ_{it} + \beta_2 MB_{it} + \beta_3 MB * KZ_{ti} + \sum_{i=1}^{n} \beta_i X_{it} + \varepsilon_{it} \text{.....(1)}$$

Where:

β_0 *is the constant term*

KZ_{it} *is the indicator variable for levered repurchase*

MB_{it} *is the market-to-book ratio for mispricing*

$MB * KZ_{it}$ *is the interaction term between market-to-book ratio and internal financial constraints*

X_{it} *is the set of control variables: pre-announcement abnormal returns (AR), dummy for financial crisis (CRISIS) and market liquidity (LIQ), firm size (LMV), capital expenditure (CAPX), earnings deviation (ED), profitability (PROFIT), time dummies, and industry dummies*

Logistic regression models have been applied extensively in the empirical finance and corporate finance literature. Martin (1977) explores early warning of bank failure, Martin (1996) the method of payment in corporate acquisitions, Fama and French (2001) firm characteristics and the propensity to pay dividends, Goyal and Park (2002) the board leadership structure and CEO turnover, Baker and Wurgler (2004) link the propensity to pay dividends to catering incentives, and Denis and Osobov (2008) he reasons for dividend payments. This study adopts a similar estimation model to study the propensity for equity issues given the level of internal financial constraints and a set of firm characteristics.

The following pooled OLS regression model is used to test the above hypothesis about the post-issue stock returns.

H_4: Issuance of overvalued equity is associated with more negative abnormal returns, especially for firms with high internal financially constraints

H_5: Issuance of overvalued equity is associated with more negative abnormal returns, especially for firms with high internal financially constraints and during periods of high external financial constraints

$$CAR_i = \beta_0 + \beta_1 KZ_i + \beta_2 MB_i + \beta_3 MB * KZ_i + \sum_{i=1}^{n} \beta_i X_i + \varepsilon_i \text{.....(2)}$$

Where:

β_0 *is the constant term*

KZ_{it} *is the indicator variable for internal financial constraints which is 1 for constrained and 0 for unconstrained*

MB_{it} *is the market-to-book ratio for mispricing*

$MB * KZ_{it}$ *is the interaction term between market-to-book ratio and internal financial constraint*

X_{it} *is the set of control variables: pre-announcement abnormal returns (AR), dummy for financial crisis (CRISIS) and market liquidity (LIQ),*

firm size (LMV), capital expenditure (CAPX), earnings deviation (ED), profitability (PROFIT), time dummies, and industry dummies

All regression estimations throughout the thesis are carried out using the STATA software.

5.3.2. Share Issuance Methods: Operating Performance and Stock Returns

The second research objective of the study is to explore the effects of operating performance on the choice of equity issuance methods. It also uses the operating performance to examine the different long run stock performance associated with rights issues, open offers, and private placement. This section discusses the dependent variables, the explanatory, and control variables. It also specifies the model for the empirical testing of the hypotheses.

5.3.2.1. Dependent Variable:

The following sections explain the dependent variables used to carry out the empirical analysis.

i. Indicator Variable for Rights Issues, Open Offers, and Private Placement

The study compares rights issues with open offers on one hand, and rights issues and private placement on the other. Thus, for the first part the dependent variable is 1 for rights issues and 0 for open offers. In the second part, the dependent variable is 1 for rights issues and 0 for private placement.

ii. Long term abnormal returns

Long-term returns estimation presents important statistical issues that need to be considered in order to avoid biased estimates. Unlike short-run abnormal returns with limited stock price volatility over short estimation window, long run abnormal returns can be affected by the estimation method used and produces biased estimates and misspecified test statistics. Kothari and Warner (1997) and Barber and Lyon (1997) both analyse extensively the properties of long-run abnormal returns. Both studies find significant statistical problems

with long-run abnormal returns depending on the method of estimation. Cumulative abnormal returns, buy-and-hold abnormal returns and Fama and French (1993) three-factor models have been employed to estimate long-run abnormal returns in the empirical literature. Ritter (1991), for example, note that the use of *CAR* and *BHAR* depends on the specific question to be answered. Thus, it is more likely that *CAR* and *BHAR* will produce different estimates.

Moreover, Barber and Lyon (1997) assert that empirical power and specification of test statistics are affected by the method of estimation and the approach for developing benchmark. Long-run abnormal returns benchmarks used in the literature include reference portfolio (market index or size decile portfolios), control firms approach and the three-factor model of Fama and French (1993). Fama (1998) states that long-term return anomalies are sensitive to methodology. Further, Lyon et al. (1999) recognise the problems associated with analysis of long-run abnormal returns. Bias estimates and test statistics misspecification stem from new listing bias, rebalancing bias and skewness bias (Barber and Lyon, 1997). They argue that new listing bias occurs because new firms are allowed to the market index that is benchmark for the sample firms' long-run abnormal returns. Again, compound returns of market index are computed with implicit periodic rebalancing whereas returns of sample firms do not involve rebalancing. Finally, long-run abnormal returns are positively skewed.

Control firm approach to calculating abnormal returns is able to offset the sources of bias and misspecification depending on whether *CAR* or *BHAR* is the estimation method. Without the reference portfolio benchmark such as the market index, the bias from new listing, rebalancing and skewness are eliminated. Control firm and sample firm are identical in several respects and experience comparable effects when measured against the market index. *CAR* is also associated with measurement bias. Barber and Lyon (1997) contend that *BHAR* using the control firm approach produces unbiased and well-specified test statistics since it eliminates the bias from new listing, rebalancing,

skewness and measurement. The current study follows this approach that has been applied in a number of studies in the literature.[30]

a. Cumulative Abnormal Returns (CAR)

To estimate cumulative abnormal returns for each cross section firm, the expected returns, using market model that regresses stock returns on market return, is computed. Market returns are defined as the total return on the FTSE ALL SHARE index. The relationship of the market model is thus stated as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

$$AR_{it} = R_{it} - E(R_{it}) \quad (2)$$

Where:

$$E(R_{it}) = \hat{\alpha}_i + \hat{\beta}_i R_{mt} \quad (3)$$

The parameters in equation (1) are the stock returns for each firm, R_{it} ; the market return defined as R_{mt} , and ε_{it} is the idiosyncratic risk associated with the stock returns. α_i and β_i are the alpha and beta coefficients of the regression model to be estimated. Both stock returns and market returns are the daily returns associated with the stock and market index respectively. The estimation window of 250 days prior to the announcement date is used.

The cumulative abnormal returns *(CAR)* are estimated as the sum of the abnormal returns (AR) within a specified event window. This is stated as follows:

[30] Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), Veld and Veld-Merkoulova (2004), Hertzel et al (2002) and Capstaff and Fletcher (2011) all use the control firm approach in calculating long-run abnormal returns.

$$CAR_{it} = \sum_{t=1}^{T} AR_{it}$$

Following Barber and Lyon (1997), the *t*-test is defined as the ratio of the cumulative abnormal returns to the standard deviation of the *CAR* of the firms divided by the root of number of firms.

$$t - test_{CAR_T} = \frac{CAR_T}{\sigma(CAR_{iT})/\sqrt{N}}$$

b. Buy-and-Hold Abnormal Returns (BHAR)

Buy and hold abnormal returns (*BHAR*) measure the difference between compounded actual return and the compounded predicted return. The compounding feature associated with *BHAR* better simulates the effect of an event on an investor's portfolio. Again, *BHAR* provides a good measure of the long run investor experience under the long run event studies (Loughran and Ritter, 1995). *CAR* and *BHAR* both complement each other due to their peculiar limitations. Whereas *CAR* fails to capture the compounding effects, *BHAR* can also yield incorrect statistically significant abnormal performance due to short-term return fluctuations. Therefore, the problems of extreme skewness occasioned by *BHAR* are curtailed when double-checked with *CAR*.

Similarly, the *BHAR* is computed after estimating the expected or predicted returns from the regression of stock returns and market returns. Buy and hold return is the daily compounded return on the equity security for each firm over a specified time period in days.

The buy and hold return (BHR) of each firm is given as

$$BHR_{iT} = \prod_{t=1}^{T} [1 + R_{it}] - 1.$$

In same fashion, the expected or predicted buy and hold return is calculated as

$$E(BHR_{iT}) = \prod_{t=1}^{T} [1 + E(R_{it})] - 1$$

Finally, *BHAR*, the difference between the buy and hold returns (BHR_{iT}) and the expected buy and hold returns $E(BHR_{iT})$, is computed using the equation below.

$$BHAR_{it} = \prod_{t=1}^{T}[1 + R_{it}] - \prod_{t=1}^{T}[1 + E(R_{it})]$$

Test of statistical significance of the mean returns is computed using the standard *t*-test as follows:

$$t - test_{BHAR_T} = \frac{BHAR_T}{\sigma(BHAR_{iT})/\sqrt{N}}$$

5.3.2.2. Explanatory Variable

This section discusses the proxies that are used to measure the effects of operating performance on share issuance method and stock returns. In addition to their definitions, limitations of each proxy are also explained.

i. Operating Performance (ROA)

The extant literature reports strong empirical evidence of stock underperformance following SEOs (Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995) that is related to the poor operating performance (McLaughlin et al. 1996; Loughran and Ritter, 1997; Levis, 1995).[31] The study predicts that the level of operating performance influences equity issuance method and hence explains the long run stock performance differences among issuance methods. If high profitability is favourable market information, then rights issuing firms are more likely to be profitable than open offers and private placement (Capstaff and Fletcher, 2011). This should also explain long run stock outperformance for rights issues than open offers and private placement.

Profitability is defined using returns on assets *(ROA)* and their abnormal components over matched firms. The following relations explain each measure.

$$ROA_{it} = \frac{EBIT_{it}}{TA_{it}}$$

[31] Chapter 3 provides comprehensive discussions of stock and operating performance associated with equity issuance methods

Where:

ROA is the return on assets. It can also be calculated as the ratio of EBIT, earnings before interest and taxes to TA,

5.3.2.3. Control variables

The control variables are used in previous studies to explain the stock price effects associated with equity issues and equity issuance methods. Most of these variables are based on theories that have been explored extensively in the literature. In addition to variables that explain equity issues in general as discussed in preceding sections, other variables specifically determine the choice among the equity issuance methods. Following the extant literature, the variables are defined in the same manner to reflect the same effects as indicated in the literature. The proxy for each variable is discussed as follows:

i. Mispricing (MB)

Mispricing affects the choice of equity issuance method due to its relation to high information asymmetry (Livingston et al., 2005). Moreover, Slovin et al. (2000) and Barnes and Walker (2006) find that overvalued equity are issued to existing shareholders rather than privately placed with external investors. However, Capstaff and Fletcher (2011) assert that rights issuing to existing shareholder are less likely to be overvalued. Thus, all else equal, high *MB* is negatively related to the probability of rights issues and positively related to private placement and open offers. *MB* is defined in the Section 5.3.1.2.

ii. Pre-issue Abnormal Returns (Prior AR)

AR is the cumulative abnormal stock returns *(CAR)* estimated using the market model over estimation window (-255,-21) relative to the announcement date. The pre-issue *AR* is the cumulative abnormal returns from day -30 through day -2. Thus, the *AR* is defined as *CAR (-30,-2)*. It is expected that *AR* should have a positive relationship with mispricing and thus increase the probability of equity issues through private placement.

iii. Firm Size (SIZE)

Firm size is measured as the natural logarithm of book value of total assets and has a positive relationship with equity issues. This is because large firms to have low information asymmetry and are less likely to be mispriced. Large firms are mostly matured entities that have exhausted growth options but are highly followed by analysts. Small firms possess considerable growth opportunities, low leverage yet greater uncertainty due to information asymmetry.

iv. Discount (DISC)

Empirical evidence suggests that equity issues are associated with significant discounts between the offer price and the market price at the announcement date. Armitage et al. (2012) find that about 90% of UK open offers and placings are at a discount of about 26%. However, for large discounts existing shareholder value is more protected if rights offering are used to issue equity. This is because discount transfers wealth to the new investors that will subscribe to the equity issues, when the discounted equity is issued to external investors through private placement. While this constitutes costs to existing shareholders who do not participate the new shares, due to lack of pre-emptive rights, the discount could compensate placees for the cost of investigating the issuer (Hertzel and Smith, 1993; Balachandran et al., 2013). However, Barclay et al (2007) contend that the large size of the discount undermines such conjecture.

Following the information asymmetry hypothesis, overvalued firms should attract high discounts (Hertzel et al, 2002). Armitage et al. (2014) establish that discounts are related to illiquidity of issuers' shares, financial distress and inelastic demand for the shares. Slovin et al. (2000), Armitage (2002), and Balachandran et al. (2008) report that rights issue price reaction is significantly and negatively related to the issue discount. However, Barnes and Walker (2006) assert that high discounts are more likely to be associated with placings than rights issues. This is consistent with overvaluation effects that evoke equity issues through placings. High discount (more negative value) is more

likely to be associated with issues that reflect overvaluation. Thus, equity issues are timed should attract deep discount to compensate investors.

Issue price discount is calculated using the Barnes and walker (2006) and Armitage et al. (2014) formula that compares the pre-announcement date market price and the offer price. Thus, discount is given as follows:

$$DISC_{it} = \frac{P_{offer} - P_{market}}{P_{market}},$$

Where:

P_{offer} is the offer price stated in SDC at the announcement date of the equity issues

P_{market} is the prior announcement date market price reported

v. Accruals Quality (AQ)

Consistent with the information asymmetry and earnings management hypotheses, firms with better accrual quality are more likely to issue equity to existing shareholders. Hertzel and Smith (1993), Wu (2004), Balachandran et al. (2013) argue that firms since private placement investors can obtain the true value of the firm at a cost; firms with high information asymmetry are more likely to issue equity through private placements. Accruals quality is the modified Dechow and Dichev (2002) measure of earnings quality defined in the preceding sections. This is consistent with studies such as Lee and Masulis (2009), Balachandran et al. (2013), and Armitage et al. (2014),

$$CA_{it} = \alpha_i + \gamma_1 CFO_{it-1} + \gamma_2 CFO_{it} + \gamma_3 CFO_{it+1} + \gamma_4 \Delta SALES_{it} + \gamma_5 PPE_{it} + \varepsilon_{it}$$

Where:

CA_{it} *=total current accruals=* Δ *current assets-* Δ *current liabilities-* Δ *cash+* Δ *debt in current liabilities;* Δ *=changes from year* t *to year* $t-1$

CFO = cash flow from operations= net income before extraordinary items-total accruals and total accruals=current accruals-depreciation and amortization;

SALES =total sales revenue

PPE = property, plant and equipment. Each of the variables is scaled by the average of total assets between year $t-1$ *and year* t *.*

Accruals quality (AQ) is computed as the standard deviation of the regression residuals from $t-4$ through t where larger standard deviation at year t reflects a poor earnings quality and hence high asymmetric information. All variables are scaled by average total assets over year *t-1* and *t*. Overall, four regressions using a total of four lagged values and one lead value of data over the sample period 1989-2011 is estimated. The firm-specific measure of earnings management is the standard deviation of the four regression residual values. Larger standard deviations suggest poor accruals quality and greater information asymmetry. This variable is denoted as *ACC_QUAL*.

vi. Idiosyncratic Risk (IDYRISK)

Idiosyncratic volatility is measured as the standard deviation of the excess market return relative to the date of equity issue announcements (Dierkens, 1991; Krishnaswami and Subramanian, 1999). Balachandran et al. (2013) find lower idiosyncratic risk for rights offerings than open offers and placement. This indicates that issue to existing shareholders do not produce adverse selection costs that are associated with external shareholders. Hence, firms with lower asymmetric information are more likely to conduct rights offerings. Therefore, lower idiosyncratic risk indicates that the firm is higher quality firm (Balachandran et al., 2008).

vii. Financial Crisis (CRISIS

Financial crisis is an indicator variable of 1 for the period 2008-2010 and 0 otherwise.

5.3.2.4. Model Specifications

This section discusses the econometric model for testing the effects of operating performance on the choice of equity issuance method and the long run stock performance as discussed in Section 3.4 of Chapter 3. The first part

tests the following hypotheses (H_6) using the multinomial logit regression model.

H_6: Firms that anticipate positive operating performance are more likely to conduct rights issues than open offers or private placement

The multinomial logit regression model is stated as follows:

$$\Pr(y_i = 1|x_i) = \beta_0 + \beta_1 ROA_{it} + \sum_{i=1}^{n} \beta_i X_{it} + \varepsilon_{it} \text{.....(3)}$$

Where:

β_0 *is the constant term*

ROA_{it} *is the returns on assets for long run operating performance*

X_{it} *is the set of control variables: market-to-book ratio (MB), ratio of issue proceeds over market value (P/MV), pre-announcement abnormal returns (AR), dummy for financial crisis (CRISIS),, firm size (LMV), economic growth rate (GDP), accruals quality (ACC_QUAL), idiosyncratic risk (IDY_RISK), issue price discount (DISC), time dummies, and industry dummies*

Long run stock returns are estimated using the OLS estimation to test the following hypothesis.

H_7: Equity issues through private placement generate more negative abnormal returns than rights issues

The OLS model is stated as below:

$$BHAR_i = \beta_0 + \beta_1 ROA_i + \beta_2 ISSUE_i + \beta_3 ROA * ISSUE_i + \sum_{i=1}^{n} \beta_i X_i + \varepsilon_i \text{.....(4)}$$

Where:

β_0 *is the constant term*

ROA_i *is the returns on assets for long run operating performance*

$ISSUE_i$ *is the dummy variable for equity issuance method which is 1 for rights issues and 0 otherwise*

$ROA_i * ISSUE$ *is the interaction between operating performance and equity issuance method*

X_i *is the set of control variables: market-to-book ratio (MB), ratio of issue proceeds over market value (P/MV), pre-announcement abnormal returns (AR), dummy for financial crisis (CRISIS),, firm size (LMV), economic growth rate (GDP), accruals quality (ACC_QUAL), idiosyncratic risk (IDY_RISK), issue price discount (DISC), time dummies, and industry dummies*

5.3.3. Share Repurchase and Internal Financial Constraints

The third research objective of the study is to examine the share repurchase behaviour of internally financially unconstrained firms. In other words, the study explores the effects of internal financial constraints on the financing of share repurchase programs through either internal cash flows or external borrowings. This section discusses the dependent variables, the explanatory, and control variables. It also specifies the model for the empirical testing of the hypotheses.

5.3.3.1. Dependent Variable

According to the developed hypotheses (H_8), internally financially constrained firms are more likely to borrow to finance repurchase programs. However, for unconstrained firms, the need to undertake investments are the time of repurchasing the shares motivates them to obtain debt financing (H_9). Subsequent stock returns should be more positive for unlevered repurchase firms than levered repurchase firms (H_{10}). For the levered repurchase firms, high investing firms are likely to be associated with more positive stock returns than low investing firms (H_{11}). These hypotheses are discussed in Section 4.5 of Chapter 4. Here the dependent variables that explore the hypotheses are discussed.

i. Levered and Unlevered repurchase (LEVD)

Repurchase is defined as levered/unlevered in relation to the level of borrowings that firms are predicted to have committed to finance the share repurchase. Thus, in this context changes in debt capital within the period of the repurchase represent borrowings with a view to financing the repurchase. According to Minninck and Zhao (2007), levered repurchases are those that are

financed by debt issues. The debt issues must be made within one year prior to two years post share repurchases. Thus, changes in long-term debt capital on the balance sheet are used to determine whether or not debt-financing influences repurchase. Firms that issued bonds or increased their borrowing within the repurchase time period specified are classed as levered repurchase (debt-financed); otherwise they are unlevered repurchase (cash-financed).

The sample is then classified in terms of levered or unlevered share repurchase based on the increase in the total debt. Levered share repurchase occurs when bond issues finance the repurchase. Share repurchase is defined as levered if there is a positive change in the debt capital one year prior to and/or two years after the repurchase announcement.[32] Following this definition, the dependent variable is an indicator variable that is 1 for levered and 0 for unlevered repurchase. The use of indicator variable for levered repurchase measures the probability that a firm conducts levered share repurchase given other firm characteristics. These firm characteristics are discussed under the explanatory and control variables sections. Studies such as Minnick and Zhao (2007), Dong et al. (2012), and Balachandran et al. (2013) use indictor variable as dependent variable in their studies of either equity issues or share repurchase.

ii. Stock returns

Prior research finds positive abnormal stock returns around the announcements of share repurchase programs. Signalling, free cash and undervaluation hypotheses are all consistent with the stock returns subsequent to share repurchase. Positive information signals are transmitted to the market because these theories posit that share repurchase decisions indicate that firms have positive future prospect in terms of earnings. Also, the agency theory/free cash flow hypothesis asserts that excess cash flows are distributed to shareholders when there are limited investment opportunities in order to preserve shareholder value. Therefore, share repurchase announcements mean managers do not waste resources on negative NPV projects. Maxwell and Stephens

[32] Share repurchase in the highest quintile- in either one year prior to or two years after repurchase announcements- are classified as levered repurchase whereas those in the other quintiles are unlevered repurchase.

(2003) find that not only does repurchase increase stock returns but it also transfers wealth from bondholders to shareholders. Minnick and Zhao (2007) report similar evidence in respect of levered repurchase and unlevered repurchase. Unlevered share repurchase is associated with high abnormal stock returns than levered share repurchase. Chen and Wang (2012) find that abnormal stock returns increases more for unconstrained firms than for constrained firms. Chan, Ikenberry and Lee (2007) also report evidence of abnormal stock performance following buyback announcements. The dependent variables are the initial and long run abnormal returns defined below.

a. Initial Abnormal Returns

Following previous studies, the study uses 3-day event window to estimate the initial abnormal returns associated with share repurchase announcement. Studies such as Chen and Wang (2012) use the 3-day window for initial returns. Initial announcements date abnormal stock is computed as the three-day cumulative abnormal returns *(CAR)* over the period from day -1 through day +1. Thus, initial abnormal returns is defined as *CAR(-1,1)*.

b. Long Run Abnormal Returns

Long-run abnormal stock returns are computed over 12 to 36 months following repurchase announcements, based on Barber and Lyon's (1997) methodology.[33] Buy-and-hold abnormal returns are estimated as the difference between buy and hold returns for the repurchase firm and buy and hold returns for the control firm as discussed in Section 5.3.2.1. Control firm must be within the same size decile, book-to-market (B/M) quintile, and KZ index quintile as the repurchasing firm (similar to Chen and Wang, 2012). In line with Lyon et al. (1999), t-statistics are bootstrapped skewness-adjusted.

[33] Refer to section 5.2.2.1 for discussions on cumulative abnormal returns and buy and hold abnormal returns.

5.3.3.2. Explanatory Variables

The following sections discuss the explanatory variables that are used to test the hypotheses about the levered share repurchase behaviour of internally financially unconstrained firms.

i. Internal Financial constraints (KZ index and WW index)

Corporate events are impacted by the degree of financial constraints. However, Chen and Wang (2012) find evidence which indicates that a sample of internally financially constrained firms repurchase their shares. Repurchase for undervalued firms are also associated with less financially constrained firms. Internally financially constrained firms would be more likely to borrow in order to repurchase their shares. However, the study predicts that unconstrained firms that undertake investment projects would also be likely to conduct levered repurchase. Consistent with the hypothesis, the study explores the extent to which internally financially unconstrained firms engage in levered repurchase. In line with Chen and Wang (2012), share repurchase in the highest quintile are classified as internally financially constrained whereas those in the other quintiles are internally financially unconstrained.[34]

ii. Bond Ratings (RATINGS)

Share repurchase increases leverage and therefore results in debt ratings downgrades. It follows that the bond ratings at the time of share repurchase would determine the extent of debt-financed repurchase. Interest payments for firm borrowings will be influenced by the creditworthiness of the firms, including other factors. Investment grade firms will more likely obtain debt financing at a cheaper cost than speculative grade firms. Maxwell and Stephens (2003) and Minnick and Zhao (2006) both find that bond ratings are twice likely to be downgraded as upgraded after the announcement of repurchase programs. This is due to the relatively increased risk of excessive debt capital. These downgrades are inspired by the likely risk of financial distress following

[34] See subsection 5.2.1.2 for comprehensive discussion on the measurement of the KZ index and WW index. Chapter 4 examines the literature review about the effects of financial constraints on share repurchase programs.

debt issuance and repurchase. Following from this evidence, we expect levered repurchasing firms to report significant downgrades especially when they are internally financially constrained.

iii. Financial Distress (Z score)

Excessive leverage capital increases the risk of bankruptcy. Repurchase reduces the share capital and invariably increases the debt component of the capital of the firm. Even though repurchase does not necessary change firm value, it results in distress risk. Opler and Titman (1994) find a significant and positive relationship between leverage and financial distress. Internal financial constraints in relation to repurchase will have a far greater effect on distress risk than unconstrained firm. Chen and Wang (2012) find that constrained firms with high actual repurchase ratios report significantly greater distress risk than unconstrained firms. This is due to the lower cash levels and higher leverage ratios occasioned by the repurchase transaction. Moreover, increased debt levels increase the probability of default on the bonds and expose the firm to financial distress. The likelihood of downgrades is related to the increase distress risk (Maxwell and Stephens, 2003; Minnick and Zhao, 2006). Purnanandam (2008) asserts that following debt issuance firms immediately institute risk-management policies due to probable financial distress risk. It is predicted that financial distress risk will increase for repurchase especially for levered repurchase conducted by internally financially constrained firms.

Financial distress is measured using the Altman (1968) Z-score for US data.[35]

This is given as

$$Z - score = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5$$

X_1 is working capital divided by book value of assets; X_2 is retained earnings over book value of assets; X_3 is the earnings before interest and taxes over book value of assets; X_4 is the market value of equity over book value of assets and X_5 is the net sales over book value of assets.

[35] Studies that use Altman (1968) Z-score to measure financial distress include Purnanandam (2008), Chen and Wang (2012); among others.

Firms with value less than 1.81 as distressed. Financial distress dummy is 1 for Z-score value less than 1.81 and 0 otherwise. It must be stressed that Taffler's Z-score is used as proxy for financial distress for UK data whereas Altman's Z-score is used for US data.

iv. Investment (INV)

Investment is the total capital expenditure plus research and development *(R&D)* over lagged total assets. Share repurchasing firms should invest less in capital projects as more cash are distributed to shareholders (Jensen, 1986; Hahn and Lee, 2009). However, debt-financed share repurchase should allow firms to also invest more. Therefore, firms investing more are likely to borrow to finance share repurchase.

5.3.3.3. Control Variables

The following variables are included in the regressions to control for the effects on share repurchase announcements.

i. Undervaluation (MB)

Market to book ratio is a proxy for undervaluation (Baker and Wurgler, 2002; Dong et al, 2012; Li and McNally, 2007; Grullon and Michaely, 2002). Market to book ratio relates to undervaluation hypothesis by which undervalued firms are more likely to repurchase their shares. It is cheaper to purchase because the suppressed market price of the shares means firms pay significantly low price for the same number of shares than they would for overvalued shares. Thus, low market to book ratio indicates undervaluation and also correlates positively with low prior stock returns.

According to the agency hypothesis, firms disgorge excess cash when there are limited positive net present value projects to invest the cash flow. Thus, available growth opportunities compete with cash paid to shareholders by way of dividends and repurchase. High growth opportunities reduce the probability of share repurchase (Boudry et al. 2013). We expect high stock returns following share repurchase for firms with low growth opportunities. Ikenberry

and Vermaelen (1996) assert that positive stock returns following repurchase explains that management commit resources in a way to benefit long term shareholders when there are no growth opportunities. Undervalued firms are more likely to repurchase their shares because the shares trade at relatively lower prices than their fundamental values (Stephens and Weisbach, 1998; D'Mello and Shroff, 2000). Thus, low *MB* firms are more likely to repurchase their shares than high *MB*.

ii. Firm size (SIZE)

Large firms are more likely to repurchase their shares due to lack of growth opportunities. Cash distributions are made in respect of investment financing including acquisitions, dividend payments and share repurchase, among others. Free cash flow hypothesis enjoins firms to disgorge excess cash flow to shareholders especially when positive net present value projects are limited. Firm size (SIZE) is given as natural logarithm of market value of equity. Firm size is computed as follows:

$$SIZE_{it} = LogTA_{it}$$

Where:

LogMV is natural logarithm of book value of total assets

All else equal, large firms that are also mature have limited growth opportunities and therefore are likely to distribute excess cash flow to shareholders. As firms increase in size and become mature, the limited investment opportunity creates free cash flow that can be distributed to shareholders. Thus, firm size positively correlates with share repurchase announcements and is consistent with the free cash flow hypothesis (Grullon and Michaely, 2004; Chen and Wang, 2012; Liang et al, 2013).

iii. Prior returns (Prior AR)

According to the undervaluation hypothesis, firms with prior poor stock performance have the incentive to repurchase their shares. The repurchase signals quality information and causes the share price to rise. Li and McNally (2007) Grullon and Michaely (2002) find evidence consistent with this

prediction. In the same view, prior stock returns should also motivate whether or not firms borrow to finance to repurchase. Thus, prior stock returns are positively related to announcement date stock returns. Following prior studies such as Maxwell and Stephens (2003), Dong et al (2012), the *prior AR* is the cumulative abnormal returns from day -30 through day -2. Thus, the *AR* is defined as *CAR (-30,-2)*.

iv. Share repurchases ratio (REP_RATIO)

This is the ratio of repurchase amount to market value of equity. This variable estimates the repurchase value relative to firm size. Firm size correlates positively with amount of share repurchase since large firms have limited growth opportunities but huge amount of free cash flows. Chen and Wang (2012) report that high repurchase ratio is associated with positive initial abnormal returns. It is therefore expected that high repurchase value should be associated with levered share repurchase. All else equal, unconstrained firms that borrow should be able to repurchase more as a percentage of firm size. Thus, high repurchase ratio is consistent with unconstrained firms, debt-financed repurchase, and large firms.

5.3.3.4. Model Specification

As stated in Section 4.5 of Chapter 4, the study predicts that internal financial constraints and investments influence the share repurchase financing of firms. The testable hypotheses are as follow:

> ***H_8: Internally financially constrained firms are more likely to conduct debt-financed repurchase than unconstrained firms***
>
> ***H_9: Internally financially unconstrained firms borrow to repurchase especially when they also undertake investments***

Logistic regression estimation is used to empirically test the above hypotheses about the effects of internal financial constraints on levered share repurchase. The logistics regression model is stated as follows:

$$P = \beta_0 + \beta_1 KZ_{it} + \beta_2 INV_{it} + \beta_3 KZ * INV_{it} + \sum_{i=1}^{n} \beta_i X_{it} + \varepsilon_{it} .....(5)$$

Where:

β_0 *is the constant term*

KZ_{it} *is the proxy for internal financial constraints (KZ index)*

INV_{it} *is the investment expenditure of the firm during the repurchase period*

$KZ * INV_{it}$ *is the interaction term between financial constraints (KZ index) and investment expenditure (INV)*

X_{it} *is the set of control variables: market-to-book ratio (MB), pre-announcement abnormal returns (AR), dummy for financial crisis (CRISIS), firm size (LMV), share repurchase ratio (RPR), time dummies, and industry dummies*

The second part of the research objective explores the stock returns associated with levered share repurchase programs. It focuses on both the initial and long run stock returns of firms that conduct levered repurchase and simultaneously invest in capital projects. The hypotheses are thus stated below:

> ***H_{10}: Cash-financed repurchase is associated with more positive abnormal returns than debt-financed repurchase, especially when the firm is internally financially unconstrained.***
>
> ***H_{11}: All else equal, internally financially unconstrained firms which conduct levered share repurchase should be associated with more positive returns for high investing firms than low investing firms.***

The following pooled OLS regression model is used to test the above hypothesis about the post-repurchase stock returns similar to Stephens and Weisbach (1998), Maxwell and Stephens (2003), Chen and Wang (2012), Dong et al. (2012),

$$CAR_i = \beta_0 + \beta_1 LEVD_i + \beta_2 INV_i + \beta_3 LEVD * INV_i + \sum_{i=1}^{n} \beta_i X_i + \varepsilon_i .....(6)$$

Where:

β_0 *is the constant term*

$LEVD_i$ *is the indicator variable for levered repurchase*

INV_i *is the investment expenditure of the firm during the repurchase period*

$LEVD * INV_i$ *is the interaction term between indicator variable levered repurchase (LEVD) and investment expenditure (INV)*

X_i *is the set of control variables: market-to-book ratio (MB), pre-announcement abnormal returns (AR), dummy for financial crisis (CRISIS), firm size (LMV), share repurchase ratio (RPR), time dummies, and industry dummies*.

5.4. Conclusion

This chapter discussed the research design including definition of variables and the methodology for carrying out the empirical analyses. It provided overview of the data and sources and justified the choice of the data. The study uses two datasets for equity issues on one hand and repurchase on the other hand. Data on equity issues are made up of a sample of UK listed firms and collected from SDC and Datastream. The final sample is 1257 equity issues from the period January 1, 1994 to December 31, 2010. For the analysis of operating performance and stock returns associated with equity issuance methods, the data is restricted to the period from January 1, 1996 to December 31, 2010 and divided into rights issues, open offers, and private placement. For the share repurchase sample, the data consist of US firms repurchase announcements made between January 1, 1990 and December 31, 2012. The final sample consists of 5874 share repurchase announcements and collected from SDC. For this dataset, the accounting data and stock prices are collected from Compustat and CRSP, respectively.

The chapter also presented and defined the variables that explain the hypotheses developed in Chapters 2, 3, and 4. Since the research objectives examine the probability of equity issues and share repurchase, the dependent variable is an indicator variable. This means the logistic regression model and

multinomial logit regression (for equity issuance methods) are used to test the first part of the research objectives as summarised in Chapter 1. The second part of the research objective examines the stock returns associated with equity issues and repurchase and for that the appropriate dependent variable is determined as abnormal stock returns. The analysis of stock returns is carried out using OLS regression analyses. The above methodology is discussed in line with previous studies.

Finally, the explanatory and control variables are discussed in this chapter. Also, the models for testing the hypotheses are specified. Logistic regression models are specified to test the effects of mispricing and internal financial constraints on equity issues including the effects of operating performance on equity issuance methods. Chapters 6 and 7 provide empirical results for the models proposed for equity issues. The models for testing the levered share repurchase behaviour of financially unconstrained firms are also defined. Chapter 8 provides empirical results for the model stated to analyse the share repurchase announcements.

Chapter 6

SHARE ISSUANCE AND FINANCIAL CONSTRAINTS

6.1. Introduction

This chapter discusses the empirical analysis of the effects of financial constraints on share issuance decisions of UK listed firms. A number of studies explore whether firms' share issuance decisions reflect mispricing. The market timing (e.g., Taggart, 1977; Marsh, 1982; Asquith and Mullins, 1986) is the prevalent developed theory, stating that managers issue equity when firms' share prices are overvalued. Several studies (e.g., Loughran and Ritter, 1995; Baker and Wurgler, 2002) empirically support the market timing theory, showing that overvalued equity is associated with significant negative abnormal announcement returns. For example, the empirical evidence by Baker and Wurgler (2002) highlights the long-term effects on capital structure of firms' market timing behaviour of equity issues. Their evidence indicates that not only do firms time their equity issues but also that the equity issues determine the long-term changes in the capital structure.

The recent financial crisis provides a new dimension to equity market timing phenomenon. The argument explored in this thesis is whether the market timing theory is incomplete, since it does not capture firms' financial constraints according to which managers time their equity issuance as long as their firms are in good enough financial condition to pay for the costs associated with external equity financing. In particular, the effects of the financial crisis not only reduced available financing in the market but it also increased the costs of such financing. For example, Korajczyk and Levy (2003) assert that firms are better placed to obtain external financing during periods of favourable market conditions. Thus, whether or not firms time their equity issues should be influenced by both the firm's own internal financial constraints and the external financial conditions.

Within a mature market, most listed firms have rather limited financial constraints, and this thesis focuses on the variation of distress during the financial crisis to test whether financial constraints influence firms' equity

issuance decisions. Ivashina and Scharfstein's (2010) highlight the significant drop of bank lending during the financial crisis showing that bank lending reduced by 47 percent in the fourth quarter of 2008 in relation to its prior quarter. Campello et al. (2010) also survey CFOs from US, European, and Asian firms and reported significant difficulties in accessing external funding during the recent financial crisis, even for funding profitable projects. More than half of the firms in their sample faced difficulties to access funding during the crisis.[36]

Studies such as Frank and Goyal (2003), Fama and French (2005), and Dong et al. (2012) look at equity issues of listed firms relative to the level of financial constraints. In particular, Dong et al. (2012) use Canadian firms' issuance decisions between 1998 and 2007 and support that the issue of overvalued equity is conditional on the level of firms' financial constraints during the whole sample period. However, Fama and French (2005), using data between 1973 and 2002, and Frank and Goyal (2003), between 1971 and 1998, find no evidence that financial constraints affect the decision of US firms to issue equity. They argue that in anticipation of investment opportunities, firms could retain cash even if they are financially constrained. These mixed results cast doubt on whether firm financial constraints impact equity issuance decisions. Using UK firm sample, this analyses the extent to which financial constraints influence market timing's predictions as long as focusing on the recent financial crisis. This chapter presents both univariate and multivariate analyses to explain the effects of financial constraints on share issuance decisions.

The chapter consists of four parts. Section 6.2 describes the sample used to perform the empirical analysis and treats outliers. Section 6.3 presents the multivariate analysis of the effects of financial constraints on share issuance decisions. Section 6.4 discusses additional results, performs logit regression diagnostic tests, and undertakes robustness checks using different estimation techniques. Section 6.5 concludes the chapter.

[36] According to Howcroft et al. (2014) even the level of syndicated banks loans, which involves a group of banks borrowing to a single party, was reduced significantly during the financial crisis among European banks.

6.2. Sample Statistics

In this section, the descriptive statistics of the variables selected to undertake the empirical analysis are discussed. The variables presented here are used in prior studies to explain equity issuance decisions of firms. Thus, the variables allow the study to test the effects of market timing and financial constraints on share issuance among listed UK firms. Section 6.2.1 presents the descriptive statistics for the final sample after outliers are considered.

6.2.1. Descriptive Statistics of Variables

This section presents the descriptive statistics of independent and control variables used to undertake the empirical analysis. It focuses on the statistics of the firm characteristics of both equity issuing and non-issuing firms.

6.2.1.1. Descriptive Statistics of Sample

Table 6.1 presents the descriptive statistics of the variables selected to estimate the effects of financial constraints on share issuance decisions. In the presence of extreme values/outliers, the regression analysis will produce spurious results that will distort analysis. In other words, outliers are deviations from the normal value that would produce meaningful results, both in statistical terms and in theory. However, even when outliers are due to errors by removing them do not necessarily reduce estimation bias (Bollinger and Chandra, 2003). The method of treating outliers depends on the magnitude and the potential effects on the analysis of the regression estimations. Therefore, for this sample, most of the variables are winsorised. Whereas trimming and truncation of data reduces the sample size, winsorising variables only restricts the magnitude of the outliers while maintaining the sample size.

Table 6.1 provides descriptive statistics of some firm characteristics that distinguish equity issuing from non-issuing firms. It also performs independent sample t-test of the mean difference between issuing and non-issuing firms. This mean difference test provides preliminary differences in firm characteristics that define issuing and non-issuing firms. Panel A shows the descriptive statistics for the issuing firms whereas Panel B displays the descriptive statistics for the matched non-issuing firms. The mean difference

tests are reported in Panel C. Firms issue equity to coincide with periods of high stock price run-ups. Thus, market timing of equity issues occurs when firms have significantly high stock prices in the period leading up to the issuance decisions. These firms issue overvalued equity in an attempt to profit from the temporary high stock prices.

Table 6.1: Comparison of Issuing and Non-issuing Firms

Panel A: Issuing firms

Variables	N	Mean	Median	S.D	Min	Max
MB	1144	4.32	2.08	6.07	0.00	28.36
Prior AR	1252	0.07	0.04	0.28	-0.44	0.75
ED	868	1.15	0.60	1.88	0.00	10.18
SIZE	1144	5.12	5.06	0.73	3.13	8.08
PROF	1257	-0.21	0.01	0.81	-4.61	2.12
CAPX	1137	0.05	0.02	0.11	-0.02	2.16
KZ	815	3.31	1.22	6.30	-1.39	38.63
Z	1154	-5.42	2.14	20.19	-87.00	19.25
LIQD	1257	0.00	0.00	0.00	-0.00	0.01

Panel B: Non-issuing firms

Variables	N	Mean	Median	S.D	Min	Max
MB	779	2.04	1.69	1.34	0.57	3.89
Prior AR	1248	0.01	0.00	0.32	-1.31	1.61
ED	790	0.47	0.26	0.38	0.10	0.99
SIZE	1257	4.29	4.34	1.90	-2.12	10.94
PROF	1070	0.08	0.09	0.10	-0.06	0.20
CAPX	1017	0.09	0.04	0.24	0.00	6.45
KZ	992	0.06	-0.05	0.25	-0.05	1.32
Z	1045	1.28	2.88	13.04	-53.55	34.68
LIQD	1257	0.00	0.00	0.00	-0.00	0.01

Variables	N	Mean	Median	S.D	Min	Max

Panel C: Test of Mean Difference of issuing and non-issuing

Variables	N	Mean difference	t-stat
MB	1923	2.28***	(10.32)
AR	2500	0.06***	(5.15)
ED	1658	0.68***	(10.01)
SIZE	2401	0.84***	(13.97)
PROF	2327	-0.28***	(-11.34)
CAPX	2154	-0.04***	(-5.55)
KZ	1807	3.25***	(16.23)
Z	2199	-6.69***	(-9.13)
LIQD	2514	0.00	(0.00)

Notes: This table shows the descriptive statistics of the variables used in the empirical analysis for both issuing and non-issuing firms after winsoring extreme values or outliers. Variables included market to book ratio (MB), pre-announcement abnormal returns (Prior AR), earnings deviation measure of asymmetric information (ED), logarithm of book value of total assets (SIZE), the ratio of earnings before interest, taxes and depreciation to total assets (PROF), ratio of capital expenditure to total assets (CAPX), financial

constraints measure (KZ), Taffler's Z score measure of financial distress (Z), and market liquidity (LIQD). T-statistics are shown in parenthesis. *** *denote significance at the 1% level.*

As can be seen from Table 6.1, the mean MB for issuing firms is 4.32 compared to 2.04 for non-issuing firms. AR is 0.07 or 7% for issuing firms and 0.01 or 1% for non-issuing firms. The mean difference for MB is 2.28 and statistically significant at the 1% level. For AR, the mean difference is 6% and significant at the 1% level. The table also shows mean difference of 0.68 for ED at 1% significance level. The difference in firm size is also positive (0.84) and significant at 1% level whereas PROF and CAPX differences are negative and significant at 1% level. Mean difference for KZ and Z score are significantly positive and negative respectively at the 1% level. Finally, the difference in LIQD is not statistically significant.

These results provide preliminary evidence consistent with the extant evidence on issuance of overpriced equity. Both MB and AR show that issuing firms are more overvalued and subsequently are more likely to time their issues than no-issuing firms. Market timing of equity issues should be consistent with low information asymmetry (Lucas and McDonald, 1990; Korajczyk, et al., 1992; Baker and Wurgler, 2002). However, the results on ED indicate that issuing firms have high information asymmetry than non-issuing firms. This could possibly explain the post issue stock returns. It also appears that issuing firms are large firms, unprofitable and do not spend much on capital expenditure. Again, the low profitability could indicate that such firms are in need of external financing without which they would be unable to undertake investment projects. Thus, the need for "near term" cash flow is consistent with equity issuing (DeAngelo et al. 2010). It also appears that issuing firms are more internally financially constrained than non-issuing firms but not internally susceptible to financial distress. Thus, issuing firms have internal cash flow limitations and external financing is readily needed. The findings about equity issuing firms are in line with prior literature about market timing (Baker and Wurgler, 2002; DeAngelo et al., 2010; Dong et al., 2012).

6.2.1.2. Yearly Average of Equity Issues

Table 6.2 presents the number of yearly equity issues during the sample period, the average value of the equity proceeds, and the average ratio of the proceeds to market value. As can be seen from the table, the annual issues are generally stable during the early part of the sample period from 1994 to 1999. During years 2000 and 2001, the number of equity issues increases significantly and drops to the levels in the 1990s between years 2002 and 2008. For the equity issue proceeds, the table show that much of the proceeds were generated between the periods from 2006 to 2009. This result is rather interesting given that the same period experienced the effects of the financial crisis. However, the ratio of proceeds to market value (PMV) indicates a stable value of proceeds per unit of firm value. It appears the large firms issued more equity during the financial crisis compared to small firms. This evidence implies that the effects of financial crisis less constrained large firms in obtaining external equity financing than would for small firms.

Table 6.2: Yearly Average Amounts and Ratio of Equity Issues

Year	N	Proceeds	PMV
1994	63	67.24	0.30
1995	63	122.70	0.35
1996	83	57.97	0.35
1997	51	44.57	0.20
1998	49	57.00	0.23
1999	58	61.67	0.26
2000	126	76.12	0.29
2001	104	136.19	1.80
2002	51	153.04	0.69
2003	77	25.92	0.11
2004	65	31.38	0.33
2005	44	76.41	0.34
2006	47	100.67	0.36
2007	83	129.40	0.30
2008	54	113.38	0.45
2009	159	250.36	1.95
2010	80	59.37	0.23
Total	1257	103.84	0.66

Notes: This table shows the annual equity issues of sample firms. It also indicates the average yearly proceeds from equity issues (PROCEEDS) and the ratio of proceeds to market value of firms (PMV).

6.2.1.3. Pearson's Correlation Matrix of Variables

Logistic regression is used to estimate the model that tests the effects of internal financial constraints on share issuance ($H_{1,}H_2$, and H_3) as explained in Section 5.3.1.4. However, OLS is used to test hypothesis H_4 and H_5 about the stock returns following share issuance. 'No multicollinearity', which is an important assumption for the OLS, requires that the explanatory variables and control variables are not perfectly or highly intercorrelated with each other. In estimating regression coefficient using OLS, everything else being equal, it is better to have less correlation between independent variables (Wooldridge, 2009, p. 98). A correlation coefficient close to or equal to +1 and -1 suggests high collinearity or perfect multicollinearity among the variables. Table 6.3 provides the Pearson's correlation matrixes of independent and control variables for the sample of equity issues.

As the shown in Table 6.3, none of the variable indicates high collinearity with the highest being 0.61 for ED and KZ. In the multivariate analysis, separate results are run excluding the ED. Most of the variables are correlated at either the 1% or 5% level, with most of the correlations lying close or below 0.20. This results implies low multicollinearity and thus tolerable for OLS estimation. The high correlation between ED and KZ indicates perhaps high correlation between asymmetric information and internal financial constraints. Also, MB seems to indicate high internal financial constraints with correlation coefficient of 0.44. Overall, the results show that multicollinearity is not a problem for estimating the regression model using OLS.

Table 6.3: Pearson's Correlation Matrix of Variables

	KZ	MB	Prior AR	ED	SIZE	PROFIT	CAPX	PMV	$CRISIS_{dum}$	MKTLIQ
KZ	1.00									
MB	0.44***	1.00								
Prior AR	0.10***	0.14***	1.00							
ED	0.61***	-0.12***	0.03	1.00						
SIZE	-0.02	0.01	0.06**	-0.01	1.00					
PROF	-0.28***	-0.23***	0.10***	-0.01	0.23***	1.00				
CAPX	0.06*	0.01	-0.06**	-0.02	-0.03	-0.13***	1.00			
PMV	0.04	-0.01	0.00	0.01	-0.06**	-0.01	-0.01	1.00		
$CRISIS_{dum}$	-0.05	-0.13***	0.01	0.12***	0.14***	-0.05*	0.01	0.04	1.00	
MKTLIQ	0.05	-0.08***	0.01	0.09***	-0.04	0.00	-0.03	-0.02	-0.01	1.00

Notes: Variables are defined as KZ index measure of internal financial constraints (KZ), market to book ratio (MB), pre-announcement abnormal returns (Prior AR), earnings deviation as measure of asymmetric information (ED), logarithm of book value of total assets (SIZE), profitability (PROFIT), capital expenditure (CAPX), ratio of issue value to market value (PMV), financial crisis dummy ($CRISIS_{dum}$) and measure of market liquidity (MKTLIQ). *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

6.3. Testing the Effects of Financial Constraints on Share Issuance

This section tests the hypotheses specified in Section 2.5.1 and 2.5.2 of Chapter 2 using the logit regression model (Model 1) stated in Chapter 5.

Model 1 discussed in Section 5.3.1.4 tests the effects of internal financial constraints on equity issues. The model is re-stated below:

$$\Pr(y_i = 1|x_i) = \beta_0 + \beta_1 KZ_{it} + \beta_2 MB_{it} + \beta_3 MB * KZ_{ti} + \sum_{i=1}^{n} \beta_i X_{it} + \varepsilon_{it} \text{.....(2)}$$

The model tests the probability of equity issuance given a set of firm characteristics for both the issuing and non-issuing firms. Since the model represent logit regression estimation, the dependent variable is 1 for issuing firm and 0 for non-issuing firm.

6.3.1. Internal Financial Constraints and Share Issuance

[Hypothesis H_1]

Hypothesis H_1 is re-stated below:

> ***H_1: There is high probability for less internally financially constrained firms to issue overvalued equity***

Table 6.4 presents the logit regression results about the probability of equity issues when firms are both mispriced and internally financially constrained. Regression Model 1 shows the results for the effects of internal financial constraints on equity issues holding constant the firm level variables including market to book ratio. Model 2 gives the results of the logit regression when internal financial constraints and mispricing are interacted (MB*KZ). Models 3 and 4 uses prior AR to proxy for stock price run-ups as alternative measure of mispricing. Here the regression outputs also contain control variables as well as year and industry dummies to control for year and industry specific effects.

The coefficient of KZ is negative but statistically insignificant in Models 1 and 1. Consistent with the hypothesis, this negative coefficient indicates that internally financially constrained firms are less likely to issue equity. First, constrained firms might have significant asymmetric information effects and second they will be less likely to pay the costs of equity issuance. However, it

can be argued that constrained firm's even need external financing to enable them invest, especially when the investments are value-increasing. But the evidence seems to suggest that financial constraints limit the demand for external equity financing. Also, the coefficient of MB is positive and statistically significant at the 1% level. More importantly, MB*KZ is significantly positive. Overall, the results provide strong evidence for market timing of equity issues. For Models 3 and 4, where ED is excluded from the control variables (due to high correlation between KZ and ED), the coefficient of KZ significant at the 5% level in Model 3. The variable of interest is the interaction term MB*KZ which tests the probability of equity issues given simultaneous effects of mispricing and internal financial constraints. The coefficient of MB*KZ is positive and statistically significant at the 1% level. Thus, the results are similar with or without the ED variable.

Consistent with the developed hypothesis (H_1), constrained firms are less likely to take advantage of issuing overvalued equity. This implies issuing overvalued equity dominates the presence of internal financial constraints. For example, whereas financially constrained firms will less likely issue equity, when this same equity is mispriced, the firms are more likely to issue even when they are financially constrained. These results do not support the findings by DeAngelo et al. (2010) and Dong et al. (2012) who assert that due to costs of equity issuance only unconstrained firms are likely to issue overvalued equity. In other words, financially unconstrained firms undertake market timing of equity issues. Constrained firms might issue overvalued equity when the overall market liquidity is high or general economic environment is favourable. These results could also mean that constrained firms are willing to trade short term advantage of issuing overvalued equity for subsequent stock price underperformance following the equity issues. The results of the odds ratios presented in Table 6.5 highlight the effects of internal financial constraints and mispricing on the probability to issue equity. For example, the odds ratio for MB*KZ of 5.257 in Model 2 implies constrained firms and overvalued firms are about 5 times more likely to issue equity than unconstrained and undervalued firms.

Table 6.4: Logit Regression Estimates of Internal Financial Constraints (KZ index) and Share Issuance

	Model 1	Model 2	Model 3	Model 4
Dependent Variable is Issuance (1) vs Non-Issuance (0)				
KZ	-1.003***	-1.931***	-0.091	-0.451**
	(0.00)	(0.00)	(0.60)	(0.03)
MB	0.479***	0.433***	0.485***	0.453***
	(0.00)	(0.00)	(0.00)	(0.00)
MB*KZ		1.660***		0.937***
		(0.00)		(0.01)
SIZE	0.287***	0.288***	0.354***	0.349***
	(0.00)	(0.00)	(0.00)	(0.00)
ED	1.160***	1.186***		
	(0.00)	(0.00)		
PROF	-4.314***	-4.191***	-5.377***	-5.203***
	(0.00)	(0.00)	(0.00)	(0.00)
CAPX	-8.631***	-8.800***	-7.993***	-8.208***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-2.061***	-1.989***	-1.825***	-1.727***
	(0.00)	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	1366	1366	1477	1477
Pseudo R^2	0.315	0.322	0.254	0.258
chi2	241.753	278.796	185.602	194.979
p-value	0.000	0.000	0.000	0.000

*Notes: This table shows the logit regression results for equity issues. The dependent variable is 1 for share issuance and 0 for non-issuance. Variables included in the regressions include KZ-index measure of internal financial constraints (KZ), market-to-book ratio (MB), the interaction term (MB*KZ), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROFIT), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* ** *and* *** *denote significance at the 5% and 1% levels respectively.*

Table 6.5: Logit Regression Estimates (Odds ratio) of Share Issuance				
	Model 1	Model 2	Model 3	Model 4
Dependent Variable is Issuance (1) vs Non-Issuance (0)				
KZ	0.367***	0.145***	0.913	0.637**
	(0.00)	(0.00)	(0.60)	(0.03)
MB	1.614***	1.542***	1.624***	1.574***
	(0.00)	(0.00)	(0.00)	(0.00)
MB*KZ		5.257***		2.552***
		(0.00)		(0.01)
SIZE	1.332***	1.334***	1.425***	1.418***
	(0.00)	(0.00)	(0.00)	(0.00)
ED	3.190***	3.275***		
	(0.00)	(0.00)		
PROF	0.013***	0.015***	0.005***	0.005***
	(0.00)	(0.00)	(0.00)	(0.00)
CAPX	0.000***	0.000***	0.000***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	1366	1366	1477	1477
pseudo R^2	0.315	0.322	0.254	0.258
chi2	241.753	278.796	185.602	194.979
p-value	0.000	0.000	0.000	0.000

*Notes: This table shows the exponentiated coefficients of the logit regression results for equity issues. The dependent variable is 1 for share issuance and 0 for non-issuance. Variables included in the regressions include KZ-index measure of internal financial constraints (KZ), market-to-book ratio (MB), interaction term (MB*KZ), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROF), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis. ** and *** denote significance at the 5% and 1% levels respectively.*

6.3.2. The Effects of External Financial Constraints

[Hypotheses H_2 and H_3]

The analysis and results produced in this section tests the following hypotheses about the effects of external financial constraints on share issuance decisions given the level of firm's internal financial constraints.

> ***H_2: Firms are more likely to issue overvalued equity when external financial constraints are low (non-financial crisis period or periods of high market liquidity)***
>
> ***H_3: The probability of issuing overvalued equity during periods of high external financial constraints increases for firms with low***

internal financially constraints than those with high internal financial constraints

The results in Table 6.6 represent the analysis of the effects of external financial constraints on the interaction between mispricing and internal financial constraints on share issuance decisions. Financial crisis and market liquidity measure external financial constraints. Pre-crisis period is defined as the period between 1994 and 2007 whereas crisis period is from 2008 to 2010. Thus, between 2008 and 2010 there are external financial constraints compared to the period prior to year 2008. Similarly, low market liquidity represents external financial constraints compared to period of high market liquidity (refer to Section 5.3.1.2 of Chapter 5. for discussions on market liquidity). The independent and control variables are the same as those used in Table 6.4. Again, Table 6.6 provides the results when financial crisis is used as proxy for external financial constraints whereas Table 6.7 gives the results for when market liquidity is a measure of external financial constraints. The results for the crisis period are shown in Models 1 and 2 of Table 6.6 respectively. Models 3 and 4 are the results for non-crisis period. Hypothesis H_2 asserts that firms issue overvalued equity during non-crisis or periods of high market liquidity. Conversely, hypothesis H_3 argues that unconstrained firms are able to issue overvalued equity during external financial constraints.

The coefficient for KZ is negative and statistically significant at the 1% level for Models 1 and 3. This implies, as already hypothesised, that internally financially constrained firms are less likely to issue equity. Since these effects are consistent in both crisis and non-crisis periods, it also implies that the equity issuance behaviour of internally financially constrained firms is independent of the level of external financial constraints. On the other hand, and in line with the market timing literature, the positive and statistically significant coefficient for MB in both Models 1 and 3 suggests that regardless of the level of external financial constraints, firms are more likely to issue overvalued equity. These results also show that large firms and firms with high asymmetric information are likely to issue equity regardless of external financial constraints. However, less profitable firms and those that undertake

less capital expenditure are more likely to issue equity. It appears profitable firms do not need external financing since they would have accumulated internal funds to undertake corporate expenditure. It also suggests that profitable firms follow the pecking order theory of external financing by which firms would issue equity only after exhausting both internal funds and debt capacity.

Table 6.6: The Effects of External Financial Constraints (Financial Crisis) on Share Issuance

	Crisis		Non-Crisis	
	Model 1	Model 2	Model 3	Model 4
Dependent Variable is Issuance (1) vs Non-Issuance (0)				
KZ	-3.233***	-1.059***	-1.254***	-0.251
	(0.00)	(0.00)	(0.00)	(0.38)
MB	0.248***	0.461***	0.458***	0.443***
	(0.01)	(0.00)	(0.00)	(0.00)
MB*KZ	-3.045***	-1.099	1.337***	1.239***
	(0.00)	(0.12)	(0.00)	(0.01)
SIZE	0.325***	0.377***	0.315***	0.393***
	(0.01)	(0.00)	(0.00)	(0.00)
ED	2.255***		0.807***	
	(0.00)		(0.00)	
PROF	-7.120***	-11.726***	-3.337***	-3.958***
	(0.00)	(0.00)	(0.00)	(0.00)
CAPX	-10.353***	-8.098***	-8.691***	-8.421***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-2.273**	-1.990***	-2.358***	-2.430***
	(0.01)	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	368	394	998	1083
Pseudo R^2	0.502	0.342	0.291	0.263
chi2	130.816	72.249	175.377	172.479
p-value	0.000	0.000	0.000	0.000

*Notes: This table displays the logit regression results for equity issues given internal and external financial constraints. The results for the crisis period are given in Model 1, non-crisis period subsample in Model 2, low market liquidity in Model 3 and high market liquidity in Model 4. The dependent variable for this logit regression is 1 for share issuance and 0 for non-issuance. Variables included in the regressions include KZ-index measure of internal financial constraints (KZ), market-to-book ratio (MB), the interaction term (KZ*MB, logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROF), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis. ** and *** denote significance at the 5% and 1% level, respectively.*

Additional variable, MB* KZ, measures the simultaneous effects of mispricing and internal financial constraints for both low and high external financial constraints. For the crisis period in Model 1, the coefficient of MB* KZ is -3.045 which is significant at the 1% level. However, the coefficient of MB*KZ for the non-crisis period is 1.337 and significant at the 1% level. In Model 4 where ED is excluded, the coefficients of MB*KZ is still positive and statistically significant at the 1% level. Table 6.7 produces the logit regression using market liquidity as a measure of external financial constraints. The coefficient of MB* KZ is again negative and significant at the 1% level for the low market liquidity subsample given in Model 2. This is different for the high market liquidity subsample where the coefficient of MB* KZ is positive and significant at the 5% level as given in Model 3. Thus, the two definitions of external financial constraints produce similar results for the effects of mispricing and internal financial constraints on share issuance decisions.

Consistent with the developed hypothesis, and prior study by McLean and Zhao (2014), frictions in the external equity market or the general economic conditions seem to have significant effects on the share issuance decisions of firms. Whereas internal financial constraints determine the demand for external financing, the level of external financial constraints influences the amount of capital that investors would be willing to provide to firms through equity offerings. Thus, market timing behaviour depends to a large extent on the overall economic conditions when firms will be better off to issue equity during periods of favourable market conditions (Korajczyk and Levy, 2003). According to the conjecture about the effects of external financial constraints, the benefits of issuing overvalued equity seem to overshadow the effects of external financial constraints for financially unconstrained firms. Similarly, for the constrained firms, the effects of internal financial constraints do not seem to impact the issue of overvalued equity when the overall external market conditions are favourable.

Overall, these results provide strong support for the hypothesis about the issuance of equity and the effects of mispricing and financial constraints. Therefore, the hypotheses H_1, H_2, and H_3 are accepted based on the results in

this section of the study. Unlike previous studies, this thesis performs analysis of equity issues for simultaneous effects of internal and external financial constraints. In other words, the issue of overvalued equity in the equity marketplace reflects both the degree of internal cash flows and external costs associated with such issues.

Table 6.7: The Effects of External Financial Constraints (Market Liquidity) on Share Issuance

	Low Market Liquidity		High Market Liquidity	
	Model 1	Model 2	Model 3	Model 4
Dependent Variables is Issuance (1) vs Non-Issuance (0)				
KZ	-2.038***	-0.414	-1.910***	-0.542
	(0.00)	(0.11)	(0.00)	(0.20)
MB	0.426***	0.420***	0.527***	0.591***
	(0.00)	(0.00)	(0.00)	(0.00)
MB*KZ	-1.689***	-0.918**	1.667**	0.829
	(0.00)	(0.02)	(0.03)	(0.22)
SIZE	0.224***	0.285***	0.452***	0.534***
	(0.00)	(0.00)	(0.00)	(0.00)
ED	1.298***		1.060***	
	(0.00)		(0.00)	
PROF	-3.448***	-4.680***	-6.762***	-7.032***
	(0.00)	(0.00)	(0.00)	(0.00)
CAPX	-9.049***	-8.509***	-6.856	-6.910
	(0.00)	(0.00)	(0.21)	(0.14)
Constant	-1.781***	-1.338***	-2.749**	-2.920***
	(0.00)	(0.01)	(0.03)	(0.00)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	962	1033	404	444
Pseudo R^2	0.296	0.223	0.425	0.367
chi2	196.177	130.704	120.903	113.487
p-value	0.000	0.000	0.000	0.000

*Notes: This table displays the logit regression results for equity issues given internal and external financial constraints. The results for the crisis period are given in Model 1, non-crisis period subsample in Model 2, low market liquidity in Model 3 and high market liquidity in Model 4. The dependent variable for this logit regression is 1 for share issuance and 0 for non-issuance. Variables included in the regressions include KZ-index measure of internal financial constraints (KZ), market-to-book ratio (MB), the interaction term (KZ*MB), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROF), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* ** *and* *** *denote significance at the 5% and 1% level, respectively.*

These results are consistent with the evidence of prior studies about market timing of equity issues (e.g. Baker and Wurgler, 2002; Dong et al., 2012).

Thus, internally financially constrained firms are less likely to issue overvalued equity. The evidence in this section further demonstrates that unconstrained firms issue overvalued equity even during periods of significant external financial constraints. Also, for the constrained firms the probability of issuing overvalued equity is evidenced only during periods of favourable economic conditions. These findings are similar to studies such as Corwin (2003); Butler et al. (2005); McLean and Zhao (2014) which argue that during crisis periods, market liquidity dampens and increases the costs of raising external equity financing. For instance, Naes et al. (2011) show that U.S. stock market liquidity is countercyclical, and argue that during recessions there is a "flight to quality" in equities. Moreover, the results of the control variables seem to provide further evidence of market timing of equity issues among UK listed firms.

6.3.3. Share Issuance, Financial Constraints and Stock Returns

[Hypothesis H_4 and H_5]

The hypotheses about stock returns are discussed in Section 2.5.4 of Chapter 2. This section tests these hypotheses using the pooled OLS regression model (Model 2) stated in Section 5.3.1.4 of Chapter 5. The hypotheses are re-stated below:

H_4: Issuance of overvalued equity is associated with more negative abnormal returns, especially for firms with high internal financially constraints

H_5: Issuance of overvalued equity is associated with more negative abnormal returns, especially for firms with high internal financially constraints and during periods of high external financial constraints

The pooled OLS estimation model used to test the hypothesis about stock returns as discussed in Section 5.3.1.4 of Chapter 5 is stated below.

$$CAR_i = \beta_0 + \beta_1 KZ_i + \beta_2 MB_i + \beta_3 KZ * MB_i + \sum_{i=1}^{n} \beta_i X_i + \varepsilon_i \text{.....(2)}$$

From the model above, the dependent variable is the cumulative abnormal returns (CAR) over 6 months post equity issue. KZ and MB are the main

independent variables with set of control variables defined in Section 5.3.1.3 of Chapter 5.

6.3.3.1. Univariate Results for Stock Returns

The extant literature provides substantial evidence of stock price underperformance following equity issues. Various explanations have been advocated to justify the stock price performance of equity issuing firms as discussed in Section 2.4 of Chapter 2. Overall, evidence suggests that stock underperformance is consistent with market timing hypothesis and overvaluation for both initial public offerings and seasoned equity offerings (Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995; Baker and Wurgler, 2000, 2002; Dong et al. 2012). Thus, by issuing overvalued equity, firms suffer from adverse market perception that the value of the firm does not reflect the true value of the fundamentals. It seems to follow that overvalued equity persists when there is significant information asymmetry associated with the equity issuing firms.

This section provides results about the short-term stock returns associated with equity issues depending on both mispricing and internal financial constraints. It further looks at how the returns behave when there are external financial constraints, particularly during the financial crisis. According to the developed hypotheses, all else equal, constrained firms that issue overvalued equity should underperform counterpart unconstrained firms. Also, the returns should be more negative for financially constrained firms that issue overvalued equity during periods of financial crisis. The rationale for this expectation is that the firm suffers from both internal constraints and possible adverse effects of friction in the external equity market and the general unfavourable economic conditions (Ivashina and Scharfstein, 2010; and McLean and Zhao, 2014).

Table 6.8 shows the univariate results. Panel A examines the abnormal stock returns for the full sample partitioned into high/low MB/KZ in line with hypothesis H_5. According to H_5, overvalued firms are associated with more negative abnormal returns, especially when they are faced with high internal financial constraints. The total abnormal returns are -9.8% (significant at the

1% level) and insignificant -0.8% for high MB and low MB respectively. The mean difference returns between high and low MB is -9.5% which is statistically significant at the 1% level. For the KZ partition, high and low KZ subsamples record abnormal returns of respectively -6.0% and 3.4%, with both significant at the 1% level. The mean difference is -2.5% which is insignificant. For the high KZ subsample, the abnormal returns for high MB and low MB are -10.2% (significant at 1% level) and 0.2% (not significant) with a mean difference which is statistically significant the 1% level. This evidence is similar to Lamont et al. (2001) who argue that financially unconstrained firms report less negative stock returns than more constrained firms. However, these results contradict Whited and Wu (2006) who explain that the financial-constraints effects dominates the firm size effects. For the low KZ firms, the mean difference returns between high and low MB is negative and statistically significant at the 1% level. Thus, the abnormal returns indicate that internal financial constraints and mispricing determines the level of stock price underperformance following equity issues. In particular, it appears that financially constrained firms perform worse when they issue overvalued equity than when the equity overvaluation is low.

Panels B and C show the abnormal returns based on the period of financial crisis and pre-crisis, respectively. Thus, the sample is split into two subsamples for crisis and non-crisis period to investigate the effects of external financial constraints on the results. The mean abnormal stock returns difference between high KZ and low KZ, during crisis period as shown in Panel B, is -11.4% and is significant at 5% level. However, for non-crisis subsample in Panel C, the mean difference returns between high KZ and low KZ firms is insignificant. For the high KZ firms, the mean difference returns between high and low MB is negative and significant at 1% level for the non-crisis period. The same evidence is true for the low KZ firms. It appears the market is unable to differentiate between high and low KZ during the pre-crisis period. Therefore, the market seems to react unfavourably to both firms when equity issues are made.

Table 6.8: Univariate Results of Abnormal Stock Returns

PANEL A: Full Sample MB and KZ

		High KZ	Low KZ	Total	Mean diff.
	N	1	2	3	t-stat
High MB	408	-0.102	-0.068	-0.098	-0.033
		(-6.41)***	(-1.53)	(-8.21)***	(-0.72)
Low MB	404	0.002	-0.024	-0.008	0.025
		(0.09)	(-0.97)	(-1.64)	(0.86)
Total	812	-0.060	-0.034	-0.053	-0.025
		(-4.16)***	(-6.30)***	(-5.89)***	(-1.06)
Mean diff		-0.104***	-0.087***	-0.095***	
t-stat		(-5.09)	(-2.98)	(-5.16)	

PANEL B: During Crisis MB and KZ

	N	High KZ	Low KZ	Total	Mean diff.
High MB	62	-0.099	0.022	-0.083	-0.121
		(-3.56)***	(0.30)	(-3.05)***	(-1.54)
Low MB	168	-0.047	0.023	-0.006	-0.070
		(-0.90)	(0.41)	(-0.29)	(-0.87)
Total	230	-0.091	0.023	-0.063	-0.114
		(-3.38)***	(0.05)	(-2.76)***	(-2.26)**
Mean diff		-0.052	-0.011	-0.066	
t-stat		(-0.93)	(-0.15)	(-1.48)	

PANEL C: Pre-Crisis MB and KZ

	N	High KZ	Low KZ	Total	Mean diff.
High MB	240	-0.139	-0.105	-0.109	-0.035
		(-2.69)**	(-5.49)***	(-7.65)***	(-0.62)
Low MB	342	-0.038	0.007	-0.008	-0.045
		(-1.41)	(0.40)	(-0.49)	(-1.41)
Total	582	-0.057	-0.048	-0.050	-0.009
		(-3.84)	(-4.66)***	(-5.21)***	(-0.34)
Mean diff		-0.109	-0.116	-0.108	
t-stat		(-3.41)***	(-5.16)***	(-5.26)***	

Notes: The table shows the abnormal stock returns associated with share issues. Panel A displays the results for the short run returns based for the full sample partitioned into high/low KZ and MB. Panel B shows the stock returns for crisis period (2008-2010) and Panel C for the non-crisis period (1994-2007). T-statistics are shown in parenthesis. ** *and* *** *denote significance at the 5% and 1% level, respectively.*

Overall, the evidence is consistent with prior findings about post-issue stock returns. But importantly, internal financial constraints seem to explain the level of stock underperformance for overvalued firms. Given that the results in Section 6.5.1 suggest that financially constrained firms are less likely to issue overvalued equity, the more negative stock returns associated with such firms justify why these firms would rather not issue overvalued equity. Financially unconstrained firms are better off than constrained firms when they issue overvalued equity. These findings are consistent with Dong et al. (2012) who

indicate that due to issuance costs, unconstrained firms rather than constrained firms should issue overvalued equity. However, the univariate results on post-issue stock returns do not entirely support the findings by Korajczyk and Levy (2003) and McLean and Zhao (2014) about the effects of external financial constraints on equity issuance. This can be extended to imply that the market is unable to differentiate better performing firms from poor performing firms when there are adverse general economic conditions. In sum, the equity issuance decisions and the subsequent stock price performance is determined by the combined effects of both mispricing and internal/external financial constraints.

6.3.3.2. Cross-Sectional Regression Results for Stock Returns

Table 6.9 reports the results for pooled cross-sectional regressions estimation of the short run abnormal stock returns associated with equity issues. The dependent variable is short-run abnormal stock returns, CAR (2,120) using Model 2 discussed in Section 5.3.1.1 and Section 5.3.1.4 of Chapter 5 respectively. According to hypothesis H_4 financially constrained firms that issue overvalued equity are associated with more negative abnormal stock returns than unconstrained firms. Hypothesis H_5, on the other hand, explores the effects of external financial constraints on the stock returns of equity issuing firms given the level of internal financial constraints. Model 1 provides the results for the full sample, Model 2 gives the results for the sample period during the financial crisis and Model 3 restricts the sample period to the pre-crisis period. As usual, pre-crisis period is defined as the period between 1994 and 2007 whereas crisis period is from 2008 to 2010. The independent and control variables are the same as those used in Table 6.4.

From Model 1 for the full sample, the coefficient of KZ is not statistically significant. Also, MB has a coefficient of 0.008 that is statistically significant at the 1% level. The coefficients of SIZE and ED are not significant with PROF also showing a positive and statistically significant coefficient at the 1% level. CAPX shows a positive and marginally significant coefficient at the 10% level. These results imply that the level of internal financial constraints do not affect stock returns of equity issuing firms. MB does not show the expected

sign for negative effects of overvaluation on stock returns. It also shows that profitable firms are associated with positive stock price response whereas capital expenditure has marginal positive effects on stock returns. Finally, the coefficient of MB*KZ is not statistically significant for the full sample.

Table 6.9: Cross-sectional Regression Analysis of Share Issuance and Short Run Stock Returns

	Full	Crisis	Non-Crisis
	Model 1	Model 2	Model 3
Dependent Variable is the Post-announcement CAR$_{(2,120)}$			
KZ	0.068	0.322***	-0.048
	(0.26)	(0.01)	(0.45)
MB	0.008***	0.009	0.008***
	(0.00)	(0.14)	(0.01)
MB*KZ	-0.065	-0.296**	0.030
	(0.27)	(0.02)	(0.63)
SIZE	0.027	0.026	0.036*
	(0.11)	(0.47)	(0.08)
ED	-0.013	-0.042**	-0.005
	(0.16)	(0.02)	(0.65)
PROF	0.056***	0.024	0.054***
	(0.00)	(0.59)	(0.00)
CAPX	0.240**	-0.040	0.302**
	(0.05)	(0.89)	(0.02)
Constant	-0.198*	-0.117	-0.293**
	(0.05)	(0.54)	(0.02)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	756	226	530
adj. R^2	0.125	0.150	0.132

*Notes: This table shows the cross-sectional regression results for stock returns. The results for the full sample are given in Model 1, crisis period subsample in Model 2 and non-crisis period subsample in Model 3. The dependent variable CAR (2,120). Variables included in the regressions include KZ measure of internal financial constraints, market-to-book ratio (MB), the interaction term (KZ*MB), prior stock returns (Prior AR), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROF), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.*

The results for the crisis and non-crisis subsamples shed more light on the stock returns impacts of equity issuance decisions. In Models 2 and 3, the coefficient of KZ is positive and significant at 1% level and negative and insignificant respectively. MB is positive in both models but only significant in Model 3. The coefficient of ED is negative and statistically significant at the

5% level in Model 2 indicating the adverse selection costs of equity issues. Profitable firms and capital expenditure are associated with positive post issue returns in the non-crisis period. More importantly, the coefficient of the interaction term MB*KZ is negative and statistically significant at the 5% level for the crisis period whereas it is not significant during the non-crisis period.

It appears the multivariate analysis suggests that the effects of internal financial constraints and mispricing on stock returns of equity issuing firms are influenced by the crisis period. Periods of financial crisis between 2008-2010 are characterised by significant slump in stock prices. Moreover, the supply of equity financing is low with high associated transaction costs. Taken together, these features of the stock market during financial crisis mean that firms issuing equity are likely to generate low post-issue stock returns. Given that overvaluation and internal financial constraints are associated with stock price underperformance of equity issuing firms, the hypothesis about stock price is accepted. Hence, the issue of overvalued equity by internally financially constrained firms is associated with stock price underperformance, especially during significant external financial constraints.

6.4. Robustness Checks and Additional Results

This section provides additional analysis to ensure the results are robustness to alternative definitions of internal financial constraints. It also presents logit regression diagnostic tests and the results using alternative estimation technique for the main results.

6.4.1. Internal Financial Constraints (WW index) and Share Issuance

The results in Table 6.10 analyses the effects of financial constraints on share issuance in testing hypothesis H_1. Here, the financial constraints measure is the Whited and Wu (2006) index. Using alternative measure of internal financial constraints enhances the robustness of the results when the KZ-index was used. Studies such as Chen and Wang (2012) use this measure together with the KZ-index to test the effects of financial constraints on share repurchase. Models 1 and 2 use market to book ratio as proxy for mispricing, whereas Models 3 and 4 use prior stock returns as measure of mispricing. This is similar to Table 6.4

and also includes the interaction term MB*WW to measure the effects of mispricing and internal financial constraints on share issuance as shown in Models 2 and 4.

Table 6.10: Logit Regression Estimates of Internal Financial Constraints (WW index) and Share Issuance

	Model 1	Model 2	Model 3	Model 4
Dependent Variable is Issuance (1) vs Non-Issuance (0)				
WW	0.171	0.651**	-0.047	0.391*
	(0.38)	(0.01)	(0.78)	(0.06)
MB	0.433***	0.479***	0.414***	0.449***
	(0.00)	(0.00)	(0.00)	(0.00)
MB*WW		1.049***		0.988***
		(0.00)		(0.00)
SIZE	0.277***	0.286***	0.317***	0.332***
	(0.00)	(0.00)	(0.00)	(0.00)
ED	1.003***	0.981***		
	(0.00)	(0.00)		
PROF	-3.858***	-3.850***	-4.598***	-4.697***
	(0.00)	(0.00)	(0.00)	(0.00)
CAPX	-9.552***	-9.512***	-5.679***	-5.655***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-1.399**	-1.535***	-0.897*	-1.083**
	(0.01)	(0.01)	(0.06)	(0.02)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	1176	1176	1517	1517
Pseudo R^2	0.301	0.307	0.226	0.232
chi2	203.286	208.807	117.392	127.065
p-value	0.000	0.000	0.000	0.000

*Notes: This table shows the logit regression results for equity issues. The dependent variable is 1 for share issuance and 0 for non-issuance. Variables included in the regressions include WW-index measure of internal financial constraints (WW), market-to-book ratio (MB), the interaction term (MB*WW), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROFIT), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* ** *and* *** *denote significance at the 5% and 1% levels respectively.*

From the table, the coefficient of the interaction term MB*WW is positive and statistically significant at the 1% level. This result indicates that financially constrained firms issue overvalued equity. But perhaps, as argued in hypothesis H_2 the effects of external financial constraints might drive the issue of overvalued equity beyond the effects of internal financial constraints. What the results show is both KZ index and WW index provide similar outcome of the

effects of internal financial constraints on share issuance. The positive coefficient of MB*WW in Model 4 is similar to that in Model 2 and indicates that excluding ED due to high correlation with KZ does not affect the results.

6.4.2. Share Issuance and the Effects of Financial Distress

Additional tests of the probability of equity issues use financial distress to proxy for internal financial constraints. Firms that have high costs of financial distress are highly levered firms with limited debt capacity to issue debt financing and hence suffer from significant costs of bankruptcy. As explained earlier, financially distressed firms are more likely to require external equity financing unless high costs of external financing restricts their ability to issue overvalued equity. Also, given that equity issues are associated with high transactions costs, financially distressed firms may be unable to afford such issues. In the logit regression in Table 6.11, Z is the Taffler's Z score measure of financial distressed discussed in Section 5.3.1.2 of Chapter 5. The control variables are the same as used in the previous regressions.

In line with the hypothesis, the coefficient of the interaction term MB*Z is negative for the full sample (Model 1) and the crisis period subsample (Model 2) and statistically significant at the 1% level and 5% level respectively. In Model 3, which represents the non-crisis period subsample, the coefficient of Z*MB is positive and significant at the 1% level. Like previous results, this result indicates that financially distressed firms are less likely to issue overvalued equity, especially during financial crisis. However, in the non-crisis period these firms are more likely to issue overvalued equity apparently because the external market conditions favour stock price performance than during crisis period. Thus, costs of external financing play a key role in market timing. Costs of external financing reflect lack of available finance and low investor sentiments such that investors are less likely to purchase shares that are riskier during financial crisis and/or low market liquidity. Overall, the findings are consistent with financial constraints impact on market timing.

Table 6.11: The Effects of Financial Distress on Share Issuance			
	Full Model 1	Crisis Model 2	Non-crisis Model 3
Dependent Variable is Issuance (1) vs Non-Issuance (0)			
Z	0.132	0.883**	-0.352
	(0.52)	(0.04)	(0.20)
MB	0.550***	0.386***	0.543***
	(0.00)	(0.00)	(0.00)
MB*Z	-1.406***	-1.514**	1.045***
	(0.00)	(0.03)	(0.00)
SIZE	0.293***	0.319**	0.333***
	(0.00)	(0.02)	(0.00)
ED	0.977***	1.912***	0.637***
	(0.00)	(0.00)	(0.00)
PROF	-4.568***	-6.808***	-3.976***
	(0.00)	(0.00)	(0.00)
CAPX	-8.317***	-10.147***	-8.097***
	(0.00)	(0.00)	(0.00)
Constant	-1.729***	-2.340**	-2.048***
	(0.00)	(0.02)	(0.00)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	1299	354	945
Pseudo R^2	0.311	0.464	0.290
chi2	227.144	92.252	157.826
p-value	0.000	0.000	0.000

*Notes: This table shows the logit regression results for equity issues given financial distress. The results for the full sample are given in Model 1, crisis period subsample in Model 2 and non-crisis period subsample in Model 3. The dependent variable for this logit regression is 1 for share issuance and 0 for non-issuance. Variables included in the regressions include Taffler's Z score measure of financial distress (Z), market-to-book ratio (MB), the interaction term (Z*MB), prior stock returns (Prior AR), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROF), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.*

6.4.3. Tobit Regression Estimation of Equity Issues

Table 6.12 provides the tobit regression results for equity issues given financial constraints and mispricing. The dependent variable is the dollar value of equity issues divided by the market value of equity. This variable explains the effects of financial constraints and mispricing on the amount of shares issued. Model 1 give the results of the effects of internal financial constraints (KZ) and market to book ratio (MB) on the value of equity issued whereas Model 2 examines

the simultaneously effects of mispricing and internal financial constraints (MB*KZ) on the value of equity issued. Models 3 and 4 exclude ED as a control variable due to high correlation with KZ. As can be seen from the table, the coefficient of MB*KZ is positive and statistically significant at the 1% level in Models 1 and 3, indicating that financially constrained firms issue overvalued equity.

Table 6.12: Tobit Regression Analysis of Internal Financial Constraints and Share Issuance

	Model 1	Model 2	Model 3	Model 4
Dependent Variable is Proceeds over Market Value (P/MV)				
KZ	1.697***	0.324	1.205***	-0.130
	(0.00)	(0.27)	(0.00)	(0.54)
MB	-0.000	-0.013	0.014	-0.011
	(0.99)	(0.31)	(0.24)	(0.36)
MB*KZ		1.665***		1.966***
		(0.00)		(0.00)
SIZE	-0.880***	-0.876***	-0.831***	-0.840***
	(0.00)	(0.00)	(0.00)	(0.00)
ED	-0.187***	-0.095**		
	(0.00)	(0.01)		
PROF	0.234***	0.254***	0.166**	0.211***
	(0.00)	(0.00)	(0.03)	(0.01)
CAPX	-0.269	-0.407	-0.148	-0.396
	(0.78)	(0.67)	(0.88)	(0.68)
Constant	8.530***	8.448***	7.956***	8.017***
	(0.00)	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	752	752	763	763
Pseudo R^2	0.006	0.006	0.006	0.006
p-value	0.000	0.000	0.000	0.000

*Notes: This table shows the Tobit regression results for equity issues. The dependent variable is the dollar value of share repurchase divided by the prior year market value of equity. Variables included in the regressions include KZ-index measure of internal financial constraints (KZ), market-to-book ratio (MB), the interaction term (MB*KZ), prior stock returns (Prior AR), the interaction term (AR*KZ), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROF), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.** and *** denote significance at the 5% and 1% level respectively.*

6.4.4. Random and Fixed Effects Logit Regression Estimation

The random and fixed effects regressions are estimated as robustness check. Whereas logit regression is the main estimation technique and estimates as

cross-sectional regression, random and fixed effects accounts for the time series aspect of the data. Fixed effects estimation leads to significant loss in efficiency that is compensated by consistent coefficients. Thus, standard errors are larger for fixed effects estimation because of loss of observations by dropping all time-invariant regressors. Coefficients of time-varying independent variables may even be difficult to identify in nonlinear models with fixed effects (Cameron and Trivedi, 2005, p. 715). Fixed effects use only within variation of the regressors and are much less precise compared to random effects model. This contrasts with the random effects estimation that corrects for individual correlation over time.

The random effects logit regression model is stated as follows:

$$\Pr(y_{it} = 1|x_{it}) = \beta_0 + \beta_1 KZ_{it} + \beta_2 MB_{it} + \beta_3 MB * KZ_{ti} + \sum_{i=1}^{n} \beta_i X_{it} + \alpha_i + \varepsilon_{it} \text{.....(1)}$$

And the fixed effects logit regression model is given below.

$$\Pr(y_{it} = 1|x_{it}) = \beta_1 KZ_{it} + \beta_2 MB_{it} + \beta_3 MB * KZ_{ti} + \sum_{i=1}^{n} \beta_i X_{it} + \alpha_i + \varepsilon_{it} \text{.....(2)}$$

The results presented in Table 6.14 are the random and fixed effects estimation of the main results.

From the table, Models 1, 2, and 3 are for random effects whereas fixed effects estimation results are given in Models 4 to 6. Both the random effects and fixed effects results confirm the previous findings reported in the chapter about the effects of financial constraints and mispricing on share issuance decisions. Here again, the coefficient of KZ is significantly negative for all the models whereas MB is significantly positive. Also, the coefficient of the interaction term KZ*MB is significantly positive in all the models. These results provide further emphasis that internally financially constrained firms are less likely to issue equity. It also shows that firms are more likely to issue overvalued equity. However, given overvalued equity, internally financially constrained firms are more likely to issue equity indicating that internally financially constrained firms probably derive significant benefits from issuing overvalued equity. Thus, the results after using alternative estimation techniques still support the

hypotheses about the effects of internal financial constraints and mispricing on share issuance decisions.

Table 6.13: Random and Fixed Effects Logit Regression Estimation (Financial Constraints and Share Issuance)

	Random Effects		Fixed Effects	
Variables	(1)	(2)	(3)	(4)
Dependent Variable is Issuance (1) vs Non-Issuance (0)				
KZ	-0.943***	-1.831***	-0.867***	-2.161***
	(0.00)	(0.00)	(0.00)	(0.00)
MB	0.434***	0.392***	0.217***	0.182***
	(0.00)	(0.00)	(0.00)	(0.00)
MB*KZ		1.556***		2.201***
		(0.00)		(0.00)
SIZE	0.288***	0.289***	0.412***	0.397***
	(0.00)	(0.00)	(0.00)	(0.00)
ED	1.169***	1.179***	0.811***	0.860***
	(0.00)	(0.00)	(0.00)	(0.00)
PROF	-4.122***	-4.008***	-1.483***	-1.506***
	(0.00)	(0.00)	(0.00)	(0.00)
CAPX	-7.667***	-7.839***	-8.463***	-8.561***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-2.268***	-2.184***		
	(0.00)	(0.00)		
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	1366	1366	1366	1366
pseudo R^2			0.255	0.267
chi-squared	232.996	235.243	449.709	471.257
p-value	0.000	0.000	0.000	0.000

*Notes: This table shows the random and fixed effects logit regression results for equity issues. The results for random effects logit regression are given in Models 1 to 3 whereas fixed effects logit regression results are shown in Models 4 to 6. The dependent variable for this logit regression is 1 for share issuance and 0 for non-issuance. Variables included in the regressions include KZ measure of internal financial constraints (KZ), market-to-book ratio (MB), the interaction term (MB*KZ), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROF), capital expenditure (CAPX) and Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.*

Similarly, further analysis of the effects of external financial constraints on equity issuance given the interaction of internal financial constraints and mispricing is robust to random and fixed effects estimations. Table 6.14 shows

that constrained firms are likely to issue overvalued equity only during periods of economic upturn. However, during crisis periods, as shown in both the random and effects models, only financially unconstrained firms are likely to issue overvalued equity.

Table 6.14: Random and Fixed Effects Logit Regression Estimation Financial Constraints and Share Issuance (Crisis and Non-crisis)

	Random Effects		Fixed Effects	
	Crisis	Non-crisis	Crisis	Non-crisis
Variables	1	2	3	4
Dependent Variable is Issuance (1) vs Non-Issuance (0)				
KZ	-3.523***	-1.027**	-3.672***	-1.071***
	(0.00)	(0.02)	(0.00)	(0.01)
MB	0.268***	0.398***	-0.036	0.301***
	(0.01)	(0.00)	(0.53)	(0.00)
MB*KZ	3.173***	1.249**	4.260***	1.358***
	(0.00)	(0.02)	(0.00)	(0.01)
SIZE	0.326***	0.289***	0.321***	0.341***
	(0.01)	(0.00)	(0.00)	(0.00)
ED	2.149***	0.799***	1.171***	0.710***
	(0.00)	(0.00)	(0.00)	(0.00)
PROF	-7.300***	-3.020***	-2.921***	-1.752***
	(0.00)	(0.00)	(0.00)	(0.00)
CAPX	-9.739***	-7.853***	-7.685***	-8.221***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-2.424***	-2.157***		
	(0.00)	(0.00)		
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	368	998	368	998
pseudo R^2			0.422	0.262
chi-squared	80.140	150.627	200.488	337.112
p	0.000	0.000	0.000	0.000

*Notes: This table displays the random and fixed effects logit regression results for equity issues given internal and external financial constraints. The results for the random effects estimation are given in model 1 (crisis) and 2 (non-crisis) and for fixed effects in model 3 (crisis) and 4 (non-crisis). The dependent variable for this logit regression is 1 for share issuance and 0 for non-issuance. Variables included in the regressions include KZ-index measure of internal financial constraints (KZ), market-to-book ratio (MB), and the interaction term (MB*KZ), logarithm of book value of total assets (SIZE), earnings deviation (ED) which measures asymmetric information effects, profitability (PROF), capital expenditure (CAPX) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* ** *and* *** *denote significance at the 5% and 1% level, respectively.*

These results demonstrate the robustness of the earlier results using the logit regression estimation. Overall, the results in this chapter are robust to the

alternative estimation technique and further strengthen the hypothesis that both internal and external financial constraints play important roles in the market timing of equity issues. It is only when there are external financial constraints will financially constrained firms be restricted in their attempts to time their equity issues.

A formal test of the appropriateness and comparison of random and fixed effects models is carried. Appendices 6A to 6C present the hausman test output for comparing random and fixed effects estimations. The starting point for the hausman test is that the two models do not produce significantly different coefficients. Thus, the null hypothesis is that the coefficient is not different between random and fixed effects in which case both estimations are appropriate otherwise the fixed effects is chosen because it gives consistent coefficients. As can be seen from the hausman test output in Appendix 6A, the chi-square is 185 and probability is 0.0000 indicating that the null hypothesis is rejected in favour of the alternative hypothesis. Therefore, the difference in the coefficients between random and fixed effects is systematic. Hence, the fixed effects output is more appropriate with consistent coefficient.

6.5. Conclusion

This chapter presented empirical results to explore the share issuance decisions of firms. It specifically investigated the simultaneous effects of financial constraints and mispricing on share issuance decisions. The main hypothesis tested in this chapter was that financial constraints limits market timing of equity issues. Thus, financially constraints firms are less likely to issue overvalued equity, especially when market conditions are unfavourable. This hypothesis emphasised that the costs of issuing equity increases substantially when there is economic crisis that also limits the availability of financing. The implication of this hypothesis was that financially unconstrained firms would be in a better position to issue overvalued equity even when the market conditions are less favourable. The results used the Kaplan and Zingales (1997) index and Whited and Wu (2006) index as well as Taffler's Z score as the proxies for internal financial constraints. Financial crisis and market liquidity are proxies for external financial constraints.

Consistent with prior studies, the results of this chapter support the developed hypotheses H_1, H_2, and H_3 about share issuance and financial constraints. The results presented in this chapter show that financially constrained firms are more likely to issue overvalued equity. Results further support the effects of external financial constraints on the interaction between internal financial constraints and mispricing. Specifically, the results showed in this chapter stress that firms are more likely to issue overvalued equity during periods of favourable market conditions or during non-crisis period, even when they are financially constrained. Thus, favourable market conditions allow firms to, regardless of their internal financing constraints, to exploit overvaluation advantages. However, only unconstrained firms are able to issue overvalued equity during periods of significant external financing constraints. Moreover, the chapter addresses issues with estimation assumptions and also presented results using alternative proxies for financial constraints. Finally, the chapter presented robust results for alternative estimation techniques.

The findings in this chapter highlight the market timing activities of firms. Studies such as Stein (1996), Graham and Harvey (2001), Baker and Wurgler (2002), Dong et al. (2012), all find evidence about equity market timing by which firms issue overvalued equity. Also, Korajczyk and Levy (2003), Dong et al. (2012) and (McLean and Zhao, 2014) assert that internal financial constraints restricts external financing. However, the results in this chapter differ markedly from prior studies on several fronts. For example, Baker and Wurgler (2002) do not explore the effects of financial constraints on equity market timing and Dong et al. (2012) only investigate the effects of internal financial constraints on equity issues. The results presented in this chapter, on the other hand, synthesise the effects of both internal and external financial constraints and demonstrate how these two determine the issuance of overvalued equity. This evidence has not previously been explored in the literature and therefore the results presented in this chapter extend the extant literature on equity issuance and market timing.

Chapter 7
SHARE ISSUANCE METHODS AND OPERATING PERFORMANCE

7.1. Introduction

This section presents the empirical results and discusses the effects of operating performance on the choice of share issuance methods and the subsequent long run stock returns associated with rights issues, open offers, and private placement. Firms that issue equity tend to be associated with poor long-term stock performance (Loughran and Ritter, 1995; Kabir and Roosenboom, 2003; Capstaff and Fletcher, 2011). Three main explanations have been suggested for this price pattern. According to the information asymmetry hypothesis (e.g., Myers and Majluf, 1984), managers have superior knowledge about their firms, compared to market participants, and use their private information to issue equity prior to public knowledge. Loughran and Ritter (1997) assert that investor over-optimism at the time of equity issue causes firms to overweigh recent good operating performance consistent with the over-optimism hypothesis. Finally, according to the window of opportunity hypothesis (Choe et al., 1993; Bayless and Chaplinsky, 1996), overvalued firms issue equity during favourable market conditions. Long-term stock returns tend to be poor after issuance, and are significantly in the magnitude based on the equity issuance method used.

This study sheds light on why long-term stock returns after issuance tend to be poor and, more importantly, why alternative issuance methods are associated with different levels of long-term stock returns. As argued in this thesis, firms that make rights issues have less incentive to sell equity with poor prospects, since existing shareholders sell shares to themselves in comparison to counterpart private placements and open offers. Based on the information asymmetry hypothesis, managers are therefore expected to use their inside information to select the issuance method. Since operating performance may vary after the issuance of alternative methods, the long-term stock returns would vary accordingly. In line with a number of studies in the literature (e.g.,

Cooper et al., 2008), operating performance is related positively with stock returns, and therefore rights issues are expected to result in better operating performance and long-term stock returns after issuance compared to counterpart private placements and open offers.

Several studies demonstrate that the method of equity issuance has implications for post-issue stock returns (Slovin et al., 2000; Barnes and Walker, 2006; Armitage, 2010; Capstaff and Fletcher, 2011) and operating performance (Loughran and Ritter, 1997; Hertzel et al., 2002; Kabir and Roosenboom, 2003). These findings suggest a direct relationship between the post-issue long run stock returns and the operating performance. Hence, as argued in the extant literature, not only does the issuance method choice affect the long run stock performance but this performance is largely dependent on the level of operating performance. It is argued that firms' expectations about future operating performance can be exploited in the choice of issuance method. If firms were motivated to maximise shareholder value, then they would more likely choose rights offerings when operating performance is anticipated to be good. The choice of rights issues transfers part of the benefits to the existing shareholders. Stated another way, for anticipated poor operating performance, issuance which involves outside investors will be preferred in order to exploit less informed investors, all other things being equal. Thus, this study tests the effects of long-term operating performance on the decision to choose one equity issuance method over other(s).

Unlike UK, where three issuance methods exist for firms, rights issues are the main equity issuance method in many European countries (e.g., Gajewski and Ginglinger, 2002; Bohren et al., 1997; Tsangarakis, 1996; Pastor-Llorca and Martin-Ugedo, 2004), but is uncommon in the US where firm commitments are the method most commonly used. Eckbo and Masulis (1992) and Kothare (1997) explain that US firms' non-selection of rights offerings may be due to relatively high transaction costs and capital gain taxes, and they estimate that more than 80% of US equity issuance is for non-rights offerings. Therefore, UK equity issues constitute three widely used equity issuance methods and offer an ideal environment to explore whether information asymmetry and

firms' operating performance after issuance is aligned with differential long-term stock returns.

The literature on the choice of equity issuance has been widely explored in the UK where firms are entitled to issue equity through rights issues, open offers, and private placement. Largely, such decisions have been attributed to the motivations of the market timing theory by which firms issue overvalued equity. However, the evidence is mixed even though most studies (for example Slovin et al. 2000; Barnes and Walker, 2006) find that rights issues are more likely to be timed. Information asymmetry is a related theory to market timing by which firms are deemed to have inside information about the issue more than the investors. Therefore, firms are likely to be influenced by such information to exploit potential investors through the issuance method. Operating performance is one variable which firms can have a better forecast than outside investors who will need more information, mostly at a cost, to determine the true value of an issuing firm. Thus, the hypotheses explained in Section 3.5 of Chapter 3 explore the influence of expected operating performance in determining whether a firm chooses rights issues, open offers, or private placement at the time of equity issues. Specifically, the study predicts that firms are more likely to choose rights issues than open offer or private placement when they anticipate high operating performance. It follows, therefore, that rights issuing firms are associated with less negative post-issue long run stock price performance compared to open offers and private placement.

The chapter consists of four parts. Section 7.2 describes the sample used to perform the empirical analysis. Section 7.3 presents the multivariate analysis of the effects of operating performance on the choice of equity issuance method and the subsequent stock price performance. Section 7.4 discusses additional results and performs robustness checks using alternative definitions of operating performance and estimation techniques. It also conducts logit regression diagnostic tests to determine the appropriateness of the models. Section 7.5 concludes the chapter.

7.2. Sample Statistics and Diagnostics

This section discusses the descriptive statistics of the variables used to undertake the empirical analysis. The study follows prior studies and uses variables that explain the choice of equity issuance method. Section 7.1.1 presents the descriptive statistics for the final sample.

7.2.1. Descriptive Statistics of Independent and Control Variables

This section presents the descriptive statistics of independent and control variables used to undertake the empirical analysis. It focuses on the statistics of the firm characteristics of equity issues and issuance methods. Thus, the equity sample is divided into rights issues (RI), open offers (OO), and private placement (PP).

7.2.1.1. Equity Issues by Issuance Method during the Sample Period

Table 7.1 presents the number of yearly equity issues that are made through rights issues, open offers, and private placement over the sample period. It also includes the anticipated proceeds from the equity issues, and the average ratio of the proceeds to market value for each issuance method. The results in the table show that rights issues were relatively more dominant in the early part of the sample period. However, private placement increased significantly in the year 2000 and 2001 and was relatively dominant from 2008 to 2010. Thus, more issues are made through private placement and open offers than rights issues, und relying the 'rights issues demise' phenomenon. Both Burton et al. (2005) and Armitage (2007) show that rights issue have significantly reduced as an equity issuance method at least in the period after the year 2000. Also, it can be seen from the table that the amount of proceeds from rights issues is higher than those generated from open offers and private placement. This is surprising given that greater number of private placement and open offers are made by equity issuing firms than rights issues. It appears open offers and private placement attract higher issue price discount to appeal to or compensate the new investors.

Finally, the ratio of proceeds to market value indicates a stable value of proceeds per unit of firm value. During the years 2001, 2002, 2004 2008, and

2009, the proceeds per market value for rights issues is greater than one indicating that the proceeds is more than 1 times the firm size. In fact, the total proceeds per market value for rights issues is 2.51 compared to 0.13 and 0.27 for open offers and private placement respectively. This implies small firms make rights issues or that the proceeds far exceed the value of the firm. It could also suggest that the stock price of rights issues is relatively higher than that of open offers and private placement.

Table 7.1: Yearly Average Amounts and Ratio of Equity Issues

	Rights Issues			Open Offers			Private Placement		
Year	N	Proceeds	PMV	N	Proceeds	PMV	N	Proceeds	PMV
1994	42	73.36	0.23	0	0.00	0.00	21	55.00	0.43
1995	39	86.86	0.42	0	0.00	0.00	24	180.92	0.24
1996	48	71.48	0.46	0	0.00	0.00	35	39.44	0.19
1997	29	54.97	0.20	10	30.29	0.29	12	31.34	0.15
1998	17	94.52	0.39	27	37.55	0.14	5	34.50	0.15
1999	16	100.32	0.28	26	36.55	0.22	16	63.84	0.31
2000	18	284.13	0.98	47	32.29	0.18	61	48.52	0.19
2001	19	493.61	9.21	44	16.23	0.08	41	99.31	0.23
2002	13	569.76	2.80	29	4.55	0.03	9	29.58	0.19
2003	11	23.99	0.15	41	15.18	0.06	25	44.40	0.18
2004	11	80.39	1.55	29	8.89	0.06	25	35.91	0.21
2005	19	135.71	0.45	4	20.55	0.11	21	33.40	0.28
2006	11	203.24	0.55	4	51.59	0.19	32	71.55	0.32
2007	2	163.38	0.64	10	110.82	0.30	71	131.06	0.30
2008	7	241.07	1.16	8	46.23	0.22	39	104.23	0.36
2009	24	872.36	12.08	29	77.79	0.17	106	156.75	0.38
2010	2	196.01	0.41	13	16.97	0.13	65	63.65	0.24
Total	328	200.95	1.96	321	30.39	0.13	608	90.24	0.28

This table shows the annual equity issues of sample firms for rights issues, open offers, and private placement. It also indicates the average yearly proceeds from equity issues (PROCEEDS) and the ratio of proceeds to market value of firms (PMV).

7.2.1.2. Descriptive Statistics of Variables

Table 7.2 provides the descriptive statistics for rights issues (Panel A), open offers (Panel B), and private placement (Panel C). It also shows the t-test of the mean difference between rights issues and open offers on one hand and rights issues and private placement on the other hand (as shown in Panel D). The variables include market to book ratio (MB), pre-issue announcement date abnormal returns (Prior AR), profitability (PROF), logarithm of market value (SIZE), issue price discount (DISC), accrual quality as a measure of earnings management (ACC_QUAL), idiosyncratic risk (RISK), issue proceeds

(PROCEEDS) and the proceeds relative to market value (PMV). These variables measure both firm and issue quality and determines the choice of issuance method as discussed in Section 5.3.2.3 of Chapter 5.

As can be seen from the table, rights issues firms report highest MB of 4.49 compared to 4.02 and 4.31 for open offers and private placement, respectively. However, the mean difference tests show that the MB values are not different for rights issues, open offers and private placement. For the prior AR, rights also experience lower stock returns (Prior AR) prior to the issuance than open offers and private placement. In particular, the cumulative abnormal returns prior to each issuance are 2.0% for rights issues, 6.0% for open offers and 10.0% for private placements. It also shows that private placement experience statistically significant higher returns than rights issuing firms with mean difference of 8.2% significant at the 1% level. This result indicates that private placement is more likely to be timed when firms experience stock price run-ups. Moreover, PROF shows that rights issuing firms are better performing firms than those which conduct open offers and private placement. Overall, these results offer the first indication that managers that issue equity through rights issues have less of an incentive to time their equity issues using rights issues.

Furthermore, rights issuers are also bigger firms than open offers, as indicated by SIZE. Rights issues are associated with lower discount (DISC), accruals quality (ACC_QUAL) and idiosyncratic volatility RISK than private placements, and rights issuers generated more proceeds both in money terms and per unit of market value. These results are consistent with the hypothesis that rights issuing firms are less likely to exploit existing shareholders by issuing overvalued equity. On the contrary, it appears firms using private placement are of low quality seeking to exploit investors who might have insufficient about the firm. These results show that rights issues are perceived as a high quality issuance method, with lower information asymmetry.

Table 7.2: Summary Statistics of Firm Characteristics

PANEL A: Rights Issues (RI)

Variables	N	Mean	Median	SD	Min	Max
MB	293	4.31	2.06	6.18	0.01	25.55
Prior AR	327	0.02	0.01	0.24	-0.44	0.75
PROF	313	0.08	0.09	0.04	0.02	0.12
SIZE	307	11.24	11.43	1.89	6.58	18.15
DISC	263	0.53	0.13	0.86	-0.34	1.64
ACC_QUAL	240	0.08	0.05	0.09	0.00	0.65
RISK	327	0.03	0.02	0.02	0.00	0.08
PROCEEDS	328	200.95	43.49	872.84	0.12	12277.61
PMV	285	1.96	0.24	15.31	0.00	202.51

PANEL B: Open Offers (OO)

Variables	N	Mean	Median	SD	Min	Max
MB	291	4.02	1.88	5.87	0.04	28.36
Prior AR	321	0.06	0.03	0.30	-0.44	0.75
PROF	309	0.02	0.04	0.07	-0.06	0.10
SIZE	299	10.30	10.31	1.52	6.48	15.03
DISC	274	1.44	0.79	1.65	-0.24	3.55
ACC_QUAL	213	0.11	0.07	0.13	0.00	0.91
RISK	320	0.04	0.03	0.02	0.00	0.11
PROCEEDS	321	30.39	7.39	69.35	0.07	648.49
PMV	294	0.13	0.06	0.15	0.00	1.18

PANEL C: Private Placement (PP)

Variables	N	Mean	Median	SD	Min	Max
MB	560	4.48	2.21	6.12	0.00	28.31
Prior AR	604	0.10	0.06	0.29	-0.44	0.75
PROF	584	0.04	0.05	0.07	-0.06	0.12
SIZE	576	11.25	11.07	1.64	6.46	18.58
DISC	518	0.53	0.21	1.00	-0.51	1.81
ACC_QUAL	460	0.09	0.06	0.10	0.00	1.08
RISK	603	0.03	0.03	0.02	0.00	0.10
PROCEEDS	608	90.24	30.24	226.55	10.00	2815.26
PMV	565	0.28	0.20	0.30	0.02	4.60

PANEL D: Tests of Mean difference

	Rights vs Open offers			**Rights vs Placement**		
Variables	N	diff.	t-stat	N	diff.	t-stat
MB	584	0.287	(0.57)	853	-0.175	(-0.40)
Prior AR	648	-0.032	(-1.51)	931	-0.074***	(-3.95)
PROF	622	0.057***	(12.74)	897	0.042***	(9.19)
SIZE	606	0.939***	(6.73)	883	-0.015	(-0.12)
DISC	537	-0.904***	(-7.92)	781	0.005	(0.07)
ACC_QUAL	453	-0.031***	(-2.90)	700	-0.013*	(-1.67)
RISK	647	-0.012***	(-7.08)	930	-0.008***	(-6.01)
PROCEEDS	649	170.561***	(3.49)	936	110.706***	(2.95)
PMV	579	1.835**	(2.06)	850	1.685***	(2.62)

Notes: This table shows the descriptive statistics of the variables used in the empirical analysis for the choice of equity issuance methods. Panel A provides results for rights issues, Panel B for open offers, Panel C for private placement, and Panel C tests the mean difference of variables between rights issues and open offers as well as rights

issues and private placement. Variables include market to book ratio (MB), pre-announcement abnormal returns (Prior AR), profitability (PROF), logarithm of book value of total assets (SIZE), issue price discount (DISC), measure of earnings management (ACC_QUAL), measure of idiosyncratic risk (RISK), issue proceeds (PROCEEDS), and ratio of issue value to market value (PMV). T-statistics are shown in parenthesis in Panel D. ** and *** *denote significance at the 5% and 1% level respectively.*

7.2.1.3. Pearson's Correlation Matrix of Equity Issue Characteristics

Logistic regression is used to estimate the model that tests the effects of operating performance on the choice of equity issuance methods (H_7) as explained in Section 5.3.3.4. However, OLS is used to test hypothesis H_8 about the stock returns following equity issuance choice. As discussed in Chapter 6 Section 6.2.1.3, a correlation coefficient close to or equal to +1 and -1 suggests high collinearity or perfect multicollinearity among the variables. Tables 7.3, 7.4 and 7.5 provide the Pearson's correlation matrixes of independent and control variables for the sample of rights issues, open offers and private placement.

High correlations are recorded for PROCEEDS and PMV simply because PMV is derived from PROCEEDS. However, only PMV is used in the regression analysis. Most of the variables are correlated at either the 1% or 5% level, with most of the correlations lying close or below 0.20. This results implies low multicollinearity and thus tolerable for OLS estimation. Overall, the results show that multicollinearity is not a problem for estimating the regression model using OLS.

Table 7.3: Pearson's Correlation Matrix of Equity Issue Characteristics (Rights Issues)

	ROA	MB	Prior AR	SIZE	DISC	ACC_QUAL	RISK	PROCEEDS	PMV	$CRISIS_{dum}$
ROA	1.000									
MB	-0.061	1.000								
Prior AR	-0.008	0.242***	1.000							
SIZE	0.364***	-0.049	-0.035	1.000						
DISC	-0.058	-0.084	-0.028	-0.013	1.000					
ACC_QUAL	-0.405***	0.141*	-0.079	-0.284***	0.177**	1.000				
RISK	-0.164**	0.112*	0.084	-0.174***	0.304***	0.314***	1.000			
PROCEEDS	0.160**	-0.026	0.014	0.465***	-0.007	-0.074	0.043	1.000		
PMV	0.121*	-0.021	0.030	0.357***	-0.036	-0.059	0.055	0.961***	1.000	
$CRISIS_{dum}$	0.095	-0.055	-0.042	0.280***	0.274***	-0.090	0.298***	0.180***	0.143**	1.000

Notes: Variables are defined as returns on assets (ROA), market to book ratio (MB), pre-announcement abnormal returns (Prior AR), logarithm of book value of total assets (SIZE), issue price discount (DISC), measure of earnings management (ACC_QUAL), measure of idiosyncratic risk (RISK), issue proceeds (PROCEEDS), ratio of issue value to market value (PMV), and financial crisis dummy ($CRISIS_{dum}$). *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

Table 7.4: Pearson's Correlation Matrix of Equity Issue Characteristics (Open Offers)

	ROA	MB	Prior AR	SIZE	DISC	ACC_QUAL	RISK	PROCEEDS	PMV	$CRISIS_{dum}$
ROA	1.000									
MB	-0.098*	1.000								
Prior AR	0.041	0.100*	1.000							
SIZE	0.195***	-0.139**	-0.007	1.000						
DISC	-0.176***	-0.034	-0.104*	-0.065	1.000					
ACC_QUAL	-0.314***	0.066	0.038	-0.121*	0.089	1.000				
RISK	-0.323***	-0.031	0.015	-0.103*	0.338***	0.234***	1.000			
PROCEEDS	0.141**	-0.054	0.107*	0.445***	0.063	-0.077	0.068	1.000		
PMV	0.112*	0.109*	0.148**	0.369***	-0.006	-0.085	0.019	0.760***	1.000	
$CRISIS_{dum}$	0.073	-0.153***	-0.058	0.033	0.230***	-0.079	0.357***	0.165***	0.117**	1.000

Notes: Variables are defined as returns on assets (ROA), market to book ratio (MB), pre-announcement abnormal returns (Prior AR), logarithm of book value of total assets (SIZE), issue price discount (DISC), measure of earnings management (ACC_QUAL), measure of idiosyncratic risk (RISK), issue proceeds (PROCEEDS), ratio of issue value to market value (PMV), and financial crisis dummy ($CRISIS_{dum}$). *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

Table 7.5: Pearson's Correlation Matrix of Equity Issue Characteristics (Private Placement)

	ROA	MB	Prior AR	SIZE	DISC	ACC_QUAL	RISK	PROCEEDS	PMV	$CRISIS_{dum}$
ROA	1.000									
MB	0.018	1.000								
Prior AR	-0.082*	0.106**	1.000							
SIZE	0.104**	-0.005	-0.103**	1.000						
DISC	0.046	-0.067	-0.104**	-0.008	1.000					
ACC_QUAL	-0.043	0.210***	0.073	-0.240***	0.046	1.000				
RISK	-0.110**	0.004	0.074*	-0.238***	0.226***	0.205***	1.000			
PROCEEDS	0.065	-0.002	-0.018	0.522***	0.062	-0.126***	-0.053	1.000		
PMV	0.026	-0.075*	0.011	0.238***	0.088*	-0.077	0.043	0.633***	1.000	
$CRISIS_{dum}$	-0.049	-0.165***	-0.009	0.087**	0.209***	0.040	0.291***	0.115***	0.180***	1.000

*Notes: Variables are defined as returns on assets (ROA), market to book ratio (MB), pre-announcement abnormal returns (Prior AR), logarithm of book value of total assets (SIZE), issue price discount (DISC), measure of earnings management (ACC_QUAL), measure of idiosyncratic risk (RISK), issue proceeds (PROCEEDS), ratio of issue value to market value (PMV), and financial crisis dummy ($CRISIS_{dum}$). *, ** and *** denote significance at the 10%, 5% and 1% level respectively.*

7.3. Testing the Effects of Operating Performance on the Choice of Equity Issuance Methods

This section tests the hypotheses specified in Section 3.5 of Chapter 3 using the multinomial logit regression model (Model 3) stated in Chapter 5. The hypothesis is re-stated below:

> ***H_6: Firms that anticipate positive operating performance are more likely to conduct rights issues than open offers or private placement***

Model 3 discussed in Section 5.2.2.4 tests the effects of operating performance on the choice of equity issuance method of UK listed firms. The model is re-stated below:

$$\Pr(y_i = 1|x_i) = \beta_0 + \beta_1 ROA_{it} + \sum_{i=1}^{n} \beta_i X_{it} + \varepsilon_{it} \text{.....(3)}$$

The model tests the probability of equity issuance through rights issues depending on the level of anticipated operating performance and set of firm characteristics. Since the model represents multinomial logit regression estimation, the dependent variable is 1 for rights issues and 0 otherwise.

7.3.1. Multinomial Logit Regression Analysis of Equity Issuance Methods

[Hypothesis H_6]

This section presents the results of the multinomial logit regression analyses about the choice of equity issuance method given operating performance. The main variable of interest is ROA (measure of operating performance) that measures the level of information asymmetry. Following the extant literature, factors that are controlled for include measures of issue quality using DISC, PMV or firm characteristics as indicated by SIZE, MB, Prior AR, RISK (Barnes and Walker, 2006; Dissanaike et al. 2014) and ACC_QUAL, which is an accounting measure, to capture the information asymmetry hypothesis (Armitage et al. 2014) or earnings management (Teoh et al., 1998; Chi and Gupta, 2009). CRISIS dummy is used to control for macroeconomic conditions. The parameter coefficient of ROA proxies for operating performance, since if managers have superior knowledge they will raise equity through private placements and open offers when their firms are expected to

perform poorly after issuance. Moreover, and as earlier argued, firms that issue rights issues have less of an incentive to sell equity to existing shareholders when their next period operating performance is poor.

The MB and Prior AR also capture the over-optimism hypothesis (Loughran and Ritter, 1997), according to which investor over-optimism at the time of equity issue causes firms to overweigh conditions on the issuance day. Thus, high MB and Prior AR indicate a high level of optimism in a market and make investors optimistic about post-issuance stock performance. In addition, the model includes control for the recent financial crisis (CRISIS) by assigning the value of 1 if an issuance was made during the period 2008-2010 and 0 otherwise. This variable captures the window of opportunity hypothesis (Choe et al., 1993; Bayless and Chaplinsky, 1996), according to which overvalued firms issue equity during favourable market conditions. Finally, the estimations include year dummies to control for different levels of usage among the issuance methods during the sample period and industry dummies to control for industry characteristics.

Panel A of Table 7.6 presents the results for the multinomial logit regression for the choice between rights issues and open offers. Accordingly, the dependent variable is 1 for open offers (Panel A) and private placement (Panel B) and 0 for rights issues (the base outcome). This model explores whether managers select a rights issuance method based on their expectation of future operating performance. As can be seen from the table, the coefficient of ROA is significantly negative in year 1 (Models 1-3), year 2 (Model 4) and year 3 (Model 5). Unexpectedly, MB and SIZE are not significant but AR is significantly positive in year 1. Also, DISC is positive and significant at 1% level in Models 1-5 of Panel A whereas DISC is significantly negative in Panel B at 5% level in all the Models except Model 4. ACC_QUAL is significantly negative in all the Models of Panel A but not Panel B whereas RISK is not significant. PMV is positive and significant and CRISIS is significantly positive in all the models.

These results about ROA is consistent with the hypothesis that high operating performance increases the probability of rights issues at the expense of open

offers and private placement as shown in Panels A and B, respectively. Also, the evidence about AR means that high stock price run-ups increase the probability of open offers and high price discount is consistent with open offers but not private placement. These findings suggest that firms are less likely to time their rights issues. But the decision to issue equity through rights issues is negatively affected by the adverse market conditions. Thus, during periods of economic crisis, firms are more likely to make open offers and private placement than rights issues. As Capstaff and Fletcher (2011) argue, it seems rights issuing firms are quality firms compared to firms that undertake open offers and private placement. Studies such as Slovin et al. (2000) and Barnes and Walker (2006) find evidence that is contrary to what this study reports. Both studies use sample period that is characterised by the dominance of rights issues, especially during the 1980s and early 1990s. The study uses sample period that mirrors Capstaff and Fletcher (2011) and reinforces the trend of rights issues demise (Burton et al. 2005; Armitage, 2007)

Table 7.6: Multinomial Logit Regression Estimates of Choice of Equity Issuance Method

PANEL A: Open Offers (1) vs Rights Issues (0)

	Year 1			Year 2	Year 3
Variables	(1)	(2)	(3)	(4)	(5)
ROA	-15.706***	-14.138***	-15.739***	-11.558***	-8.817***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
MB	0.046	0.039	0.047	0.031	0.035
	(0.29)	(0.19)	(0.28)	(0.45)	(0.38)
AR	1.854**	1.222*	1.794**	1.137	1.235
	(0.02)	(0.05)	(0.02)	(0.18)	(0.11)
SIZE	-0.115	-0.103	-0.118	-0.145	-0.126
	(0.41)	(0.33)	(0.39)	(0.31)	(0.37)
DISC	0.419***	0.358***	0.441***	0.493***	0.414***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
ACC_QUAL	-3.007***		-2.949***	-2.489**	-2.100*
	(0.01)		(0.01)	(0.02)	(0.07)
RISK		-7.233	-3.610	-1.066	-1.646
		(0.39)	(0.74)	(0.92)	(0.88)
PMV	-7.851***	-5.711***	-7.915***	-7.113***	-7.187***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CRISIS	17.433***	18.283***	17.473***	16.806***	16.592***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	-11.319***	-12.998***	-11.121***	-10.431***	-11.265***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

PANEL B: Private Placement (1) vs Rights Issues (0)					
	Year 1			Year 2	Year 3
Variables	(1)	(2)	(3)	(4)	(5)
ROA	-13.374***	-12.568***	-13.661***	-10.594***	-3.172
	(0.00)	(0.00)	(0.00)	(0.00)	(0.19)
MB	0.091**	0.063**	0.092**	0.080**	0.085**
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)
AR	1.579**	1.162**	1.538**	1.189	1.127
	(0.04)	(0.05)	(0.04)	(0.13)	(0.13)
SIZE	0.029	0.072	0.006	0.014	-0.042
	(0.82)	(0.44)	(0.96)	(0.92)	(0.73)
DISC	-0.354**	-0.282**	-0.305**	-0.247	-0.288**
	(0.01)	(0.03)	(0.04)	(0.14)	(0.05)
ACC_QUAL	-1.543		-1.223	-1.346	-1.023
	(0.17)		(0.29)	(0.31)	(0.44)
RISK		-8.131	-12.658	-10.182	-6.941
		(0.26)	(0.19)	(0.33)	(0.47)
PMV	-2.686***	-2.183***	-2.680***	-2.758***	-2.402***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CRISIS	4.044***	4.315***	4.248***	4.247***	4.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	2.131	0.935	2.746*	2.594	2.498
	(0.16)	(0.45)	(0.08)	(0.10)	(0.12)
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
N	601	772	601	548	555
pseudo R^2	0.391	0.355	0.394	0.392	0.377
chi2	4041.922	4794.190	4066.833	4723.022	5682.218
p	0.000	0.000	0.000	0.000	0.000

Notes: This table shows multinomial logit results for equity issuance method. The dependent variable is 1 open offers (OO) in Panel A and private placements (PP) in Panel B and 0 for rights issues. The main independent variable is ROA and the following control variables are included: MB is the market-to-book ratio, Prior AR is the cumulative returns, SIZE is the logarithm of book value of total assets, DISC is the issuing price discount, ACC_QUAL measures earnings management, RISK is idiosyncratic volatility of stock returns, PMV is the total proceeds relative to firm size, and CRISIS is a dummy variable that takes the value of 1 during the years 2008-2010. Standard errors are heteroscedasticity consistent. Year and industry dummies are included. P-values are shown in parentheses. , ** *and* *** *show significance at the 10%, 5% and 1% levels, respectively.*

Panel B shows the results for the multinomial logit regression of the choice between rights issues and private placement. The results show that there is a high probability that firms' ROA subsequent to the issuance is higher when issuing equity through rights issues rather than private placements. In particular, the parameter coefficient of ROA is positive and statistically significant at the 1% level within most of the estimations, supporting the

economical interpretation of the information asymmetry hypothesis. When firms raise equity through rights issues, they tend to experience better operating performance after the issuance. MB is significantly negative indicating that firms are more likely to issue overvalued equity through private placement. Also, Prior AR increases the probability of private placement relative to rights issues. This result suggests that rights issuing firms are not likely to issue overpriced equity to the existing shareholders. In other words, issues that involve outside investors, such as private placement, are more likely to be timed to take advantage of significant overvaluation.

However, the parameter coefficient of ACC_QUAL does not support the information asymmetry hypothesis in accounting terms, indicating that a conventional information asymmetry proxy does not capture the interpretation of asymmetric information. The positive coefficient of DISC implies rights issues are less likely to be associated with significant issue price discount. This price discount compensates investors for the costs of obtaining information about the true value of the issuing firm. However, RISK has a negative and significant coefficient at the 1% level indicating asymmetric information does not increase the probability of rights issues relative to private placement. Also, rights issues generate larger PMV and have lower stock returns prior to the issuance, indicating that managers are less prone to take advantage of the timing of the issue when selecting rights issues. The negative parameter coefficient for CRISIS indicates that there is a lower probability for firms to issue equity through rights issues during the financial crisis, supporting the evidence that the use of rights issues in the UK market has become less common in recent years (e.g., Armitage, 2010).

These findings are consistent with the hypothesis that expected operating performance determines the choice of equity issuance method. It further supports the extant evidence about market timing of equity issues through private placement. The study departs from most previous studies that look at the short-term returns associated with share issuance methods. Consistent with Capstaff and Fletcher (2011), the study finds that rights issuing firms outperform open offers and private placement in the long run. Unlike Slovin et

al. (2000) and Barnes and Walker (2006), rights issuing firms are associated with quality information signalling since it is unlikely that firms would issue overvalued equity to exploit existing shareholders. It appears rights issuing firms are not overvalued but significantly perform better than firms making open offers and private placement. In effect, the evidence implies that the hypothesis that high operating performance is associated with rights issues is accepted. Also, the evidence is consistent with the hypothesis that rights issues are less likely to be overvalued and hence less likely to be timed.

7.3.2. Long-term Stock returns

[Hypothesis H_8]

This section analyses the long run stock returns associated with rights issues (RI), open offers (OO), and private placement (PP). The hypothesis about stock returns associated with equity issues is re-stated below.

> ***H_7: Equity issues through private placement generate more negative abnormal returns than rights issues***

Test of hypothesis H_8 is carried out using the OLS regression model below, also discussed in Section 5.2.2.4 of Chapter 5.

$$BHAR_i = \beta_0 + \beta_1 ROA_i + \beta_2 ISSUE_i + \beta_3 ROA * ISSUE_i + \sum_{i=1}^{n} \beta_i X_i + \varepsilon_i \text{.....(4)}$$

As discussed in Section 5.3.2.1 of Chapter 5, long run returns is the buy and hold abnormal returns (BHAR) computed as the excess of buy and hold returns of the issuing firm over that of its control firm. Table 7.7 provides the results of the BHAR for RI, OO, and PP as well as for RI-OO and RI-PP indicating the difference in returns between rights issues and open offers and between rights issues and private placement, respectively. The results show that BHAR for rights issues are not significantly different from zero over the three years after the issue. For the open offer sample firms, the BHAR is -7.9% (significant at the 5% level), -20.5% (significant at the 1% level), and -21.8% (significant at the 1% level) over year 1, year 2, and year 3, respectively. Similarly, the BHAR for private placement are -6.9%, -20.1%, and -32.7% all significant at the 1% level for year 1, year 2, and year 3, respectively.

Table 7.7: Long Run Buy and Hold Abnormal Returns and Equity Issuance Method						
Year	*RI*	*OO*	*PP*	*All issues*	*RI-OO*	*RI-PP*
1	-0.008	-0.079**	-0.069***	-0.056***	0.071	0.061*
2	0.006	-0.205***	-0.201***	-0.148***	0.211***	0.207***
3	-0.078	-0.218***	-0.327***	-0.234***	0.140	0.249***
N	327	321	608	1256		

*This table shows the long run stock returns for each of the three years following the issuance of rights issues (RI), open offers (OO) and private placements (PP). Returns are buy-and-hold based on Barber and Lyon's (1997) methodology, and t-statistics are bootstrapped skewness-adjusted. *, ** and *** show significance at the 10%, 5% and 1% levels, respectively.*

Together, long run post-issue stock returns are significantly negative for equity issues. Also, the mean difference in returns is significantly positive over year 2 between rights issues and open offers and significantly positive over year 2 and 3 between rights issues and private placement. These results support the findings by Capstaff and Fletcher (2011) that rights issuing firms outperform open offers and private placement and highlight the argument that rights issuing firms are not poor quality firms seeking to exploit investors by issuing overvalued equity. Stated differently, firms issuing equity through open offers and private placement are more likely to time their issues and subsequently report significant stock price underperformance.

Table 7.8 presents results that explore the significance of operating performance for post-issuance stock returns. In particular, the long-term stock returns on firms are partitioned into firms with positive and negative ROA at each year after issuance. These results show that over the three-year period, rights issuing firms do not report operating losses which strengthen the earlier evidence that these firms are associated with less negative stock returns. Instead, around half of the firms issuing equity through open offers and private placements report deteriorating long-term operating performance after issuance. ROA also seems to influence the magnitude of stock returns after issuance, since poor stock returns are more prominent within firms that had negative ROA. It appears operating performance have significant implications for long-term stock returns after equity issuance.

Table 7.8: Long Run Stock Returns and Operating Performance (Positive and Negative)

Year	*RI*	*OO*	*PP*	*Total*
		Negative ROA		
1	n/a	-0.109	-0.081	-0.092
2	n/a	-0.213	-0.259	-0.242
3	n/a	-0.394	-0.559	-0.493
N	0	136	208	344
		Positive ROA		
1	-0.008	-0.057	-0.063	-0.042
2	0.006	-0.200	-0.175	-0.119
3	-0.078	-0.075	-0.170	-0.118
N	327	185	400	912
		T-test (Positive - Negative ROA)		
1	n/a	0.052	0.018	0.050
2	n/a	0.013	0.084	0.123**
3	n/a	0.319**	0.389***	0.375***

*This table shows the returns for each of the three years following the issuance of rights issues (RI), open offers (OO) and private placements (PP). Panel A shows the returns of the full sample, Panel B separately for negative and positive ROA firms and Panel C separately for low and high ROA firms when the split is based on the median ROA. ROA is the return on assets. Returns are buy-and-hold based on Barber and Lyon's (1997) methodology, and t-statistics are bootstrapped skewness-adjusted. *, ** and *** show significance at the 10%, 5% and 1% levels, respectively.*

Further analysis of stock returns partitions the sample in terms of the level of operating performance. Table 7.9 shows long-term stock returns when firms are split into high and low ROA based on their median ROA. This test intends to offer further robustness, since no firm that issued rights issues had operating losses. Once again, firms with low ROA are associated with lower long-term stock returns after issuance than counterpart firms with high ROA. For example, the mean difference in BHAR between high ROA and low ROA over three years after issuance are 67.4%, 42.2%, and 58.7% for rights issues, open offers and private placements, respectively. These stock returns also provide further evidence that long run stock returns are significantly determined by operating performance. Moreover, the results demonstrate that rights issuing firms outperform their counterpart open offers and private placement.

Table 7.9: Long Run Stock Returns and Operating Performance (High and Low)

Year	*RI*	*OO*	*PP*	*Total*
		Low ROA		
1	-0.050	-0.094	-0.066	-0.069
2	-0.125	-0.221	-0.238	-0.203
3	-0.434	-0.345	-0.588	-0.485
N	158	150	285	593
		High ROA		
1	0.027	-0.016	-0.070	-0.030
2	0.158	-0.005	-0.171	-0.038
3	0.240	0.076	-0.001	0.085
N	157	171	284	591
		Test of Mean Difference T-test (High - Low ROA)		
	R1	*OO*	*PP*	*Total*
1	0.077	0.078	-0.003	0.039
2	0.283***	0.216**	0.067	0.165***
3	0.674***	0.422***	0.587***	0.570***

*This table shows the returns for each of the three years following the issuance of rights issues (RI), open offers (OO) and private placements (PP). Panel A shows the returns of the full sample, Panel B separately for negative and positive ROA firms and Panel C separately for low and high ROA firms when the split is based on the median ROA. ROA is the return on assets. Returns are buy-and-hold based on Barber and Lyon's (1997) methodology, and t-statistics are bootstrapped skewness-adjusted. *, ** and *** show significance at the 10%, 5% and 1% levels, respectively.*

Table 7.10 provides OLS regression results for long run abnormal stock returns. The dependent variable BHAR for Year 1, Year 2 and Year 3 after equity issuance and the main independent variable is *ROA* after issuance. The control variables are the same as those used in the multinomial logit regression estimation in Table 7.6. ROA*OO and ROA*PP are the interaction terms for returns on assets and open offers and returns on assets and private placement respectively. The interaction term for rights issues and returns on assets (ROA*RI) is the baseline. The OLS results show that ROA is positively related to long-term stock returns after equity issuance. The relation is significant at the 1% level for two years and three years following the issuance. The parameter coefficients for the interaction variables ROA*OO and ROA*PP also tend to be negative, especially during the second year of issuance, indicating that rights issues tend to be related to higher operating performance than counterpart open offers and private placements. Also, the coefficients for control variables tend to be statistically insignificant, indicating that ROA seems to have strong explanatory power for long-term stock returns after issuance. Overall, these results further show that operating performance

explains the long run stock returns associated with equity issues and more importantly rights issuing firms are associated with more positive operating performance and long run stock returns than open offers and private placement.

Table 7.10: Cross-sectional Regression Analysis of Long Run Stock Returns

	Year 1		Year 2		Year 3	
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable is the Long-run Buy and Hold Abnormal Return, BHAR						
ROA	1.805**	1.926	4.161***	4.943***	6.298***	8.619***
	(0.04)	(0.17)	(0.00)	(0.01)	(0.00)	(0.00)
OO	0.068	0.021	0.198	0.199	0.343***	0.121
	(0.38)	(0.86)	(0.12)	(0.30)	(0.00)	(0.46)
PP	0.066	0.099	0.105	0.204	0.053	-0.009
	(0.37)	(0.37)	(0.39)	(0.27)	(0.61)	(0.95)
ROA*OO	-0.887	0.218	-2.961**	-3.975*	-3.513*	-5.103**
	(0.41)	(0.89)	(0.03)	(0.05)	(0.06)	(0.02)
ROA*PP	-1.758*	-1.915	-3.620***	-4.441**	-2.026	-2.485
	(0.07)	(0.18)	(0.00)	(0.02)	(0.27)	(0.21)
MB		0.004		0.016**		0.007
		(0.47)		(0.05)		(0.41)
AR		0.006		0.020		-0.032
		(0.95)		(0.90)		(0.86)
SIZE		-0.046***		-0.074***		-0.076***
		(0.00)		(0.00)		(0.01)
DISC		-0.003		-0.011		-0.017
		(0.88)		(0.75)		(0.69)
ACC_QUAL		0.026		-0.327		-0.714
		(0.92)		(0.40)		(0.17)
RISK		0.252		0.041		2.526
		(0.87)		(0.99)		(0.40)
PMV		0.002***		0.001		0.002
		(0.01)		(0.32)		(0.29)
CRISIS		-0.101		0.143		0.519*
		(0.39)		(0.49)		(0.06)
Constant	-0.136**	0.253	-0.327***	0.044	-0.424***	-0.454
	(0.05)	(0.27)	(0.00)	(0.91)	(0.00)	(0.31)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	1184	662	1085	609	1086	618
adj. R^2	0.003	0.047	0.021	0.055	0.087	0.131

*Notes: This table shows the cross sectional regression results of long run abnormal returns associated with equity issues. The dependent variable is the 12-month buy-and-hold abnormal returns BHAR (2, 12) for models 1 and 2, 24-month buy-and-hold abnormal returns BHAR (2, 24) for models 3 and 4, and 36-month buy-and-hold abnormal returns BHAR (2, 36) for models 5 and 6. Variables included in the regressions are operating performance (ROA), dummy for open offers (OO), and private placement (PP), the interaction terms for operating performance and open offers (ROA*OO) and private placement (ROA*PP), market-to-book ratio (MB), prior stock returns (Prior AR), logarithm of book value of total assets (SIZE), issue price discount (DISC), accruals quality (ACC_QUAL), idiosyncratic risk (RISK), ratio of proceeds to market value (PMV), dummy for financial crisis (CRISIS), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

7.3.3. Long-term Operating Performance

Table 7.11 gives the results for the post-issue operating performance associated with equity issuing firms on whether the issue is made through rights issues (RI), open offers (OO), and private placement (PP). If managers select the issuance method in line with their expectations of firm operating performance, as argued above, rights issuing firms are more likely to have higher operating performance than counterpart firms that issue open offers and private placements. As discussed in Section 5.3.2.2 of Chapter 5, operating performance is the returns on assets of the issuing firm less the returns on assets of its control firm. As reported in the table rights issuing firms report higher average ROA than counterpart firms using open offers and private placements. The mean difference in ROA between RI and OO is significantly positive at the 1% level over the three-year period. Similarly, the ROA difference between RI and PP is also significantly positive over the three-year period. These results are to a large extent in line with the pattern previously found in returns after the issuance, offering further credence that firm managers select the equity issuance method based on a firm's future operating performance, which is then linked with differential long-term stock returns.

Table 7.11: Post-issue Changes in Operating Performance

Year	RI	OO	PP	Total	RI-OO	RI-PP
1	0.069***	0.013***	0.031***	0.036***	0.056***	0.038***
2	0.082***	0.014***	0.031***	0.041***	0.069***	0.051***
3	0.052***	-0.019***	0.018***	0.018***	0.071***	0.034***
N	328	321	608	1257		

*Notes: This table shows the average operating performance (ROA) for rights issues (RI), open offers (OO) and private placements (PP) after equity issuance.*** *shows significance at the 1% level.*

7.4. Robustness and Sensitivity Analysis

This section presents the results of a number of robustness and sensitivity analysis. These additional results provide further support for the main results and also ensure the results are robust to alternative estimation techniques. The section is divided into Subsection 7.4.1 which provides results for alternative measures of operating performance; Subsection 7.4.2 gives results for firms using multiple issuance method during the period and Subsection 7.4.3 shows the tests of tobit regression estimates.

7.4.1. Logit Regression Results for Abnormal Returns on Assets (aROA) and Returns on Equity (ROE)

Table 7.12 presents the results for choice of equity issuance method based on operating performance measured as abnormal returns on assets (aROA). aROA is measured as the difference between the returns on assets of equity issuing firm and the returns on assets of the control firms. Control firms are identified in line with Spiess and Affleck-Graves (1995), Loughran and Ritter (1995) and Capstaff and Fletcher (2011). Panel A provides the results for the abnormal returns on assets proxy for the choice between open offers and rights issues whereas Panel B gives the results for the choice between private placement and rights issues. Tables 7.12 and 7.13 show multinomial logit estimations with independent variables αROA and ROE. Similar to prior results and consistent with the predictions, the parameter coefficients of *aROA* and ROE are significantly negative, indicating that firms issuing open offers and private placements tend to anticipate poor operating performance at the time of issuance. Therefore, rights issuing firms are more likely to be profitable and better quality firms than those conducting open offers and private placement.

Table 7.12: Multinomial Logit Regression Estimates of Equity Issuance Method (abnormal ROA)

Variables	(Year 1) (1)	(Year 2) (2)	(Year 3) (3)
PANEL A: Open Offers (1) vs Rights Issues (0)			
aROA	-12.770***	-9.137***	-5.254*
	(0.00)	(0.00)	(0.05)
MB	0.018	-0.042	-0.024
	(0.68)	(0.29)	(0.54)
AR	2.221**	2.091*	2.250**
	(0.01)	(0.09)	(0.04)
SIZE	-0.183	-0.293*	-0.132
	(0.23)	(0.09)	(0.43)
DISC	0.492***	0.596***	0.533***
	(0.01)	(0.01)	(0.01)
ACC_QUAL	-3.232**	-3.980***	-2.918**
	(0.03)	(0.00)	(0.04)
RISK	7.605	11.678	8.849
	(0.54)	(0.40)	(0.50)
PMV	-10.266***	-9.426***	-9.995***
	(0.00)	(0.00)	(0.00)
CRISIS	18.321***	17.143***	15.967***
	(0.00)	(0.00)	(0.00)
Constant	-13.337***	-11.542***	-12.002***
	(0.00)	(0.00)	(0.00)

PANEL B: Private Placement (1) vs Rights Issues (0)			
aROA	-9.123***	-9.106***	-2.012
	(0.00)	(0.00)	(0.39)
MB	0.071*	0.047	0.053
	(0.09)	(0.20)	(0.13)
AR	1.915**	2.027*	1.928*
	(0.02)	(0.07)	(0.06)
SIZE	-0.008	-0.008	0.018
	(0.95)	(0.95)	(0.89)
DISC	-0.312*	-0.295	-0.274
	(0.08)	(0.17)	(0.14)
ACC_QUAL	-0.615	-1.713	-1.461
	(0.62)	(0.27)	(0.35)
RISK	-5.301	2.211	1.812
	(0.64)	(0.86)	(0.88)
PMV	-3.212***	-3.258***	-2.911***
	(0.00)	(0.00)	(0.00)
CRISIS	4.182***	3.895***	3.645***
	(0.00)	(0.00)	(0.00)
Constant	1.224	1.094	0.961
	(0.48)	(0.56)	(0.60)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	467	393	403
pseudo R^2	0.431	0.446	0.420
chi2	3706.498	3328.775	4118.569
p	0.000	0.000	0.000

Notes: This table shows multinomial logit results equity issuance method during the sample period. The dependent variable is 1 open offers (OO) in Panel A and private placements (PP) in Panel B and 0 for rights issues. The main independent variable is aROA and the following control variables are included: MB is the market-to-book ratio, Prior AR is the cumulative returns, SIZE is the logarithm of book value of total assets, DISC is the issuing price discount, ACC_QUAL measures earnings management, RISK is idiosyncratic volatility of stock returns, PMV is the total proceeds relative to firm size and CRISIS is a dummy variable that takes the value of 1 during the years 2008-2010. Standard errors are heteroscedasticity consistent. Year and industry dummies are included. P-values are shown in parentheses. *, ** *and* *** *show significance at the 10%, 5% and 1% levels, respectively.*

These results imply that the earlier results are robust to alternative definitions of operating performance. It further supports the hypothesis about the effects of anticipated operating performance on the choice of equity issuance method. Therefore, the hypothesis is confirmed regardless of the measure of operating performance, firms making rights issues anticipate high post-issue operating performance. This evidence is consistent with the overall outperformance of long run stock returns compared to open offers and private placements. P-

values, like the main results, are also significant suggesting that the joint hypotheses about the coefficients are significantly different from zero. In other words, the variables significantly define the choice of equity issuance method.

Table 7.13: Multinomial Logit Regression Estimates of Equity Issuance Method (ROE)

Variables	(Year 1) (1)	(Year 2) (2)	(Year 3) (3)
PANEL A: Open Offers (1) vs Rights Issues (0)			
ROE	-4.117***	-2.281**	-2.842**
	(0.00)	(0.05)	(0.04)
MB	0.033	0.034	0.016
	(0.44)	(0.41)	(0.71)
AR	1.665**	1.143	0.990
	(0.03)	(0.14)	(0.26)
SIZE	-0.065	-0.215	-0.183
	(0.65)	(0.14)	(0.28)
DISC	0.415***	0.442***	0.609***
	(0.01)	(0.01)	(0.00)
ACC_QUAL	-2.495**	-2.369**	-2.274
	(0.03)	(0.04)	(0.15)
RISK	-5.427	-5.386	-2.594
	(0.60)	(0.64)	(0.84)
PMV	-7.715***	-6.894***	-7.526***
	(0.00)	(0.00)	(0.00)
CRISIS	18.817***	17.635***	31.812***
	(0.00)	(0.00)	(0.00)
Constant	-14.103***	-11.386***	-12.438***
	(0.00)	(0.00)	(0.00)

PANEL B: Private Placement (1) vs Rights Issues (0)			
ROE	-1.370	-1.294	-0.880
	(0.21)	(0.22)	(0.47)
MB	0.084**	0.087**	0.077**
	(0.02)	(0.02)	(0.02)
AR	1.501**	0.992	0.750
	(0.04)	(0.16)	(0.33)
SIZE	0.011	-0.110	-0.103
	(0.93)	(0.40)	(0.49)
DISC	-0.275*	-0.268*	-0.232
	(0.05)	(0.08)	(0.20)
ACC_QUAL	-1.053	-1.453	-1.755
	(0.40)	(0.28)	(0.26)
RISK	-10.225	-9.426	-6.302
	(0.26)	(0.36)	(0.59)
PMV	-2.458***	-2.028***	-2.103***
	(0.00)	(0.00)	(0.00)
CRISIS	4.205***	3.979***	17.630***
	(0.00)	(0.00)	(0.00)
Constant	1.895	3.069*	3.409*
	(0.22)	(0.06)	(0.07)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	597	534	443
pseudo R^2	0.379	0.369	0.401
chi2	.	11235.336	.
p	.	0.000	.

*Notes: This table shows multinomial logit results equity issuance method during the sample period. The dependent variable is 1 open offers (OO) in Panel A and private placements (PP) in Panel B and 0 for rights issues. The main independent variable is ROE and the following control variables are included: MB is the market-to-book ratio, Prior AR is the cumulative returns, SIZE is the logarithm of book value of total assets, DISC is the issuing price discount, ACC_QUAL measures earnings management, RISK is idiosyncratic volatility of stock returns, PMV is the total proceeds relative to firm size and CRISIS is a dummy variable that takes the value of 1 during the years 2008-2010. Standard errors are heteroscedasticity consistent. Year and industry dummies are included. P-values are shown in parentheses. *, **and *** show significance at the 10%, 5% and 1% levels, respectively.*

7.4.2. Multinomial Logit Regression Results for Multiple Equity Issuance Method during the Period

If anticipated operating performance or asymmetric information determines the choice of equity issuance method, it can also be argued that managers may be reluctant to change their issuing approach. Thus, some firms may have selected the same issuance method throughout the sample period irrespective of managers' expectations of forthcoming operating performance. For example, Iqbal et al. (2013) contend that long-term stock returns after issuance for rights issues is influenced by whether firms had previously used the same equity issuance method. They find higher long-term stock returns after issuance for firms that had previously issued rights issues at least twice.

Table 7.14 shows the results for the logit estimations using only firms that have changed their equity issuance method during the sample period. As noted in the reported results, the coefficient of ROA is significantly negative in Panels A and B indicating that anticipated operating performance actually influences the choice of rights issues method over open offers and private placement. The parameter coefficients of the control variables are similar to the main results for the full sample. These results offer support to the acceptance of hypothesis about the effects of anticipated operating performance on the choice of rights issuance method.

Table 7.14: Multinomial Logit Regression Estimates of Changes in Firm's Issuance Method During the Sample Period

Variables	(Year 1) (1)	(Year 2) (2)	(Year 3) (3)
PANEL A: Open Offers (1) vs Rights Issues (0)			
ROA	-14.976***	-10.283***	-5.157
	(0.00)	(0.00)	(0.14)
MB	0.015	0.005	0.006
	(0.71)	(0.91)	(0.87)
AR	1.579*	0.956	1.099
	(0.09)	(0.32)	(0.22)
SIZE	-0.201	-0.207	-0.210
	(0.26)	(0.24)	(0.22)
DISC	0.542***	0.534***	0.485***
	(0.00)	(0.01)	(0.01)
ACC_QUAL	-2.912**	-2.047	-1.630
	(0.04)	(0.15)	(0.29)
RISK	4.464	7.480	7.108
	(0.68)	(0.51)	(0.55)
PMV	-7.517***	-6.883***	-6.805***
	(0.00)	(0.00)	(0.00)
CRISIS	16.721***	17.865***	17.356***
	(0.00)	(0.00)	(0.00)
Constant	-11.460***	-12.693***	-12.869***
	(0.00)	(0.00)	(0.00)

PANEL B: Private Placement (1) vs Rights Issues (0)			
ROA	-13.675***	-10.237***	-0.923
	(0.00)	(0.00)	(0.73)
MB	0.065**	0.059*	0.066**
	(0.05)	(0.07)	(0.03)
AR	1.743**	1.395	1.385*
	(0.04)	(0.11)	(0.10)
SIZE	-0.040	-0.039	-0.084
	(0.80)	(0.81)	(0.58)
DISC	-0.151	-0.100	-0.149
	(0.38)	(0.60)	(0.36)
ACC_QUAL	-2.163	-2.437	-2.458
	(0.14)	(0.13)	(0.13)
RISK	-7.634	-5.014	0.489
	(0.43)	(0.65)	(0.96)
PMV	-2.096***	-2.091**	-1.811***
	(0.01)	(0.02)	(0.01)
CRISIS	3.494***	3.544***	3.438***
	(0.01)	(0.01)	(0.01)
Constant	2.692	2.531	2.241
	(0.16)	(0.20)	(0.23)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	441	406	407
pseudo R^2	0.358	0.354	0.337
chi2	4453.672	4609.836	5905.474
p	0.000	0.000	0.000

Notes: This table shows multinomial logit results for firms that used more than one equity issuance method during the sample period. Firms that only used one issuance method to raise equity are excluded. The dependent variable is 1 open offers (OO) in Panel A and private placements (PP) in Panel B and 0 for rights issues. The main independent variable is ROA and the following control variables are included: MB is the market-to-book ratio, Prior AR is the cumulative returns, SIZE is the logarithm of book value of total assets, DISC is the issuing price discount, ACC_QUAL measures earnings management, RISK is idiosyncratic volatility of stock returns, PMV is the total proceeds relative to firm size, and CRISIS is a dummy variable that takes the value of 1 during the years 2008-2010. Standard errors are heteroscedasticity consistent. Year and industry dummies are included. P-values are shown in parentheses. , ** *and* *** *show significance at the 10%, 5% and 1% levels, respectively.*

7.4.3. Tobit Regression Estimation of Main Results

Table 7.15 provides the tobit regression results for equity issues given the level of operating performance. The dependent variable is the dollar value of equity issues divided by the market value of equity. This variable explains the effects of operating performance on the amount of shares issued. Model 1, 2, and 3 give the results of the effects of operating performance on equity issues for year 1, 2, and 3 respectively. As can be seen from the table, the coefficient of ROA is positive and statistically significant at the 1% level in Models 1 and 2. Overall, the results indicate that high operating performing firms are more likely to increase the amount of equity issues.

The coefficient of ROA*OO and ROA*PP are negative and significant at the 1% level in Models 1 and 2. This result suggests high operating performing firms increase the amount generated from equity issues when they make rights issues rather than open offers and private placement. Thus, firms are more likely to generate greater value from rights issues when they have better operating performance. This result suggests that the level of operating performance not only determine the probability of equity issues but also the amount that can potentially be generated from such issues. Overall, the above results provide further evidence about the effects of operating performance on equity issuance decisions.

Table 7.15: Tobit Regression Analysis of Equity Issuance Method

	Year 1	Year 2	Year 3
Variables	(1)	(2)	(3)
ROA	9.659***	2.438***	1.342
	(0.00)	(0.00)	(0.11)
OO	1.478**	2.197***	-2.007***
	(0.02)	(0.00)	(0.00)
PP	0.827	1.235*	-2.911***
	(0.23)	(0.07)	(0.00)
ROA*OO	-3.066***	-3.091***	-2.847
	(0.00)	(0.00)	(0.11)
ROA*PP	-3.960***	-7.825***	-4.938
	(0.00)	(0.00)	(0.17)
MB	0.064**	0.082**	0.042
	(0.04)	(0.02)	(0.41)
AR	0.198	0.556	0.279
	(0.74)	(0.44)	(0.70)
SIZE	1.099***	1.266***	1.248***
	(0.00)	(0.00)	(0.00)
DISC	-0.016	-0.055	-0.075
	(0.93)	(0.77)	(0.69)
ACC_QUAL	1.095	0.432	0.444
	(0.50)	(0.82)	(0.82)
RISK	3.378	8.618	3.881
	(0.70)	(0.42)	(0.73)
CRISIS	2.476***	2.048*	2.072**
	(0.00)	(0.05)	(0.04)
Constant	-12.835***	-14.718***	-10.052*
	(0.01)	(0.00)	(0.05)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	662	609	618
pseudo R^2	0.019	0.021	0.019
p	0.000	0.000	0.000

*Notes: This table shows Tobit regression results for equity issuance method. The dependent variable is the total proceeds divided by market value of equity. The main independent variable is ROA, OO is 1 for open offers and 0 for rights issues, PP is 1 for private placement and 0 for rights issues, ROA*OO is the interaction between returns on assets and 1 for open offers and 0 for rights issues, and ROA*PP is the interaction between returns on assets and 1 for private placement and 0 for rights issues. MB is the market-to-book ratio, Prior AR is the cumulative returns, SIZE is the logarithm of book value of total assets, DISC is the issuing price discount, ACC_QUAL measures earnings management, RISK is idiosyncratic volatility of stock returns, PMV is the total proceeds relative to firm size, CRISIS is a dummy variable that takes the value of 1 during the years 2008-2010. Standard errors are heteroscedasticity consistent. Year and industry dummies are included. P-values are shown in parentheses. *, **and *** show significance at the 10%, 5% and 1% levels, respectively.*

7.5. Conclusion

This chapter presented empirical results to explore the information asymmetry effects on the choice of equity issuance methods of UK listed firms. It specifically investigated how anticipated or future operating performance determines firm's selection of the equity issuance methods. The main hypothesis tested in this chapter was that firms with anticipated high operating performance are more likely to choose rights issues in issuing equity. In other words, firms with high information asymmetry in the form of anticipated improved operating performance prefer to issue equity to the existing shareholders in order to transfer part of the future benefits to them. Conversely, firms with overvalued equity are more likely to issue equity through open offers and private placement that involve outside or new investors. The implication of this hypothesis was that better performing firms prefer to transfer the benefits to existing shareholders whereas firms which are likely to record poor performance are motivated to exploit outside investors who would have insufficient information about the performance of the firms. In addition to the traditional proxies for information asymmetry such as accruals quality, issue price discount, idiosyncratic risks, and market to book ratio (which all measure the quality of the issuing firms, operating performance is used as the main descriptor of information asymmetry.

Consistent with prior studies, the results of this chapter find strong support for the preference for rights issues when operating performance is anticipated to improve. Thus, better performing firms are more likely to issue equity through rights issues than open offers and private placement. This evidence indicates that the firms do not exploit existing shareholders and that rights issuing firms are of better quality than open offers and private placement. Also, the chapter 7 finds that rights issuing firms report more positive post-issue operating performance which is consistent with stock price outperformance over open offers and private placement. Moreover, the chapter addresses issues with estimation assumptions and also presented results using alternative measures of operating performance. Finally, the chapter presented robust results for alternative estimation techniques.

These findings are consistent with Kabir and Roosenboom (2003), Armitage and Snell (2004), Chi and Gupta (2009), and Capstaff and Fletcher (2011). However, the results in this chapter do not support the findings by Slovin et al. (2000) and Barnes and Walker (2006). Unlike previous studies, this chapter used operating performance to demonstrate that future anticipated changes in operating performance by which firms determine their choice of equity issuance method. Thus, holding the measures of firm and issue quality constant- such as mispricing, the decision to utilise a particular issuance method is influenced by operating performance. However, the results presented in this chapter demonstrate that firms choose equity issuance method based on specific firm and issue characteristics. This evidence complements the extant literature on the equity issuance method in the UK. It shows that operating performance does not only influence the post-issue stock price performance but also and more importantly determine the choice of the issuance method.

Chapter 8

LEVERED SHARE REPURCHASE AND INTERNAL FINANCIAL CONSTRAINTS

8.1. Introduction

This section discusses the empirical results for levered share repurchase of internally financially unconstrained firms. During the last decades, share repurchases have become very popular as a means to return cash to shareholders. In 2007, share repurchases peaked at more than $700 billion near the market top.[37] A large number of these repurchases were funded with debt issues. For instance, in 2009 alone 37 companies announced plans to spend $39 billion on these levered repurchases.[38] It may be understandable for internally financially constrained firms to repurchase their shares by borrowing due to limited financial resources available, but it seems puzzling for internally financially unconstrained firms to borrow money in order to repurchase shares. The empirical analysis in this chapter investigates why internally financially unconstrained firms borrow money to repurchase shares. It further explores the stock returns associated with share repurchase given the level of internal financial constraints and sources of repurchase financing.

The extant empirical literature finds strong support for positive announcement period abnormal stock returns associated with share repurchase programs (see, for example, Vermaelen, 1981; Ikenberry et al., 1995). Theories such as the signalling hypothesis, the undervaluation hypothesis (see Vermaelen, 1981; Comment and Jarrell, 1991; Dittmar, 2000; Chan et al., 2007) and the free cash flow hypothesis of Jensen (1986) all explain the positive price reactions subsequent to share repurchase announcements. Since internally financially unconstrained firms already have sufficient excess cash flow to finance share repurchases, managers may borrow at the time of share repurchase in order to fund wealth-maximizing projects. Also, stock returns of internally financially

[37] See Michael Milken: "Why capital structure matters", *The Wall Street Journal*, April 21, 2009.
[38] Source: research by JP Morgan cited by Herb Greenbert in: "Debt to buy back stock", CNBC, November 8, 2011. See: http://www.cnbc.com/id/45209702 (retrieved on March 30, 2015).

unconstrained firms with a high level of investment should increase on the announcement of share repurchases; otherwise the increase in their stock returns will appear in the long-run stock returns when the benefits of the investments materialize, especially in an efficient market.

It can be argued that internally financially unconstrained firms conduct levered share repurchases to support investment expenditures. A number of studies have shown that share repurchases involve a significant cost that may limit the availability of internal cash to fund investments. Grullon and Michaely (2004), for example, show that firms may reduce their investments after share repurchase activities due to limited available cash flows. However, according to the precautionary motive for holding cash, future uncertainties in the capital market motivate firms to build cash buffers that allow them to undertake future investments (See, Opler, et al., 1999; Bates et al., 2006). Hahn and Lee (2009) further argue that firms with a high debt capacity are able to borrow more, which in turn allows for more investments in assets that can serve as collateral for further borrowing. Since internally financially unconstrained firms both have the borrowing capacity and the access to attractive interest rates, it is hypothesised that they borrow externally to retain adequate capital for funding investments. Thus, the hypothesis explained in Section 4.5 of Chapter 4 explores the share repurchase financing of internally financially unconstrained firms. Specifically, the study predicts that internally financially unconstrained firms are likely to conduct levered share repurchase when they also invest more. This behaviour should also have significant stock price implications for the levered share repurchasing firms, both in the short run and the long run. The hypotheses about the levered share repurchase are tested using both univariate and multivariate analyses.

Recent evidence by Chen and Wang (2012) highlights the share repurchase behaviour of constrained firms and the subsequent post-repurchase stock price underperformance. The inference from their studies is consistent with debt-financed repurchase of financially constrained firms. This study explores the levered share repurchase behaviour of internally financially unconstrained firms and tests the factors that drive cash-rich firms to finance their share

repurchases through borrowings. Minnick and Zhao (2007) find that firms borrow at the time of repurchase whereas De Jong et al. (2011) also assert that convertible bond issuers repurchase their stock in order to facilitate short selling. Both evidence shed some light on firm share repurchase financing. However this study contributes to the literature by focusing on unconstrained firms that undertake levered share repurchases.

The chapter consists of four parts. Section 8.1 describes the sample used to perform the empirical analysis. Section 8.2 presents the empirical findings about why internally financially unconstrained firms borrow to conduct share repurchase. Section 8.3 discusses additional results and performs robustness checks using alternative definitions of internal financial constraints and estimation techniques. Section 8.4 concludes the chapter.

8.2. Sample Statistics

This section discusses the descriptive statistics of the variables selected to undertake the empirical analysis. The variables presented here are used in prior studies to explain share repurchase transactions of firms. Thus, the variables allow the study to test the reasons why internally financial unconstrained firms conduct levered or debt-financed share repurchase. Section 8.2.1 presents the descriptive statistics for the final sample.

8.2.1. Descriptive Statistics of Independent and Control Variables

This section presents the descriptive statistics of independent and control variables used to undertake the empirical analysis. It focuses on the statistics of the firm characteristics of share repurchasing firms. These repurchase firms are partitioned into constrained and unconstrained. The unconstrained firm subsample is further divided into levered and unlevered to draw meaningful comparisons about the characteristics of repurchase firms based on the source of financing.

8.2.1.1. Share Repurchase during the Sample Period

Table 8.1 presents the number of yearly share repurchase announcements during the sample period, the anticipated proceeds from the repurchase, and the

average ratio of the proceeds to market value. As can be seen from the table, the annual issues are generally stable during the early part of the sample period from 1990 to 1993. During years 1994 and 2000, the number of share repurchases announcements increases significantly and drops to the levels in the 1990s between years 2001 and 2006 with a marginal increase in 2007 and 2008. Finally, the number drops significantly after year 2008; perhaps the financial crisis accounted for such drop as more firms faced significant cash constraints to even distribute to shareholders. The results on the proposed proceeds show a marked different picture from the volume of repurchase. Specifically, the proceeds are significantly lower during the first part of the sample period from year 1990 to 1999.

Table 8.1: Yearly Average Proceeds and Ratio of Share Repurchase Proceeds

Year	N	Proceeds	PMV
1990	233	336.82	0.13
1991	113	58.31	0.08
1992	194	81.82	0.07
1993	170	92.44	0.05
1994	253	106.19	0.07
1995	308	110.89	0.08
1996	442	185.46	0.06
1997	416	153.68	0.22
1998	642	145.78	0.08
1999	468	122.69	0.09
2000	256	251.05	0.09
2001	155	289.08	0.08
2002	123	268.01	0.09
2003	100	243.81	0.07
2004	153	570.20	0.08
2005	229	553.56	0.08
2006	193	980.25	0.08
2007	298	720.96	0.11
2008	394	418.06	0.15
2009	135	545.49	0.08
2010	188	758.96	0.09
2011	264	648.55	0.11
2012	147	1429.43	0.10
Total	5,874	345.84	0.10

This table shows the annual share repurchase of sample firms. It also indicates the average yearly proceeds from share repurchase announcements (PROCEEDS) and the ratio of proceeds to market value of firms (PMV).

However, between 2000 and 2012 the proceeds increase markedly. This amount of proceeds does not seem to depend on the number of repurchase announcements. In fact, during some periods when fewer repurchase announcements are made, the amount of proceeds is even larger than some periods of significantly higher number of repurchase announcements. Finally, the ratios indicate a stable value of proceeds per unit of firm value. It appears large firms announced more share repurchases than small firms. This evidence is consistent with free cash hypothesis that hold that large and mature firms (which have limited growth opportunities) are more likely to have significant free cash flows to distribute to shareholders (Jensen, 1986; Grullon and Michaely, 2004; Liang et al. 2013).

8.2.1.2. Descriptive Statistics of Variables

Table 8.2 provides descriptive statistics of some firm characteristics that affect share repurchase by internally financially constrained and unconstrained firms.[39] It also performs independent sample *t-test* of the mean difference between constrained and unconstrained repurchasing firms. This mean difference test provides preliminary differences in firm characteristics that explain the share repurchase behaviour given the level of internal financial constraints. Panel A shows the descriptive statistics for the unconstrained firms whereas Panel B displays the descriptive statistics for constrained firms. The mean difference tests are reported in Panel C.

As can be seen from Table 8.2, the mean MB for unconstrained firms is 2.77 compared to 2.24 for constrained firms. AR is -4% and -6% for unconstrained and constrained firms, respectively. The mean difference for MB is 0.53 and statistically significant at the 1% level, where as that of AR is 1% and significant at the 1% level. These results indicate that constrained firms are more undervalued than unconstrained firms. Perhaps, the level of undervaluation motivates constrained firms to conduct share repurchase.

[39] The definition of financial constraints is given in Section Chapter 5. It further describes how repurchasing firms are classified as constrained or unconstrained.

Table 8.2: Summary Statistics: Comparison of Unconstrained and Constrained Firms

Panel A: Unconstrained						
Variables	N	Mean	Median	S.D	Min	Max
MB	4700	2.77	2.11	2.12	0.44	10.26
Prior AR	4700	-0.04	-0.03	0.17	-1.43	1.03
INV	4700	0.06	0.05	0.06	0.00	0.68
SIZE	4700	2.79	2.76	0.95	-0.06	5.80
PROCEEDS ($'m)	4623	388.61	30.00	2184.47	0.12	90000.00
PMV	4611	0.08	0.06	0.16	0.00	8.46
Panel B: Constrained						
Variables	N	Mean	Median	S.D	Min	Max
MB	1174	2.24	1.66	2.02	0.44	10.26
Prior AR	1174	-0.06	-0.04	0.17	-1.00	0.50
INV	1174	0.09	0.06	0.12	-0.02	1.09
SIZE	1174	2.61	2.64	0.80	0.00	5.57
PROCEEDS ($'m)	1162	175.69	25.00	803.40	0.11	15000.00
PMV	1160	0.16	0.07	1.91	0.00	64.94

Panel C: Test of Mean Difference of unconstrained and constrained firms			
Variables	**N**	**Mean difference**	**t-stat**
MB	5874	0.53^{***}	(7.73)
Prior AR	5874	0.01^{***}	(2.60)
INV	5874	-0.03^{***}	(-12.59)
SIZE	5874	0.18^{***}	(5.92)
PROCEEDS	5785	212.92^{***}	(3.27)
PMV	5771	-0.07^{**}	(-2.54)

Notes: This table shows the descriptive statistics of the variables used in the empirical analysis for testing levered share repurchase behaviour of firms. Panel A provides results for constrained firms, Panel B for unconstrained firms and Panel C tests the mean difference of variables. Variables include market to book ratio (MB), pre-announcement abnormal returns (Prior AR), ratio of capital expenditure and research and development expenditure to total assets (INV), logarithm of book value of total assets (SIZE), value of repurchase proceeds (PROCEEDS), and ratio of repurchase value to market value (PMV). T-statistics are shown in parenthesis in Panel C. ** and *** *denote significance at the 5% and 1% level respectively.*

Unexpectedly, the mean difference in INV between unconstrained and constrained is negative and significant at the 1% level indicating that constrained firms invest more than unconstrained firms. The table also shows mean difference of 0.18 for SIZE at 1% significance level. The difference in firm size is consistent with the theory that large firms are more likely to be unconstrained. Moreover, the proceeds from share repurchase are larger for the unconstrained firms than the constrained firms. Overall, these results show that unconstrained firms have more free cash flows and thus are more likely to disburse cash flows to shareholders. It appears the evidence is consistent with prior literature about share repurchase of firms.

Table 8.3: Summary Statistics: Comparison of Unlevered and Levered Repurchase

Panel A: Unlevered						
Variables	N	Mean	Median	S.D	Min	Max
MB	3359	2.49	1.92	1.93	0.44	10.26
Prior AR	3359	-0.05	-0.03	0.19	-1.43	1.03
INV	3359	0.06	0.04	0.06	0.00	0.68
SIZE	3359	2.46	2.43	0.84	-0.06	5.80
PROCEEDS	3302	170.77	15.00	1750.08	0.12	90000.00
PMV	3290	0.08	0.06	0.10	0.00	1.95
Panel B: Levered						
Variables	N	Mean	Median	S.D	Min	Max
MB	1341	3.47	2.70	2.41	0.44	10.26
Prior AR	1341	-0.03	-0.02	0.12	-0.60	0.51
INV	1341	0.07	0.05	0.07	0.00	0.67
SIZE	1341	3.60	3.57	0.70	1.65	5.59
PROCEEDS	1321	933.14	224.40	2938.40	0.35	65000.00
PMV	1321	0.09	0.06	0.25	0.00	8.46

Panel C: Test of Mean Difference of levered and unlevered repurchase			
Variables	N	Mean difference	t-stat
MB	1923	-2.28***	(-10.32)
Prior AR	2500	-0.06***	(-5.15)
INV	1658	-0.76***	(-7.74)
SIZE	2401	-0.84***	(-13.97)
PROCEEDS	2327	0.28***	(11.34)
PMV	2154	0.04***	(5.55)

*Notes: This table shows the descriptive statistics of the variables used in the empirical analysis for testing levered share repurchase behaviour of unconstrained firms. Panel A provides results for unlevered, Panel B for levered repurchase and Panel C tests the mean difference of variables. Variables include market to book ratio (MB), pre-announcement abnormal returns (Prior AR), ratio of capital expenditure and research and development expenditure to total assets (INV), logarithm of book value of total assets (SIZE), value of repurchase proceeds (PROCEEDS), and ratio of repurchase value to market value (PMV). T-statistics are in parenthesis in Panel C and *** denotes significance at the 1% level.*

Table 8.3 provides the summary statistics of firm and repurchase characteristics of unconstrained firm subsample. The sample is further divided into unlevered and levered depending on whether share repurchase financing is from internal cash flows or external debt financing. Panel A presents the results for unlevered repurchase whereas Panel B gives the results for levered repurchase. The tests of the mean difference in the variables between unlevered and levered repurchase is provided in Panel C.

It is found that the mean MB is 2.49 and 3.47 for unlevered and levered repurchase, respectively with a negative and significant mean difference at the

1% level. The average prior repurchase abnormal returns are -5.0% and -3.0% for unlevered and levered repurchase respectively with mean difference significant at the 1% level. These two results indicate that unlevered repurchase firms are more undervalued than levered repurchase firms. The table also reports that the mean difference in investment between unlevered and levered is negative and significant at the 1% level. This result implies levered repurchase firms expend more on investments than unlevered repurchase firms. Levered repurchase firms are bigger than unlevered repurchase firms but the ratio of repurchase amount is not statistically different between unlevered and levered repurchase firms. Generally, large firms have adequate debt capacity and collateral to enable them obtain external debt financing. Overall, evidence shows the first sign that levered repurchase firms are likely borrow to invest.

8.2.1.3. Pearson's Correlation Matrix of Variables

Logistic regression is used to estimate the model that tests the effects of internal financial constraints on share repurchase (H_8 and H_9) as explained in Section 5.3.3.4. However, OLS is used to test hypothesis H_{10} and H_{11} about the stock returns following share repurchase. As discussed in Chapter 6 Section 6.2.1.3, a correlation coefficient close to or equal to +1 and -1 suggests high collinearity or perfect multicollinearity among the variables. Table 8.4 provides the Pearson's correlation matrixes of independent and control variables for the sample of share repurchase.

As the shown in Table 8.4, none of the variable indicates high collinearity with the highest being 0.507 for SIZE and LEVD. Most of the variables are correlated at either the 1% or 5% level, with most of the correlations lying close or below 0.20. This results implies low multicollinearity and thus tolerable for OLS estimation. The high correlation between SIZE and LEVD could explain that large firms possess collateral to obtain external borrowings. Overall, the results show that multicollinearity is not a problem for estimating the regression model using OLS.

Table 8.4: Pearson's Correlation Matrix of Variables

	$LEVD_{dum}$	KZ	MB	Prior AR	INV	SIZE	VALUE	PMV	$CRISIS_{dum}$
$LEVD_{dum}$	1.000								
KZ	0.110***	1.000							
MB	0.174***	-0.265***	1.000						
Prior AR	0.033**	-0.053***	0.021	1.000					
INV	0.107***	0.136***	0.080***	-0.055***	1.000				
SIZE	0.507***	-0.164***	0.469***	0.097***	0.023*	1.000			
VALUE	0.139***	-0.087***	0.130***	0.028**	-0.012	0.314***	1.000		
PMV	-0.009	0.026**	-0.021	-0.014	-0.011	-0.041***	0.067***	1.000	
$CRISIS_{dum}$	0.020	-0.034***	-0.025*	0.038***	-0.128***	0.154***	0.080***	0.008	1.000

Notes: Variables are defined as dummy for levered share repurchase ($LEVD_{dum}$), KZ index measure of internal financial constraints (KZ), market to book ratio (MB), pre-announcement abnormal returns (Prior AR), ratio of capital expenditure and research and development expenditure to total assets (INV), logarithm of book value of total assets (SIZE), financial crisis dummy ($CRISIS_{dum}$), amount of share repurchase (VALUE), ratio of repurchase value value to market value (PMV). *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

8.3. Testing the Effects of Internal Financial Constraints on Levered Share Repurchase

This section tests the hypotheses specified in Section 4.4.1 and 4.4.2 of Chapter 4 using the logit regression model (Model 5) stated in Chapter 5. The hypotheses are re-stated below:

> ***H_8: Financially constrained firms are more likely to conduct debt-financed repurchase than unconstrained firms***
>
> ***H_9: Financially unconstrained firms borrow to repurchase especially when they also undertake investments***

Model 5 discussed in Section 5.2.3.4 tests the effects of internal financial constraints on levered share repurchase. The model is re-stated below:

$$\Pr(y_i = 1|x_i) = \beta_0 + \beta_1 KZ_{it} + \beta_2 INV_{it} + \beta_3 KZ * INV_{it} + \sum_{i=1}^{n} \beta_i X_{it} + \varepsilon_{it} \text{.....(5)}$$

The model tests the probability of levered share repurchases given internal financial constraints and a set of firm characteristics that explain share repurchase behaviour of firms. Since the model represents logit regression estimation, the dependent variable is 1 for levered repurchase and 0 for unlevered repurchase firm.

8.3.1. Logistic Regression Results for Levered Share Repurchase of Unconstrained Firms

[*Hypothesis H_8 and H_9*]

Table 8.5 presents the logit regression results about the probability that a firm conducts levered share repurchase given the level of internal financial constraints and a set of firm characteristics. The results for Models 1 and 2 use the full sample of share repurchase firms. Regression Model 1 shows the results for the effects of internal financial constraints on levered share repurchase holding constant the firm level variables including investment, INV. Model 2 gives the results of the logit regression when internal financial constraints and investments are interacted (KZ^*INV). Both Models also contain control variables and year and industry dummies to control for year and

industry specific effects. Model 3 restricts the sample to only internally financially unconstrained firms that conducted share repurchase. The rationale is to detach the effects of investments on repurchase from the internal financial constraints variables that includes the constrained firm subsample. It also allows the study to investigate clearly how INV affects the levered share repurchase of internally financially unconstrained firms. In other words, Model 3 answers the question about why unconstrained firms borrow to conduct share repurchases.

As hypothesised, KZ has a positive and significant coefficient in Models 1 and 2 indicating that internal financial constraints increase the probability of levered share repurchase. Also, the coefficient of INV is positive and statistically significant at the 1% level in both Models 1 and 2. It shows that high investing firms are more likely to borrow to conduct share repurchase. The evidence about investment is consistent with building cash buffers at the time of share repurchase since repurchase reduces subsequent cash flows and hence stifle investment expenditure. Importantly, the coefficient of the interaction term KZ*INV is negative and statistically significant at the 1% level as shown in Model 2.

Table 8.6 is similar to Table 8.5 with SIZE variable excluded due to high correlation with LEVD and MB variables. The coefficients are similar to what is reported in Table 8.5. The results about the interaction term may produce two conclusions: They could imply that internally financially unconstrained and high investing firms are more likely to conduct levered share repurchase or that internally financially constrained firms which invest less are likely to conduct levered repurchase. The former conclusion is consistent with the developed hypothesis about share repurchase as explained in Sections 4.5.1 and 4.5.2 of Chapter 4.

Table 8.5: Logit Regression Estimates (Raw Coefficient Estimates) of Levered Repurchase and Internal Financial Constraints

Variables	(1)	(2)	(3)
KZ	1.162***	0.873***	
	(0.00)	(0.00)	
INV	0.466***	0.424***	0.384***
	(0.00)	(0.00)	(0.00)
KZ*INV		-2.673***	
		(0.00)	
MB	-0.101***	-0.085***	-0.119***
	(0.00)	(0.00)	(0.00)
Prior AR	-0.651***	-0.633***	-0.408
	(0.00)	(0.01)	(0.13)
CRISIS	-1.018***	-1.082***	-1.589***
	(0.00)	(0.00)	(0.00)
SIZE	1.995***	2.021***	2.106***
	(0.00)	(0.00)	(0.00)
PMV	0.030	0.033*	1.072**
	(0.11)	(0.08)	(0.02)
Constant	-6.496***	-6.470***	-6.548***
	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	5771	5771	4611
pseudo R^2	0.319	0.324	0.346
chi-squared	1302.556	1306.272	1043.698
p	0.000	0.000	0.000

*Notes: This table shows the coefficient estimates of the logit regression for share repurchase. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Models 1 and 2 provide results for the full sample whereas model 3 uses only the subsample of unconstrained firms. Variables included in the regressions include KZ-index measure of internal financial constraints (KZ), investment expenditure (INV), the interaction term between internal financial constraints and investment (KZ*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), the ratio of repurchase proceeds to market value (PMV), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

Table 8.6: Logit Regression Estimates (Raw Coefficient Estimates) of Levered Repurchase and Internal Financial Constraints

Variables	(1)	(2)	(3)
KZ	0.692***	0.565***	
	(0.00)	(0.00)	
INV	0.361***	0.346***	0.249***
	(0.00)	(0.00)	(0.01)
KZ*INV		-1.139***	
		(0.00)	
MB	0.188***	0.196***	0.221***
	(0.00)	(0.00)	(0.00)
Prior AR	0.189	0.202	0.530***
	(0.27)	(0.24)	(0.01)
CRISIS	0.659**	0.652**	0.230
	(0.02)	(0.02)	(0.47)
PMV	-0.035	-0.035	0.469***
	(0.18)	(0.19)	(0.01)
Constant	-2.338***	-2.313***	-2.367***
	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	5771	5771	4611
pseudo R^2	0.107	0.108	0.116
chi-squared	638.615	638.383	528.748
p	0.000	0.000	0.000

*Notes: This table shows the coefficient estimates of the logit regression for share repurchase. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Models 1 and 2 provide results for the full sample whereas model 3 uses only the subsample of unconstrained firms. Variables included in the regressions include KZ-index measure of internal financial constraints (KZ), investment expenditure (INV), the interaction term between internal financial constraints and investment (KZ*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), the ratio of repurchase proceeds to market value (PMV), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* ** and *** *denote significance at the 5% and 1% level respectively.*

Tables 8.7 and 8.8 provide the odds ratios of the logit regression estimations with SIZE and without SIZE respectively. From these results, the odds ratio for KZ*INV indicates that constrained firms which invest more are 0.48 times likely to conduct levered repurchase. The inverse produces higher odds ratio for unconstrained high investing firms indicating that these firms would more likely conduct levered repurchase.

Table 8.7: Logit Regression Estimates (Odds Ratio) of Levered Repurchase and Internal Financial Constraints

Variables	(1)	(2)	(3)
KZ	3.197***	2.393***	
	(0.00)	(0.00)	
INV	1.594***	1.528***	1.468***
	(0.00)	(0.00)	(0.00)
KZ*INV		0.480***	
		(0.00)	
MB	0.904***	0.919***	0.888***
	(0.00)	(0.00)	(0.00)
Prior AR	0.522***	0.531***	0.665
	(0.00)	(0.01)	(0.13)
CRISIS	0.361***	0.339***	0.204***
	(0.00)	(0.00)	(0.00)
SIZE	7.355***	7.544***	8.213***
	(0.00)	(0.00)	(0.00)
PMV	1.030	1.033*	2.921**
	(0.11)	(0.08)	(0.02)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	5771	5771	4611
pseudo R^2	0.319	0.324	0.346
chi-squared	1302.556	1306.272	1043.698
p	0.000	0.000	0.000

*Notes: This table shows the exponentiated coefficient estimates (odds ratio) of the logit regression for share repurchase. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Models 1 and 2 provide results for the full sample whereas model 3 uses only the subsample of unconstrained firms. Variables included in the regressions are KZ-index measure of internal financial constraints (KZ), investment expenditure (INV), the interaction term between internal financial constraints and investment (KZ*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), the ratio of repurchase proceeds to market value (PMV), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

Table 8.8: Logit Regression Estimates (Odds Ratio) of Levered Repurchase and Internal Financial Constraints

Variables	(1)	(2)	(3)
KZ	1.998***	1.760***	
	(0.00)	(0.00)	
INV	1.435***	1.414***	1.283***
	(0.00)	(0.00)	(0.01)
KZ*INV		0.124***	
		(0.00)	
MB	1.206***	1.217***	1.248***
	(0.00)	(0.00)	(0.00)
Prior AR	1.208	1.224	1.698***
	(0.27)	(0.24)	(0.01)
CRISIS	1.933**	1.920**	1.259
	(0.02)	(0.02)	(0.47)
SIZE	0.965	0.966	1.599***
	(0.18)	(0.19)	(0.01)
PMV	Yes	Yes	Yes
	Yes	Yes	Yes
Year Dummies	5771	5771	4611
Industry Dummies	0.107	0.108	0.116
N	638.615	638.383	528.748
pseudo R^2	0.000	0.000	0.000
chi-squared	1.998***	1.760***	
p	(0.00)	(0.00)	

*Notes: This table shows the exponentiated coefficient estimates (odds ratio) of the logit regression for share repurchase. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Models 1 and 2 provide results for the full sample whereas model 3 uses only the subsample of unconstrained firms. Variables included in the regressions are KZ-index measure of internal financial constraints (KZ), investment expenditure (INV), the interaction term between internal financial constraints and investment (KZ*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), the ratio of repurchase proceeds to market value (PMV), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

The other variables give the expected signs for the effects on the probability of a levered share repurchase. For example, the coefficients of MB and AR are negative and statistically significant at the 1% level in Models 1 and 2. These evidence support the undervaluation hypothesis of share repurchase transactions (Stephens and Weisbach, 1998; D'Mello and Shroff, 2000). More undervalued firms are likely to conduct levered repurchase. It seems firms take advantage of undervalued equity to borrow to enable them buy back undervalued shares in order to gain from subsequent price appreciations. The

CRISIS coefficient is also negative and statistically significant at the 1% level in all the outputs indicating that firms are likely to repurchase during periods of favourable economic conditions. Moreover, during crisis periods, firms are likely to be internally financially constrained internally which will imply less available free cash flows to distribute to shareholders. It further means that debt capital would be expensive such that borrowings become suboptimal. SIZE is also positive and significant at the 1% level in all three models consistent with the free cash flow hypothesis that explain that large firms with limited growth opportunities are more likely to have significant amount of free cash flows to distribute to shareholders to avoid investing in value-destroying projects. Repurchase ratio is positive and significant at 10% and 5% levels for Models 2 and 3 respectively.

These results are consistent with hypotheses about the effects of internal financial constraints on levered share repurchase and I argue that firms do not only utilize internal cash flows to finance share repurchase but also a significant number of firms borrow to finance share repurchase (Chen and Wang, 2012; Lei and Zhang, 2015; Farre-Mensa et al. 2015). These findings extend the evidence by Chen and Wang (2012) that some internally financially constrained firms repurchase their shares. Moreover, this study highlights the effects of investments in the decisions for internally financially unconstrained firms to finance their share repurchase programs through borrowings. Whereas unconstrained firms have internal cash flows to distribute through share repurchase programs, levered share repurchase by these firms are accompanied by significant investments expenditure. Thus, by obtaining external debt finance unconstrained firms build cash buffer sufficient to finance both share repurchase and investments. The rationale for unconstrained firms to borrow is that the external debt financing is more likely to be cheaper for these firms than it will be for constrained firms that might not even have debt ratings.

It further suggests that for unconstrained firms, there is no motivation to borrow to finance share repurchase since that will encourage excess perquisites and hence the agency costs of free cash flows (Jensen, 1986). The increased corporate liquidity is an advantage to obtain cheap debt financing which allows

the firm to invest more than constrained firm counterpart. Thus, to the extent that there is positive stock price reaction following announcements of share repurchase, levered repurchase of unconstrained firms should be combined with investments. Constrained firms cannot borrow cheap and this constraint limits the ability to combine share repurchase with investments. The stock reactions associated with levered repurchase of constrained firms is that the cash constraint is the only reason these firms will borrow. Share repurchase limits subsequent investment in capital projects since more internal cash flows are disbursed to shareholders (Grullon and Michaely, 2004). In other words, by taking advantage of potential cheap debt financing, unconstrained firms generate sufficient funds to also undertake investments. Thus, levered share repurchase allows the firm to simultaneously distribute cash flows to shareholders and also undertake investments.

Overall, evidence indicates that the decision to conduct levered share repurchase extends to the possibility of firm not foregoing investment projects at the time of share repurchase announcements. Share repurchase generally utilises internal cash flows and reduces available funds for subsequent investments (Denis and Sibilkov, 2010). Therefore, these findings about the effects of internal financial constraints on borrowings and investments are consistent with the effects of repurchase on investments. It also indicates that the effects of investments on the decision to finance repurchase through borrowings is driven by the unconstrained firms. It is only when firms are unconstrained will they be able to obtain sufficient amount of debt financing to undertake both share repurchase transactions and investments. Unconstrained firms have higher debt capacity that allows them to borrow more and increase investments expenditure (Hahn and Lee, 2009).

8.3.2. Share Repurchase and Stock Returns

This section discusses the post repurchase stock returns associated with repurchasing firms. It analyses both the announcement date abnormal returns and the long run abnormal returns. If the market underreacts to initial announcement of repurchase, then the long run returns should be more positive for these repurchasing firms. The analyses further consider the returns based on

whether the repurchase is unlevered or levered for unconstrained firms. The hypotheses about stock returns are re-stated below:

> ***H_{11}: Cash-financed repurchase is associated with more positive abnormal returns than debt-financed repurchase, especially when the firm is internally financially unconstrained.***
>
> ***H_{12}: All else equal, unconstrained firms which conduct levered share repurchase should be associated with more positive returns for high investing firms than low investing firms.***

As discussed in Section 5.2.3.4 of Chapter 5, the above hypotheses about stock returns are tested using the following cross-sectional regression model.

$$RET_i = \beta_0 + \beta_1 LEVD_i + \beta_2 INV_i + \beta_3 LEVD * INV_i + \sum_{i=1}^{n} \beta_i X_i + \varepsilon_i \text{.....(6)}$$

From the model above, the dependent variable is the 3-day cumulative abnormal returns for announcement date abnormal returns and 36-month buy and hold abnormal. KZ and MB are the main independent variables with set of control variables defined in Section 5.2.1.3 of Chapter 5.

8.3.2.1. Share Repurchase and Announcement Date Abnormal Returns

[Hypothesis H_{11} and H_{12}]

The extant literature finds significant support for positive announcement date abnormal stock returns associated with share repurchase programs. These stock returns are explained by undervaluation hypothesis (Vermaelen, 1981; Comment and Jarrell, 1991; Stephens and Weisbach, 1998), information signalling hypothesis (Vermaelen, 1981 and 1984; Grullon and Michaely; 2004; Liang et al. 2013) as well as the free cash flow hypothesis (Jensen, 1986; Grullon and Michaely, 2004; Chan et al. 2004; Bozanic, 2010). Thus, each of the theories emphasises that repurchase constitutes positive information to the market about the future prospects of the repurchasing firms. This section explores whether the selection of unconstrained firms to borrow to repurchase shares influence their announcement date returns. Borrowing to repurchase may signal future investment prospects because firms are able to build cash

buffers during the share repurchase announcements without depleting the internal cash flows.

Table 8.9: Univariate Analysis of 3-day Announcement Date Abnormal Returns *($CAR_{(-1,1)}$)* following Share Repurchase

Panel A: Full sample - Investments and Levered Share Repurchase

		Unlevered	*Levered*	*Total*	*Mean diff.*
	N	1	2	3	*t-stat*
High investment	1700	0.030	0.014	0.025	0.015
		(18.29)***	(9.53)***	(20.42)***	(5.78)***
Low investment	4700	0.017	0.015	0.016	0.002
		(4.88)***	(4.24)***	(6.40)***	(0.44)
Total	5874	0.027	0.014	0.023	0.013
		(18.58)***	(10.12)***	(21.06)***	(5.48)***
Mean diff		0.012	-0.000	0.008	
t-stat		(3.16)***	(-0.29)	(3.07)***	

Panel B: Unconstrained Firms - Investments and Levered Share Repurchase

		Unlevered	*Levered*	*Total*	*Mean diff.*
	N	1	2	3	*t-stat*
High investment	835	0.030	0.014	0.026	0.016
		(17.33)***	(9.57)***	(19.36)***	(5.36)***
Low investment	3865	0.014	0.014	0.014	-0.000
		(3.28)***	(4.14)***	(4.61)***	(-0.08)
Total	4700	0.027	0.014	0.024	0.013
		(17.04)***	(10.34)***	(19.41)***	(4.91)***
Mean diff		0.017	0.000	0.012	
t-stat		(3.84)***	(0.06)	(3.79)***	

Panel C: Constrained Firms - Investments and Levered Share Repurchase

		Unlevered	*Levered*	*Total*	*Mean diff.*
	N	1	2	3	*t-stat*
High investment	339	0.026	0.014	0.021	0.012
		(6.03)***	(3.44)***	(6.93)***	(1.97)**
Low investment	835	0.031	0.017	0.023	0.014
		(4.52)***	(2.25)**	(4.60)***	(1.38)
Total	1174	0.027	0.015	0.022	0.012
		(7.42)***	(4.04)***	(8.32)***	(2.35)**
Mean diff		-0.005	-0.003	-0.002	
t-stat		(-0.54)	(-0.38)	(-0.37)	

Notes: This table shows the univariate analysis of initial abnormal returns associated with share repurchase. The abnormal return measure is the 3-day cumulative abnormal returns, CAR(-1,1).

Panel A of Table 8.9 shows the 3-day abnormal returns associated with share repurchase based on investment and levered repurchase. Levered repurchase firms are associated with more positive stock returns (2.7%) compared to levered repurchase firms (1.4%), both significant at the 1% level. The mean difference is 1.3% and significant at the 1.0% level. Firms investing more show

abnormal returns of that are 1.5% significant at the 0.8% level more than those investing less. For the unconstrained firm subsample, as reported in Panel B, unlevered firms report more positive stock returns than levered repurchase firms. These results are consistent with the hypothesis (H_{11}) that cash-financed share repurchase is associated with more positive stock returns than debt-financed share repurchase. The reason is that the additional debt increases leverage and risks of financial distress and bankruptcy (Fama and French, 1992; Daniel and Titman, 1997).

Table 8.10 presents the cross-sectional regression analysis of the initial abnormal returns following share repurchase announcements. The dependent variable is the 3-day cumulative abnormal stock returns during the repurchase announcement period. LEVD is the dummy variable that equals 1 for levered share repurchase and 0 otherwise whereas LEVD*INV is the interaction term for levered repurchase and investments. INV is continuous variable for investment expenditure. MB is the market to book ratio, AR is the pre-announcement stock returns, CRISIS is dummy variable for financial crisis, SIZE is the firm size and REP_RATIO is the repurchase value relative to firm size. In addition to the control variables, we also include one-digit SIC and year dummies in the regressions to control for the potential effects of industry-specific and time-specific differences.

The coefficient of LEVD is significantly negative in Models 1 and 3 indicating that levered repurchase of internally financially unconstrained firms is associated with less positive stock returns. However, the coefficient is positive in Models 4 (significant) and 5 (insignificant). INV is significantly negative in all outputs suggesting that investment is associated with less positive stock returns. This evidence is consistent with market perception about investment in value-destroying projects of internally financially unconstrained firms. The free cash flow hypothesis also describes this phenomenon about the stock reactions of investing firms, especially when they are internally financially unconstrained. The coefficient of LEVD*INV is positive and statistically significant at the 5% level in Model 3 and insignificant in Model 5. This result indicates that high investing of levered share repurchase firms is associated

with more positive stock returns. AR is significantly negative which is in line with the extant evidence. Large firms are associated with lower stock returns as shown by the negative coefficient of the SIZE variable. This result is consistent with the firm size effects and stock returns.

Table 8.10: Cross-sectional Regression Analysis of Announcement Date Abnormal Returns

Variables	(1)	(2)	(3)	(4)	(5)
Dependent Variable is the 3-day CAR(-1,1)					
LEVD	-0.013***		-0.018***	0.006**	0.001
	(0.00)		(0.00)	(0.03)	(0.75)
INV		-0.063***	-0.086***	-0.048**	-0.071**
		(0.00)	(0.01)	(0.04)	(0.02)
LEVD*INV			0.088**		0.065
			(0.03)		(0.11)
MB				0.000	0.000
				(0.84)	(0.83)
Prior AR				-0.023**	-0.023**
				(0.04)	(0.04)
CRISIS				0.013	0.013
				(0.14)	(0.15)
SIZE				-0.015***	-0.015***
				(0.00)	(0.00)
PMV				0.008	0.008
				(0.36)	(0.38)
Constant	0.027***	0.028***	0.032***	0.062***	0.064***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
N	4700	4700	4700	4611	4611
adj. R^2	0.005	0.002	0.007	0.029	0.029
p	0.000	0.004	0.000	0.000	0.000

*Notes: This table shows the cross sectional regression results of initial abnormal returns associated with repurchase of unconstrained firms. The dependent variable is the 3-day cumulative abnormal returns, CAR(-1,1). Variables included in the regressions dummy for levered repurchase (LEVD), investment expenditure (INV), the interaction term between levered repurchase and investment (LEVD*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), ratio of repurchase proceeds to market value (PMV), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* ** and *** *denote significance at the 5% and 1% level respectively.*

These findings support the hypothesis that levered repurchase of internally financially unconstrained firms affects the announcement period abnormal returns. Unconstrained firms should finance share repurchase with internal finance and not borrow from external debt market. The additional leverage and the effects on firm risk mean these firms will be associated with less positive

announcement date abnormal returns. Share repurchase of these firms will be associated with poorer stock performance when they finance the repurchase through borrowings, unless there is a simultaneous expenditure in more capital investments. The evidence provided in the regression output implies the hypotheses about post-repurchase stock returns are accepted.

8.3.2.2. Share Repurchase and Long Run Abnormal Returns

The long-run returns are given as the buy and hold abnormal returns 36-months post share repurchase announcements. Generally, unlevered share repurchase is associated with more positive long-term stock price performance than levered repurchase. This evidence is consistent with the adverse effects of increased leveraged on firm financial distress risk. In essence, the level of investment at the time of levered share repurchase has long-run impact on stock price reactions. For levered repurchase firms, it appears investment motivates firms to borrow in order to undertake investment projects that have long run benefits to the firms. This finding also implies investors initially underreact to levered share repurchase and the level of investment at the repurchase announcement. For example, Grullon and Michaely (2004) report that investors underreact to repurchase announcements because they initially underestimate reduction in the costs of capital. The increased investments of levered repurchase firms also indicate no or limited agency costs of debt that results in underinvestment (Myers, 1977). These findings suggest that investors react positively in the long run to levered share repurchase of unconstrained firms especially when these firms invest.

Table 8.11 reports the univariate analysis of long run abnormal returns associated with share repurchase announcements. Panel A analyses the stock returns for the full sample and examines whether or not the returns differ based on investment expenditure and levered share repurchase. The stock returns are 13.0% and 2.6% for unlevered and levered repurchase firms, respectively (H_{11}). The mean difference between the returns is 10.4% and significant at the 10% level. High investing firms are associated with 18.0% returns more than low investing firms. Panel B provides the stock returns for unconstrained firms based on investment expenditure and levered share repurchase. Levered

repurchase firms that undertake more investment projects are associated with more positive abnormal returns of 25.9% significant at the 10% level than low investing firms. Again, high investing firms are associated with more positive abnormal returns of 21.5% significant at the 5% level, more than low investing firms. These results are consistent with the hypothesis (H_{12}) that unconstrained firms that conduct levered share repurchase should be associated with more positive returns for high investing firms than low investing firms.

Table 8.11: Univariate Analysis of 36-month Buy and Hold Abnormal Returns ($BHAR_{36\text{-}month}$) following Share Repurchase

Panel A: Full sample - Investments and Levered Share Repurchase

		Unlevered	*Levered*	*Total*	*Mean diff.*
	N	1	2	3	*t-stat*
High investment	1089	0.253	0.221	0.240	0.032
		(2.95)***	(2.48)**	(3.84)***	(0.25)
Low investment	4361	0.103	-0.039	0.069	0.142
		(2.93)***	(-0.53)	(0.51)	(1.97)**
Total	5450	0.130	0.026	0.096	0.104
		(3.96)***	(0.44)	(3.31)***	(1.66)*
Mean diff		0.150	0.259	0.180	
t-stat		(1.75)*	(1.90)*	(2.47)**	

Panel B: Unconstrained Firms - Investments and Levered Share Repurchase

		Unlevered	*Levered*	*Total*	*Mean diff.*
	N	1	2	3	*t-stat*
High investment	775	0.252	0.270	0.258	-0.018
		(2.51)**	(2.63)***	(3.45)***	(-0.11)
Low investment	3581	0.103	-0.107	0.043	0.210
		(2.69)***	(-1.23)	(1.18)	(2.57)**
Total	4356	0.128	-0.029	0.082	0.157
		(3.55)***	(-0.40)***	(2.46)**	(2.16)**
Mean diff		0.149	0.377	0.215	
t-stat		(1.54)	(2.12)**	(2.48)**	

Panel C: Constrained Firms - Investments and Levered Share Repurchase

		Unlevered	*Levered*	*Total*	*Mean diff.*
	N	1	2	3	*t-stat*
High investment	314	0.257	0.146	0.196	-0.111
		(1.60)	(0.90)	(1.71)*	(-0.48)
Low investment	780	0.103	0.181	0.135	0.078
		(1.15)	(1.44)	(1.83)*	(0.52)
Total	1094	0.139	0.169	0.152	0.030
		(1.78)*	(1.69)*	(2.45)**	(0.24)
Mean diff		0.154	-0.035	0.061	
t-stat		(0.83)	(-0.17)	(0.45)	

Notes: This table shows the univariate analysis of initial abnormal returns associated with share repurchase. The abnormal return measure is the 36-month buy and hold abnormal returns, BHAR(2,36).

Table 8.12: Cross-sectional Regression Analysis of Long Run Buy and Hold Abnormal Returns

Variables	(1)	(2)	(3)	(4)	(5)
Dependent Variable is the 3-year BHAR(2,36)					
LEVD	-0.157*		-0.133	-0.149	-0.141
	(0.05)		(0.25)	(0.13)	(0.29)
INV		1.332***	1.652***	1.664***	1.706***
		(0.01)	(0.01)	(0.00)	(0.01)
LEVD*INV			-0.590		-0.113
			(0.57)		(0.91)
MB				-0.045**	-0.045**
				(0.03)	(0.03)
Prior AR				-0.010	-0.010
				(0.95)	(0.96)
CRISIS				-0.386	-0.388
				(0.26)	(0.26)
SIZE				0.054	0.054
				(0.23)	(0.23)
PMV				0.060	0.060
				(0.79)	(0.78)
Constant	0.128***	-0.001	0.030	0.282	0.281
	(0.00)	(0.98)	(0.54)	(0.37)	(0.37)
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
N	4356	4356	4356	4280	4280
adj. R^2	0.001	0.001	0.002	0.008	0.008
p	0.052	0.007	0.011	0.000	0.000

*Notes: This table shows the cross sectional regression results of long run abnormal returns associated with repurchase of unconstrained firms. The dependent variable is the 3-year buy and hold abnormal returns. Variables included in the regressions dummy for levered repurchase (LEVD), investment expenditure (INV), the interaction term between levered repurchase and investment (LEVD*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), ratio of repurchase proceeds to market value (PMV), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* *, ** and *** denote significance at the 10%, 5% and 1% level respectively.*

Table 8.12 above reports the cross-sectional regression analyses of the long run stock price reactions to share repurchase announcements. The dependent variable is the BHAR over 36-month period post-repurchase announcements and independent/control variables are the same as in earlier regressions.[40] Also year and industry dummies are controlled for to account for time and industry specific effects. Model 1 tests the effects on stock returns of levered repurchase. LEVD is marginally significant at the 10% level indicating that

[40] Similar cross-sectional regression analyses are provided for buy and hold returns over 12-month and 24-month.

levered repurchase is associated with less positive stock returns. INV is significantly positive at the 1% level showing that investment is associated with positive long run stock returns. However, LEVD is not significant in Models 3, 4, and 5. Importantly, LEVD*INV is not significant in Model 3 and 5.

These findings are consistent with the adverse effects of leverage on firm value and the associated stock price reactions. Studies such as Ikenberry et al. (1995, 2000) and Peyer and Vermaelen (2009) and Chen and Wang (2012) all find strong support for the long-term abnormal returns associated with share repurchase. For example, Peyer and Vermaelen (2009) assert that the long run abnormal returns are a correction of prior overreaction to bad news about the firms at the time of repurchase. However, as hypothesised, the source of financing the repurchase of financially unconstrained could affect the magnitude of the long run stock returns.

8.4. Robustness and Sensitivity Analysis

This section presents the results of a number of robustness and sensitivity analysis. These additional results provide further support for the main results and also ensure the results are robust to alternative estimation techniques. The section is divided into subsection 8.4.1 which provides results for alternative cut-off points for KZ, 8.4.2 which provides results for WW index measure of internal financial constraints, subsection 8.4.3 gives results for the effects of bond ratings on share repurchase; subsection 8.4.4 shows results for the effects of financial distress on share repurchase, Subsection 8.4.5 estimates tobit regression of the main model, and Subsection 8.4.6 provides results for random and fixed effects logit regression estimation techniques.

8.4.1. Unconstrained firms defined using alternative cut-off point of KZ

This section provides results for alternative cut-off points for classifying share repurchase firms as constrained or unconstrained. Results from previous sections define share repurchase firms within the bottom 80% as unconstrained and the top 20% as constrained. Here firms are classified as internally

financially unconstrained when they fall within the bottom 90%, 75%, and 50% of KZ. In other words, internally financially constrained firms are those in the top 10%, 25% and 50% of KZ. Table 8.13 reports the results of the logit regressions for these alternative KZ cut-off points. In all three models, the coefficient of INV is significantly positive indicating that investment increases the probability that unconstrained firms will conduct levered share repurchase. MB is significantly negative in line with the undervaluation hypothesis of share repurchase. The coefficient of CRISIS and SIZE are significantly negative and positive, respectively. Overall, these results provide further evidence that the classification of internal financial constraints produce consistent evidence about the probability of levered share repurchase programs.

Table 8.13: Logit Regression Estimates of Main Results (alternative cut-off points)

	90%	75%	50%
Variables	(1)	(2)	(3)
INV	0.417***	0.371***	0.509***
	(0.00)	(0.00)	(0.00)
MB	-0.132***	-0.105***	-0.096***
	(0.00)	(0.00)	(0.00)
Prior AR	-0.598**	-0.395	-0.508
	(0.02)	(0.17)	(0.21)
CRISIS	-1.336***	-1.486***	-2.075***
	(0.00)	(0.00)	(0.00)
SIZE	2.073***	2.142***	2.289***
	(0.00)	(0.00)	(0.00)
PMV	0.954**	1.057**	0.550
	(0.02)	(0.03)	(0.42)
Constant	-6.465***	-6.774***	-6.844***
	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	5193	4323	2882
pseudo R^2	0.328	0.356	0.385
chi-squared	1142.077	972.443	662.240
p	0.000	0.000	0.000

Notes: This table shows the results of the logit regression for share repurchase using 95% (model 1), 75% (model 2) and 50% (model 3) cut-off points of KZ to classify firms as unconstrained. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Variables included in the regressions are investment expenditure (INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), ratio of repurchase proceeds to market value (PMV) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis. ** and *** *denote significance at the 5% and 1% level respectively.*

8.4.2. Levered Share Repurchase and WW index Internal Financial Constraints

As a robustness check, this section uses Whited and Wu (2006) index measure of internal financial constraints to analyse the effects of internal financial constraints on levered share repurchase. The logit regression results are shown in Table 8.14. Consistent with the results given in Table 8.2 using the KZ index measure of internal financial constraints, the coefficient of WW is positive and significant at 1% level in Model 1 and at 5% level in Model 2 for full sample. However, as shown in Model 2, the coefficient of the interaction term WW*INV is not significant. Investment INV is positive and significant in all the Models indicating that investment is drives levered share repurchase. In other words, firms that conduct debt-financed share repurchase are more likely to invest more. Overall, the findings are similar when KZ index and WW index are used as measure of internal financial constraints.

Table 8.14: Logit Regression Estimates of Levered Repurchase and Internal Financial Constraints (WW index)

Variables	(1)	(2)	(3)
WW	0.491***	0.403**	
	(0.00)	(0.01)	
INV	0.586***	0.602***	0.558***
	(0.00)	(0.00)	(0.00)
WW*INV		-2.604	
		(0.20)	
MB	-0.120***	-0.119***	-0.124***
	(0.00)	(0.00)	(0.00)
Prior AR	-0.726***	-0.730***	-0.817***
	(0.00)	(0.00)	(0.00)
CRISIS	-0.771**	-0.775**	-0.708**
	(0.02)	(0.01)	(0.03)
SIZE	1.813***	1.803***	1.804***
	(0.00)	(0.00)	(0.00)
PMV	0.046**	0.046**	0.770***
	(0.01)	(0.02)	(0.01)
Constant	-5.737***	-5.710***	-5.749***
	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	5678	5678	4547
pseudo R^2	0.297	0.298	0.240
chi-squared	1224.464	1229.421	909.225
p	0.000	0.000	0.000

*Notes: This table shows the coefficient estimates of the logit regression for share repurchase. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Models 1 and 2 provide results for the full sample whereas model 3 uses only the subsample of unconstrained firms. Variables included in the regressions include WW-index measure of internal financial constraints (KZ), investment expenditure (INV), the interaction term between internal financial constraints and investment (WW*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), the ratio of repurchase proceeds to market value (PMV), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are in parenthesis.* , ** and *** denote significance at the 10%, 5% and 1% level respectively.*

8.4.3. Levered Share Repurchase and Bond Ratings

Prior studies assert that share repurchase have significant post-repurchase effects of bond ratings. Specifically, the increased leverage from repurchase results in credit ratings downgrades (Minnick and Zhao, 2007; Chen and Wang, 2012). This implies that levered share repurchase should be associated with significant credit rating downgrades. It also follows that investment grade rating firms will be more likely to borrow more to finance share repurchase programs. Firms with bond ratings and investment grade ratings would be internally financially unconstrained and therefore will be more likely to conduct levered share repurchase to allow them to also invest. Firms are classed as internally financially constrained when they have positive debt but without S&P rating, whereas internally financially unconstrained firms have positive debt and an S&P bond rating.[41] Bond ratings represent the Standard and Poor's ratings assigned to bonds one month prior to the share repurchase announcement. In addition to this definition, firms with ratings are further classified into investment and non-investment grade ratings where investment grade rating firms are unconstrained and non-investment grade firms are constrained. Rated and investment grade rated firms are able to borrow large amounts and at low interests than non-rated and non-investment grade rated firms.

Table 8.15 presents the results for the probability of levered repurchase using bond ratings as internal financial constraints measure. Model 1 provides the

[41] Whited (1992), and Hahn and Lee (2009) use the presence of bond ratings as a proxy for access to debt financing and financial constraints.

results for rated firms with INV significantly positive. Also, in Model 2 for investment grade firms INV is significantly positive. MB and AR are both negative and marginally significantly in Models 1 and 2 whereas SIZE is significantly positive in both models. These results are consistent with the hypothesis that investment increases the probability of levered share repurchase for internally financially unconstrained firms. This borrowing ability increases the probability that rated firms are likely to conduct levered share repurchase. This result suggests that rated firms that are unconstrained are likely to borrow to finance repurchase when they also invest more. Results are robust when investment grade and non-investment grade ratings definition is used. To the extent that financially constrained or non-rated firms will suffer downgrades and increase risk of financial distress, financially unconstrained (rated firms) are expected to borrow to finance share repurchase.

Table 8.15: Logit Regression Estimates of Levered Repurchase and Bond Ratings

Variables	(1)	(2)
INV	0.615***	0.514***
	(0.00)	(0.00)
MB	-0.045*	-0.047
	(0.10)	(0.15)
Prior AR	-0.691*	-0.425
	(0.07)	(0.41)
CRISIS	-0.685	-1.037*
	(0.16)	(0.09)
SIZE	1.496***	1.607***
	(0.00)	(0.00)
PMV	0.015	-0.155
	(0.98)	(0.83)
Constant	-4.506***	-4.498***
	(0.00)	(0.00)
Year Dummies	Yes	Yes
Industry Dummies	Yes	Yes
N	1978	1398
pseudo R^2	0.224	0.249
chi-squared	415.344	312.294
p	0.000	0.000

Notes: This table shows the results of the logit regression for share repurchase using bond ratings to classify firms as unconstrained. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Variables included in the regressions are investment expenditure (INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), ratio of repurchase proceeds to market

value (PMV) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis. *, and *** *denote significance at the 10% and 1% level respectively.*

8.4.4. Levered Share Repurchase and Financial Distress

Financially distressed firms are highly leveraged with high costs of bankruptcy. These firms have limited debt capacity and as such more expensive to obtain external debt financing. The combined effects of additional leverage and lower cash levels as a result of share repurchase increase firm risk of financial distress (Stephens and Weisbach, 1998; Hovakimian, 2004; Chen and Wang, 2012). All else equal, levered repurchase should increase financial distress risk. Stated differently, prior financial distress risk should limit debt financed share repurchase. Altman's Z score is used to proxy for financial distress as discussed in Section 5.2.3.2 of Chapter 5.

The results in Table 8.16 provide tests of the effects of prior financial distress risk on the probability of levered share repurchase. Models 1 and 2 give the results for the full sample whereas Model 3 shows the results for less financially distressed firm subsample. The coefficient of Z-score is significantly negative for both Models 1 and 2. This evidence is consistent with the hypothesis that financially constrained firms are less likely to conduct debt financed share repurchase due to the significant increase in distress risk associated with debt increasing share repurchase program. INV is positive and significant at the 1% level indicating that investment is associated with levered repurchase. The coefficient of Z*INV is significantly negative which implies that less financially distressed firms will conduct levered repurchase when they invest more. This result also suggests the debt capacity associated with less distressed firms allows them to borrow more and provide cash buffer for investment expenditure at the time of distributing cash to shareholders. MB, AR, CRISIS, and SIZE all have the expected signs about the effects on share repurchase. INV in Model 3 is significantly positive indicating that for less financially distressed firms' investment determines the probability of levered share repurchase.

Overall, the above results provide further evidence about the levered share repurchase of financially unconstrained firms. It highlights the role of investment in conducting debt financed share repurchase. Thus, this evidence implies that the hypothesis that less financially distressed firms are more likely to conduct levered repurchase when they invest more is accepted. Less financially constrained firms have debt capacity and therefore are more likely to borrow to finance their share repurchase, especially when they have more investment expenditure. Hahn and Lee (2009) assert that higher debt capacity, a feature of non-distressed firms-allow firms to borrow and undertake more investments. Also as Chen and Wang (2012) point out, share repurchase depletes corporate liquidity and results in high leverage such that the firm is exposed to greater financial risk. Stated differently, unconstrained firms are less likely to suffer greater financial distress since the cash levels do not fall substantially following share repurchase.

Table 8.16: Logit Regression Estimates of Levered Repurchase and Financial Distress

Variables	(1)	(2)	(3)
Z score	-0.211***	-0.244***	
	(0.00)	(0.00)	
INV	0.615***	0.422***	0.446***
	(0.00)	(0.00)	(0.00)
Z*INV		-0.361***	
		(0.00)	
MB	0.004	-0.001	-0.125***
	(0.84)	(0.96)	(0.00)
Prior AR	-0.807***	-0.784***	-0.798***
	(0.00)	(0.00)	(0.00)
CRISIS	-0.967***	-0.945***	-0.769**
	(0.00)	(0.00)	(0.03)
SIZE	1.861***	1.869***	2.030***
	(0.00)	(0.00)	(0.00)
PMV	0.031	0.031*	0.045**
	(0.10)	(0.10)	(0.02)
Constant	-5.311***	-5.250***	-6.536***
	(0.00)	(0.00)	(0.00)
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
N	5771	5771	5088
pseudo R^2	0.334	0.335	0.311
chi-squared	1245.789	1245.597	1134.734
p	0.000	0.000	0.000

Notes: This table shows the results of the logit regression for share repurchase using financial distress (Altman's Z score) to classify

firms as unconstrained. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Variables included in the regressions are investment expenditure (INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), ratio of repurchase proceeds to market value (PMV) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis. *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

8.4.5. Tobit Regression Estimation of Main Results

Table 8.17 provides the tobit regression results for share repurchase by internally financially unconstrained firms. The dependent variable is the dollar value of share repurchases divided by the market value of equity, indicating the effects of investment and borrowings on the value of shares firms are likely to repurchase in the market. Model 1 gives the results of the effects of levered (LEVD) and investment (INV) on the value of share repurchase whereas Model 2 examines the simultaneously effects of levered and investment (LEVD*INV) on the value of share repurchase. As can be seen from the table, the coefficient of LEVD is positive and statistically significant at the 5% level. This evidence is consistent with the hypothesis that internally financially constrained firms are less likely to conduct debt financed share repurchase due to the significant increase in distress risk associated with debt increasing share repurchase program.

The coefficient of LEVD*INV is positive and significant at the 5% level indicating that borrowings and increase the value of share repurchase even for high investing firms. This result suggests the increased cash flows from debt financing allow firms to repurchase greater amount of shares even when they also engage in investment projects. As argued earlier, the borrowings provide cash buffer for investment expenditure at the time of distributing cash to shareholders. The negative coefficients of MB and prior AR are consistent with the undervaluation and information signaling theories by which firms repurchase their shares when their shares are cheap. Overall, the above results provide further evidence about the levered share repurchase of internally financially unconstrained firms. It underlines the effects of debt financing on share repurchase decisions of firms. Thus, this evidence implies the hypothesis about debt financed share repurchase is accepted.

Table 8.17: Tobit Regression Analysis of Levered Share Repurchase

Variables	(1)	(2)
LEVD	0.016**	0.004
	(0.01)	(0.65)
INV	-0.008	-0.071
	(0.83)	(0.14)
LEVD*INV		0.180**
		(0.03)
MB	-0.006***	-0.006***
	(0.00)	(0.00)
Prior AR	-0.025*	-0.025*
	(0.08)	(0.07)
CRISIS	0.026***	0.026***
	(0.00)	(0.00)
SIZE	-0.006*	-0.005
	(0.10)	(0.11)
Constant	0.107***	0.110***
	(0.00)	(0.00)
Year Dummies	Yes	Yes
Industry Dummies	Yes	Yes
N	4611	4611
pseudo R^2	-0.017	-0.018
chi-squared	64.026	68.886
p	0.000	0.000

*Notes: This table shows the Tobit regression results for share repurchase of unconstrained firms. The dependent variable is the ratio of repurchase proceeds to market value of equity. Variables included in the regressions include dummy which is 1 for levered repurchase and 0 otherwise (LEVD), investment expenditure (INV), the interaction term between levered repurchase and investment (LEVD*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are in parenthesis.* *, ** and *** *denote significance at the 10%, 5% and 1% level respectively.*

8.4.6. Random and Fixed Effects Logit Regression Estimation of Main Results

The results presented in Table 8.18 are the random and fixed effects estimation of the main results. From the table, Models 1 and 2 are for random effects whereas fixed effects estimation results are given in Models 3 and 4. For a start the fixed effects eliminate time invariant variables (CRISIS variable has no output) and no constants are given. The chi-square and the probability statistics indicate the model is significant and that the coefficients are jointly significantly different from zero. Both the random effects and fixed effects results confirm the previous findings reported in the chapter about the share repurchase behaviour of internally financially unconstrained firms. Here again, the coefficients of KZ and INV are significantly positive for all the Models. Also, the coefficient of the interaction term KZ*INV is significantly negative in Models 2 and 4 for random and fixed effects, respectively. These results provide further evidence that internally financially unconstrained firms are more likely to conduct levered share repurchase when they also invest more. The parameter coefficient of MB, AR, CRISIS, and SIZE all give the expected signs. For example, MB and AR show that undervalued shares are more likely to be repurchased when firms also borrow. Overall, these results after using alternative estimation techniques still support the hypotheses about the levered share repurchase of internally financially unconstrained driven by investment expenditure.

The results of the hausman test are shown in Appendix 8. The starting point for the hausman test is that the two models do not produce significantly different coefficients. Thus, the null hypothesis is that the coefficient are not different between random and fixed effects in which case both estimations are appropriate otherwise the fixed effects is chosen because it gives consistent coefficients. As can be seen from the hausman test output in Appendix 8, the chi-square χ^2 is 11.77 and probability is 0.1083 indicating that the null hypothesis cannot be rejected in favour of the alternative hypothesis. Therefore, the difference in the coefficients between random and fixed effects is not systematic. This implies the random effects output is efficient and fixed effects

give consistent results for the coefficient. The coefficients of the two estimation techniques are comparable and not significantly different.

Table 8.18: Random and Fixed Effects Logit Regression of Levered Repurchase and Internal Financial Constraints

	Random Effects Model		Fixed Effects Model	
Variables	(1)	(2)	(3)	(4)
Dependent Variable is Levered (1) vs Unlevered (0)				
KZ	1.162***	0.873***	1.156***	0.868***
	(0.00)	(0.00)	(0.00)	(0.00)
INV	0.466***	0.424***	0.464***	0.422***
	(0.00)	(0.00)	(0.00)	(0.00)
KZ*INV		-2.673***		-2.660***
		(0.00)		(0.00)
MB	-0.101***	-0.085***	-0.101***	-0.084***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior AR	-0.651***	-0.633***	-0.647***	-0.630***
	(0.01)	(0.01)	(0.01)	(0.01)
CRISIS	-1.018***	-1.082***		
	(0.00)	(0.00)		
SIZE	1.995***	2.021***	1.985***	2.010***
	(0.00)	(0.00)	(0.00)	(0.00)
PMV	0.030	0.033	0.030	0.032
	(0.50)	(0.46)	(0.50)	(0.47)
Constant	-6.496***	-6.470***		
	(0.00)	(0.00)		
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
N	5771	5771	5771	5771
pseudo R^2			0.302	0.307
chi-squared	1272.563	1284.977	2071.254	2103.090
p	0.000	0.000	0.000	0.000

*Notes: This table shows the results of the random and fixed effects logit regression for share repurchase. The dependent variable is 1 for levered repurchase and 0 for unlevered repurchase. Variables included in the regressions are KZ index measure of internal financial constraints (KZ), investment expenditure (INV), interaction term between internal financial constraints and investment (KZ*INV), market-to-book ratio (MB), prior stock returns (Prior AR), dummy for financial crisis (CRISIS), logarithm of book value of total assets (SIZE), ratio of repurchase proceeds to market value (PMV) and year and industry dummies. Standard errors are heteroscedasticity consistent. P-values are shown in parenthesis.* *** *denote significance at the 1% level.*

Summarily, the results of the random and fixed effects as well as the main analysis using the logit regression provide strong support for the hypothesis about the levered share repurchase of internally financially unconstrained firms. The findings indicate that financially constrained firms are more likely to

conduct levered repurchase. Also, firms with significant investment expenditure at the time of share repurchase are also more likely to borrow to finance their share repurchase programs. And more importantly, unconstrained firms that do not require external financing to finance repurchase programs only borrow when they also invest more. The results seem to assert that the investment expenditure drives unconstrained firms to seek external financing as cash buffer during the repurchase period. Thus, the additional financing from borrowings enable to firm to invest without forgoing investment opportunities. This evidence reinforces the post-repurchase reduced cash flow and limited liquidity hypothesis.

8.5. Conclusion

This chapter presented empirical results to explore the share repurchase financing of firms. It specifically, investigated the levered share repurchase behaviour of internally financially unconstrained firms. The main hypothesis tested in this chapter was that internally financially unconstrained firms are likely to conduct levered share repurchase when they also invest more. This hypothesis emphasised that without investment expenditure, internally financially unconstrained firms will be less likely to borrow at the time of share repurchase because these firms would have sufficient internal cash flow to support their share repurchase programs. The implication of this hypothesis was that internally financially constrained firms would need external financing in order to conduct share repurchase. The results used the Kaplan and Zingales (1997) index to proxy for internal financial constraints. In addition, bond ratings and Altman's Z score measure of financial distress are additional proxies that were used to measure financial constraints. Change in leverage was used to indicate whether a firm has financed share repurchase using external borrowings.

Consistent with prior studies, the results of this chapter find strong support for the levered share repurchase of unconstrained firms when investment expenditure is high. Thus, unconstrained firms borrow at the time of share repurchase when they also invest more. This evidence indicates that the additional external financing provides cash buffer to preserve the post-

repurchase cash and liquidity levels of the firm to support investment expenditure. Also, the chapter finds that unlevered repurchase firms outperform levered repurchase firms. However, the levered repurchase firms' investment seems to increase returns at least in the short run. Moreover, the chapter addresses issues with estimation assumptions and also presented results using alternative proxies for internal financial constraints. Finally, the chapter presented robust results for alternative estimation techniques.

The findings in this chapter of the study are consistent with Minnick and Zhao (2007), De Jong et al. (2011), and Chen and Wang (2012). However, the results in this chapter differ markedly from prior studies on several fronts. For example, Minnick and Zhao (2007) focus on the wealth effect of levered share repurchases whereas De Jong et al. (2011) assert that convertible issuers repurchase their stock in order to facilitate short selling. Both studies examine the market as whole without differentiating their results for internally financially constrained and unconstrained firms. Also, Chen and Wang (2012) instead focus on share repurchases of internally financially constrained firms and report that managerial hubris drives constrained firms to repurchase their shares. However, the results presented in this chapter demonstrate the share repurchase financing of internally financially unconstrained firms. This evidence has not previously been explored in the literature and therefore the results presented in this chapter contribute to the extant literature on share repurchase.

Chapter 9
CONCLUSION

9.1. Introduction

This chapter provides the conclusions in this thesis. It presents the main findings and the research implications for corporate financing decisions and policy changes. It also discusses the limitations of the current study, suggests areas of improvement including suggestions for future research. The remainder of the chapter is organised into four sections. Section 9.2 presents the main findings of the three empirical chapters. Section 9.3 discusses the research implications for corporate financing decisions and policy makers. Section 9.4 outlines the limitations of the study. Finally, Section 9.5 proposes suggestions for future research.

9.2. Main Findings of the Thesis

9.2.1. Share Issuance and Financial Constraints

The first empirical chapter (Chapter 6) explored the simultaneous effects of internal and external financial constraints on share issuance decisions of a sample of UK listed firms. Following the predictions of market timing-where firms are more likely to issue overvalued equity- this thesis tested the extent to which financially constrained firms are restricted in their attempts to issue overvalued equity. In this regard, the research hypothesised that internally financially constrained firms are less likely to issue overvalued equity compared to counterpart financially unconstrained firms. Financial constraints limit firms' ability to issue equity due to frictions associated with the external equity financing market. This effect arises because equity financing is associated with significant transaction costs in terms of commissions and fees as well as the adverse selection costs occasioned by such transactions. In essence, internally financially unconstrained firms should be able to afford such costs and will be likely to issue overvalued equity. However, given that internally financially constrained firms would more likely require external equity financing to finance investment projects, these firms would be equally

motivated to issue overvalued equity. Thus, the hypothesis (H_1) tested in Chapter 6 (defined in Subsection 2.5 in Chapter 2) states that financially constrained firms are more likely to issue overvalued equity. This study contributes to the market timing and information asymmetry theories as explained in Section 2.2 of Chapter 2.

In addition to internal financial constraints, the study also tested the share issuance behaviour of firms during periods of external financial constraints. As defined in the thesis, external financial constraints relate to the conditions of the external equity market including the general economic conditions and market liquidity. Consistent with hypothesis (H_2), I find that firms that are internally financially unconstrained issue overvalued equity even when external financial constraints are high. Conversely, internally financially constrained firms are less likely to issue overvalued equity during periods of financial crisis or when there is low market liquidity. During periods of favourable market conditions, such as high market liquidity at times of no financial crisis, costs of equity issues are relatively low. This is because investor confidence in the market increases resulting in increases in the supply of financing in the market. Therefore, firms that intend to issue overvalued equity would be motivated during periods of favourable market conditions, even when these firms are internally financially constrained. The above effects of financial constraints on market timing of equity issues translate into the stock price reactions subsequent to the equity issues.

A sample of UK listed firms is used to test the developed hypotheses about the effects of financial constraints on share issuance decisions. The study finds that both internal and external financial constraints are important factors that influence the market timing of equity issues. It also shows that post-issue stock price reactions are related to the level of financial constraints and mispricing. The findings of the study support the developed hypotheses indicating that internal financial constraints determine whether or not firm issues overvalued equity. It further shows that during periods of economic downturn, only internally financially unconstrained firms are likely to issue overvalued equity. The results are robust to alternative definitions of financial constraints and

estimation techniques. The study finds strong support for the simultaneous effects of internal and external financial constraints on market timing of equity issues.

Overall, the findings in this study are consistent with prior studies about market timing of equity issues. Studies such as Stein (1992), Baker and Wurgler (2002) and Dong et al. (2012), all find evidence of equity market timing by which firms issue overvalued equity. For example, Baker and Wurgler (2002) stress that long-term changes in capital structure reflect the effects of persistent market timing of equity issues. Also, Korajczyk and Levy (2003), Dong et al. (2012) and (McLean and Zhao, 2014) assert that internal financial constraints restricts external equity financing. Favourable market conditions produce investor confidence and boost stock prices. Thus, all else equal, favourable market conditions motivate the issuance of overvalued equity even when the firm is financially constrained. The results, therefore, highlight the importance of external financing constraints on the equity issuance decisions of financially constrained firms. By this, the study synthesises the effects of both internal and external financial constraints and demonstrates how these two conditions determine the issuance of overvalued equity.

9.2.2. Share Issuance Methods and Operating Performance

The second empirical chapter (Chapter 7) focuses on the impact of operating performance on the choice of equity issuance methods among a sample of UK listed firms. Expectations of future operating performance have significant effects on the choice of equity issuance method. This is because information about future operating performance is unlikely to be available to outside investors who might have to incur substantial costs to obtain information about the firm. The choice of equity issuance method depends on both firm and issue characteristics. It is therefore argued that contemporaneous long-term operating performance might determine whether a firm chooses rights issues, open offers, and private placement. Firms would be more likely to choose rights offerings over open offers and private placement when operating performance is anticipated to be good, consistent with the objective of shareholder wealth maximisation. Stated differently, for anticipated poor operating performance,

issuance which involves outside investors will be preferred in order to exploit less informed investors, all other things being equal. Thus, it is hypothesised that rights issuing firms anticipate high operating performance than open offers and private placement *(H_6)*. Rights issuing firms are likely to be firms of better quality and are less likely to issue equity in order to exploit equity mispricing. In other words, open offers and private placement are likely to be undertaken by firms seeking to time the issue of overvalued equity. It further implies that rights issuing firms are more likely to outperform open offers and private placement subsequent to the equity issues *(H_7)*.

The study finds that operating performance is an important determinant of the choice of equity issuance method. In effect, the findings provide strong support for the developed hypothesis about the effects of long term operating performance on the choice of equity issuance method. This study asserts that operating performance not only determines the choice of issuance methods but it also explains the post-issue long run stock returns associated with each equity issuance method. Operating performance explains better the firm quality theory over the long term. Subsequent to equity issues, firms conducting rights issues report better operating performance than open offers and private placement. Thus, firms associated with better operating performance seem more likely to conduct rights issues rather than open offers and private placements. Consistent with Capstaff and Fletcher (2011), the study further finds that rights issuing firms outperform open offers and private placement in the long run.

Firms that make rights issues are associated with anticipated high operating performance than open offers and private placement. Through rights issues, firms return part of the potential benefit of better operating performance to existing shareholders. When the operating performance is eventually realised, stock prices rise accordingly causing shareholders value to increase in turn. For open offers and private placement, firms are motivated by the attempt to profit from temporary mispricing. These firms do not anticipate better operating performance but the pre-issue stock price run-up provides benefits to allow them to make the issue. The effects of long-term operating performance on the

choice of equity issuance method also explain the long run stock price performance. Rights issues outperform both open offers and private placement. Stated another way, open offers and private placement are associated with more negative stock returns than rights issues.

These findings are consistent Capstaff and Fletcher (2011) about the relation between post-issue stock returns and operating performance associated with equity issuing firms. Both the operating performance and stock performance indicate that high quality firms undertake rights issues. However, unlike Capstaff and Fletcher (2011), the current study focuses on how operating performance determines the probability of equity issues through rights issues, open offers, and private placement as well as explaining the long run stock price performance. For instance, Loughran and Ritter (1997) find that long run operating performance explains stock returns subsequent to US equity issues that are dominated by firm commitments. Holding the measures of firm and issue quality constant, the decision to utilise a particular issuance method is influenced by operating performance. Thus, the current study offers insights into the choice of UK issuance methods explained by the differential long run operating performance.

9.2.3. Share Repurchase and Internal Financial Constraints

The third empirical chapter (Chapter 8) focuses on the effects of internal financial constraints on share repurchase financing among a sample of US listed firms. It is argued that firms borrow to finance share repurchase when they are financially constrained (H_8). However, internally financially unconstrained conduct levered repurchase when they also undertake significant investment projects (H_9). While internally financially constrained would obtain debt financing to provide sufficient cash flow to finance share repurchase programs, it is unlikely that internally financially unconstrained that have excess cash flows would seek debt financing when they repurchase their shares. The hypothesis is consistent with the prediction that additional cash flows from borrowings allow the firm to build cash buffers in order to finance investment projects.

As argued in prior studies, share repurchase transactions reduce subsequent cash flows for investment (Grullon and Michaely, 2004; Denis and Sibilkov, 2010). Therefore, by borrowing the firm would be in better financial position to both disburse cash to shareholders without foregoing investment projects. In essence, the study explored the levered share repurchase behaviour of financially unconstrained firms and tests the factors that drive cash-rich firms to finance their share repurchases through borrowings. Consistent with hypotheses (H_8) and (H_9), I find that internally financially unconstrained firms borrow when they conduct share repurchase and undertake significant capital expenditure. Firms do not only utilise internal cash flows to finance share repurchase but also a significant number of firms borrow to finance share repurchase (Chen and Wang, 2012; Lei and Zhang, 2015; Farre-Mensa et al., 2015). Whereas Chen and Wang (2012) assert that internally financially constrained firms conduct share repurchases due to managerial overconfidence and hubris, this study highlights that internally financially unconstrained firms also borrow during share repurchase programs. Similar to Farre-Mensa et al. (2015), firms undertaking share repurchases obtain external debt-financing. In particular, these unconstrained firms borrow during share repurchase announcements and potentially utilize the additional cash buffers to finance investment expenditure. The study further argued that the financing of share repurchase determines the post-repurchase stock returns associated the firm (H_{10}) consistent with the undervaluation, information signaling, and the free cash flow hypotheses.

A sample of share repurchase by US listed firms is used to test the hypothesis about levered share repurchase and financial constraints. The choice of US data is based on the evidence that a significant number of share repurchase programs involve debt financing (Milken, 2009).[42] In general, the results provide strong support for the hypothesis about why internally financially unconstrained firms conduct levered share repurchase. It further demonstrates the stock price reactions associated with share repurchase firms based on both the degree of financial constraints and the source of financing. Overall, the current research shed more light on share repurchase and notes that investment

[42] See Section 1.3 of Chapter 3 for explanation of the choice of US data.

expenditure has explanatory power as to whether firms borrow during share repurchase programs, given the level of internal financial constraints. This is because unless firms are willing to undertake investment expenditures, it is unlikely that unconstrained firms would borrow during share repurchase programs. It also appears unconstrained firms have debt capacity and are also able to obtain cheap debt financing due to favourable credit ratings. Thus, the presence of debt capacity and credit ratings are both symptoms of unconstrained firms.

Firms conducting share repurchases are undervalued and associated with low stock prices prior to the repurchase announcements. Thus, repurchase firms attempt to benefits from subsequent stock price appreciations. The study also finds that internally financially constrained firms are likely to borrow to finance share repurchase programs, all else equal. However, internally financially unconstrained firms are likely to conduct levered share repurchase when they also invest more. The results imply that the effects of share repurchase on reducing cash flow and stifling investments motivate firms to borrow to add to their cash buffers. Unconstrained firms also appear to be firms with investment grade bond ratings that allow them to borrow cheap in the external capital market. Internally financially constrained firms face significant costs of additional borrowings to the extent that would be sufficient to conduct share repurchase and also invest. Excessive borrowings would increase leverage ratios as to result in probability of financial distress. Unlike Chen and Wang (2012), this study not only show evidence of share repurchase by internally financially constrained firms, but it also provides evidence that debt financing affect the relation between share repurchase and internal financial constraints.

The three empirical chapters provide new insights into share issuance and repurchase decisions of firms. Financial constraints- both internal and external- affect share issuance decisions. Firms systematically time their equity issues to coincide with periods of mispricing. Financially constrained firms issue overvalued equity in order to profit from the temporary overpricing. However, additional analysis indicates that issue overvalued equity by financially

constrained only occurs during periods of favourable economic conditions. Also, in regards to share issuance methods, the study show that expected long run operating performance influence the choice of equity issuance methods. Better quality firms are likely to conduct rights issues rather than open offers and private placement, and are associated with significant stock price outperformance. For share repurchase, financially unconstrained firms borrow to finance share repurchase programs insofar as they also invest more. In effect, the costs of investment expenditure motivate financially unconstrained to obtain additional cash flows from the debt market while also disbursing cash flows to existing shareholders.

9.3. Research Implications and Recommendations

This section outlines and discusses implications of the findings for theoretical underpinnings of corporate decisions and for policy directions. Subsection 9.3.1 discusses the implications of the study for academics whereas Subsection 9.3.2 presents the implications for practitioners and policy makers.

9.3.1. Implications for Academics

The study tested the market timing theory in relation to share issuance and choice of issuance methods. It also explored the information asymmetry impact on share issuance decisions and the choice of issuance methods. The study on share issuance and issuance methods provides implications for the market timing theory. Market timing implies firms are likely to issue overvalued equity. Whereas this phenomenon is extensively explored in the literature, the current research indicates that financial constraints are an important determinant of the extent to which firms can systematically time their equity issues. The study also shows that financial constraints are related to the degree of information asymmetry. Overall, the study finds that financial constraint is an important variable in determining equity issuance decisions. Financial constraints have strong explanatory power after controlling for firm characteristics that have been found in the empirical literature to affect share issuance decisions. Thus, the findings provide insights for academics in the

study of share issuance behaviour of firms and note that future research should consider the effects of financial constraints on market timing of equity issues.

As regards share issuance methods, the study notes that operating performance reflects the degree of information asymmetry associated with equity issuing firms. After controlling for both firm and issue characteristics, the research finds that future expected operating performance is an important variable in choosing equity issuance methods. Operating performance measures information asymmetry that would not be captured by the traditional measures of information asymmetry such as accruals quality or idiosyncratic risk. Studies on the equity issuance methods should, therefore, consider the effects of operating performance. It should also examine how long run stock price reacts for each issuance methods given the level of anticipated long run operating performance.

The study further asserts that academic research on share repurchase should consider the source of financing. By undervaluation hypothesis, firms are likely to repurchase cheap shares whereas excess free cash flows motivate firms to repurchase under the free cash flow hypothesis. Information signalling hypothesis states that firms choose repurchase programs in order to convey significant information about the prospects of the firm to the market. The level of financial constraints is an important variable that explains share repurchase behaviour beyond the predictions of the undervaluation, free cash, and information signalling theories. As emphasised in the study, financially constrained firms also undertake repurchase by engaging in debt financing. Thus, the ability of firms to borrow might motivate firms to conduct share repurchase contrary to predictions of the free cash flow hypothesis. Therefore, academics should account for the effects of firms financial conditions in future research on share repurchases.

9.3.2. Implications for Practitioners and Policymakers

The implications of this study for practitioners and policymakers are particularly important given the impact of the recent financial crisis on corporate decisions. Regulations and policies for capital structure should

ensure that firms are not significantly exposed to high leverage to the extent that they would be unable to finance important corporate events. The effects of the financial crisis meant that several firms could not undertake investment projects or employ people leading to overall downturn in economic activities. Most firms could only resort to the sale of assets in order to provide some liquidity to sustain the day-to-day running of their businesses. The study highlights that given the huge costs associated with equity issues; it might be suboptimal to issue them during periods of financial crisis. Therefore, practitioners need to appropriately time their equity issues to coincide with periods when costs of issuance are relatively low, especially during periods of favourable economic conditions with increased market liquidity.

It is important that business strategies are aligned with financial strategies to obtain optimum operational and financial benefits. Firms should also consider the appropriate financial strategy that is consistent with the corporate life cycle. It is important that practitioners institute a borrowing behaviour that is in line with the level of internal financial constraints, share repurchase decisions, and corporate investment strategy. Aggressive borrowings by internally financially constrained firms could significantly distort capital structure, especially when such debt financing is used to finance share repurchase programs. Furthermore, corporate governance issues determine financial policy changes of firms. Therefore, corporate governance policies should be formulated to assess the impact of share issuance and repurchase decisions in obtaining the overall optimum capital structure. In carrying out their legally mandated responsibilities, boards influence the financial performance of firms. Therefore, the findings of this study would guide board decisions to achieve optimal financial performance for their firms.

Share repurchase regulation in the US allows firms to exploit undervaluation by repurchasing cheap shares in the market. This phenomenon has given firms the latitude to systematically disburse excess cash to shareholders with the aim of buying them out of the ownership interest in the company. Also, the repurchase regulations make it possible for firms to engage in levered share repurchase even when they are significantly financially constrained. Increased

leverage adversely affects financial distress costs that could plunge the firm into bankruptcy. Regulations and policy changes could stifle the persistent attempts by firms to repurchase when it is suboptimal for the long-term sustainability of the firm.

9.4. Limitations of the Study

The empirical analysis of share issuance considers the probability of issuing and not issuing equity given the simultaneous effects of internal and external financial constraints. However, not issuing equity could imply issuing debt or even repurchasing equity. Thus, the dataset could consist of equity on one side and debt/repurchase on the other side of the dependent variable. For instance UK regulations restrict share repurchase announcements (Rau and Vermaelen, 2002) whereas bank loans that are not normally traded dominate corporate lending.[43] The unique features of UK share repurchase and debt issues make it difficult to model a choice analysis between equity issues on one hand and share repurchase and debt issues on the other hand. However, the study captures the effects of potential share repurchase and debt issues by selecting matching firms where the non-issue firm belongs to the same industry group and have comparable market to book ratio as the issuing firms.

Other factors such as the level of corporate governance affect corporate decisions. Also, external factors such as regulation, institutional arrangements, and corporate governance have significant impact on corporate decisions (Rau and Vermaelen, 2002; Bhagat and Bolton, 2008; Cornett et al. 2009). For example, regulatory and institutional changes take time to reflect on corporate decisions and market conditions such that the timing of the impact is difficult to capture. Furthermore, corporate governance variables need to be hand collected since most of such variables- board size, committees, board independence etc.-are not reported in databases. But given that the sample size of equity issues used in this study, it is impossible to collect data on governance. This study excludes these variables due to the difficulty in collecting them and also in line with prior studies. It is also impossible to even

[43] Bank of England (2009)

accurate measure human characteristics that define these variables. Therefore, their exclusion amounts to potential omitted variables bias in the models.

9.5. Suggestions for Future Research

Like all other studies, there are still avenues to extend and improve the predictions of both share issuance and repurchase decisions.

Following Dong et al. (2012), this current study has investigated the effects of financial constraints on share issuance decisions. However, like previous studies, it does not look at how corporate governance issues can potentially affect the relationship between internal financial constraints and market timing of equity issues. Corporate governance issues have become more important in this era of financial crisis and the effects of corporate decisions cannot be overemphasised. As such, future research should focus on the moderating impacts of governance issues in determining how financial constraints relate to governance and the subsequent effects on equity market timing. Furthermore, corporate governance impact on the choice of equity issuance method could be analysed in future research.

Given the global impact of the financial crisis, a cross-country study involving major European countries, Asian countries, Canada, and the US would provide an improved understanding of how external financing constraints moderate the relation between internal financing constraints and equity market timing. Since countries were affected and responded differently to the financial crisis, it can be argued that market timing of equity issues would be pursued in different fashions. For instance, this present study finds different predictions for the effects of financial constraints on market timing from the findings by Dong et al. (2012) who used Canadian data. Perhaps, regulatory differences and institutional arrangements impact differently on equity issuance decisions. Future research would help delineate these potential differences.

Similarly, share repurchase decisions, like other corporate events, should relate to how the firm is governed. Thus, whether or not firms repurchase based on undervaluation, free cash flow, or information signalling would be explained

by the quality of corporate governance. Moreover, since levered share repurchase has significant impact on debt ratios with increased financial distress, corporate governance issues should determine the decision to borrow to finance share repurchase. It is even more important when the firm anticipating levered share repurchase program is internally financially constrained or not. Therefore, future research should consider how better governed firms behave in their share repurchase decisions. Thus, future research could empirically test the share repurchase behaviour of financially constrained given the level of corporate governance.

The objective of the third empirical chapter was to investigate the levered share repurchase behaviour of a sample of financially unconstrained US listed firms. Share repurchase transactions have increased significantly over the last two decades among US firms. However, several European countries that previously did not permit share repurchase have recently allowed firms to repurchase their shares, albeit in a relatively controlled fashion. Thus, it is more likely firms in these countries pursue the notion of levered share repurchase. Therefore, future research could conduct a cross-country empirical analyse of levered share repurchase to present a holistic view of this corporate policy. Moreover, this research could focus on the effects of financial constraints on levered share repurchase for these countries.

Given the importance of financial constraints on corporate decisions, including share issuance and repurchase, the potential effects on dividend policy could be explored. Generally, dividend payments are made from excess profits or cash flows that imply firms with high levels of profitability should be paying more dividends than low profitability firms. Also, given the adverse effects of decreasing dividends, firms that are cash-strapped would be in a difficult situation in retaining current dividends. It follows, therefore, that the degree of internal financial constraints would significantly affect dividend payments. Dividend payments relate the degree of internal financial constraints such that dividend-paying firms are classed as internally financially unconstrained. However, future research could explore how internally financially constrained firms finance subsequent dividend payments. Thus, the idea of levered

dividend payments could be investigated to provide empirical understanding of dividend payment financing.

Future research could also explore the choice between dividend payment and share repurchase given the level of internal financial constraints. Since both payout policies are considered substitutes in the empirical literature, it would be ideal to investigate the effects of internal financial constraints on the decision to pay dividends or repurchase shares. Moreover, the idea of leverage-financed corporate decisions could be extended to the choice between dividend payments and share repurchase. Thus, the research could examine the corporate events that are more likely to be financed using debt issues. For instance, it can be argued that since repurchase is less binding than dividend payments, internally financially constrained firms might be motivated to borrow to conduct share repurchase than they would for dividend payments unlikely to be sustained in the future.

APPRENDICES

Appendix 6A

Hausman Test for Random versus Fixed Effects

Variables	b Random	B Fixed	b-B Diff. (b-B)	sqrt(diag(V_b-V_B)) S.E
KZ	-1.928	-1.645	0.283	0.288
MB	0.433	0.147	-0.286	0.040
KZ*MB	1.658	2.123	0.465	0.328
SIZE	0.289	0.400	0.111	0.024
ED	1.188	0.427	-0.762	0.135
PROF	-4.203	-1.379	2.824	0.496
CAPX	-8.727	-9.635	-0.908	.

b = consistent
under Ho and Ha
B = inconsistent under Ha, efficient under Ho
Test: Ho: difference in coefficients not systematic
chi-squared = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 185.02
Prob>chi-squared = 0.0000
(V_b-V_B is not positive definite)

Notes: This table displays the results for the hausman test for random versus fixed effects logit regression estimation given in Table 6.12

Appendix 6B

Hausman Test for Random versus Fixed Effects (Crisis Period)

Variables	b Random	B Fixed	b-B Difference	sqrt(diag(V_b-V_B)) S.E
KZ	-3.241	-3.561	0.319	0.696
MB	0.248	-0.027	0.275	0.077
KZ*MB	-3.033	-3.946	0.914	0.831
SIZE	0.329	0.304	0.025	0.061
ED	2.269	1.184	1.085	0.339
PROF	-7.102	-2.886	-4.216	1.344
CAPX	-10.393	-9.035	-1.357	.

b = consistent under Ho and Ha
B = inconsistent under Ha, efficient under Ho
Test: Ho: difference in coefficients not systematic
chi-squared = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 21.66
Prob>chi-squared = 0.1170
(V_b-V_B is not positive definite)

Notes: This table displays the results for the hausman test for random versus fixed effects logit regression estimation given in Table 6.13.

Appendix 6C

Hausman Test for Random versus Fixed Effects (Non-Crisis Period)

Variables	b Random	B Fixed	b-B Difference	sqrt(diag(V_b-V_B)) S.E
KZ	-1.246	-1.240	-0.006	0.192
MB	0.458	0.308	0.151	0.042
KZ*MB	1.334	1.429	-0.095	0.218
SIZE	0.318	0.359	-0.041	0.018
ED	0.813	0.744	0.069	0.096
PROF	-3.360	-1.797	-1.563	0.484
CAPX	-8.557	-8.839	0.282	0.159

b = consistent under Ho and Ha
B = inconsistent under Ha, efficient under Ho
Test: Ho: difference in coefficients not systematic
chi-squared = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 16.06
Prob>chi-squared = 0.3783
(V_b-V_B is not positive definite)

Notes: This table displays the results for the hausman test for random versus fixed effects logit regression estimation given in Table 6.13

Appendix 8A

Hausman Test for Random versus Fixed Effects

Variables	b Random	B Fixed	b-B Diff. (b-B)	sqrt(diag(V_b-V_B)) S.E
KZ	0.936	0.935	-0.001	.
INV	0.342	0.33	-0.012	0.004
KZ*INV	-2.684	-2.707	-0.023	0.032
MB	-0.1	-0.098	0.001	0.001
Prior AR	-0.413	-0.424	-0.01	0.015
SIZE	1.986	1.994	0.008	0.006
PMV	0.035	0.034	0	.

b = consistent under Ho and Ha
B = inconsistent under Ha, efficient under Ho
Test: Ho: difference in coefficients not systematic
chi-squared = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 11.77
Prob>chi-squared = 0.1083
(V_b-V_B is not positive definite)

Notes: This table displays the results for the hausman test for random versus fixed effects logit regression estimation.

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