Essays on Shari'ah Compliant Equities

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ABSTRACT

This dissertation presents three essays on Shari'ah[1] Compliant Equities. The reported work analyses the impact of Shari'ah Compliant Requirements (SCR) on the capital structure of the firms and its effect on cost of equity capital, payout policy and mitigation of firm level political risk.

The first study examines if adoption of SCR affects the cost of equity capital for firms. It estimates the cost of equity capital, implied by market prices and analyst forecasts and account for changes in growth expectations around adoption of SCR. Results of the study show that transitional implications of Shari'ah compliance can diverge depending on information spread. The findings reveal that getting a Shari'ah compliance certificate, initially increases the cost of equity for a firm, potentially due to higher financial constraints and other burdens associated with Shari'ah requirements. However, with greater exposure and awareness in Islamic markets, Shari'ah compliance eventually leads to a fall in the cost of equity. The industry-level, SCR adoption effects are stronger in relatively tangible sectors. Robustness analyses confirm that becoming Shari'ah compliant increases the stock liquidity of SCR adopted firms, which co-varies negatively with the cost of equity.

The second study examines if and to what extent adoption of SCR affects the payout smoothing policy of firms. More importantly, this study aims to identify and assess a possible mechanism behind such linkage and measure the amount of fluctuations of earnings absorbed by investment, borrowings and payout policies. Variance decomposition strategy that enables to empirically analyse the adjustments of borrowings and investment policies to comply with payout smoothing in order to

[1] The set of sources of the sacred law of Islam, governing all aspects of Muslim life.

buffer net income fluctuations in the environment of Shari'ah compliance is employed. Using a new approach in the literature, this chapter measures the extent of intertemporal payout smoothing across business cycles to test the permanent income hypothesis for firms. Accordingly, the impacts of temporary vs. permanent net income shocks on the payout policy of firms are distinguished. The study also, documents that even though their payout ratios are mostly independent from the year by year net income growth (temporary shocks), dividends are impacted deeply by long term net income growth (permanent shocks). Interestingly, being Shari'ah compliant makes dividends more dependent on permanent income growth.

The third study, using a novel Economic Policy Uncertainty (EPU) firm-level political risk index as a proxy for political risk and uncertainty firms face, examines the impact of firm-level risk on the cost of equity and dividend payouts policy of firms. The paper aims to shed light on transitional implications of Shari'ah compliance on firms exposed to firm-level political risk. It analyses if adoption of SCR mitigates the firm-level political risk and their impact on cost of equity and dividend policy. Benchmark results show that 1% increase in the exposure of political risk contributes to a rise in its cost of equity capital by 0.2% and in dividend payout by 13%. Shari'ah compliance eventually leads to a fall in the cost of equity and a rise in dividend payouts, despite exposure of the firm to political risk. These findings have important policy implications that are relevant to Shari'ah compliant equities and beyond.

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RESEARCH OUTPUT FROM THE THESIS

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CHAPTER ONE: MOTIVATION AND OVERVIEW

This chapter presents the overall motivations and objectives of the thesis as well as briefly overviews the three essays individually, including main findings and contributions. The chapter concludes with an outline of the thesis structure.

Islamic financial products are aimed at investors who want to comply with the Shari'ah requirements. Shari'ah compliant assets have become popular not only in Muslim-majority countries, but also have been trading in Europe and the United States. Since its inception three decades ago, the Islamic finance industry has expanded rapidly, especially over the past decade, growing annually at 15% in average (El Qorchi, 2005). Today, Shari'ah-compliant financial assets are estimated at roughly 2 trillion USD, covering bank and non-bank financial institutions, capital markets, money markets, and insurance ("Takaful") (IFSB – Islamic Financial Services Board, 2016). This growth has been fuelled by the large savings accumulated by many oil-exporting countries that are seeking to invest in Shari'ah compliant financial products. The market size of Islamic finance assets is expected to be 3.4 trillion USD by the end of 2018 (Naveed, 2016). Shari'ah-compliant stocks constitute 36% of the assets of Islamic funds (IFSB 2016).

Among Shari'ah compliant stocks, one of the specialized financial instruments are tradable stocks, which function in accordance with the Shari'ah investment requirements. It is claimed that the adoption of Shari'ah Compliant Requirements (SCR) can potentially lead to a number of significant capital market benefits. Firstly, it can facilitate a firm's access to the savings of religious sensitive investors and channel those savings to productive investments. Given the large population of religiously sensitive investors from

the Muslim world[2], the amount of their savings becomes very impressive. Making possible investment of these funds in a country's firms could improve the liquidity of the capital markets and enlarge the firm investor base, which in turn improves risk sharing and lowers the cost of capital as stated in Merton (1987). Secondly, Islamic finance makes a firm inherently less prone to financial distress, since its risk-sharing feature reduces firm leverage, which is one of the requirements of being Shari'ah compliant, encourages better risk management and is founded on strong ethical precepts (Kammer, Norat, Pinon, Prasad, Towe & Zeidane, 2015).

SCR are set by AAOIFI-Accounting and Auditing Organization for Islamic Financial Institutions a not-for-profit organization, which maintains and promotes Shari'ah standards for Islamic financial institutions, participants and the overall industry. Different organisations apply their screening policies based on AAOIFI standards[3]. The SCR adoption process requires firms to meet certain conditions such as keeping particular financial ratios within specific limits. According to the Dow Jones Islamic Market Indices[4] Methodology (2016), acceptable debt-to-asset[5], liquid assets-to-total assets[6] and receivables-to-assets ratios[7] are mandated to remain less or equal to 33%[8]. These conditions that lead to a change in the capital structure of a firm may alter the cost of equity. On the other hand, as already listed companies become Shari'ah compliant there is no

[2]1.6 billion Muslims around the world, which is about 23% of the world's population (Global Religious Landscape Report, December, 2012)

[3]For the sake of simplicity, we did not mention all the requirements of AAOIFI. For the full content of the standard please see http://aaoifi.com/?lang=en

[4] There are several studies e.g. Dawood, A (2016), which compared all the Islamic Equity Indices. Due to format of the thesis and for the sake of brevity we did not briefly discuss about these indices in the thesis.

[5] Calculated as Total Debt divided by Trailing Twelve Month Average Market Capitalization (TTMAMC).

[6] Sum of cash and interest-bearing securities divided by TTMAMC.

[7]Sum of current receivables and long-term receivables.

[8]In addition to financial ratio restrictions, the DJIMI (Dow Jones Islamic Market Index) Shari'ah Supervisory Board established some broad categories of industries such as alcohol, pork related products, conventional financial services (banking, insurance, etc.), entertainment (hotels, casinos/gambling, cinema, pornography, music, etc.), tobacco, and weapons and defence as inconsistent with Shari'ah precepts (Dow Jones, 2016). SCR adopted firms should meet al. of the restrictions of Shari'ah law and the principles articulated for Islamic Finance and firms whose activities are not contrary to the above mentioned Shari'ah principles will be classified as Shari'ah-compliant securities.

extra cost to shareholders. Another argument is that not only religious sensitive but also other investors can buy these shares at no extra costs. In addition, prior analytical and empirical studies suggest that becoming Shari'ah compliant may serve as liquidity-enhancing policy, which provides greater float, since it can decrease illiquidity by improving investors' diversification opportunities (Amihud & Mendelson, 1988). Taking into account these special conditions applied to Shari'ah compliant firms, the analysis of implications on firm behaviour needs a special approach, empirical data and modelling methodology.

Chapter two links SCR and cost of equity capital. The multivariate framework enables us to analyze the effects of becoming Shari'ah compliant on the cost of equity capital while controlling the impact of other determinants such as leverage, firm size and return volatility, which adds to both Islamic finance and cost of capital literature. To the best of our knowledge, no study has asked this research question.

We document a significant negative relationship between adoption of SCR and cost of equity. This result relates to investor recognition hypothesis suggesting that the improvement of the liquidity of the capital markets and enlargement of the firm investor base improves risk sharing and lowers the cost of capital as stated in Merton (1987). Our estimations also include business sector-specific effects to account for the industrial patterns reflecting in the cost of equity after SCR adoption.

This study attempts to complement the literature in several ways. The ultimate purpose of our research is to model and investigate the changes in the cost of equity capital after voluntary adoption of SCR. Furthermore, our study also aims to identify and assess a possible mechanism behind such linkage and investigates the impact of other determinants in the model of cost of equity,

such as leverage, firm size and return volatility.

In chapter three, we extend the literature on corporate payout by applying a variance decomposition methodology to evaluate the financial adjustments of Shari'ah compliant firms make in response to changes in earnings. Our study was motivated by the proposition that adoption of Shari'ah compliance points to general advantages. A lower-risk environment with lower leverage and other screening measures are among these advantages. Based on the strategies proposed by literature, we decompose the variance in net income to quantify the amount of fluctuations to earnings absorbed by investment, debt and payout.

Our results are consistent with the Lambrecht & Myers (2012) budget constraint theory that identifies debt and investment as the main mechanisms to smooth volatility in net income. When the model is checked to account for a time trend, we find that Shari'ah compliance will eventually lead to a fall in the portion of debt and rise in the portion of payout in smoothing income, potentially due to higher financial constraints and other burdens associated with Shari'ah requirements.

We further analyzed a complete assessment of payout smoothing by a joint examination of risk sharing and intertemporal smoothing hypotheses. Payout and long-term income growth correlation has become increasingly significant even more when the firms become Shari'ah compliant. This is quite intuitive since the firms would like to become less risky as they have limited ability to borrow loans and financial distress is avoidable. Secondly, they are not able to finance payout through extra debt after becoming Shari'ah compliant. Lastly, consonant with Darling (1957) and lending support to the permanent income hypothesis, payouts would not be decided on short-term

income flows but in line with long term income growth. Last but not least, aggregate income growth among firms is also correlated with payout growth.

In chapter four, we extend the literature on political risk by using a novel dataset to evaluate the impact of firm level political risk on implied cost of equity and dividend payout policy of firms. Our estimations also include Shari'ah dummy variable to account for Shari'ah compliance-specific patterns being reflected in the mitigating the firm level political risk.

Our benchmark results show that 1% increase in the exposure of political risk contributes to a rise in its cost of equity capital by 0.2% and in dividend payout by 13%. Consistent with the literature, this is due to investors in stock markets requiring a premium to compensate them for bearing additional political risk (Belkhir, Boubakri & Grira, 2017; Pastor & Veronesi, 2013) and firms facing firm-level uncertainty try to send positive signal to the markets Huang et al. (2015). When the both models are checked to account for Shari'ah compliance, we find that Shari'ah compliance will eventually lead to a fall in cost of equity and rise in dividend payouts despite exposure of the firm to political risk.

We further augmented our models with two-stage regression by including some instrumental variables in order to remedy endogeneity. Implied cost of equity 2SLS models reveal similar coefficients and signs of all variables. However, in dividend payout 2SLS models the political risk variable shows negative and significant coefficient (-0.52), pointing on to effects of the PRISK eventually leads to a fall in dividend payouts when the firm exposure to firm-level political risk.

The main part of this dissertation embraces three essays, each building upon the behavior of Shari'ah compliant firms. In order to organize the dissertation in a methodical manner, the three essays will appear as three independent chapters. Specifically, the structure of this dissertation is briefly described as follows.

Chapter two theoretically and empirically examines the link between SCR and cost of equity. The analysis focuses on the cost of equity capital, implied by market prices and analyst forecasts and account for changes in growth expectations around adoption of. The ultimate aim of chapter three is to model and analyze the changes in payout smoothing policy of a firm after becoming Shari'ah compliant. Chapter four provides a novel approach to shed light on recent Islamic equity developments and political risk. Chapter five concludes and discusses future research directions.

CHAPTER TWO: SHARI'AH COMPLIANCE REQUIREMENTS AND THE COST OF EQUITY CAPITAL

2.1 Introduction

As explained earlier, the SCR adoption process requires firms to meet certain conditions such as keeping particular financial ratios within specific limits such as acceptable debt-to-asset[9], liquid assets-to-total assets[10] and receivables-to-assets ratios[11] are mandated to remain less or equal to 33%[12]. These conditions that lead to a change in the capital structure of a firm may alter the cost of equity. On the other hand, as already listed companies become Shari'ah compliant, there is no extra cost to shareholders. Another argument is that not only religious sensitive but also other investors can buy these shares at no extra costs. In addition, prior analytical and empirical studies suggest that becoming Shari'ah compliant may serve as liquidity-enhancing policy, which provides greater float, since it can decrease illiquidity by improving investors' diversification opportunities (Amihud & Mendelson, 1988; Abbes & Trichilli, 2015; Brière, Oosterlinck, & Szafarz, 2015). Taking into account these special conditions applied to Shari'ah compliant firms, the analysis of implications on firm behavior needs a special approach, empirical data and modelling methodology.

Extant research analyze behavior of Shari'ah compliant stocks and their co-movement with Sukuks (Aloui, Hammoudeh & Hamida, 2015), risk and

[9] Calculated as Total Debt divided by Trailing Twelve Month Average Market Capitalization (TTMAMC).
[10] Sum of cash and interest-bearing securities divided by TTMAMC.
[11] Sum of current receivables and long-term receivables.
[12] In addition to financial ratio restrictions, the DJIMI (Dow Jones Islamic Market Index) Shari'ah Supervisory Board established some broad categories of industries such as alcohol, pork related products, conventional financial services (banking, insurance, etc.), entertainment (hotels, casinos/gambling, cinema, pornography, music, etc.), tobacco, and weapons and defence as inconsistent with Shari'ah precepts (Dow Jones, 2016). SCR adopted firms should meet al. of the restrictions of Shari'ah law and the principles articulated for Islamic Finance and firms whose activities are not contrary to the above mentioned Shari'ah principles will be classified as Shari'ah-compliant securities.

returns (Hanif, Shah & Iqbal, 2015; Narayan, Phan, Sharma, & Westerlund, 2016 and Akhtar, Jahromi, & Smith, 2017) and firm performance (Girard & Hassan, 2008; Walkshäusl & Lobe, 2012 and Reddy & Fu, 2014). However, the argument whether and to what extent adoption of SCR affects the cost of equity of a firm, remains an open question. Understanding this relationship is becoming increasingly important for the decision making of firms, since the cost of equity is a crucial element in their future investment decisions. While the volume of Islamic finance is increasing and poses important managerial questions on the issue of the adoption of SCR, there is no detailed empirical research that analyses the effect of the SCR adoption on firm capital structure and in turn, cost of equity. Becoming Shari'ah compliant might increase the exposure by religious sensitive investors, which results in upward change in liquidity. We also suspect there is a structural break at the time firms become Shari'ah compliant, thus altering firm capital structure and cost of equity.

In the context of these critical managerial and policy questions, the present study attempts to complement the literature in several ways. The ultimate purpose of our research is to model and investigate the changes in the cost of equity capital after voluntary adoption of SCR. The bonding argument suggests that the cost of equity is altered congruent with: changes in firm risks; inclusion to the stock listings (Karolyi, 1998); greater information disclosure and transparency due to the compliance to particular standards (Daske, Hail, Leuz, & Verdi, 2008; Diamond & Verrecchia, 1991); signaling to investors and rise in their recognition of a firm that leads to increase in investor base as well as liquidity (Merton, 1987; Hail & Leuz, 2009). Another argument is that Shari'ah compliance can make it less costly for investors to analyze and compare firms across regions, facilitate cross-border investments and improve

risk sharing - all of which could reduce the cost of equity capital. Consistent with these premises, we are particularly interested in whether adoption of SCR triggers significant changes in external finance and liquidity of firms, contributing to a decline in the cost of equity capital[13]. Furthermore, our study also aims to identify and assess a possible mechanism behind such linkage and investigates the impact of other determinants in the model of cost of equity, such as leverage, firm size and return volatility. Our estimations include business sector-specific effects to account for the industrial patterns reflected in the cost of equity after SCR adoption. Based on theoretical propositions, we therefore, expect that adoption of SCR increases firm market liquidity - attracting new investors, hence decreasing the cost of equity.

To estimate the effects, we employ a two steps empirical strategy. We begin our analysis with ex ante estimates of firm cost of equity capital, implied by market prices and analyst forecasts. This approach explicitly accounts for changes in the market's growth expectations around adoption of SCR. It also allows us to evaluate the magnitude of both growth and cost of equity effects on firm valuations. Next, we run firm-level panel regressions that control for time-varying firm characteristics, and firm-fixed effects. Our analysis is based on a comprehensive panel sample of 6435 firm-year observations classified into nine industries over the period of 2006-2016. To our knowledge, our study is the first to examine this relationship of adoption of SCR and cost of equity in Islamic investment markets.

Our empirical results are consistent with the investor recognition hypothesis (Merton, 1987) and reveal that adoption of SCR significantly reduces the cost of equity capital of firms. However, the magnitude of the

[13] In contrast, firms adopting SCR may be subject to boycotts by non-Muslim consumers and investors. In this case, we may see increase in cost of equity.

effect may vary by sectors and possibly, firm size. Overall, Shari'ah compliance provides more liquidity with its strict requirement on the leverage rate (not surpassing 33%), simultaneously might reduce the cost of equity. We also provide policy recommendations based on our empirical results.

The remainder of the chapter proceeds as follows. Section 2.2 presents a brief literature review; section 2.3 discusses the methodology and outlines the estimation model. The empirical estimation with findings and insights are presented in section 2.4. Lastly, section 2.5 concludes by summarizing the findings and discussing them with policy implications.

2.2 Theoretical Background and Literature Review

2.2.1 Capital Structure effects on cost of equity

Traditionally, a firm should minimize its weighted average cost of capital (WACC) and maximize the value of its marketable assets. This approach suggests that the use of debt financing has a clear and identifiable limit. Any debt capital beyond that point will create company devaluation and unnecessary leverage.

Modigliani & Miller (1958) were the first to landmark the topic of capital structure in modern finance. In principle, under the idealistic assumptions of Modigliani and Miller's irrelevancy theory, changes in capital structure should have no impact on overall WACC. They argue that the type of instrument used to finance an investment is irrelevant for a company in judging the profitability of an investment project. Thus, a firm's capital structure, i.e., how its assets are financed, is irrelevant in determining firm value and its future performance. However, when deductibility of interest payments from

corporate-tax liabilities considered, Miller & Modigliani (1958) also concluded that use of borrowed funds reduces cost of capital of the firms. Moreover, William & Burton (1967) suggest that when realistic transactions costs are considered, leverage is likely to decrease the cost of capital over certain ranges of leverage. So, theoretically, any firm that decreases the leverage increases the weighted cost of capital of the firm. Thus, AAOIFI requirements actually increases the cost of capital as it limits firms to access debt which is cheaper than equity. However, we argue that WACC decreases as cost of equity decrease due to high demand for the Shari'ah compliant equities as liquidity is reverse related with cost of equity.

Since Modigliani and Miller, many studies have examined the "irrelevance theory" of capital structure. Robichek & Myers (1966) and Kraus & Litzenberger (1973) conclude that when reliance on the financial debt is small, the tax-shelter effect dominates, but as soon as leverage increases too much, risk of ruin prevails. This is because shareholders view higher leverage as risky and demand a higher return on equity, thus raising the total cost of capital. Furthermore, Miller (1977) introduce the effect of personal taxes to the Modigliani and Miller model arguing that the optimal capital structure is simply a matter of rebalancing tax advantages against bankruptcy costs. DeAngelo & Masulis (1980) argue that Miller's theorem is extremely sensitive to the realistic and simple modifications in the corporate tax code. They show there is a market equilibrium, where every firm has a unique optimal capital structure by including into the analysis a tax shield that is not a result of the interest costs (e.g. accounting depreciation, depletion allowance, and investment tax credits).

Other capital structure theories have emerged over the past years. These

include the trade-off theory, the pecking order theory and market timing theory. According to the trade-off theory, there is an optimal capital structure of a firm. This optimal capital structure is a mix of financing that equates the marginal costs to marginal benefits of debt financing (Lemmon & Zender, 2010). The pecking order theory, however, states that there is no optimal capital structure, but rather firms choose capital according to the preference of internal finance, debt then equity (Chen & Chen, 2011). In other words, firms trade off the costs and benefits associated with debt and equity by finding an optimal capital structure after accounting for market imperfections and will source funds following a preference order of internal funds, debt and then equity (Myers & Majluf, 1984). Frank & Goyal (2009) summarized market timing theory as management analyzing the current market conditions in debt and equity markets. When a firm needs new financing, management uses the type of financing which is more favorable at the moment. If neither of them looks favorable, management can defer the issuances. On the other hand, if current conditions look unusually favorable, funds may be raised even if the firm currently does not need new funds.

Despite the proposed theories on leverage neutrality on cost of equity, the existence of market imperfections has led financial theorists to agree that an optimal capital structure does exist for each firm (e.g. Flannery & Rangan, 2006). Firms decision to determine the source of funds (debt, equity or a combination of both) to finance assets, operations and growth of the firms depends on several factors. Business risk, tax exposure, market conditions, the firm's growth rate and the cost of capital are examples for these factors (Huang & Song, 2006). Another important firm characteristic found in the literature is future growth opportunities. Firms with high future growth opportunities are

expected to use more equity financing because a highly leveraged company may forgo profitable investment opportunities when it expects by undertaking new project, the value goes to the firm's existing debt holders (Myers, 1977). This suggests negative relationship between leverage and growth. This view is supported by Smith & Watts (1992), Rajan & Zingales (1995) and Akhtar & Oliver (2009). In short, various currently held theories make very different predictions as to the relationships between capital structure and the valuation of the firm and its individual securities.

Furthermore, studies highlight that ability of disclosure to affect equity costs, reduces information asymmetries and change investor preferences (Diamond & Verrecchia, 1991). From this point of view, disclosure of information allows companies to reduce information asymmetries in capital markets, increasing stock liquidity and decreasing, in turn, cost of equity (Amihud & Mendelson, 1988; Diamond & Verrecchia, 1991).

From an Islamic finance perspective, there are certain limitations to a debt level of a firm. Shari'ah compliant equities should pass financial ratio screens with regard to high leverage, cash and interest-bearing securities and accounts receivables. Therefore, they should meet a Shari'ah screening threshold of 33% on leverage if they want to adopt SCR (Khatkhatay & Nisar, 2007). So, what is the effect of this on firm's value as any changes made in the level of debt or equity will modify the firm's value? Trade-off theories of corporate financing help approach to this question as they are built around the concept of target capital structure that balances various costs and benefits of debt and equity. These include the tax benefits of debt and the costs of financial distress (Modigliani & Miller, 1963), various agency costs of debt and equity financing (e.g., Jensen & Meckling, 1976; Myers, 1977; Stulz, 1990; Hart &

Moore, 1994), and the costs and benefits of signaling with capital structure (Ross, 1977).

2.2.2 Liquidity effects on cost of equity

Although in the theory, the main determinant of the cost of equity is the firm's capital structure, several recent studies point that liquidity and structural breaks, caused by adopting SCR, may also play a critical role. Becker-Blease & Paul (2006) examine the relationship between increased stock liquidity following S&P 500 Index inclusion and expansion of the investment opportunity set and argue that if stock liquidity increases, then the cost of equity and, subsequently, the overall cost of capital for the firm decreases. Diamond & Verrecchia (1991) analyzed the causes and consequences of a security's liquidity, especially the effect of future liquidity on the security's current price. They found that attracting increased demand from large investors due to increased liquidity of firms' securities can reduce a firm's cost of capital.

Although there is no particular study that documents increase of the investor base of a firm by becoming Shari'ah compliant, there are several studies that have examined religion's influence upon people's financial behavior and investment decisions (Anand & Cowton, 1993; Keister, 2003; Lehrer, 2004; Renneboog, Ter Horst & Zhang 2011). Anand & Cowton (1993) documented that there is evidence of a growing number of investors who wish to incorporate moral or social concerns in their decision-making. Literature also documents that religious sensitive investors might derive utility from investing within the restrictions of their faith and value the Shari'ah Compliant shares (Renneboog, Ter Horst, & Zhang 2011). Tahir & Brimble (2011) examined what drives investment decisions by Muslims and whether or not Muslim

investment behavior is more in accordance with Islamic culture or the assumptions underlying modern portfolio theory. They found that investment behavior is more associated with Islamic culture, in respect of religious sensitive Muslims. Thus, being Shari'ah compliant should be associated with increase in purchase intention of religious sensitive investors, as adopting SCR triggers enhanced investor recognition and enlarges firms' investor base, which in turn increase market liquidity of the firm, whereby liquidity is reverse correlated with cost of equity, as stated in Merton (1987). This effect of being Shari'ah compliant may reduce risk premium as stated in Foerster & Karolyi (1999). In line to this, Luo, Wang, Raithel, & Zheng (2015) found that firms carrying out Corporate Social Responsibility, which is similar in a way to SCR adoption, engagement are more likely to attract shareholders to buy their stocks and consequently reduce their cost of equity.

Another argument is that adoption of SCR may cause structural breaks and this structural break may change the cost of equity of the firm. There are mixed results regarding amount and direction of the change in the cost of equity after structural breaks. Daske et al. (2008) analyzed the impact of adopting International Financial Reporting Standards (IFRS) on firms' cost of equity and found that there was an increase in the cost of equity due to the change in accounting rules. Similarly, Richardson & Welker (2001) find that corporate social disclosure – a company's public revelation of its Corporate Social Responsibility engagement – is positively related to cost of equity. Contrary to expectations, they find that there is a significant positive relation between social disclosures and the cost of equity capital. They also consider some biases in social disclosures that may explain this result. However, Bekaert & Harvey (2000) report break points and documented that liquidity contributes

to the decline in the cost of capital post-liberalization in the emerging markets. They attempt to observe a shift in the cost of capital by examining the behavior of equity returns, namely dividend yields.

In particular, the traditional finance literature has little to say about empirical implications of SCR. The existing research literature pertaining Shari'ah compliant stocks is still embryonic, despite their increasing popularity. Early research by Naughton & Naughton (2000), examine the instruments traded and the structure and practices of stock markets from an Islamic perspective by reviewing a range of issues relating to the potential for a separate Islamic securities exchange. Study by Hakim & Rashidian (2004) is more related to Islamic stock indices, where they analyzed beta of Dow Jones Islamic (DJI) using the CAPM as a theoretical basis. Another study by Chen & Ngo (2017) analyze the effects of inclusion and exclusion of stock into DJI and found that firms added to the DJI experience significant positive excess returns in both the short window and long window upon the announcements, whereas deleted firms experience significant negative excess returns. Added firms enjoy significant increases in liquidity and deleted firms suffer from decreases in liquidity. They also document a decrease in the cost of equity and an increase in operating performance for added firms.

2.3 Methodology and Empirical Analysis

In order to construct the model of the cost of equity and Shari'ah compliance nexus, we start our analyses by estimating the cost of equity. Cost of equity measurement is extensively discussed in the literature. It can be calculated with the use of realized returns in an asset pricing model and/or be implied using expected cash flows and earnings. While the accounting, finance and economics literature have suggested a wide range of procedures to estimate a firm's cost of equity capital, traditional state-of-the-art methods, such as the CAPM have produced disappointing empirical results (Fama & French, 1997; 2004) and are questionable in that they use average realized returns instead of measures of expected returns (Elton, 1999). Thus, we use the ex-ante cost of equity implied in current stock prices and analyst forecasts of future earnings. This implied cost of equity measure is more suitable in this research setting compared to the alternatives as it estimates expected returns directly from stock prices and cash flow forecasts without relying on biased realized returns or on asset pricing models (Hou, van Dijk, & Zhang, 2012). This section sheds light on the estimation methods and techniques.

2.3.1 Estimating the Implied Cost of Equity Capital

The implied cost of equity is the discount rate that sets the current stock price equal to the present value of expected future dividends per share. The relation between the current stock price (P_0), the cost of equity (r), and future expected dividends per share $(d_1, d_2, d_3, ...)$ is represented by the dividend discount model (DDM):

$$P_0 = \frac{d_1}{(1+r)} + \frac{d_2}{(1+r)^2} + \frac{d_3}{(1+r)^3} + \cdots \quad (1)$$

2.3.1.1 Gordon Dividend Growth Model

The Gordon Dividend Growth Model, the simplest form of the DDM, assumes a constant perpetual rate of growth (g) in expected dividends per share, and the cost of equity can be written as follows:

$$P_0 = \frac{d_1}{(1+r)} + g \quad (2)$$

2.3.1.2. Abnormal Earnings Growth Models

Abnormal Earnings Growth Models assume that the change in abnormal earnings from year to year grows at a constant rate into perpetuity. Gode & Mohanram (2003) implement the theoretical model of Ohlson & Juettner-Nauroth (2005) by assuming that the short-term growth rate (g_s) is equal to the average of the forecasted growth rate between year one and year two and the average five-year growth rate provided by analysts. Furthermore, they assume that the long-term growth rate (g_l) is equal to expected inflation for all firms. The cost of equity can be obtained from the following relation between price, and the next year's earnings per share estimate (eps_1) and expected dividends per share (d_1):

$$P_0 = \frac{d_1}{r-g_l} + \frac{eps_1 \times (g_s - g_l)}{r \times (r-g_l)} \quad (3)$$

Another Abnormal Earnings Growth model is Easton's (2004) Modified-PEG ratio model. It is also a modified version of the Ohlson &

Juettner-Nauroth (2005) model, where the growth rate in the change in dividends is set equal to zero ($g_l = 0$) so that dividends grow by the same amount every year into perpetuity. The current stock price is related to the cost of equity, the next two year's forecasted earnings, as well as the next year's dividend.

$$P_0 = \frac{eps_2 - eps_1 + d_1 \times r}{r^2} \qquad (4)$$

Although, there are other many different implied costs of capital estimates in the literature, lack of a comparative evaluation of these methods makes it impossible to choose among the alternative implied estimates. Our analysis focuses on these two Abnormal Earnings Growth Models. Following Hail & Leuz (2006), we average over the two proxies, cost of equity (COE) obtained from equations 3 and 4 and use the resulting mean estimate as our primary dependent variable COE.

2.3.2 Data and the Estimation Model

In order to document the change of the cost of equity around the SCR adoption we target firms that adopted SCR recently. In other words, the selected firms were not Shari'ah compliant initially (conventional equities) and were accepted as Shari'ah compliant at some stage of their activity and remained to be Shari'ah over the sample period of time. As of December 2016, we find a total of 584 SCR adopted US firms, identified by Ideal Ratings[14],

[14] Ideal Ratings is an asset management firm and covers a universe of 40,000+ equities globally. Its services have been reviewed and approved by several Shariah scholars and advisors globally as the service has been designed to support in making investment decisions by screening and managing the compliance cycle for Shariah compliant products, such as equities, funds, EITs and indexes. They do this mainly for selling data and different Islamic funds buy data from them. Please refer to Ho, CSF (2015) for detailed discussion of the roles and functions of independent companies such as Ideal Ratings that provide data on Shari'ah-compliant firms

consistent with their business and financial screenings, which are broadly based on the AAOIFI standards. The firms in our sample became Shari'ah compliant as of 1st of January 2011 and this gives us opportunity to analyze post adoption cost of equity changes. To estimate the cost of equity, we obtain financial data from Worldscope and analyst forecasts and share price information from the I/B/E/S over the period 2006-2016.

We further classify these equities according to the sectoral characteristics of the Standard Industrial Classification (SIC) to analyze whether or not there are significant differences across the sectors. The SIC classifies a system of 10 industries namely - Agriculture, Forestry and Fishing; Mining, Construction; Manufacturing; Transportation, Communications, Electric, Gas and Sanitary service; Wholesale Trade; Retail Trade; Finance, Insurance and Real Estate; Services and Public Administration. Table 1 displays the number of firms for each sector.

Table 1. Industrial Classification of Firms

Industry Title	SIC Division	Equities

Agriculture, Forestry and Fishing	A	3
Mining	B	48
Construction	C	8
Manufacturing	D	288
Transportation, Communications, Electric, Gas and Sanitary service	E	65
Wholesale Trade	F	28
Retail Trade	G	61
Finance, Insurance and Real Estate	H	3
Services	I	81
Public Administration	J	0
	Total	585

Notes: Firms are classified according to Standard Industrial Classification (SIC). Division J is omitted from analysis due to absence of data.

2.3.3 Empirical Analysis

We start our analysis by estimating the implied cost of equity for each individual firm over each year of our sample (2006-2016), using firm level data. We use a panel regression analysis to identify the effects of various firm-level and dummy variables on the cost of equity for our sample of firms. To examine the main determinants for the change of the cost of equity and to analyze impact of adopting SCR on cost of equity around SCR adoption, we include the cost of equity as the dependent variable and perform regression analyses.

Following the Hail & Leuz (2006) strategy and extending it further by including dummy variables to control effects of Global Financial Crisis and adoption of SCR and a variable to capture the trend in time, we estimate the coefficients of the following model:

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 RVAR_{it} + \beta_3 FBIAS_{it} + \beta_4 inflation_t + \beta_5 + \beta_6 LEV_{it} + \beta_7 Trend_t + \beta_8 + \beta_9 Shari'ah_t \times Trend_t + \varepsilon_{it}, \quad (5)$$

Where $\overline{COE_{it}}$ is the average estimates from the implied cost of equity capital models, proposed by Gode and Mohanram (2003) and Easton (2004), $\overline{SIZE_{it}}$ is natural logarithm of total assets of the firm, $\overline{RVAR_{it}is}$return variability measured as the standard deviation of monthly stock returns over the last 12 months, $\overline{FBIAS_{it}}$ is a control variable for forecast bias and measured using the one-year-ahead forecast error (forecasts minus actual values) scaled by total assets, $\overline{inflation_t}$ is inflation rate for the year, $\overline{LEV_{it}}$is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, $\overline{GFC_t}$ is dummy variable, takes the value of 1 for the year of the Global Financial Crisis 2008 and 0 otherwise, $\overline{Trend_t}$ is a variable taking values from 1 to 11 assigned for each year to capture the trend in time as stated in Balli, Balli, & Louis, 2013, $\overline{Shariah_t}$ is dummy variable equal to 1 if an observation is SCR adopted, and 0 non-adopted, $\overline{\varepsilon_{it}}$ is error term. Descriptive statistical properties for the implied cost of equity estimates and control variables are given in table 2. Estimated cost of equity by implied method as explained above reveals the mean of 0.15 with standard deviation 0.08. We can see more considerable variability in the size of firms in our sample, that show relatively high standard deviation of around 1.63. The same applies to the leverage, whereby some firms have higher ratios of 0.92 (applicable for the periods when these firms had not adopted SCR yet), while some other firms hold their leverage as low as zero. All variables are positively skewed except $\overline{inflation_t}$, which is skewed to the left. All variables except $\overline{inflation_t}$ and $\overline{SIZE_{it}}$ are peaked.

Table 2. Descriptive statistics for the implied cost of equity estimates and control variables

	Obs	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis
COE	5886	0.150	0.131	1.971	0.008	0.081	5.485	72.905
SIZE	6424	14.608	14.484	19.816	9.569	1.638	0.357	2.840
RVAR	6434	0.349	0.301	4.238	0.070	0.211	4.025	45.013
LEVERAGE	6415	0.188	0.189	0.921	0.000	0.141	0.743	5.098
FBIAS	6414	0.029	0.006	11.371	-5.458	0.280	24.319	868.460
INFLATION	6435	0.019	0.019	0.055	-0.020	0.019	-0.085	2.851

Notes: The sample comprises 6435 firm-year observations from 9 sectors between 2006 and 2016 for which sufficient Worldscope financial data, I/B/E/S forecast, and pricing data exist. COE is the average cost of capital estimate implied by the mean analyst consensus forecasts and stock prices using equations (3) and (4). SIZE is natural logarithm of total assets of the firm. RVAR is the return variability computed as annual standard deviation of monthly stock returns. FBIAS equals the IBES analyst forecast error (mean forecast for the next fiscal year minus actual earnings) scaled by total assets. Inflation is inflation rate for the year. LEV is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year.

Table 3 displays correlation matrix of the variables. It is seen that multicollinearity problem does not exist since results are in the range of 0.017 and 0.451 of the correlation coefficients. Consistent with the literature the variables reveal expected signs. With respect to COE SIZE and LEV have negative and positive sign, respectively.

Table 3. Correlation of the variables.

	COE	Size	RVAR	LEV	FBIAS	Inflation
COE	1.000					
SIZE	-0.163***	1.000				
RVAR	0.451***	-0.318***	1.000			
LEVERAGE	0.013	0.335***	-0.030**	1.000		
FBIAS	0.050***	-0.044***	0.131***	0.031**	1.000	
INFLATION	-0.071***	-0.045***	-0.020	-0.052***	0.017	1.000

Notes: The sample comprises 6435 firm-year observations from 9 sectors between 2006 and 2016 for which sufficient Worldscope financial data, I/B/E/S forecast, and pricing data exist. COE is the average cost of capital estimate implied by the mean analyst consensus forecasts and stock prices using equations (3) and (4). SIZE is natural logarithm of total assets of the firm. RVAR is the return variability computed as annual standard deviation of monthly stock returns. FBIAS equals the IBES analyst forecast error (mean forecast for the next fiscal year minus actual earnings) scaled by total assets. Inflation is inflation rate for the year. LEV is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 4 exhibits t-statistics for difference in means for each variable used for before and after adopting SCR. We find highly significant evidence for difference in means before and after adopting SCR for each characteristics of firms except the variable FBIAS. As expected, the mean of the cost of equity after being SC is less than before being SC. Surprisingly the mean of the leverage after 2011 is significantly higher than that before 2011. However, it is good to note that mean of the leverage is less than 33%, which is the threshold of SCR.

Table 4. T-statistics for difference in means (2006–2010) and (2011–2016).

	Pre-SCR firm-years			Post SCR firm-years			t-Statistics
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	
COE	2644	0.156	0.081	3242	0.145	0.081	4.899***
SIZE	2923	14.404	1.630	3501	14.780	1.624	-9.216***
RVAR	2924	0.395	0.237	3510	0.311	0.178	16.161***
LEVERAGE	2914	0.167	0.123	3501	0.206	0.151	-11.267***
FBIAS	2915	0.031	0.336	3499	0.028	0.222	0.508
INFLATION	2925	0.023	0.026	3510	0.016	0.011	12.896***

Notes: The sample comprises 6435 firm-year observations from 9 sectors between 2006 and 2016 for which sufficient Worldscope financial data, I/B/E/S forecast, and pricing data exist. COE is the average cost of capital estimate implied by the mean analyst consensus forecasts and stock prices using equations (3) and (4). SIZE is natural logarithm of total assets of the firm. RVAR is the return variability computed as annual standard deviation of monthly stock returns. FBIAS equals the IBES analyst forecast error (mean forecast for the next fiscal year minus actual earnings) scaled by total assets. Inflation is inflation rate for the year. LEV is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

We also checked for the stationarity of the variables using Fisher type Augmented Dickey Fuller (ADF) (Dickey & Fuller, 1979) unit root tests. All variables came out to be stationary, implying there is no problem of unit root in the series.[15]

2.4 Estimation Results and Discussions

Table 5 displays the results in different model specifications estimated using the GLS (Generalized Least Squares) technique. Hausman test result indicated favor for the fixed effect over random effect test, which we applied in our regressions. The robust standard errors were also applied to avoid the problem of heteroscedasticity and serial correlation in the model.

The first model specification represents the benchmark model, where we find the relationship of the stated variables excluding the Shari'ah compliance indicator. All the coefficients reveal theoretically expected signs, with mostly significant coefficients. The leverage variable exhibits positive and significant coefficient of 0.061, which validates its positive impact on the cost

[15]For the sake of brevity, we did not post the unit root test results. They are available upon request.

of equity. If leverage increases by 1%, the cost of equity increases by 0.061 points. This might be associated with the perception of rising risk as financial leverage rises; higher risk triggers higher cost of equity for a firm. In the same vein, the return volatility variable ($\overline{RVAR_{it}}$) with the highly significant coefficient of 0.107, is positively related to a rising cost of capital. In contrast, 1 % increase in inflation seems to reduce the cost of equity capital by 0.359 points, consistent with Khan & Rafiq (2013), who states that higher inflation generally increases the stock prices, thereby reducing the cost of equity. Concurrently, it is discussed that an increase in inflation causes earnings of the firm to increase, as a result the firm's cost of equity declines. Lastly, 1 % increase in the firm SIZE contributes to a fall in its cost of equity capital by 0.00029 points; larger firms could get more net benefit from higher disclosure compared to smaller firms due to economies of scale (lower relative costs to produce) and lower proprietary cost (Embong, Mohd-Saleh & Sabri, 2012).

The second specification model captures the effect of a dichotomous break, represented by the Shari'ah variable. It reveals positive and significant coefficient, which indicates that after becoming Shari'ah compliant, a firm's cost of equity capital rises on average by 0.006 points. This may be due to the reason mentioned in footnote 8. However, before making the general conclusion on the positive relationship between Shari'ah compliance and cost of equity, we augmented the model by including the trend function to account for the time pattern of the variable effects and the data in third model. The time trend function has been frequently ignored in the relevant literature, and yet, plays a crucial role. It is widely known that the models with the dichotomous break variables may reveal inaccurate estimation results due to the strong effects of the shock/break at the particular time, which is not spread over the

whole sample period. As such, when we deal with those models, we have good prior reason to suppose that a function is shifting over time, so we add time trend variable ($\overline{Trend_t}$) to assume the shift is the same in each year. Adding the trend in the models with structural breaks, allows the parameters to change with a constant value each year (Balli et al. 2013). The trend variable can also be a good proxy for unmeasurable factors and/or time effects that can potentially affect the dependent variable.

Table 5. Multivariate regressions of cost of equity capital on SCR adoption and other determinants.

	Model 1	Model 2	Model 3	Model 4
SIZE	-0.029***	-0.032***	-0.028***	-0.029***
	(-7.39)	(-7.32)	(-6.07)	(-6.2)
RVAR	0.107***	0.108***	0.117***	0.114***
	(5.44)	(5.48)	(5.63)	(5.38)
FBIAS	-0.011**	-0.011**	-0.0101**	-0.011**
	(-2.42)	(-2.44)	(-2.35)	(-2.36)
INFLATION	-0.359***	-0.282***	-0.670***	-0.654***
	(-4.32)	(-3.68)	(-5.97)	(-5.76)
GFC	-0.004	0.003	-0.0128*	-0.015**
	(-0.59)	(0.45)	(-1.81)	(-2.13)
LEVERAGE	0.061***	0.060***	0.067***	0.075***
	(3.18)	(3.13)	(3.52)	(3.82)
SHARI'AH	-	0.006***	0.028***	0.046***
		(2.9)	(6.45)	(6.25)
TREND	-	-	-0.005***	-0.002*
			(-5.54)	(-1.89)
SHARI'AH X TREND	-	-	-	-0.004***
				(3.09)
Obs.	5854	5854	5854	5854
R^2	12.89%	12.44%	13.27%	13.46%

Notes: Coefficients estimations are made by Panel estimated GLS (FGLS). The equation is as below:

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 RVAR_{it} + \beta_3 FBIAS_{it} + \beta_4 inflation_t + \beta_5 GFC_t + \beta_6 LEV_{it} + \beta_7 Trend_t + \beta_8 Shari'ah_t + \beta_9 Shari'ah_t \times Trend_t + \varepsilon_{it}$$

where COE_{it} is the average estimates from the implied cost of equity capital models, proposed by Gode & Mohanram (2003) and Easton (2004), $SIZE_{it}$ is natural logarithm of total assets of the firm, $RVAR_{it}$ is return variability measured as the standard deviation of monthly stock returns over the last 12 month, $FBIAS_{it}$ is a control variable for forecast bias and measured as using the one-year-ahead forecast error (forecasts minus actual values), scaled by total assets, $inflation_t$ inflation rate for the year, LEV_{it} is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, GFC_t is dummy variable, takes the value of 1 for the year of the Global Financial Crisis 2008 and 0 otherwise, $Trend_t$ is a variable taking values from 1 to 11 assigned for each year to capture the trend in time as stated in Balli et al. (2013), $Shariah_t$ is dummy variable equal to 1 if an observation is SC adopted, and 0 non-adopted, ε_{it} is error term. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

In our case, those factors can be identified as the shifts in investor expectations, information disclosure and market reactions caused by the news of becoming Shari'ah compliant. Therefore, including the time trend variable largely helps detect those unknown unmeasurable effects over time spread as well as other control variables in the model. Our trend variable is normalized to the value of 1 at the start of the period for each firm, ascending at a unit frequency for successive observations, and resets at the start of next firm.

Despite the initial validation of the positive relationship between SCR and cost of equity, the fourth specification model reveals that the cost of equity

actually falls when the time trend is taken into account. The trended interaction variable of the Shari'ah compliance ($\overline{Shari'ah \times Trend_t}$) shows negative and significant coefficient, pointing on to long-term effects of the Shari'ah compliance announcement that eventually leads to a fall in cost of equity. It implies that it may take some time for the firms and markets to incorporate the relevant considerations associated with the SCR adoption news and adjust to reduce the cost of equity over time. Becoming Shari'ah compliant may trigger higher stress and financial constraints, which might increase cost of capital in the initial period, however, in the total time frame, cost of equity falls, possibly in correspondence with improved market information in the market. This effect is also explained in Daske et al. (2008). They suggest that structural shocks may initially raise the cost of equity due to some anticipation effects and concerns about first-time International Financial Reporting Standards (IFRS) interim reporting, press releases, and other disclosures ahead of the accounting change, all of which would likely accelerate capital market effects. However, when those effects were removed, the study observed that switching to IFRS actually lowered the cost of equity. By looking at the values of observed mean cost of equity, it can be suggested that although trivial, Shari'ah compliance is able to alter the values of cost of equity capital of a firm. As for other control variables, inclusion of trend variable does not notably alter their sign and significance. As expected GFC variable reveals negative significant coefficient in the model 4 and 5.

Around 50% of our sample consist of the manufacturing firms (SICD). Thus, we run above mentioned regressions once more excluding SICD firm in order to validate the results. Table 6 displays that the results hold.

Table 6. Multivariate regressions of cost of equity capital on SCR adoption and other determinants. Excluding manufacturing (SIC D) firms.

	Model 1	Model 2	Model 3	Model 4
SIZE	-0.031***	-0.036***	-0.031***	-0.032***
	(-5.22)	(-5.41)	(-4.15)	(-4.20)
RVAR	0.124***	0.124***	0.137***	0.134***
	(3.5)	(3.48)	(3.61)	(3.44)
FBIAS	-0.023***	-0.023***	-0.022***	-0.022***
	(-3.03)	(-3.02)	(-2.87)	(-2.95)
INFLATION	-0.407***	-0.282***	-0.684***	-0.669***
	(-3.07)	(-2.62)	(-3.53)	(-3.40)
GFC	-0.019***	-0.009	-0.025**	-0.027***
	(-2.71)	(-1.17)	(-2.4)	(-2.70)
LEVERAGE	0.071**	0.067**	0.077**	0.085***
	(2.2)	(2.12)	(2.43)	(2.63)
SHARI'AH	-	0.011***	0.033***	0.052***
		(3.34)	(4.68)	(4.97)
TREND	-	-	-0.005***	-0.003
			(-3.15)	(-1.10)
SHARI'AH X TREND	-	-	-	-0.004**
				(-2.34)
Obs.	2949	2949	2949	2949
R^2	15.91%	16.40%	17.46%	17.72%

Notes: Coefficients estimations are made by Panel estimated GLS (FGLS). The equation is as below:

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 RVAR_{it} + \beta_3 FBIAS_{it} + \beta_4 inflation_t + \beta_5 GFC_t + \beta_6 LEV_{it} + \beta_7 Trend_t + \beta_8 Shari'ah_t + \beta_9 Shari'ah_t \times Trend_t + \varepsilon_{it}$$

where COE_{it} is the average estimates from the implied cost of equity capital models, proposed by Gode & Mohanram (2003) and Easton (2004), $SIZE_{it}$ is natural logarithm of total assetsof the firm, $RVAR_{it}$ is return variability measured as the standard deviation of monthly stock returns over the last 12 month, $FBIAS_{it}$ is a control variable for forecast bias and measured as using the one-year-ahead forecast error (forecasts minus actual values), scaled by total assets, $inflation_t$ inflation rate for the year, LEV_{it} is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, GFC_t is dummy variable, takes the value of 1 for the year of the Global Financial Crisis 2008 and 0 otherwise, $Trend_t$ is a variable taking values from 1 to 11 assigned for each year to capture the trend in time as stated in Balli et al. (2013), $Shariah_t$ is dummy variable equal to 1 if an observation is SC adopted, and 0 non-adopted, ε_{it} is error term. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

2.4.1 Industry Based Estimations

We further differentiate equities into nine separate industries to detect specific sector-based effects after adopting Shari'ah requirements. In fact, there are ten sectors by Standard Industry Classification, however, for public administration sector we could not find SCR adopted firms, which became Shari'ah compliant at the same date as the whole sample. Therefore, we did not include this industry in our estimations.

Table 7 displays industry-based estimation results with some interesting points to mention. For most of the sectors $Shari'ah_t$ and $Shari'ah \times Trend_t$

interaction variables have opposite signs, as explained above. They tend to reveal relatively significant coefficients in industries mostly with greater number of observations such as Manufacturing, Transportation / Communication / Utility Services, Retail Trade and Services industries. The trend interaction $\overline{Shari'ah \times Trend_t}$ is also significant for Financial Services sector, but in this case, it has a positive coefficient. This indicates that firms in this sector, does not experience a fall in the cost of their equities after becoming Shari'ah compliant. However, we should not ignore the fact that number of firms in our industry sample is considerably low, as well as the share of this industry in total economy, so the results may not reflect all the available information.

Table 7. Industrial Analysis

	SIZE	RVAR	FBIAS	INFLATION	GFC	LEV	Shari'ah	Trend	Shari'ah x Trend	Obs.	R^2
Agriculture, Forestry and Fishing	0.104	-0.023	0.473	-0.153	-0.021	0.239*	-0.020	-0.024*	0.008	29	68%
	(1.60)	(-0.50)	(1.51)	(-0.61)	(-1.56)	(3.05)	(-0.61)	(-4.12)	(1.98)		
Mining	-0.047***	0.079**	-0.025**	-0.434	-0.003	0.143	0.080	0.003	-0.002	444	30%
	(-3.78)	(2.26)	(-2.57)	(-1.48)	(-0.13)	(1.29)	(0.31)	(0.67)	(-0.06)		
Construction	-0.069**	0.014	0.209*	-0.877**	-0.078***	0.031	0.010**	0.006	-0.012*	85	35%
	(-2.75)	(0.53)	(1.88)	(-2.51)	(-5.02)	(0.22)	(2.89)	(0.97)	(-1.91)		
Manufacturing	-0.024***	0.095***	-0.005	-0.635***	-0.002	0.060***	0.041***	-0.002	-0.004**	2905	11%
	(-4.70)	(4.64)	(-0.59)	(-4.97)	(-0.27)	(3.15)	(3.92)	(-1.59)	(-2.25)		
Transportation, Communication& Utilities Service	-0.009	0.090***	-0.026	-0.221	-0.015	0.057*	0.065***	-0.001	-0.010***	2901	11%
	(0.71)	(2.98)	(-0.97)	(-1.45)	(-1.63)	(1.78)	(3.55)	(-0.02)	(-3.79)		
Wholesale Trade	0.040	0.067**	0.018	-0.067	-0.003	-0.095	0.016	-0.001	-0.002	896	10%
	(0.26)	(2.56)	(0.99)	(-0.28)	(-0.13)	(-1.64)	(0.47)	(-0.16)	(-0.42)		
Retail Trade	-0.021	0.227***	-0.206	-0.932**	-0.036	0.096*	0.077**	-0.008	-0.003	638	32%
	(-1.19)	(2.74)	(-1.44)	(-2.03)	(-1.28)	(1.86)	(2.50)	(-1.34)	(-0.54)		
Finance, Insurance and Real Estate	0.023**	0.003	0.127	-0.467	-0.018	0.200	0.021	-0.016	0.006*	32	63%
	(3.41)	(0.02)	(1.85)	(-0.85)	(-0.45)	(2.48)	(1.75)	(-8.72)	(3.51)		
Services	-0.036***	0.064***	-0.01	-0.643***	-0.033***	0.030	0.050***	-0.002	-0.004	818	12%
	(-3.64)	(3.27)	(-0.41)	(-3.60)	(-3.13)	(1.16)	(2.63)	(-0.98)	(-1.52)		

Notes: Coefficients estimations are made by Panel estimated GLS (FGLS). The equation is as below:

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 RVAR_{it} + \beta_3 FBIAS_{it} + \beta_4 inflation_t + \beta_5 GFC_t + \beta_6 LEV_{it} + \beta_7 Trend_t + \beta_8 Shari'ah_t + \beta_9 Shari'ah_t \times Trend_t + \varepsilon_{it}$$

where COE_{it} is the average estimates from the implied cost of equity capital models using equations (3) and (4), $SIZE_{it}$ is natural logarithm of total assetsof the firm, $RVAR_{it}$ isreturn variability measured as the standard deviation of monthly stock returns over the last 12 month, $FBIAS_i$ is a control variable for forecast bias and measured as using the one-year-ahead forecast error (forecasts minus actual values), scaled by total assets, $inflation_t$ inflation rate for the year, $LEV_{it}$is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, GFC_t is dummy variable denoting Global Financial Crisis 2008, $Trend_t$ is a variable taking values from 1 to 11 assigned for each year to capture the trend in time, $Shariah_t$ is dummy variable equal to 1 if an observation is SC adopted, and 0 non-adopted. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

Nevertheless, for most of the sectors, becoming Islamic compliant, first, tends to increase cost of equity capital, probably as a consequence of firms' distress due to possible financial constraints and other burdens to meet Shari'ah requirements. However, taking into account the time trend and therefore, information adjustment, the cost eventually starts to fall. Our results also show that long-run Shari'ah adoption effects are stronger in relatively tangible sectors, namely, Manufacturing, Construction, Transportation/Communication/Utility Services and Retail Trade, where investors are likely to invest more after the compliance. In particular, our claim is that international investors (Shari'ah compliant funds) are mostly interested in investing in Manufacturing and construction utility sectors, since by Islamic scholars these sectors are more appealed as Islamic scholars believe that these sectors contribute more to social welfare.

On the contrary, non-tangible sectors that do not produce output (like finance or service sectors) are not so attractive within Islamic societies and accordingly, the investment on these sectors by Islamic funds can be less restricted and liquidity is limited. Hence, non-tangible industries such as Services and Finance, experience no long-term Shari'ah effects in their cost of equity. However notably, Shari'ah compliance raises the cost of equity in the Services sector around the time of its adoption.

Analysis of other control variables reveals, SIZE and inflation reduce cost of equity, with significant coefficients in Manufacturing, Construction and Services industries. Surprisingly, the leverage variable appears to have significant effect only in Agriculture, Forestry and Fishing,

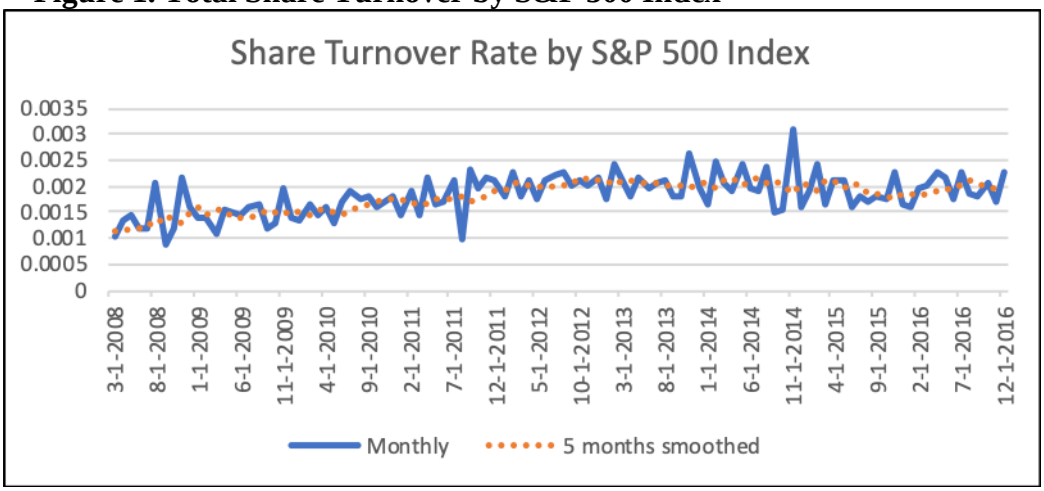
Manufacturing, Transportation, Communication, Utility Services, and Retail Trade sectors as expected, shows positive coefficient, leading to higher cost of equity capital. On a sectoral basis, the insignificance of leverage can be well justified by neutralizing major leverage-risk-based effects on the decisions of investors as when a firm becomes Shari'ah compliant, it automatically signals that the leverage level is lower than 33% and therefore the risks are well controlled. Overall, the sectoral estimates exhibit similar patterns as the total sample estimates, and we could get relatively significant coefficients in the industries, which contained greater number of firms. The sectoral estimates also provide additional evidence to our initial insight that shocks from becoming Shari'ah compliant may validate higher cost of capital for firms, but these effects mitigate over time leading to gradual fall in the cost of equity in the long run.

2.4.2 Cost of Equity and Liquidity relationship

We further analyze the results by looking at the trends in stock market liquidity measured as share turnover ratio. We employ this figure to verify the robustness of the relation between adoption of SCR and cost of equity, which we believe is caused by liquidity of the shares. This gives us the opportunity to investigate the feedback effect of adopting SCR on stock market liquidity, which is consistent with the literature that documents a negative relationship between liquidity shocks and cost of equity (Diamond & Verrecchia, 1991; Becker-Blease & Paul, 2006). The share turnover ratio of the firms is calculated by dividing the total number of shares traded over

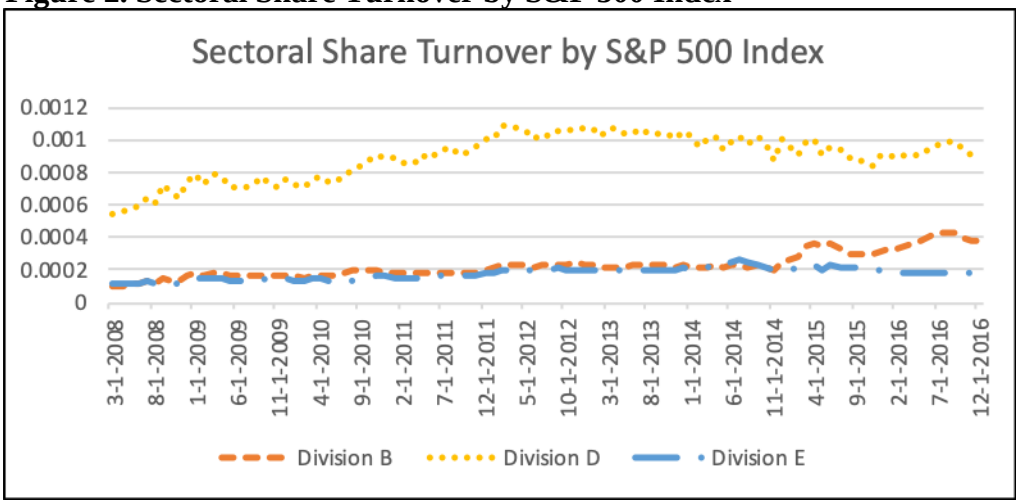
a period by the average number of S&P 500 index shares traded. Figures 1 and 2 shows notable upward trend in total turnover ratio for all firms under all sectors over the period. The liquidity shock effect of adopting SCR in year 2011 is evidently present, and we can see gradual rise in the share turnover ratio after this point. We found similar patterns when analyzing share turnover ratios by individual sectors, as illustrated in Figures 1 and 2. The trends exhibit similar properties, with continuous increase in Mining and Manufacturing after 2011, while Transport/Communication/Utility Services experience long-term rise after Shari'ah compliance until around 2014. The robustness checks for the analysis of liquidity, discussed above, do not alter the conclusion reached in the main findings, and indeed support it.

Figure 1. Total Share Turnover by S&P 500 Index



Note: Monthly share turnover ratio is calculated by dividing total monthly volume of traded shares of sample firms by monthly volume traded shares of S&P 500 index. Shari'ah adoption date corresponds to 01.01.2011. Data collected from Bloomberg Terminal.

Figure 2. Sectoral Share Turnover by S&P 500 Index



Note: Monthly share turnover ratio is calculated by dividing monthly volume of traded shares of each firm by monthly volume traded shares of S&P 500 index and averaged 5 months. Divisions are Mining (B), Manufacturing (D), and Transportation, Communications, Electric, Gas and Sanitary (E) service respectively. Shari'ah adoption date corresponds to 01.01.2011.

2.5 Concluding Remarks

Our study was motivated by the proposition that adoption of Shari'ah compliance points to general advantages. Higher transparency and information disclosure, attraction of a large number of potential investors from oil-rich countries and a lower-risk environment with lower leverage and other screening measures are some advantages of being Shari'ah compliant. We analyze the effects of becoming Shari'ah compliant on the cost of equity capital while controlling the impact of other determinants such as leverage, firm size and return volatility. Our estimations also include business sector-specific effects to account for the industrial patterns reflecting in the cost of equity after SCR adoption. Since optimal capital structure is one of the ultimate goals of financial managers, this study provides useful insights and some empirical evidence on the management of equity capital in the light of Shari'ah equity developments.

Our results show that transitional implications of Shari'ah compliance can diverge depending on a time trend and information spread. The findings reveal that becoming Shari'ah compliant initially increases the cost of equity, potentially due to higher financial constraints and other burdens associated with Shari'ah requirements. However, when the model is checked to account for a time trend, we find that Shari'ah compliance will eventually lead to a fall in the cost of equity capital over time. This implies that it may take some time for the firms and markets to incorporate the relevant considerations associated with the adoption of SCR news and

shift their expectations according to new conditions. Specifically, we find the magnitude of the Shari'ah effects to be trivial, despite its significant coefficients across most of the industries. In addition, inflation and return volatility appear to be important factors to change cost of capital, documenting strong positive impact. Consistent with the theory and recent findings, firm size contributes to a fall in equity cost, which is valid for almost all sectors. We observe that significance of the estimated coefficients largely depended on greater availability of firms in the sector-samples, while both industry-based and total sample estimations validated identical patterns. Our further robustness analyses confirm that adoption of SCR increases the stock liquidity of SCR adopted firms, which co-varies negatively with the cost of equity.

Our findings imply that firms can expect long-run benefits from becoming Shari'ah compliant in terms of reducing their equity costs through increasing investor base and liquidity. This finding is important from the perspectives of financial and capital structure management. Together with providing a novel approach to shed light on recent Islamic equity developments, our study also opens up a number of avenues for future research. For example, the study could be extended to investigation of SCR effects across global markets and international country-levels. It would be interesting to compare and contrast global trends in the corporate response to Shari'ah equity market developments in different regions, with varying economic conditions and diverse market structures.

CHAPTER THREE: CORPORATE PAYOUT SMOOTHING UNDER SHARI'AH COMPLIANCE

3.1 Introduction

As it discussed in the previous chapter adoption of SCR can potentially lead to a number of significant capital market benefits. First, it can facilitate a firm's access to the savings of religious sensitive investors, who constitute a large number, considering the population of the Muslim world.[16] Channelling these funds and investments into the corporate sector could improve the liquidity of the capital markets and boost the firm investor ground, which results in the enhancement of risk sharing and decreasing the cost of equity (Merton 1987). Second, Islamic finance makes a firm inherently less prone to financial distress, since its risk-sharing feature reduces firm leverage[17], encourages better risk management and is founded on strong ethical precepts (Kammer, Norat, Pinon, Prasad, Towe & Zeidane, 2015).

Together with offering a number of advantages, such as mean–variance efficiency (Akhtar, Jahromi, & Smith, 2017) and better firm performance (Walkshäusl & Lobe, 2012; Reddy & Fu, 2014), Shari'ah compliance rules also impose certain requirements as explained in previous chapters. These conditions naturally lead to an alteration in the capital structure of a Shari'ah compliant firm-at least aim to be-and therefore, have

[16]1.75 billion Muslims around the world, which is about 24% of the world's population (Global Religious Landscape Report, April 2017).
[17]One of the requirements of being Shari'ah compliant is keeping a debt level within certain limits.

direct effects on many aspects of this firm's policies, including corporate payout policy, that captures both investment and debt decisions.

While earlier research in the literature states that the dividend policy is independent from the debt and investment policies (Modigliani & Miller, 1961), growing finance literature (Dhrymes & Kurz, 1967; Fama,1974; Myers, 1974; Myers & Majluf, 1984; Brav, Graham, Harvey, & Michaely, 2005) acknowledge that all of the three elements of firm financing are inter-related. This is especially true for firms, which smooth their payouts to keep them less fluctuating and minimize the effects of income volatility through the adjustment of debt and investment. Most firms undertake borrowings and investment policies to absorb shocks to net earnings and keep corporate payouts stable (Lintner,1956; Bhattacharya, 1979; Brav et al., 2005; Anderson & Carverhill, 2012; Lambrecht & Myers, 2012; Chen, 2016; and Hoang & Hoxha, 2016). Under these conditions, the obvious question would be how and to what extend Shari'ah compliant firms maintain their policies of payout smoothing (if they want to carry on being a Shari'ah compliant firm) by changing debt and investment strategies. Firms that want to continue to be Shari'ah compliant, need to meet the requirements cited above and this might impact on their payout policies. Thus, it is fundamental to ascertain the implications of SCR on firms' payout behaviour, which needs special empirical analysis and approach. Becoming Shari'ah compliant would considerably affect not only the capital structure of a firm (Girard & Hassan, 2008; Narayan, Phan, Sharma & Westerlund, 2016) but

also the dynamics of its smoothing behavior in reaction to fluctuations of net earnings.

According to the literature, firms typically smooth shocks in earnings through dividend smoothing. Firstly, Lambrecht & Myers (2012) and Hoang & Hoxha (2016) document that most firms prefer to smooth payouts to keep them stable, typically through changes in debt and investment to neutralise the effects of the fluctuations in net income. More specifically, Lambrecht & Myers (2012) show that undesired income shocks are primarily absorbed by debt financing, while Hoang & Hoxha (2016) indicates that positive shocks in times of favorable conditions lead to the decision of an increase in corporate investment. Consistent with these premises, we are particularly interested in whether the adoption of SCR triggers significant changes in firms' intertemporal budget constraint and if these changes cause an interaction of the three corporate financing decisions, namely investment, debt and dividend policies. This is because under the SCR conditions, a firm may face additional constraint – certain limits imposed to the debt ratio (up to 33%), which would limit its capability of debt financing in the case of severe negative income shocks. On the other hand, SCR do not apply any restrictions on the changes in investment, which means that in the case of positive shocks to net income, firms might be able to smooth them through investment expansion without major disturbances. In the context of these important managerial and policy questions, our research is the first paper that empirically analyses the impact of adopting SCR on firms' payout

smoothing policies through adjustments in debt and investment to smooth the net income fluctuations.

The present study complements the literature in several ways. The ultimate aim of this study is to model and analyse the changes in payout smoothing policy of a firm after becoming Shari'ah compliant. We employ a variance decomposition strategy that enables us to empirically analyse the adjustments of borrowing and investment policies to comply with smoothed payout in order to neutralise net income fluctuations in the environment of Shari'ah compliance. Furthermore, the paper aims to identify and assess a possible mechanism behind such linkage and augment the amount of fluctuations in net earnings absorbed by investment, borrowing and payout policies. This method explicitly accounts for the alterations in the market's growth expectations around adoption of SCR. It also enables us to evaluate the magnitude of both absorbed and unobserved shocks to net income and how the smoothing policies are quantitatively affected after becoming SCR, which imposes additional constraint in the debt financing policy.

We are particularly interested whether and to what extent the amount of fluctuations to net earnings absorbed by investment and borrowing policy are altered after SCR adoption, and what implications it may have for payout smoothing policies of the firms. In particular, we conduct our empirical estimations by dividing our data into different time periods for firms: before and after becoming Shari'ah compliant and check the magnitudes of the changes in payout smoothing behaviour by revising debt, investment strategies. The study also aims to identify and assess a possible mechanism

behind such linkage, more specifically smoothing behaviour by altering debt and SCR of restricting debt financing, and to distinguish the impacts of temporary vs. permanent net income shocks on the dividend policy of the firms.

More importantly and very novel to the literature, we also decompose the payout smoothing into permanent and temporary income shocks to check if the firms behave in accordance with the permanent income hypothesis (Friedman 1957). Our findings show that payout growth has a significant correlation with the average income growth with 22.22% indicating that average net income growth significantly explains the payout changes of firms.

Due to the variations in the capital structure and payout policies of the firms in different industries, results might vary across different industries. Thus, we also differentiate our firms into industries to detect sector- specific effects and account for the industry patterns reflected in the payout smoothing policy after SCR adoption. Our study is based on a comprehensive panel sample of 34055 firm-year observations classified into nine industries over the period of 1982-2016.

The remainder of the paper proceeds as follows. Section 3.2 presents a brief literature review; section 3.3 discusses the methodology and outlines the estimation model. The empirical estimation with findings and insights are presented in section 3.4. Lastly, section 3.5 makes some concluding comments by summarising the findings and discussing their policy implications.

3.2 Prior Research and Theoretical Background

Payout policy has been analysed both theoretically and empirically since Lintner (1956), who laid the base for the modern theory of the payout policy. In his pioneering study, Lintner (1956) explored the impact of payout policy on the capital structure decisions, and managers usually adjust the target payout ratio based upon the value of available investments as well as changes in net income. Using cash dividends as a measure of payout in the example of 28 mature firms, Lintner (1956) found that net income was the most important determinant of any alterations in dividend payouts, which were adjusted from year to year. In contrast to Lintner (1956), Miller & Modigliani (1961) argued that in perfect capital markets, a firm's payout policy is irrelevant to earnings and does not have joint dynamics with firm value. However, they admitted that dividend payments have signalling effect as they convey information about future cash flows and earnings of the firm. Later research on the dividend strategy have been primarily concerned if there is any optimum payout ratio that would maximize the current worth of the shares and the possible factors that should be considered in order to achieve that level, if it exists. The literature on payout policy can be grouped by asymmetric information based and agency considerations motivated.

In the presence of information asymmetry between investors and managers on the financial situation of the firm in the informationally imperfect capital markets, trends in the dividend payouts give a strong

signal about the current and future net income of a firm. Bhattacharya (1979), Miller & Rock (1985) and Kose & Williams (1985) provided models, which document that firms adjust dividends to signal their future activities. An increase in payout typically signals the firm will perform better, and a fall suggests that it will perform worse (Allen & Michaely, 1995). In line with this, Nissim & Ziv (2001) found that dividend payout changes are positively correlated with the future net income.

Another idea is that the separation between ownership and management in corporations increases conflicts of interest between both parties, which are referred to as agency conflicts (Fama & Jensen 1983, Jensen & Meckling 1976), and dividend policies might address such agency problems. Myers (1977), Easterbrook (1984) and Jensen (1986) argue that unless earnings are paid out to shareholders, they may be invested to projects that provide private benefits for the managers. According to Rozeff (1982), Easterbrook (1984), Porta, Lopez-de-Silanes, Shleifer & Vishny (2000) and DeAngelo & DeAngelo (2000) paying more dividends may lead to reduce agency costs.

From a theoretical outlook, one can go besides signalling and agency theory to illustrate the determinants of a dividend policy. They have been extensively studied and despite differing conclusions on the magnitude and behaviour of payout determinants, almost all of the work document the presence of a firm interaction between investment, borrowing and payout policy. Myers & Majluf (1984) documented that firms prioritize their sources of financing and initial use of internal financing, then borrow and

finally raise equity capital. This prioritization implies a relationship between budget constraints and payout policy of firms. For example, Brav et al. (2005), documented that firms initially arrange investment and liquidity needs and then alter the dividend payout. In an empirical study Deangelo and Deangelo (1990) analysed 80 NYSE firms that made multiple losses during 1980-1985, and find that most of them respond with dividend reductions during times of financial distress, although the paper did not show exact motivations underlying these cuts. However, when analysing the relationship between the debt and payouts in usual times, Jensen (1986) argued that managers create debt in order to keep payouts steady and avoid dividend cuts that may signal stock price reductions. The work also mentions about the adjustments in firm investment based on cash flow shocks, which also have implications for debt policy. Thus, the pattern of dividend action of firms should be examined by jointly considering the dynamics of investment and external financing.

Aivazian, Booth & Cleary (2006) summarized the joint interaction of investment, dividend and debt decisions as a dividend smoothing. The study shows that firms with public borrowing are more likely to pay a dividend and then follow a payout smoothing policy, than firms that rely exclusively on private borrowing. Smoothing also helps minimise agency and signalling problems within the corporations, especially when they have access to public market debt. Javakhadze, Ferris, & Sen (2014) examined the extent to which agency theories explain payout smoothing and find that managers of firms with less market-to-book ratios as well as the firms in highly

competitive industries engage in greater payout smoothing. They also documented that some factors such as legal requirements, culture and tax regulations have additional explanatory power for payout smoothing. Lambrecht & Myers (2017) proposed a theoretical model of the dynamics of firm behavior, which shows that managers lower the volatility in the distribution of dividends in order to smooth their own incentives. They found that for a given investment policy, volatility of net income is absorbed by borrowing in order to keep dividends and thus, managerial incentives smooth.

In light of the previously mentioned empirical evidence on the preferences of managers to keep smoothed payouts, it is of utmost importance to examine how smoothing policies will be affected by the adoption of SCR by firms. Despite its significance, the argument whether and to what extent adoption of SCR affects dividend policy of a firm, remains an open question. While the volume of Islamic finance is increasing and posing important managerial questions on the issue of the adoption of SCR, there is no detailed empirical research on how becoming Shari'ah compliance would impact the interaction among payouts, debt financing, investments and earning. Consistent with the requirements of the Shari'ah financial regulations on the restriction of debt issuance beyond 33%, firms will be unable to extend their debt financing to smooth the firm's cash flow to maintain dividends less variable. Existing literature on Islamic finance and SCR significantly lacks theoretical insights and empirical evidence on the estimation and evaluation these changes, that will come along with the

adoption of SCR. There have been some empirical investigations on the effects of SCR from different perspectives such as behaviour of Shari'ah compliant stocks and their co-movement with Sukuks (Aloui, Hammoudeh & Hamida, 2015), risk and returns (Hanif, Shah & Iqbal, 2015; Narayan et al., 2016 and Akhtar et al., 2017) and firm performance (Girard & Hassan, 2008; Walkshäusl & Lobe, 2012 and Reddy & Fu, 2014). To fill the existing gap in the literature, this study takes the first step to empirically examine the implications of SCR on payout smoothing policy of firms under conditions of certain debt restrictions and their further impact on investment adjustments, which firms undertake as a response to changes in net income. The issue is important not only for corporate managers and their policy-making strategies, but also to shareholders planning portfolios and to economists to understand the functioning of the Shari'ah compliant capital markets and instruments.

3.3 Methodology and Empirical Analysis

In this section, we describe the empirical methodology and data used to analyse the dividend payout smoothing. The foundation model for a firm's smoothing behavior considers its inter-temporal budget constraint, first introduced by Lintner's (1956) target adjustment model, further developed by Lambrecht & Myers (2012):

$$\Delta Debt_i + Net\ Income_i = \ Investment_i + Payout_i \qquad (1)$$

In this model firm can adjust the variabilities in $\overline{Net\ Income_i}$ by changing net $\overline{Debt_i}$ which is the repayment of debt, increase in borrowings, and changes in cash balances[18]. Lintner's (1956) model considered that dividends follow long-run target based upon the value of available investments as well as net income, and managers are reluctant to make frequent changes to payouts over the periods. Lintner constructed the model inductively, relying on the survey of 28 big corporations, whereby payout consisted solely of cash dividends. Lambrecht and Myers (2012) extended the model (as stipulated in Equation 1) with a number of modifications that included clear and more detailed definitions and measures and, overall, better reflected combined theory of payout, debt, and investment, consistent with intertemporal budget constraint and the dynamics of payout smoothing.[19] For instance, the payouts used in Lambrecht & Myers (2012) model comprised of both cash dividends and stock repurchases to indicate a total payout; accordingly, we make use of the both estimates as a measure of payouts in this paper.

Overall, equation (1) shows that when there are shocks to $\overline{Net\ Income_i}$ and firms want to maintain steady payouts, the intertemporal budget constraints might be balanced by the changes in net debt ($\overline{\Delta Debt_i}$), and/or by the adjustment of $\overline{Investment_i}$. Hoang & Hoxha (2016) mention that increase in investment can be expected in times when income shocks present favourable growth opportunities to firms. Otherwise, they can keep

[18]All of which are restricted by SCR.
[19] More detailed explanations are provided in Lambrecht and Myers (2012)

investments fixed and undertake changes in debts as the main tool to smooth (negative) fluctuations in net income.

Based on this background model and theory, we assume that firms are reluctant to cut their payouts as well as to increase them uncontrollably (Lintner, 1956; Brav et al., 2005; and Lambrecht & Myers, 2012). Under this payout smoothing hypothesis, we examine what happens to firms' smoothing strategies after becoming Shari'ah compliant. In order to quantitatively estimate smoothing policies of the firms, we implement the variance decomposition model, developed by Asdrubali, Sørensen, & Yosha (1996) and Sørensen & Yosha (1998). In their paper, Asdrubali et al. (1996) elaborated a variance decomposition method to decompose the volatility of shocks to the US GDP absorbed by fiscal policy and capital markets. Since then, the methodology has been used to decompose the channels of income and consumption smoothing. For example, Balli & Balli (2011) examined the potential welfare gains and channels of income smoothing for Pacific Island countries and break down output using the same methodology to quantify the extent and channels of risk sharing across region; Balli, Kalemli & Sørensen (2012) estimated the channels of international risk sharing through savings, factor income flows, and capital gains between European Monetary Union (EMU), European Union, and other OECD countries; Balli, Pericoli & Pierucci (2016) apply the standard income variance decomposition methodology for the first time to test the role and the extent of smoothing channels at a micro level using a sample of UK households.

Following Hoang & Hoxha (2016), and adapting the strategy of Asdrubali et al. (1996) and Sørensen & Yosha (1998), we suggest following identity in order to identify the firm's intertemporal budget constraint:

$$Net\ Income_i = \frac{Net\ Income_i}{Net\ Income_i + \Delta Debt_i} \times \frac{Net\ Income_i + \Delta Debt_i}{Payout_i} \times Payout_i \qquad (2)$$

Firms may smooth volatility of earnings through borrowings, which is emulated by the difference between $Net\ Income_i$ and $Net\ Income_i + \Delta Debt_i$. Further smoothing can be done through investment, which is emulated as the difference between $Net\ Income_i + \Delta Debt_i$ and $Payout_i$ (from equation 1) when fluctuations in earnings are not completely smoothed by borrowing.

Consistent with Hoang & Hoxha (2016), we apply variance decomposition of firm earnings growth in order to get regression equations that will allow us to document the magnitude of fluctuations to $Net\ Income_i$ absorbed by channels of $Debt_i$ and investment. We log transform and first difference the variables in Equation (2) to express them as growth rates. Finally, we multiply both sides by $\Delta log Net\ Income_i$ and get the following decomposition of the cross-sectional variance in

$Net\ Income_i$:

$$var\{\Delta logNet\ Income_i\} = cov\{\Delta logNet\ Income_i, \Delta logNet\ Income_i - \Delta log(Net\ Income_i + \Delta Debt_i)\} + cov\{\Delta logNet\ Income_i, (\Delta log(Net\ Income_i + \Delta Debt_i) - \Delta logPayout_i)\} + cov\{\Delta logNet\ Income_i, \Delta logPayout_i\} \quad (3)$$

We divide both sides of Equation (3) by the variance of $\Delta logNet\ Income_i$ to get the slope coefficients from three different panel univariate regressions which totals to 1:

$$1 = \beta_D + \beta_I + \beta_P \quad (4)$$

Where β_D is the slope coefficient in the regression of $\Delta logNet\ Income_i - \Delta log(Net\ Income_i + \Delta Debt_i)$ on $\Delta logNet\ Income_i$ and represents the debt channel; β_I is the slope coefficient in the regression of $\Delta log(Net\ Income_i + \Delta Debt_i) - \Delta logPayout_i$ on $\Delta logNet\ Income_i$ and represents the investment channel; and finally, β_P is the slope coefficient, in the regression of $\Delta logPayout_i$ on $\Delta logNet\ Income_i$represents the payout channel of smoothing of earnings.

The coefficients from Equation (4) are obtained from the following three panel regressions:

$$\Delta logNet\ Income_{it} - \Delta log(Net\ Income_{it} + \Delta Debt_{it}) = \beta_D \Delta logNet\ Income_{it} + \epsilon_{itD} \quad (5a)$$

$$\Delta log(Net\ Income_{it} + \Delta Debt_{it}) - \Delta logPayout_{it} = \beta_I \Delta logNet\ Income_{it} + \epsilon_{itI} \quad (5b)$$

$$\Delta logPayout_{it} = \beta_P \Delta logNet\ Income_{it} + \epsilon_{itP} \quad (5c)$$

Where i is firm indexes; t is year indexes; for each regression above. We can economically interpret a hypothetical 100% increase in the growth rate of $Net\ Income_{it}$ as the above variables in the equations are expressed in growth rates. According to Equation (5a), if fluctuations are completely smoothed by paying back debt, the growth rate of $\Delta Debt_{it}$ is 100%, which indicates the term $Net\ Income_{it} + \Delta Debt_{it}$ to grow at 0 rate. A regression of $\Delta logNet\ Income_{it} - \Delta log(Net\ Income_{it} + \Delta Debt_{it})$ on $\Delta logNet\ Income_{it}$ yields the coefficient β_D equal to 1 if fluctuations to net income are perfectly absorbed by a policy of paying back borrowing. If $Net\ Income_{it}$ increases by 100% and there is no smoothing at all at the borrowing level, then $Net\ Income_{it} + \Delta Debt_{it}$ grows at the same rate as $Net\ Income_{it}$. Therefore, regressing $\Delta logNet\ Income_{it} - \Delta log(Net\ Income_{it} + \Delta Debt_{it})$ on $\Delta logNet\ Income_{it}$ makes β_D equal to zero. If fluctuations of net income are not absorbed by borrowing totally, then further absorption of the remaining fluctuations occurs by alterations in investment with the same logic explained in the case of debt. So, the next level of smoothing occurs in Equation (5b) where the dependent variable is $\Delta log(Net\ Income_{it} + \Delta Debt_{it}) - \Delta logPayout_{it}$ which is representing the investment and the coefficient β_I capture the incremental magnitude of fluctuations of earnings that are passed through to investment. If borrowing

and investment policy unable to eliminate fluctuations of earnings, then $\overline{\beta_D + \beta_I < 1}$. Therefore, $\overline{\beta_P}$ is estimated in equation (5c) and $\overline{\beta_P}$ is the coefficient that yields the growth of dividends or percentage of fluctuations of earnings remained non-absorbed. Both cross section and time fixed effects are included in panel regressions to control for firm level and time effects.

3.3.1 Data

In order to analyze the magnitude of shocks to earnings absorbed around the SCR adoption, we target firms that adopted SCR recently. In other words, the selected firms were not originally Shari'ah compliant (had operated with conventional equities). They were accepted as Shari'ah compliant at some stage of their activity and remained so over the sample period of time, which gives us opportunity to analyse post adoption changes in firms financing decisions. As of December 2016, we find a total of 973 SCR adopted US firms, identified by Ideal Ratings. These firms are consistent with the Ideal Ratings business and financial screenings, based on the AAOIFI standards. To measure the amount of changes of earnings absorbed by borrowing, investment and the amount remained unabsorbed, we obtain yearly data on financial variables such as net income, short term and long-term debt, cash balances, cash dividends, stock repurchases and equity issuances from CompStat over the period 1982-2016.

In Table 8, the means and standard deviations for net income, debt, investment, and payouts are reported.

Table 8. Summary statistics.

	Mean	Standard Deviation	Skewness	Kurtosis
NET INCOME	247385.3	1392152	13.20591	308.21
DEBT	80591.64	1024875	16.58391	687.5381
INVESTMENT	1912166	8819506	14.45011	307.586
PAYOUT	271563.4	1313936	13.3826	265.2251

Notes: The sample comprises 34055 firm-year observations from 9 sectors between 1982 and 2016 for which sufficient Compustat financial data exist.

A correlation matrix is reported in Table 9. We use logarithmic transformation of the variables to eliminate any possible Heteroscedasticity and autocorrelation issues. We also perform the necessary tests to diagnose any remaining problems of the residual tests. Any unit root issues are also eliminated after log differencing.

Table 9. Correlation matrix.

	Δlog NI	Δlog ND	Δlog Investment	Δlog Payout
Δlog NI	1			
Δlog DEBT	0.01	1		
Δlog INVESTMENT	0.05	0.26	1	
Δlog PAYOUT	0.02	-0.03	-0.10	1

Notes: The sample comprises 34055 firm-year observations from 9 sectors between 1982 and 2016 for which sufficient CompStat financial data exist.

We further classify these equities according to the sectoral characteristics of the Standard Industrial Classification (SIC) to analyse whether or not there are significant differences across the sectors. The SIC classifies a system of 10 industries namely - Agriculture, Forestry and Fishing, Mining, Construction, Manufacturing, Transportation and

Communications, Electric, Gas and Sanitary service, Wholesale Trade, Retail Trade, Finance, Insurance and Real Estate, Services and Public Administration. Table 10 displays the number of firms for each sector.

Table 10. Industrial Classification of Firms

Industry Title	SIC Division	Equities
Agriculture, Forestry and Fishing	(1)	3
Mining	(2)	79
Construction	(3)	17
Manufacturing	(4)	498
Transportation, Communications, Electric, Gas and Sanitary service	(5)	89
Wholesale Trade	(6)	46
Retail Trade	(7)	77
Finance, Insurance and Real Estate	(8)	14
Services	(9)	150
Public Administration	(10)	0
	Total	973

Notes: Firms are classified according to Standard Industrial Classification (SIC). SIC (10) division is omitted from analysis due to absence of data.

3.4 Estimation Results and Discussions

3.4.1. Benchmark results

We start our analysis by estimating the fractions of debt, investment and payout that smooth the volatility of Net Income, using firm level data. We use equations 5a, 5b and 5c to run panel regressions. In Table 11, we present our benchmark results. We find that 37.25% of fluctuations of earnings are eliminated by borrowing and 62.27% of shocks are absorbed through investment channels. The results also document that borrowing and investment are primary channels in smoothing a large fluctuation of earnings. On the other hand, 1.3 % of the net income shocks are smoothed with dividend (payout) policy changes. These findings are consistent with the literature, indicating that net income shocks are not reflected in dividend

payouts (only 1.3%), but mostly those shocks are buffered with debt and investment policy changes.

Table 11. Benchmark results.

	Full Period (1982-2016)	Before SC (1982-2010)	After SC (2011-2016)
DEBT (β_D)	37.25***	38.11***	33.83***
	(37.80)	(34.77)	(16.78)
INVESTMENT (β_I)	62.27***	61.50***	63.49***
	(42.36)	(34.33)	(27.20)
PAYOUT (β_P)	1.3*	0.23	3.00**
	(1.68)	(0.23)	(2.42)

Notes: This table displays the benchmark results from estimating the variance decomposition equations. The sample consists of 973 firms taken from the CompStat database and covers the period 1982–2016. The numbers displayed represent the percentage of fluctuation of firm earnings absorbed by borrowing (β_D) and investment (β_I). Payout (β_P) represents the amount of fluctuations unabsorbed. Also, it measures the response of payouts to fluctuations in earnings. The measure for payouts is the sum of cash dividends and stock repurchases net of equity issues.β_D is the slope coefficient from a regression of Δlog NI − Δlog(NI + ΔD) on Δlog NI $\beta_I$is the slope coefficient from a regression of Δlog(NI + ΔD) − Δlog P on Δlog NI. β_P is the slope coefficient from a regression of Δlog P on Δlog NI. Coefficients are multiplied by 100. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

In order to capture the effect of a dichotomous break after being Shari'ah compliant, we divide the sample period into three periods. Overall sample period is from 1982 to 2016; 1982 - 2010 captures the period before becoming Shari'ah compliant (SC), and the second period after the compliance which is between 2011 and 2016. Overall, the results reveal that there is almost a 4% decrease in debt smoothing indicating that after becoming SC, a firm smooths the net income by more payouts due to restriction of Shari'ah compliance in debt financing. For the 28 years period from 1982 to 2010, the income smoothing via debt stays stable at around 37-38%, however, it drops to 34% in the last 5 years, which corresponds to being Shari'ah compliant. This sudden drop might be due to debt restriction of SCR and the inflexibility of the firms' suing debt to finance payout when

the firms' the net income decreases. Even for a longer period of time, for SC firms, we might expect this channel (debt financing) to be lower in smoothing the net income shocks. On the other hand, there is an increase in payout smoothing from 1.3% to 3% in the last 6 years, indicating that SC firms' payouts would be more correlated with their net income fluctuations after they become SC. In other words, when these SC firms experience negative shocks in their net income, they would reflect the shocks in their payouts, instead of getting debt and paying smoothed dividends. This tendency gets stronger (1.3% to 3%) after the firms became SC.

Table 12 illustrates the second specification model, which re-assures whether the joint effect of Shari'ah compliance and change in Net Income on Debt, Investment and Payout is simultaneously feasible and significant. The aim of the estimations in this model is to examine the behaviour of firms to smooth income fluctuations in the environment Shari'ah Compliance through debt, investment and payout channels. Results reveals that absorption by Debt and Payout is significant. Consistent with our benchmark results Debt has negative (-5.39%) and Payout positive (3.07%) coefficient.

Table 12. Shari'ah Interaction Results.

	Δlog NI	Δlog NI *Shari'ah
DEBT (β_D)	38.8***	-5.39**
	(35.07)	(-2.11)
INVESTMENT (β_I)	61***	0.34
	(20.64)	(0.07)
PAYOUT (β_P)	-0.05	3.0.7*
	(-0.05)	(1.92)

Notes: This table displays the benchmark results from estimating the variance decomposition equations. The sample consists of 973 firms taken from the CompStat database and covers the period 1982–2016. The numbers displayed represent the percentage of fluctuation of firm earnings absorbed by borrowing (β_D) and investment (β_I). Payout (β_P) represents the amount of fluctuations unabsorbed. Also, it measures the response of payouts to fluctuations in earnings. The measure for payouts is the sum of cash dividends and stock repurchases net of equity issues.β_D is the slope coefficient from a regression of Δlog NI − Δlog(NI + ΔD) on Δlog NI $\beta_I$is the slope coefficient from a regression of Δlog(NI + ΔD) − Δlog P on Δlog NI. β_P is the slope coefficient from a regression of Δlog P on Δlog NI. Coefficients are multiplied by 100. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

3.4.2. Industry Based Estimations

We further differentiate firms into nine separate industries to detect specific sector-based effects after adopting Shari'ah requirements and analyse the patterns in the borrowing, investment and dividend payout. In fact, there are ten sectors by Standard Industry Classification, however, for the public administration sector we could not find SCR adopted firms that became Shari'ah compliant at the same date as the whole sample. Therefore, we did not include this industry in our estimations. We also, clustered Agriculture, Forestry and Fishing, Construction, Wholesale Trade and Finance, Insurance and Real Estate sectors together, due to the few numbers of firms in each of these sectors. Table 6 displays industry-based estimation results of variance decomposition equations with some interesting points to mention. Sectoral analysis results are consistent with firm level analysis and indicate that firms become less flexible in smoothing their dividends via

debt due to the restrictions of SCR in some (SIC 2, 7 and 9) sectors. In fact, investment portion of the smoothing increased in these sectors. After being Shari'ah compliant, for most of the sectors, the extent of payout smoothing changed from negative figure to positive and increased by an average of 3% except for the Manufacturing sector (SIC 4). Portion of debt observing the shocks to Net Income declined in sectors of Mining (SIC 2) (from 48% to 27%), Retail Trade (SIC 7) (from 48% to 38%) and Services (SIC 9) (from 39% to 31%). Firms across clustered sectors and Manufacturing, Transportation, Communications, Electric, Gas and Sanitary services, do not experience a fall in the portion of debt after becoming Shari'ah compliant. Investment portion of the smoothing in these sectors is decreased too. However, we should not ignore the fact that number of firms in each industry sample is considerably low, as well as the share of this industry in total economy, so the results may not reflect all the available information.

Overall, the sectoral estimates exhibit similar patterns as the total sample estimates reported in Table 13. The sectoral estimates also provide additional evidence to our initial insight that be Shari'ah compliant restricts firms' debt financing capability and hence, firms' smooth volatility of Net Income mainly by Investment and Payout policies.

Table 13. Channels of Payout Smoothing on Sectoral Analysis

Sectors	Debt ($\overline{\beta_D}$)			Investment ($\overline{\beta_I}$)			Payout ($\overline{\beta_P}$)		
	Full Period (1982-2016)	**Before SC (1982-2010)**	**After SC (2011-2016)**	**Full Period (1982-2016)**	**Before SC (1982-2010)**	**After SC (2011-2016)**	**Full Period (1982-2016)**	**Before SC (1982-2010)**	**After SC (2011-2016)**
SIC 2	41.94 ***	48.47***	26.91***	59.64***	46.70***	72.44***	2.94	-0.36	6.48**
	(14.09)	(13.98)	(4.69)	(12.96)	(7.70)	(10.46)	(1.24)	(-0.11)	(1.96)
SIC 4	34.66***	34.24***	37.63***	61.88***	62.66***	58.69***	2.49**	2.90**	1.87
	(25.66)	(23.08)	(11.50)	(31.31)	(26.65)	(16.05)	(2.42)	(2.25)	(1.09)
SIC 5	40.32***	40.51***	40.83***	72.12***	78.62***	56.89***	-4.50**	-9.60**	6.33
	(13.22)	(12.20)	(5.25)	(14.28)	(13.04)	(6.16)	(-1.68)	(-2.96)	(1.33)
SIC 7	45.18***	47.84***	37.96***	56.40***	54.57***	57.79***	0.30	-0.9.4	1.92
	(13.27)	(12.10)	(5.64)	(11.04)	(8.06)	(7.39)	(0.10)	(-0.24)	(0.45)
SIC 9	37.21***	39.06***	30.91***	57.25***	49.05***	70.31***	2.06	1.12	3.50
	(14.15)	(13.33)	(5.14)	(14.15)	(9.69)	(10.44)	(0.96)	(0.41)	(1.05)
SIC Cluster	30.89***	29.47***	37.27***	64.53***	64.30***	63.68***	-1.60	-3.38	0.62
	(7.60)	(6.45)	(4.13)	(11.06)	(9.02)	(6.20)	(-0.59)	(-0.93)	(0.15)

Notes: This table displays the sectoral results from estimating the variance decomposition equations. The sample consists of 973 firms taken from the CompStat database and covers the period 1982–2016. The numbers displayed represent the percentage of fluctuations of firm earnings absorbed by borrowing ($\overline{\beta_D}$) and investment ($\overline{\beta_I}$). Payout ($\overline{\beta_P}$) represents the amount of fluctuations unabsorbed. Also, it measures the response of payouts to fluctuations of earnings. The measure for payouts is the sum of cash dividends and stock repurchases net of equity issues. $\overline{\beta_D}$ is the slope coefficient from a regression of Δlog NI – Δlog (NI + ΔD) on Δlog NI. $\overline{\beta_I}$ is the slope coefficient from a regression of Δlog (NI + ΔD) − Δlog P on Δlog NI. $\overline{\beta_P}$ is the slope coefficient from a regression of Δlog P on Δlog NI. t statistics are reported in parenthesis. Coefficients are multiplied by 100. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

3.4.3 Decomposition of Payout Smoothing

One of the characteristics of income smoothing is that it has an inter-temporal dimension (Acharya & Lambrecht, 2015). The permanent income hypothesis states that it is the changes in permanent income (rather than changes in temporary income), that cause changes in an economic agent's consumption. Consequently, a firm's spending patterns may also change not according to temporary, but permanent income. Firms may also alter their payout policy according to their expected long-term income because the relationship between a firm and its payout may be similar to that between consumers and consumption. Therefore, firms are more concerned with the expected long-term income changes than current income changes (Darling, 1957). Besides, from a shareholder perspective, shareholders would expect less fluctuations in their dividend income streams in response to the changes in firm income.

One of the main drawbacks of implementing the variance decomposition model, developed by Astrubali et al (1996) is that it fails to reconcile temporary (risk-sharing) and permanent (intertemporal) payout smoothing over time. Therefore, a full analysis of payout smoothing requires a joint examination of risk sharing and intertemporal smoothing hypotheses. Using characteristics of panel data analysis and methodology proposed by Mundlak (1978), Asdurbali & Kim (2008) propose a model to easily distinguish between permanent vs. temporary shocks. Asdurbali & Kim (2008) distinguish neatly between smoothing of current vs. permanent output shocks.[20] We employ the same strategy in order to explore the

[20]This can be done by taking advantage of the complementarity between the ''within'' estimator and the ''between'' estimator in a panel regression

intertemporal payout smoothing test stemming from the same model (eq. 5c) this time focusing on the time dimension. The error term can be decomposed as:

$$\epsilon_{itP} = \varepsilon_{it} + \mu_i + \vartheta_t$$

So that equation 5c is transformed into:

$$\Delta logPayout_{it} = \beta_P \Delta logNet\ Income_{it} + \varepsilon_{it} + \mu_i + \vartheta_t$$

Again, employing Mundlak's (1978) strategy, we could model individual heterogeneity by taking explicitly into account the correlation between μ_i and the time average of Net Income growth:

$$\epsilon_{itP} = \varepsilon_{it} + \alpha_P \overline{\Delta logNI_\iota} + \vartheta_t$$

In the meantime, the time fixed effect ϑ_t corresponds the risk sharing effect.

The equation to be estimated then becomes:

$$\Delta logPayout_{it} = \alpha_{iP} + \beta_P \Delta logNI_{it} + \delta_P \overline{\Delta logNI_\iota} + \delta_A \overline{\Delta logNI_t} + \varepsilon_{it}, \quad (6)$$

Here the coefficient δ_P, attached to the time average of Net Income ($\overline{\Delta logNI_\iota}$), can be explained as the extent of the correlation of permanent earnings growth with payouts, whereas the orthogonal coefficient β_P, attached to current

earnings growth, measures the extent of correlation of payouts with temporary Net Income growth. In other words, we try to capture not only year by year ($\overline{\beta_P}$) but also permanent performance of the firm ($\overline{\delta_P}$) by using the average income growth through the periods. Similarly, $\overline{\Delta logNI_t}$ measures the degree of the "risk sharing" according to the literature. As stated in Huang-Meier, Freeman & Mazouz, (2015) the dividend payouts are systematically and strongly affected by external changes in the economic environment. Thus, this variable empirically quantifies the co-movement of pay-out growth with overall income growth among firms. $\overline{\delta_A}$simply reflects the reaction of the payout ratio to overall income or overall output growth. In fact, this method can make sense when the firms aim to share the risk with each other. In other words, it shows how payout growth reacts to overall net income in the economy.

Table 12 illustrates how Net Income shocks – be they current or permanent – are dealt with intertemporally (Eq. (6)). Table 7 contains the estimation of the equation (6), which indicates measures how does the payout growth co-moves with net income growth ($\overline{\Delta logNI_{it}}$), average net income growth ($\overline{\Delta logNI_i}$) of the firm and the $\overline{(\Delta logNI_t)}$ aggregate income growth within the economythroughout the time. The first column (temporary income growth) indicates that net income growth only explains 1% of payout growth, similar to our findings in Table 11-where the smoothing via payout is 1-3% according to different periods.

Table 14. Decomposition of Payout Smoothing

Periods	Temporary (β_P)	Permanent (δ_P)	Aggregate (δ_A)
1982-2016	1.02	22.22**	9.11*
	(1.16)	(2.07)	(1.78)
1991-2000	-3.08	6.63	-62.40
	(1.19)	(0.28)	(-1.62)
2001-2010	0.41	18.17**	16.28***
	(0.33)	(2.26)	(2.59)
2011-2016	2.89**	28.43***	1.44
	(2.10)	(2.99)	(0.12)

Notes: This table displays the benchmark results from estimating the variance decomposition equations. The sample consists of 973 firms taken from the CompStat database and covers the period 1982–2016. The numbers displayed represent the percentage of fluctuation of firm earnings absorbed by borrowing (β_D) and investment (β_I). Payout (β_E) represents the amount of fluctuations unabsorbed. Also, it measures the response of payouts to fluctuations in earnings. The measure for payouts is the sum of cash dividends and stock repurchases net of equity issues. β_D is the slope coefficient from a regression of Δlog NI − Δlog(NI + ΔD) on Δlog NI β_I is the slope coefficient from a regression of Δlog(NI + ΔD) − Δlog P on Δlog NI. β_E is the slope coefficient from a regression of Δlog P on Δlog NI. Coefficients are multiplied by 100. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

Table 11 indicates that only a small portion (3%) of the current net income shocks are smoothed with payouts (dividends) after SC. However, we have observed that payout growth has a significant correlation with the average income growth with 22.22 % in the second column (permanent income growth) indicating that permanent net income growth significantly explains the payout changes. Empirically, even though payout smoothing is highly achieved in Table 4 and Table 5 stating that dividend growth is barely correlated with current net income changes this is might be to the firm's decision on payout has been given on long-term plans (Darling, 1957). Breakdown into sub periods shows an increase in overall smoothing from the 80s and 90s to the 2000s and 2010s and a subsequent increase in the last 5 years. Even though in the 1990s, the coefficient of $\Delta logNI_t$ is statistically insignificant, in later periods, it becomes highly significant even after

2011, the coefficient is over 28% and statistically significant. Payout and permanent income growth correlation has become increasingly significant; even this is greater after the firms become Shari'ah compliant. This finding is highly intuitive. Since the SC firms would become less risky as they have limited ability to borrow and financial distress is avoidable, therefore firms would be more reluctant to smooth the payouts but the they would be affected more from the long-term performance of the firm.

The statistically significant coefficient of $\overline{\Delta logNI_t}$ (9.11%) in the third column (aggregate income growth) is used to document the pro-cyclical nature of aggregate risk sharing in the literature-is also, indicating that payout is positively correlated with the aggregate net income growth of all firms, and clearly observed the pro-cyclicality of aggregate payout policy. Consistent with Carceles-Poveda (2005, 2009), Huang-Meier et al. (2015), literature states that firms are less willing to retain earnings in good times, thus pay dividends to shareholders, and vice versa. Thus, the firm most likely does not want to send negative signal to the market and due to market competition, it may increase (decrease) payout ratios when the economy is doing fine (bad). Breakdown into sub-periods, the analysis in table 7 shows that even though the aggregate income growth is highly significant for all periods in the coefficient from the 2001 to 2010 and this amount decreases to 1.44% and becomes insignificant after firms become SC. The sharp decrease in the coefficient, after 2010s is consistent with our prior findings in Table 4 and first column of Table 7. This finding is also highly intuitive, as the restriction of debt financing of SC firms makes them less capable to leverage and more reluctant to

adjust the payouts in a reacting against other firms' growth (aggregate income growth).

These findings have some relevance on the permanent income hypothesis, which asserts that economic agents base their consumption decisions in response to net income changes in their expected long term rather than current income. We argue that the permanent income hypothesis may also have relevance to firm decision making; that is, long-term net income may provide insight into a firm's adjustment of dividend payments (payout) and share repurchases. This is also consistent with being Shari'ah compliant as those firms are not able to finance payout through extra debt. Restriction of debt financing may also, lead firms to save extra income for future use.

3.5 Concluding Remarks

In this paper, we extend the literature on corporate payout by applying a variance decomposition methodology to evaluate the financial adjustments of Shari'ah compliant firms make in response to changes in earnings. Our study was motivated by the proposition that adoption of Shari'ah compliance points to general advantages. A lower-risk environment with lower leverage and other screening measures are among these advantages. Based on the strategies proposed by literature, we decompose the variance in net income to quantify the amount of fluctuations to earnings absorbed by investment, debt and payout. We analyse the effects of becoming Shari'ah compliant on the payout policy of the firms. Our estimations also include business sector-specific effects to account for industry-specific patterns being reflected in the payout policy after SCR adoption. Since

payout policy is one of the ultimate goals of financial managers, this study provides useful insights and some empirical evidence on the payout in the light of Shari'ah equity developments.

Our benchmark results show that 37.25% of shocks to net income are absorbed via borrowing and 62.27% of shocks are absorbed through investment channels. The results also document that borrowing and investment are primary channels in smoothing a large amount of fluctuations to the net income. The amount of shocks (1.3%) left unsmoothed is associated with a change in payouts. Our results are consistent with the Lambrecht & Myers (2012) budget constraint theory that identifies debt and investment as the main mechanisms to smooth volatility in net income. When the model is checked to account for a time trend, we find that Shari'ah compliance will eventually lead to a fall in the portion of debt and rise in the portion of payout in smoothing income, potentially due to higher financial constraints and other burdens associated with Shari'ah requirements.

Both industry-based and total sample estimations validated identical patterns. Specifically, we find the magnitude of the Shari'ah effects to be trivial, across most of the industries. Consistent with the theory and recent findings, our sectoral analysis results indicate that firms become less flexible in smoothing their dividends via debt due to the restrictions of SCR. After being Shari'ah compliant, for most of the sectors, smoothing patterns of net income by payout changed from negative figure to positive by an average of 3%.

We further analysed a complete assessment of payout smoothing by a joint examination of risk sharing and intertemporal smoothing hypotheses. Payout and long-term income growth correlation has become increasingly significant even more

when the firms become Shari'ah compliant. This is quite intuitive since the firms would like to become less risky as they have limited ability to borrow loans and financial distress is avoidable. Secondly, they are not able to finance payout through extra debt after becoming Shari'ah compliant. Lastly, consonant with Darling (1957) and lending support to the permanent income hypothesis, payouts would not be decided on short-term income flows but in line with long term income growth. Last but not least, aggregate income growth among firms is also correlated with payout growth. We found that SC makes firms less capable to leverage and more reluctant to adjust the payouts in a reacting against other firms aggregate income growth.

Together with providing a novel approach to shed light on recent Islamic equity developments, our study also opens up a number of avenues for future research. The study could be extended to investigation of SCR effects across global markets and international country-levels. It would be interesting to compare and contrast global trends in the corporate response to Shari'ah equity market developments in different regions, with varying economic conditions and diverse market structures. In the same way, Permanent Income Hypothesis can be tested analysed with the sample of firms globally.

CHAPTER FOUR: IMPACT OF FIRM-LEVEL POLITICAL RISK AND SHARI'AH COMPLIANCE ON COST OF EQUITY CAPITAL AND PAYOUT POLICY

4.1 Introduction

Decisions of politicians on regulation, taxation, expenditure and the enforcement of rules have a major impact on the business environment. Political risk is also a topic of hot debate among economists, business leaders, and politicians. However, much of existing researches on political risk have focused primarily on events such as presidential elections and political stability within a country. Until recently, research has used country-level indexes of political risk as proxy for the political risk and analysed the adverse impacts on firm performance due to the country political environment. This was due to availability of only country-level political risk measurement and a lack of quantification of firm-level political risk. Therefore, existing theoretical work has relied on country-level indices or event studies and has typically viewed political risk as a systematic but not idiosyncratic risk (Pastor & Veronesi, 2010, 2013; Born & Pfeifer, 2014; Belkhir, Boubakri & Grira, 2017). However, a pioneering study by Hassan, Hollander, van Lent & Tahoun (2019) documented the magnitude of firm-level political risk for the first time in the literature. They use textual analysis of quarterly earnings conference-call transcripts to construct firm-level measures of the extent and type of political risk faced by individual firms listed in the United States. Their special empirical research design made it possible to quantify the political risk faced by a given firm. Using this methodology, they documented that political shocks appear to be a significant source of idiosyncratic risk rather than systematic risk,

and firms may well be as concerned about their relative position in the distribution of firm-level political risk as they are about aggregate political risk. This newly developed dataset made it possible to analyze the impact of firm-level political risk on investment decisions and financial behavior of firms.

Firm-level political risk may affect financial behaviour of firms through several channels. Firms exposed to firm-level political risk may choose more conservative dividend distributions and are more likely to terminate dividends to "save for rainy days". Additionally, this perceived risk associated with high political risk can affect firms' external financing costs.

The gap in the literature on how firm-level political risk may affect the cost of equity capital and payouts policy and the availability of above-mentioned firm-level political risk dataset, provide the impetus for our research. The purpose of this article is to address a gap in the literature by investigating the impact of firm-level political risk on cost of equity and dividend payout. Besides corroborating the key findings documented in previous research that perceived political risk as a systematic risk (Pastor & Veronesi, 2010, 2013; Born & Pfeifer, 2014; Belkhir, Boubakri & Grira, 2017) our analysis sheds light on idiosyncratic political risk by showing how firm-level political risk measures correlate closely with the implied cost of equity and dividend payouts.

Our study contributes to the political risk literature in at least three specific ways. First, we consider how firm-level political risk may affect the cost of equity capital of firms. This augments the traditional political risk literature, which has tended to consider country-level political risk on the cost of equity capital. Understanding this relationship is becoming increasingly important for firm

decision making since the cost of equity is a crucial element in their future investment decisions. Second, we extend current literature by investigating the impact of firm-level political risk on payouts policy of firms and incentives of managers in response to political shocks.

Additionally, novel to the literature, in order to propose a measurement of risk avoidance, we investigate firm efforts to mitigate political risk by being Shari'ah compliant. The past three decades has witnessed the emergence and rapid growth of Islamic finance. Islamic financial instruments and services are anchored in the tenets of Shari'ah[21]. Despite the growing popularity of Shari'ah compliant equities in financial markets, the literature has not yet addressed the impact of firm-level political risk on this alternative asset class. Our identification strategy relies on the interaction between Shari'ah compliance and firm-level political risk. The SCR adoption process requires firms to meet certain conditions such as keeping particular financial ratios within specific limits[22]. In addition to debt restriction, thus less financial distress, profit and loss sharing and asset backing principles of Islamic finance may be an effective instrument for addressing the negative influence of firm-level risk. Taking into account these special conditions applied to Shari'ah compliant firms, the analysis of implications on firm behavior needs a special approach, empirical data and modelling methodology.

The central purpose of our research is to model and investigate the changes in the cost of equity capital and dividend payouts behavior of firms after exposure to firm-level political risk and becoming Shari'ah compliant. Another argument is that Shari'ah compliance can make it less costly for investors to analyse and compare

[21]The set of sources of the sacred law of Islam, governing all aspects of Muslim life.
[22]For simplicity, we do not mention all the requirements of SCR adoption process. For the full content of the Standard please see http://aaoifi.com/?lang=en

firms across regions, facilitate cross-border investments and improve risk sharing - all of which could reduce the cost of equity capital. On the other hand, limitations in debt financing[23] of Shari'ah compliance will also directly affect payout dynamics of firms who are affected by the political risk and may result in them being more likely to terminate their dividend payments. In particular, we are interested in whether and to what extent firm-level political shocks that impact on the dividend payouts are altered after SCR adoption, and what implications it may have for payouts smoothing policies of the firms.

Consistent with these premises, we are interested in whether exposure to firm-level political risk triggers significant changes in external finance and liquidity of firms, contributing to a change in the cost of equity capital and dividend policy. Additionally, our study aims to identify and assess a possible mechanism behind such linkage and investigates the impact of other determinants in the model of cost of equity and payouts, such as leverage, firm size and return volatility. To our knowledge, our study is the first to examine this relationship of firm-level political risk and both cost of equity and payouts.

We conduct our empirical estimations by dividing our data into different time periods for firms: before and after becoming Shari'ah compliant and check the magnitudes of the changes in the cost of equity and payouts smoothing behavior of the firms, which operate under firm-level political uncertain environment. Our analysis is based on a comprehensive panel sample of 54480 firm-year observations over the period of 2002-2016. Our estimations include business sector-specific

[23]Debt-to-asset, liquid assets-to-total assets and receivables-to-assets ratios are mandated to remain less or equal to 33%.

effects to account for the industrial patterns reflected in both cost of equity and payouts policy.

The remainder of the paper proceeds as follows. Section 2 presents literature review; section 3 data; section 4 discusses the methodologies and outlines the estimation models. The empirical estimation with findings and insights are presented in section 4.2 and 4.3. Lastly, section 5 concludes by summarising and discussing the findings and future research considerations.

4.2 Literature review

Political environments can have unexpected and adverse impacts on firm profitability, a phenomenon known as political risk (Simon, 1984; Brewer, 1985; Boddewyn, 2005). Firms exposed to political risk reduce their spending on hiring (Bernanke, 1983; Hassan et al., 2019) and investment (Pindyck, 1988; Hassan et al., 2019) and instead they increase spending on lobbying expenditure and donate to politicians (Kang, 2016; Hassan et al., 2019). The magnitude of the effects of risks from political decisions, events, or conditions, on firm behavior are intensively studied and well documented in the finance literature (Pastor & Veronesi, 2013; Gulen & Ion, 2016; Jens, 2017). An extant set of studies documents that risk and uncertainty shocks originating from the political system affect the business cycle (Belo, Gala, & Li, 2013; Born & Pfeifer, 2014; Kelly, Pastor, & Veronesi, 2016; Mueller, Tahbaz-Salehi, & Vedolin, 2017). Risks arising from the political system, influence not only profitability but also asset prices (Pastor & Veronesi, 2010; Dimic, Orlov & Piljak, 2015; Lehkonen & Heimonen, 2015; Huang, Wu, Yu &

Zhang, 2015a), international capital flows and investment decisions of firms (Clark & Jokung, 1998; Maurice DL, 1977).

Hassan, Hollander, van Lent & Tahoun (2019) documented that political shocks appear to be a significant source of idiosyncratic risk rather than systematic risk, and firms may well be as concerned about their relative position in the distribution of firm-level political risk as they are about aggregate political risk.

The cost of equity is also altered congruent with: changes in firm risks; inclusion to the stock listings (Karolyi, 1998); greater information disclosure and transparency due to the compliance to particular standards (Daske, Hail, Leuz, & Verdi, 2008; Diamond & Verrecchia, 1991); signalling to investors and rise in their recognition of a firm that leads to an increase in the investor base as well as liquidity (Merton, 1987; Hail & Leuz, 2009). Moreover, it is well documented in the literature that exposure to political risk may alter capital market participant risk perception (Pastor & Veronesi, 2013; Bekaert, Harvey, Lundblad, & Siegel, 2014) and this perceived risk associated with high political risk can affect firms external financing costs.

In addition to the uncertainties associated with government policies and the macro environment, negative signalling of cutting dividends and increases in lobbying expenditure by firms may dramatically raise external investor risk perception (Pastor & Veronesi, 2010, 2013; Huang et al., 2015b) leading to a higher required rate of return, in other words the implied cost of equity capital.

Akhtar, Jahromi& Smith (2017) document that there are substantial benefits of risk reduction and stability for Islamic stocks in comparison with conventional stocks. Furthermore, prior analytical and empirical studies suggest that becoming

Shari'ah compliance may serve as a liquidity-enhancing policy as found in Karimov, Balli, de Bruin, & Balli (2020), which provides greater float, since it can decrease illiquidity by improving investor diversification opportunities (Amihud& Mendelson, 1988).

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4.3 Data and Summary Statistics

In order to document the effects of firm-level risks originating from the political system on the cost of equity and corporate payouts policy we target firms that listed in the firm-level political risk index published by EPU (Economic Policy Uncertainty Index, 2019). Hassan et al., (2017) use textual analysis of quarterly earnings conference-call transcripts to construct a firm-level political risk index for individual firms listed in the United States. They adapt a contextual analysis to distinguish between language associated with political versus non-political topics. For each of 9,481 firms listed on a US stock market between 2001 and 2016, dataset gives the firm's name, its CompStat GVKey identifier, political risk measurement, as well as its logical components.

We select country specific, particularly US firms, first of all due to data availability of the firm level political risk. According to our best knowledge firm level political risk data is only available for US firms. Secondly, main variable of our study, political risk index depends country specific political environment, as it is defined by the risk of government actions or imperfections of the country's executive, legislative, or judicial institutions (Knudsen, 1974; Minor, 1994). Lastly, we wanted to have data from the same market so that we eliminate the country level macroeconomic and financial differentials between countries as Gurcharan (2010),

found that there is a signification relation between capital markets and financial leverage. Thus, accounting data for different countries may lead to different results. In order to avoid all these above-mentioned issues, we deliberately selected only US firms in our study. We obtain annual firm-level accounting data total assets, leverage, market-to-book ratio (MB), dividend payments, investment, free cash flow (FCF), market value (MV), return on equity (ROE), interest on Earnings Before Interest and Taxes (INTEB) and return on assets (ROA) from Worldscope (DataStream) and analyst forecasts and share price information from the I/B/E/S over the period 2002-2016. We have to choose this sample period due to the availability of our main variable, firm-level political risk data. We base firm-level political risk measurement, our main variable, on Hassan et al., (2017). Following Hail & Leuz (2009) we control for important firm characteristics such as leverage, firm size, a control variable for forecast bias and return variability and overall degree of risk or uncertainty the firm faces in our implied cost of equity estimations. Following the extant dividend literature (Huang et al, 2015; Fama & French, 2001), the firm-specific control variables used to investigate the impact of firm-level political risk on dividend payouts are firm size, return on asset, leverage, payments of firm to lobby, net funds from operations. We also use Shari'ah dummy variable to control whether firms are identified as Shari'ah compliant by Ideal Ratings, consistent with their business and financial screenings. Lastly, following Gulen & Ion (2016), we also employ Canadian Economic Policy Uncertainty Index (CAN)[24], obtained from policyuncertainty.com, as instrumental variables in order to address endogeneity concerns (see discussion in section 3).

[24]Canada and the United States are linked by extensive trade relations; hence, their economic uncertainties should be highly correlated. We get Canadian EPU from www.policyuncertainty.com

It is good to note that there are no specific details about the distinguishable institutional structure or other specifics of the firms, except they voluntarily opt in to become a Shariah compliant. There was no evidence of special characteristics or structure of the firms that would eventually lead the firm to become Shariah compliant, and the decision of becoming such is a purely action of choice and a random corporate decision. In the same way, we found no distinguishable differences at the firm level structure. However, firms' own decisions to become compliant make this study interesting. As discussed, one main incentive for such move for firms can be expanding their clientele base for their equity and earning the reputation in the finance markets as being "trustable" for the Islamic world and investors. However, in terms of structural differences, there is no difference between firms that are Shariah compliant and those that are not. Of course, excluding the conditions around adopting Shariah compliance rules but these will take place after firms decide to become Shariah compliant.

To our knowledge, this will be the first work researching and comparing conventional and Shariah compliant equities, and our sample is based on the availability of the data in terms of both the financial/equity data and the firm level political risk index, particularly, with latter being very novel data.

Descriptive statistical properties for the implied cost of equity estimates, dividend payouts, political risk and other control variables are given in Table 15. Descriptive statistical properties for the implied cost of equity estimates and control variables for both set of our samples reveal similar characteristics. Estimated cost of equity by implied method has 0.13 for Shariah firms and 0.15 for non-Shariah firms with standard deviation 0.08 and 1.00 respectively. Dividend reveal the mean of

10.51 for Shariah firms and 11.11 for non-Shariah firms with standard deviation 2.02 and 2.16 respectively. We can see more considerable variability in the political risk, market value and interest/EBIT ratio of firms in our sample, that show relatively high standard deviation. These figures are almost consistent with those presented in the previous studies Hail & Leuz (2009) mean and standard deviation of equity cost of 11.67% and 4.47%, respectively; Huang et al., (2015)–political risk exposure mean of 4.794, standard deviation of 2.111 and market value mean of 12.274, standard deviation 2.071. Our instrumental variables, ROE and CAN exhibit lower standard deviation 0.51, 59.34 respectively for Shariah firms and 0.82 and 59.40 respectively for non-Shariah firms.

Table 15. Descriptive statistics for the implied cost of equity estimates, dividend payouts and control variables

	Ob.	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
Panel A. Descriptive statistics for main (treatment) sample. (Shari'ah Compliant Firms)							
CAN	11224	144.8	232.73	62.55	59.34	0.49	1.76
COE	8934	0.13	0.95	0	0.08	3.02	20.02
DIV	5116	10.51	16.34	0.69	2.02	0.16	3.48
FBIAS	5605	-0.02	9.33	-5.86	0.66	3.44	70.94
FCF	8148	-.083	7.34	-6.90	1.17	-0.95	5.29
INTEB	10084	89.04	218302	-22579.4	2594.75	68.55	5374.70
INVESTMENT	39	11.66	17.10	1.09	4.34	-0.28	2.19
LEV	11046	0.18	0.99	0	0.15	0.72	3.62
MV	11186	7071.46	511886.8	0	25414.03	8.41	98.01
MB	10441	3.28	709.55	0	12.59	36.61	1682.01
PRISK	8990	104.53	3155.43	0	146.83	6.73	86.98
ROA	11046	0.03	2.36	-6.53	0.22	-10.19	211.04
ROE	10822	0.05	9.98	-9.36	0.51	-4.84	112.82
RVAR	10979	0.12	3.22	0.01	0.11	8.25	147.55
SIZE	11108	13.65	19.82	3.43	2.03	-0.02	3.13
Panel B. Descriptive statistics for control sample. (Non-Shari'ah Compliant Firms)							
CAN	43256	141.02	232.74	62.55	59.40	0.15	1.76
COE	20,261	0.15	0.98	0	0.1	2.8	15.57
DIV	13947	11.11	17.68	0	2.16	-0.32	3.39
FBIAS	27789	-0.01	9.67	-5.88	0.55	2.16	83.41
FCF	18642	-0.02	12.36	-6.91	1.49	-0.15	6.1
INTEB	31735	62.11	77475.33	-417419.4	10500	93.04	11107.85
INVESTMENT	5935	14.23	21.87	0.69	2.95	-0.04	3.4
LEV	32353	0.25	1	0.00	0.24	0.79	2.88
MV	30611	7498.35	608960	0	24506.97	8.07	105.98
MB	24773	6.63	30269.27	0	199.79	141.53	21277.44
PRISK	21996	136.16	4653.6	0	195.6	8.3	137.07
ROA	31735	-0.08	2.33	-9.77	0.53	-8.03	98.06
ROE	29153	-0.06	9	-9.99	0.82	-3.71	45.20
VAR	27823	0.15	3.8	0	0.18	7.78	103.68
SIZE	33788	13.63	21.89	0	2.86	-0.29	3.7

Notes: The sample comprises 54480 firm-year observations between 2002 and 2016 for firms which were listed in the firm-level political risk index published by Economic Policy Uncertainty and sufficient Worldscope financial data, I/B/E/S forecast, and pricing data exist. COE is the average cost of capital estimate implied by the mean analyst consensus forecasts and stock prices using equations (3) and (4). SIZE is natural logarithm of total assets of the firm. LEV is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year. RVAR is the return variability computed as annual standard deviation of monthly stock returns. FBIAS equals the I/B/E/S analyst forecast error (mean forecast for the next fiscal year minus actual earnings) scaled by total assets. PRISK is overall degree of risk the firm faces. MB is the natural logarithm of market-to-book ratio. MV is the market value of the firm. ROE is the return on equity rate. ROA is the return on asset rate and INTEB is the interest/EBIT ratio of the firm. DIV is natural logarithm of annual dividend payouts. FCF is natural logarithm of free cash flows from operations. INVESTMENT is the natural logarithm of firm spending on investment.CAN is Canadian uncertainty index published by Economic Policy Uncertainty.

Table 16 displays the correlation matrix of the variables. Correlation of the variables of Implied Cost of Equity estimations exhibit minimum value of -0.31 between RVAR and SIZE, and maximum value of 0.42 between SIZE and MV. Correlation of the variables of Dividend Payouts estimations exhibits minimum value of -0.30 between ROA and SIZE. We also checked for the stationarity of the variables using Fisher type Augmented Dickey Fuller (ADF) (Dickey & Fuller, 1979) unit root tests. All variables came out to be stationary, implying there is no problem of unit root in the series.[25]

[25]For the sake of brevity, we did not post the unit root test results. They are available upon request.

Table 16. Correlation of the variables.

Correlation of the variables of Implied Cost of Equity estimations									
	COE	SIZE	LEV	RVAR	FBIAS	PRISK	MV	ROE	INTEB
COE	1.000								
SIZE	-0.016	1.000							
LEVERAGE	0.039	0.219	1.000						
RVAR	0.180	-0.314	-0.036	1.000					
FBIAS	0.008	-0.005	-0.011	0.013	1.000				
PRISK	0.013	0.021	-0.024	0.047	0.011	1.000			
MV	-0.003	0.419	-0.001	-0.113	-0.010	-0.002	1.000		
ROE	-0.089	0.206	-0.018	-0.214	-0.011	-0.032	0.082	1.000	
INTEB	-0.014	-0.019	-0.016	-0.008	-0.003	-0.007	-0.002	0.013	1.000

Correlation of the variables of Dividend Payouts estimations									
Correlation	DIVIDEND	SIZE	LEV	INVEDT.	MB	PRISK	ROA	FCF	CAN
DIVIDEND	1.000								
SIZE	0.820	1.000							
LEVERAGE	0.166	0.040	1.000						
INVESTMENT	0.727	0.923	0.034	1.000					
MB	0.032	-0.153	0.108	-0.204	1.000				
PRISK	0.198	0.210	0.080	0.232	-0.013	1.000			
ROA	-0.010	-0.303	0.042	-0.326	0.264	-0.041	1.000		
FCF	0.231	0.409	-0.164	0.438	-0.032	0.124	-0.097	1.000	
CAN	-0.012	-0.018	-0.022	-0.032	-0.065	0.077	-0.062	-0.077	1.000

Notes: The sample comprises 54480 firm-year observations between 2002 and 2016 for firms which were listed in the firm-level political risk index published by Economic Policy Uncertainty and sufficient Worldscope financial data, I/B/E/S forecast, and pricing data exist. COE is the average cost of capital estimate implied by the mean analyst consensus forecasts and stock prices using equations (3) and (4). SIZE is natural logarithm of total assets of the firm. LEV is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year. RVAR is the return variability computed as annual standard deviation of monthly stock returns. FBIAS equals the I/B/E/S analyst forecast error (mean forecast for the next fiscal year minus actual earnings) scaled by total assets. PRISK is overall degree of risk the firm faces. MB is the natural logarithm of market-to-book ratio. MV is the market value of the firm. ROE is the return on equity rate. ROA is the return on asset rate and INTEB is the interest/EBIT ratio of the firm. DIV is natural logarithm of annual dividend payouts. FCF is natural logarithm of free cash flows from operations. INVESTMENT is the natural logarithm of firm spending on investment. CAN is Canadian uncertainty index published by Economic Policy Uncertainty.

4.4 Methodology and Estimations

This section sheds light on the estimation methods and techniques. We use ordinary least squares (OLS) in multivariate panel regressions to identify the effects of various firm-level and dummy variable on the cost of equity and dividend payouts for our sample of firms. To analyse impact of firm-level political risk on

cost of equity and dividend payouts, following the relevant literature, we include the cost of equity and dividend payouts as the dependent variable and perform regression analyses. Prior literature reinforces the need to control for the effects of endogeneity, which is due to mainly the reverse causality of dependent variables (cost of equity and dividend payout) with political risk (Clinch & Verrecchia, 2015; Kim & Park, 2009). Thus, in order to address possible endogeneity problem associated with reverse causality, omitted variable bias and measurement error we execute Two Stage Least Square Regressions (2SLS). In the 2SLS estimation we instrument firm-level political risk by various variables (IVs) as appropriate to both cost of equity and dividend payout estimations. We will discuss and examine these instrumental variables in detail in the relevant sections.

4.3.1 Cost of Equity Analysis

We begin our analysis with ex ante estimates of firm cost of equity capital, which was explained in detail in chapter 2, implied by market prices and analyst forecasts. This approach explicitly accounts for changes in the market's growth expectations around firms' exposure to firm level political risk. It also allows us to evaluate the magnitude of both growth and cost of equity effects on firm valuations. Next, we run firm-level panel regressions. In order to construct the model of the cost of equity and firm-level political risk nexus, we start our analyses by estimating the cost of equity. This implied cost of equity measure is more suitable in this research setting compared to the alternatives as it estimates expected returns directly from stock prices and cash flow forecasts without relying on biased realised returns or on asset pricing models (Hou, van Dijk, & Zhang, 2012).

4.3.1.1 Implied Cost of Equity Capital Estimation

The implied cost of equity is the discount rate that sets the current stock price equal to the present value of expected future dividends per share. The relation between the current stock price (P_0), the cost of equity (*r*), and future expected dividends per share ($d_1, d_2, d_3, ...$) is represented by the dividend discount model (DDM):

$$P_0 = \frac{d_1}{(1+r)} + \frac{d_2}{(1+r)^2} + \frac{d_3}{(1+r)^3} + \cdots \qquad (1)$$

4.3.1.1.1. Gordon Dividend Growth Model

The Gordon Dividend Growth Model, the simplest form of the DDM, assumes a constant perpetual rate of growth (g) in expected dividends per share, and the cost of equity can be written as follows:

$$P_0 = \frac{d_1}{(1+r)} + g \qquad (2)$$

4.3.1.1.2. Abnormal Earnings Growth Models

Abnormal Earnings Growth Models assume that the change in abnormal earnings from year to year grows at a constant rate into perpetuity. Gode & Mohanram (2003) implement the theoretical model of Ohlson & Juettner-Nauroth (2005) by assuming that the short-term growth rate (g_s) is equal to the average of

the forecasted growth rate between year one and year two and the average five-year growth rate ($\overline{g_l}$) is equal to expected inflation for all firms. The cost of equity can be obtained from the following relation between price, and the next year's earnings per share estimate ($\overline{eps_1}$) and expected dividends per share ($\overline{d_1}$):

$$P_0 = \frac{d_1}{r - g_l} + \frac{eps_1 \times (g_s - g_l)}{r \times (r - g_l)} \qquad (3)$$

Another Abnormal Earnings Growth model is Easton's (2004) Modified-PEG ratio model. It is also a modified version of the Ohlson & Juettner-Nauroth (2005) model, where the growth rate in the change in dividends is set equal to zero ($\overline{g_l}$ = 0) so that dividends grow by the same amount every year into perpetuity. The current stock price is related to the cost of equity, the next two year forecasted earnings, as well as the next year's dividend.

$$P_0 = \frac{eps_2 - eps_1 + d_1 \times r}{r^2} \qquad (4)$$

Our analysis focuses on these two Abnormal Earnings Growth Models. Following Hail & Leuz (2006), we average over the two proxies, cost of equity (COE) obtained from equations 3 and 4 and use the resulting mean estimate as our primary dependent variable COE.

4.3.1.2 Empirical Analysis

We start our analysis by estimating the implied cost of equity for each individual firm over each year of our sample (2002-2016), using firm-level data. We use multivariate panel regression analysis to identify the effects of various firm-level and dummy variable on the cost of equity for our sample of firms. To examine the main determinants for the change of the cost of equity and to analyse impact of firm-level political risk on cost of equity, we include the cost of equity as the dependent variable and perform regression analyses.

Following the Hail & Leuz (2006) strategy and extending it further by including some control and dummy variable, we estimate the coefficients of the following model:

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FBIAS_{it} + \beta_3 LEV_{it} + \beta_4 RVAR_{it} + \beta_5 SHARIAH_{it} + \beta_6 PRISK_{it} + \varepsilon_{it} \quad (5a)$$

[26]

Where $\overline{COE_{it}}$ is the average estimates from the implied cost of equity capital models, proposed by Gode & Mohanram (2003) and Easton (2004), $\overline{SIZE_{it}}$ is natural logarithm of total assetsof the firm, $\overline{FBIAS_{it}}$ is a control variable for forecast bias and measured using the one-year-ahead forecast error (forecasts minus actual values) scaled by total assets, $\overline{LEV_{it}}$ is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, $\overline{RVAR_{it}}$ is return variability measured as the standard deviation of monthly stock returns over the last 12 months, $\overline{SHARIAH_{it}}$ is dummy variable equal to 1 if an observation is SCR

[26] We also did not include a variable to control the religion and the level of religiosity within the U.S. in the model for two reasons. First, Shari'ah compliant equities can be bought from any part of the world despite they are traded in the US market. Secondly, our study is not on state based and hard to reconcile it.

adopted, and 0 non-adopted, $PRISK_{it}$ is overall degree of risk or uncertainty the firm faces, and ε_{it} is the error term.

In order to augment the effect of being SC to mitigate the firm level political risk, we interact $PRISK_{it}$ with $SHARIAH_{it}$ dummy:

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FBIAS_{it} + \beta_3 LEV_{it} + \beta_4 RVAR_{it} + \beta_5 SHARIAH_{it} + \beta_6 PRISK_{it} + \beta_7 SHARIAH_{it} \times PRISK_{it} + \varepsilon_{it} \quad (5b)$$

[27]

Hence our main variable Political Risk is derived by transcripts of conference calls held in conjunction with an earnings release, these transcripts may be regarded as voluntary disclosure. Prior literature on voluntary disclosure (Clinch & Verrecchia, 2015) reinforces the need to control for the effects of endogeneity in empirical disclosure research. Kim & Park (2009) also documents that, stock returns, which are directly related to implied cost of equity, around the disclosure can affect the firm's disclosure decisions on internal control weaknesses, and thereby leading to a decrease or an increase in market uncertainty. Thus, in order to address possible simultaneity problem between firm-level political risk and cost of equity and the reverse causality and obtain robust results we execute 2SLS regression in following two steps.

In the first stage of 2SLS analysis without interaction term, political risk variable (i.e., the endogenous variable) is regressed on IVs, which we will clarify later, and exogenous determinants of cost of equity as following (for Eq. 5a):

[27] We also did not include a variable to control the religion and the level of religiosity within the U.S. in the model for two reasons. First, Shari'ah compliant equities can be bought from any part of the world despite they are traded in the US market. Secondly, our study is not on state based and hard to reconcile it.

$$PRISK_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FBIAS_{it} + \beta_3 LEV_{it} + \beta_4 RVAR_{it} + \beta_5 SHARIAH_{it} + \beta_6 IV_{it} + \varepsilon_{it} \quad (6a)$$

In the first-stage of 2SLS analysis with interaction term, both $\widehat{PRISK_{it}}$ and $\widehat{SHARIAH_{it} \times PRISK_{it}}$ are regressed on IVs and exogenous determinants of cost of equity as following (for Eq. 5b):

$$SHARIAH_{it} \times PRISK_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FBIAS_{it} + \beta_3 LEV_{it} + \beta_4 RVAR_{it} + \beta_5 SHARIAH_{it} + \beta_6 IV_{it} + \beta_7 SHARIAH_{it} \times IV_{it} + \varepsilon_{it} \quad (6b)$$

To estimate the 2nd stage equations, without interaction terms (Eq. 5a) fitted values of the $\widehat{PRISK_{it}}$ is used (Eq. 7a). To estimate the 2nd stage equations, with interaction terms (Eq. 5b) fitted values of the $\widehat{PRISK_{it}}$ and $\widehat{SHARIAH_{it} \times PRISK_{it}}$ variables are employed (Eq. 7b):

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FBIAS_{it} + \beta_3 LEV_{it} + \beta_4 RVAR_{it} + \beta_5 SHARIAH_{it} + \beta_6 \widehat{PRISK}_{it} + \varepsilon_{it} \quad (7a)$$

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FBIAS_{it} + \beta_3 LEV_{it} + \beta_4 RVAR_{it} + \beta_5 SHARIAH_{it} + \beta_6 \widehat{PRISK}_{it} + \beta_7 \widehat{SHARIAH_{it} \times PRISK_{it}} + \varepsilon_{it} \quad (7b)$$

There is a need for a thorough search and validation process in finding the perfect candidate for IV when applying 2SLS techniques. We need at least one IV satisfying the necessary conditions to be a perfect candidate as an instrument for $\widehat{PRISK_{it}}$. We apply similar two conditions stated in Allen, Balli and Thompson need (2019) to find the perfect IV. These conditions are that the chosen instrument

must be an exogenous variable (corr(IV, ε) = 0) and it must be strongly correlated with the endogenous variable (corr(IV, PRISK) $\neq$ 0). We use the first stage regressions above to validate whether the chosen IV has a strong correlation with the endogenous variable - $\widehat{PRISK_{it}}$- or not. For the main equation (Eq. (5a)), we can easily test this by determining if the coefficient of IV is highly statistically significant when $\widehat{PRISK_{it}}$ is regressed on Eq. (6a). However, for Eq. (6b) (the main equation with interaction terms) to check the same issue, we need an F test of joint significance test of IV, IV*$\widehat{SHARIAH_{it}}$, on each of the reduced form equations (Eq. (6b)). We apply F test to see under identification (rejection implies, the excluded instruments jointly are identifying the model) and SARGAN STATISTIC-TEST to see over identification whenever we use multiple instruments (Rejection implies that some of the IVs are not valid). We also applied Ramsey Reset test in order to test linear specification. It showed that the estimated model is correctly specified as to functional form given the variables included in the regression.

4.3.1.3 Estimation Results and Discussion

Table 17 displays the results in different model specifications estimated using the GLS (Generalized Least Squares) technique. The robust standard errors were also applied to avoid the problem of heteroscedasticity and serial correlation in the model.

Table 17. Multivariate regressions of cost of equity capital on political risk, SCR adoption and other determinants (with random effects).

	Panel			2SLS	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
SIZE	-.002**	0.003***	0.003***	-0.002	-0.002
	(-2.49)	(-2.82)	(-2.82)	(-0.68)	(-0.94)
FBIAS	-.000	0.000	0.000	-0.002	0.001
	(-0.32)	(-0.13)	(-0.13)	(-0.56)	(-0.39)
LEV	.008	0.055**	0.055**	0.059**	0.068**
	(1.20)	(2.14)	(2.14)	(2.28)	(2.32)
RVAR	.074***	0.098***	0.098***	0.091	0.082
	(4.18)	(4.34)	(4.33)	(1.36)	(1.21)
SHARIAH	-.013***	-0.013***	-0.013***	0.033*	0.116
	(-4.07)	(-3.94)	(-3.53)	(1.65)	(1.09)
PRISK	-	-0.000*	-0.000	0.001**	0.001**
		(-1.71)	(-1.47)	(1.98)	(2.08)
SHARIAH* PRISK	-	-	-0.000	-	-0.001
			(-0.10)		(-0.8)
Obs.	15,376	12,527	12,527	9356	9356
R^2	1.08%	2.5%	4.08%		
Kleibergen-Paap LM 3; Ho = Under identification; P-value				0.000	0.000
Weak Instrument-Robust Inference Test; P-value				0.636	0.000
Endogeneity Test; Ho = Endogenous regressors are exogeneous; P-value				0.000	0.653

Notes: Coefficients estimations are calculated by Panel GLS. The equation is as below:

$$COE_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FBIAS_{it} + \beta_3 LEV_{it} + \beta_4 RVAR_{it} + \beta_5 SHARIAH_{it} + \beta_6 PRISK_{it} + \beta_7 SHARIAH_{it} \times PRisk_{it} + \varepsilon_{it}$$

Where COE_{it} is the average estimates from the implied cost of equity capital models, proposed by Gode & Mohanram (2003) and Easton (2004), $SIZE_{it}$ is natural logarithm of total assets of the firm, $FBIAS_{it}$ is a control variable for forecast bias and measured using the one-year-ahead forecast error (forecasts minus actual values) scaled by total assets, LEV_{it} is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, $RVAR_{it}$ is return variability measured as the standard deviation of monthly stock returns over the last 12 months, $SHARIAH_{it}$ is dummy variable equal to 1 if an observation is SCR adopted, and 0 non-adopted, $PRISK_{it}$ is overall degree of risk or uncertainty the firm faces, and ε_{it} is the error term. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

Table 17a. Multivariate regressions of cost of equity capital on political risk, SCR adoption and other determinants (Pooled OLS)

	Panel			2SLS	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
SIZE	0.002***	0.001	0.001	-0.002	-0.002
	(3.98)	(1.01)	(0.96)	(-0.86)	(-1.15)
FBIAS	-0.002	-0.001	-0.001	-0.002	-0.001
	(-1.04)	(-0.52)	(-0.51)	(-0.59)	(-0.39)
LEV	0.020***	0.027***	0.028***	0.059**	0.067***
	(4.35)	(5.61)	(5.64)	(2.56)	(2.65)
RVAR	0.143***	0.206***	0.205***	0.091	0.082
	(6.2)	(8.21)	(8.2)	(1.4)	(1.25)
SHARIAH	-0.008***	-0.009***	-0.007***	0.033*	0.116
	(-4.7)	(-4.93)	(-3.28)	(1.85)	(1.1)
PRISK	-	0.000***	0.000	0.001**	0.001**
		(1.01)	(0.46)	(2.22)	(2.35)
SHARIAH* PRISK	-	-	0.000 (-1.56)	-	-0.001 (-0.79)
Obs.	15,376	12,527	12,527	9356	9356
R^2	2%	3.5%	3%	-	-
Kleibergen-Paap rk LM 3; Ho = Under identification; P-value				0.000	0.000
Weak Instrument-Robust Inference Test; P-value				0.636	0.000
Endogeneity Test; Ho = Endogenous regressors are exogeneous; P-value				0.000	0.653

Notes: Coefficients estimations are calculated by Panel Pooled OLS. The equation is as below:

$$\overline{COE_{it}} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 FBIAS_{it} + \beta_3 LEV_{it} + \beta_4 RVAR_{it} + \beta_5 SHARIAH_{it} + \beta_6 PRISK_{it} + \beta_7 SHARIAH_{it} \times PRisk_{it} + \varepsilon_{it}$$

Where $\overline{COE_{it}}$ is the average estimates from the implied cost of equity capital models, proposed by Gode & Mohanram (2003) and Easton (2004), $\overline{SIZE_{it}}$ is natural logarithm of total assets of the firm, $\overline{FBIAS_{it}}$ is a control variable for forecast bias and measured using the one-year-ahead forecast error (forecasts minus actual values) scaled by total assets, $\overline{LEV_{it}}$ is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, $\overline{RVAR_{it}}$ is return variability measured as the standard deviation of monthly stock returns over the last 12 months, $\overline{SHARIAH_{it}}$ is dummy variable equal to 1 if an observation is SCR adopted, and 0 non-adopted, $\overline{PRISK_{it}}$ is overall degree of risk or uncertainty the firm faces, and ε_{it} is the error term. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

The first model specification represents the baseline model, where we find the relationship of the stated variables excluding the political risk indicator. All the coefficients reveal theoretically expected signs, with mostly significant coefficients. The size variable exhibits negative and significant coefficient of 0.002, which validates its negative impact on the cost of equity as stated in Fama & French (1992

and 1993). If size increases by 1%, the cost of equity increases by 0.2%. In similar vein, the return volatility variable ($RVAR_{it}$) with the highly significant coefficient of 0.074, is positively related to a rising cost of capital consistent with Hail & Leuz (2009). Lastly, the $SHARIAH_{it}$ variable captures the effect of a dichotomous break. It reveals negative and significant coefficient, which indicates that after becoming Shari'ah compliant, a firm's cost of equity capital decreases on average by 1.3%.

The second specification model captures the effect of firm-level overall degree of political risk on cost of equity. We augmented the model by including the $PRISK_{it}$. In addition to most of the coefficients and signs of variables remain similar, inconsistent with the literature $PRISK_{it}$ reveal negative sign with the significant coefficient of 0.000. This might be due to endogeneity issues discussed above. We augmented the model by including interaction variable of Shari'ah compliance and political risk ($SHARIAH_{it} \times PRISK_{it}$) to account for the Shari'ah compliance pattern on political risk in the third model. The third specification model also reveals that after becoming SC the impact of the political risk is not significantly affecting the COE. The political risk and Shari'ah interaction variable ($SHARIAH_{it} \times PRISK_{it}$) shows negative and insignificant coefficient (-0.000), pointing to neutral (not significant) effects of political risk on COE after the Shari'ah compliance announcement.

However, before making the general conclusion on the negative relationship between political risk and cost of equity and in order to address endogeneity, we also included the instrumental variables such as MV (market value of the firm), ROE (return on equity ratio), ROA (return on asset ratio) and INTEB (interest to EBIT ratio) to enable running 2SLS regression in Model 4 and Model 5. Despite the

initial validation of the negative relationship between political risk and cost of equity both 2SLS models reveal significant similar coefficients with negative signs of$\overline{PRISK_{it}}$ variable implying that actually firm level political risk positively impacts cost of equity. In fact, consistent with literature, investors in stock markets require a premium to compensate them for bearing additional political risk (Belkhir, Boubakri & Grira, 2017; Pastor & Veronesi, 2013). Table 17a presents pooled OLS results, which are similar with random effect results.

4.3.2 Dividend Payouts Analysis

The prominent dividend policy model of Fama & French (2001), which documented the characteristics of dividend payers and significant factors in determining dividend payments, found a relationship between firm's life cycle with the policy of dividend and retained earnings, profitability, and revenue growth, capital structure and growth opportunity. To analyse the dividend payouts, this model of Fama & French (2001) is adopted and additional key explanatory variables were identified in light of a review of the literature. These variables are size, profitability, investment (Fama & French, 2001), financial leverage, free cash flows, market-to-book ratio, firm-level degree of risk or uncertainty the firm faces and Shari'ah dummy variable. We use a panel regression analysis to identify the effects of various firm-level and dummy variable on the dividend payouts for our sample of firms. Including all these variables yields the following regression equation. To examine the main determinants for the change of the dividend payouts and to analyse impact of firm-level political risk, we include the dividend payouts as the dependent variable and perform regression analyses.

$$Div_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 MB_{it} + \beta_5 FCF_{it} + \beta_6 PRISK_{it} + \beta_7 INVESTMENT_{it} + \beta_8 SHARIAH_{it} + \varepsilon_{it} \quad (8a)$$

Where $\overline{DIV_{it}}$ is natural logarithm of the dividend payouts, $\overline{SIZE_{\text{it}}}$ is natural logarithm of total assetsof the firm, $\overline{ROA_{it}}$ is a control variable for Return on Asset, $\overline{LEV_{it}}$is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, $\overline{INVESTMENT_{it}MB_{\text{it}}}$ is natural logarithm of market-to-book ratio, $\overline{FCF_{it}}$ is natural logarithm of free cash flows, $\overline{PRisk_{it}}$ is firm-level degree of risk or uncertainty the firm faces and $\overline{\varepsilon_{it}}$ is the error term. We again interact $\overline{PRISK_{it}}$ with $\overline{SHARIAH_{it}}$ dummy, in order to augment the effect of being SC to mitigate the firm level political risk:

$$Div_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 MB_{it} + \beta_5 FCF_{it} + \beta_6 PRISK_{it} + \beta_7 INVESTMENT_{it} + \beta_8 SHARIAH_{it} + \beta_9 SHARIAH_{it} \times PRISK_{it} + \varepsilon_{it} \quad (8b)$$

One crucial challenge in empirical research is the presence of endogeneity. Roberts & Whited (2013), define three types of sources of endogeneity in corporate finance –omitted variables, simultaneity, and measurement error. Due to the similar reasons explained in the implied cost of equity estimations, there might be two types of endogeneity that may affect our results. First, reverse causality implies that the direction of causality may run from dividend policy to political risk, then vice versa. Second, as stated in Gulen & Ion (2016) PRISK may inadvertently capture firm-level political risk, but that may nevertheless affect corporate dividend policy.

If this is the case, there might be endogeneity caused by unobservable factors that influence both political risk and dividend policy at the same time.

Thus, in order to address the endogeneity concern and obtain robust results we execute 2SLS regression in following two steps. In the first-stage of 2SLS analysis without interaction term, political risk variable (i.e., the endogenous variable) is regressed on IV(s), which we will clarify later, and exogenous determinants of dividend as following (for Eq. 8a):

$$PRISK_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 MB_{it} + \beta_5 FCF_{it} + \beta_6 INVESTMENT_{it} + \beta_7 SHARIAH_{it} + \beta_8 IV_{it} + \varepsilon_{it} \quad (9a)$$

In the first-stage of 2SLS analysis with interaction term, both $\widehat{PRISK_{it}}$ and $\widehat{SHARIAH_{it} \times PRISK_{it}}$ are regressed on IV(s) and exogenous determinants of dividend as following (for Eq. 8b):

$$SHARIAH_{it} \times PRISK_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 MB_{it} + \beta_5 FCF_{it} + \beta_6 INVESTMENT_{it} + \beta_7 SHARIAH_{it} + \beta_8 SHARIAH_{it} \times IV_{it} + \beta_9 IV_{it} + \varepsilon_{it} \quad (9b)$$

To estimate the 2nd stage equations, without interaction terms (Eq. 8a) fitted values of the $\widehat{PRISK_{it}}$ is used (Eq. 10a). To estimate the 2nd stage equations, with interaction terms (Eq. 8b) fitted values of the $\widehat{PRISK_{it}}$ and $\widehat{SHARIAH_{it} \times PRISK_{it}}$ variables are employed (Eq. 10b):

$$Div_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 MB_{it} + \beta_5 FCF_{it} + \beta_6 INVESTMENT_{it} + \beta_7 \widehat{PRISK}_{it} + \beta_8 SHARIAH_{it} + \varepsilon_{it} \quad (10a)$$

$$Div_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 MB_{it} + \beta_5 FCF_{it} + \beta_6 INVESTMENT_{it} + \beta_7 \widehat{PRISK}_{it} + \beta_8 SHARIAH_{it} + \beta_9 \widehat{SHARIAH_{it}} \times PRISK_{it} + \varepsilon_{it} \quad (10b)$$

.

We applied the same methodology as in cost of equity estimations to identify the perfect candidate for IV when applying 2SLS techniques.

4.3.2.1 Estimation Results and Discussion

Tables 18 and 18a displays the results in different model specifications estimated using the GLS (Generalized Least Squares) technique. The robust standard errors were also applied to avoid the problem of heteroscedasticity and serial correlation in the model.

Table 18. Multivariate regressions of dividend payouts on political risk, SCR adoption and other determinants (with random effects).

	Panel			2SLS	
	(1)	(2)	(3)	(4)	(5)
SIZE	0.96***	1.00***	1.00***	1.00***	0.98***
	(21.28)	(21.14)	(21.30)	(20.28)	(22.09)
ROA	4.90***	7.04***	7.08***	7.42***	7.70***
	(3.38)	(5.1)	(5.13)	(5.20)	(5.38)
LEVERAGE	1.21***	1.29***	1.28***	1.17***	1.19***
	(4.62)	(4.44)	(4.41)	(3.47)	(3.75)
INVESTMENT	-0.11***	-0.15***	-0.15***	-0.17***	-0.15***
	(-3.56)	(-4.35)	(-4.36)	(-3.67)	(-3.92)
MB	0.04***	0.05***	0.05***	0.05***	0.05***
	(3.23)	(3.5)	(3.52)	(3.54)	(3.67)
FCF	-0.05**	-0.06**	-0.07**	-0.09**	-0.08**
	(-1.89)	(-1.96)	(-2.01)	(-2.07)	(-2.07)
SHARIAH	-0.58***	-0.73***	0.47***	-1.03**	2.98***
	(-4.84)	(-6.27)	(4.52)	(-2.50)	(7.04)
PRISK	-	0.00	0.00	0.00	0.00
		(-0.40)	(0.92)	(0.74)	(0.42)
SHARIAH * PRISK	-	-	-0.00*** (-27.44)	-	-0.01*** (-5.22)
Obs.	2652	1978	1978	1978	1978
R^2	76%	75%	76%	-	-
Kleibergen-Paap LM 3; Ho = Under identification; P-value				0.000	0.000
Weak Instrument-Robust Inference Test; P-value				0.000	0.000
Endogeneity Test; Ho = Endogenous regressors are exogeneous; P-value				0.000	0.000

Notes: Coefficients estimations are calculated by Panel GLS. The equation is as below:

$$Div_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 MB_{it} + \beta_5 FCF_{it} + \beta_6 PRISK_{it} + \beta_7 INVESTMENT_{it} + \beta_8 SHARIAH_{it} + \beta_9 SHARIAH_{it} \times PRISK_{it} + \varepsilon_{it}$$

Where DIV_{it} is natural logarithm of the dividend payouts, $SIZE_{it}$ is natural logarithm of total assets of the firm, ROA_{it} is a control variable for Return on Asset, LEV_{it} is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, MB_{it} is the natural logarithm of market-to-book ratio, FCF_{it} is natural logarithm of free cash flows from operations, $INVESTMENT_{it}$ is the natural logarithm of firm spending on investment, $PRISK_{it}$ is firm-level degree of risk or uncertainty the firm faces, $SHARIAH_{it}$ is dummy variable equal to 1 if an observation is SCR adopted, and 0 non-adopted, and ε_{it} is the error term. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

Table 18a. Multivariate regressions of dividend payouts on political risk, SCR adoption and other determinants (Pooled OLS)

	Panel			2SLS	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
SIZE	0.92*** (31.60)	0.92*** (29.94)	0.92*** (29.95)	0.93*** (29.71)	0.93*** (29.99)
ROA	11.85*** (12.24)	12.37*** (12.24)	12.40*** (12.24)	12.24*** (11.93)	12.37*** (12.08)
LEV	0.85*** (6.58)	0.89*** (5.41)	0.89 (5.37)***	0.76*** (3.99)	0.80*** (4.35)
INVESTMENT	-0.03 (-1.01)	-0.03 (-1.35)	-0.04 (-1.38)	-0.07** (-2.05)	-0.05* (-1.70)
MB	0.07*** (4.49)	0.07*** (4.16)	0.07*** (4.16)	0.07*** (3.98)	0.07*** (4.07)
FCF	-0.15*** (-7.40)	-0.19*** (-8.84)	-0.19*** (-8.88)	-0.20*** (-8.47)	-0.20*** (-8.62)
SHARI'AHH	-0.97** (-2.09)	-1.09** (-2.28)	0.28 (0.42)	-1.38** (-2.39)	3.08** (2.35)
PRISK	-	0.00* (1.95)	0.00** (2.32)	0.00* (1.72)	0.00 (1.26)
SHARIAH * PRISK	-	-	-0.00** (-3.42)	-	-0.01*** (-2.69)
Obs.	2652	1978	1978	1978	1978
R^2	78%	77%	77%	-	-
Kleibergen-Paap LM 3; Ho = Under identification; P-value				0.000	0.000
Weak Instrument-Robust Inference Test; P-value				0.000	0.000
Endogeneity Test; Ho = Endogenous regressors are exogeneous; P-value				0.000	0.000

Notes: Coefficients estimations are calculated by Panel GLS. The equation is as below:

$$Div_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 MB_{it} + \beta_5 FCF_{it} + \beta_6 PRISK_{it} + \beta_7 INVESTMENT_{it} + \beta_8 SHARIAH_{it} + \beta_9 SHARIAH_{it} \times PRISK_{it} + \varepsilon_{it}$$

Where DIV_{it} is natural logarithm of the dividend payouts, $SIZE_{it}$ is natural logarithm of total assets of the firm, ROA_{it} is a control variable for Return on Asset, LEV_{it} is financial leverage of the firm and measured as total liabilities divided by total assets at the end of the year, MB_{it} is the natural logarithm of market-to-book ratio, FCF_{it} is natural logarithm of free cash flows from operations, $INVESTMENT_{it}$ is the natural logarithm of firm spending on investment, $PRISK_{it}$ is firm-level degree of risk or uncertainty the firm faces, $SHARIAH_{it}$ is dummy variable equal to 1 if an observation is SCR adopted, and 0 non-adopted, and ε_{it} is the error term. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively and t statistics are reported in parenthesis.

The first model specification represents the baseline model, where we find the relationship of the stated variables excluding the $PRISK_{it}$. The $SIZE_{it}$ variable exhibits positive and significant coefficient of 0.95, which validates its positive impact on the dividend payouts consistent with Fama & French (2001). If the size increases by 1 unit the dividend payouts increase by 0.96 points. In the same vein, the return on asset (ROA_{it}) with the significant coefficient of 4.90, is positively

related to rising dividend payouts, which is similar to the results of Huang et al. (2015).

The second specific model includes $\overline{PRISK_{it}}$ variable, in order to see the impact of firm level political risk on dividend payments. In addition to most of the coefficients and signs of variables remain similar, as expected $\overline{PRISK_{it}}$ reveal 0.00 coefficient.

The third specification model captures the effect of being Shari'ah compliant on firms facing firm-level political risk or uncertainty. We augmented the model by including interaction variable of the Shari'ah compliance and political risk ($\overline{SHARIAH_{it} \times PRISK_{it}}$). Interaction variable also reveals similar coefficient of 0.00. Consistent with literature $\overline{SHARIAH_{it}}$ dummy variable alone reveals positive significant coefficient. This finding is similar with Farooq & Tbeur (2013) which documents that SC firms pay higher dividends than non-SC firms.

However, this relation between PRISK and dividend payouts could suffer from endogeneity. Thus, before making the general conclusion on the negative relationship between political risk and dividend payouts, we augmented the model with two-stage regression by including some instrumental variables in order to remedy a simultaneity bias in the third model. A valid instrument should not be related to dividend payouts through channels other than political risk, which implies that most company-specific characteristics do not qualify. The fourth specification model with fitted firm-level political risk, reveals result similar to the initial validation of the neutral relationship between political risk and dividend payouts. However, in our fifth model interaction of $\overline{SHARIAH_{it}}$variable with $\overline{PRISK_{it}}$ ($\overline{SHARIAH_{it} \times PRISK_{it}}$) has highly significant negative coefficient of 0.01, which

reveals $\overline{PRISK_{it}}$has negative effect on dividend payouts after being Shari'ah compliant. It also provides further empirical support to the results of prior studies that conservative payout policies to be associated with higher exposure of firms to political risk. This is different from what we obtained in above case: when firms are not Shari'ah compliant, political risk has no impact on dividend policy of firms. However, when we have Shari'ah compliant firms in our sample, dividend payouts fall as political risk increases. When firms are Shari'ah compliant, their capabilities to smooth/increase payouts and therefore, retain positive attitude of investors, are limited (Balli, de Bruin, Ozer Balli & Karimov, 2020). This might be due to financial characteristics that Shari'ah requirements dictate – low leverage, low accounts receivable, as well as low cash and interest-bearing securities. On the other hand, debt financing restrictions of SC may make firms have greater financial slack, and more able to pay and maintain dividends as stated in Aivazian, et al. (2003). This finding is also supported by the Agency theory of dividend policy. Highly levered firms have more debt and interest obligations to meet thus have high probability of paying low dividends according to Jensen (1986). We also provide results in Table 18a when we do not control for the fixed/random effects. The results are quite similar with our estimations in Table 18.

4.6 Concluding Remarks

In this paper, we extend the literature on political risk by using a novel dataset to evaluate the impact of firm level political risk on implied cost of equity and dividend payout policy of firms. Our estimations also include Shari'ah dummy variable to account for Shari'ah compliance-specific patterns being reflected in the

mitigating the frim level political risk. Our study was motivated by the proposition that adoption of Shari'ah compliance points to general advantages. A lower-risk environment with lower leverage and other screening measures are among these advantages. Since firm-level political risk is an avoidable risk, this study provides useful insights and some empirical evidence on the political risk in the light of Shari'ah equity developments.

Our benchmark results show that 1% increase in the exposure of political risk contributes to a rise in its cost of equity capital by 0.2% and in dividend payout by 13%. Consistent with the literature, this is due to investors in stock markets requiring a premium to compensate them for bearing additional political risk (Belkhir, Boubakri & Grira, 2017; Pastor & Veronesi, 2013) and firms facing firm-level uncertainty try to send positive signal to the markets Huang et al. (2015). When the both models are checked to account for Shari'ah compliance, we find that Shari'ah compliance will eventually lead to a fall in cost of equity and rise in dividend payouts despite exposure of the firm to political risk.

We further augmented our models with two-stage regression by including some instrumental variables in order to remedy endogeneity. Implied cost of equity 2SLS models reveal similar coefficients and signs of all variables. The political risk and Shari'ah interaction variable ($SHARIAH_{it} \times PRISK_{it}$) reveals negative coefficients on both COE and dividend payouts, which reveals that political risk has negative effect on both cost of equity and dividend payouts after the Shari'ah compliance announcement.

Together with providing a novel approach to shed light on recent Islamic equity developments and political risk, our study also opens up a number of avenues

for future research. The study could be extended to investigation of SCR effects across global markets and international country-levels. It would be interesting to compare and contrast global trends in the corporate response to Shari'ah equity market developments in different regions, with varying economic conditions and diverse market structures.

CHAPTER FIVE: CONCLUSION

This chapter concludes the thesis by providing a summary of the key findings and implications for each of the three essays. Essay one analysis the impact of being Shari'ah Compliant on cost of equity capital of the firms. Our results show that impact of Shari'ah compliance depends on a time trend and information spread. The findings reveal that becoming Shari'ah compliant initially increases the cost of equity, potentially due to higher financial constraints and other burdens associated with Shari'ah requirements. However, when the model is checked to account for a time trend, we find that Shari'ah compliance will eventually lead to a fall in the cost of equity capital over time. This implies that it may take some time for the firms and markets to incorporate the relevant considerations associated with the adoption of SCR news and shift their expectations according to new conditions. Specifically, we find the magnitude of the Shari'ah effects to be trivial, despite its significant coefficients across most of the industries. In addition, inflation and return volatility appear to be important factors to change cost of capital, documenting strong positive impact. Our findings imply that firms can expect long-run benefits from becoming Shari'ah compliant in terms of reducing their equity costs through increasing investor base and liquidity. This finding is important from the perspectives of financial and capital structure management.

In essay two, we extend the literature on corporate payout by applying a variance decomposition methodology to evaluate the financial adjustments of Shari'ah compliant firms make in response to changes in earnings. Our benchmark results show that 37.25% of shocks to net income are absorbed via borrowing and

62.27% of shocks are absorbed through investment channels. The results also document that borrowing and investment are primary channels in smoothing a large amount of fluctuations to the net income. The amount of shocks (1.3%) left unsmoothed is associated with a change in payouts. Our results are consistent with the Lambrecht & Myers (2012) budget constraint theory that identifies debt and investment as the main mechanisms to smooth volatility in net income. When the model is checked to account for a time trend, we find that Shari'ah compliance will eventually lead to a fall in the portion of debt and rise in the portion of payout in smoothing income, potentially due to higher financial constraints and other burdens associated with Shari'ah requirements.

Both industry-based and total sample estimations validated identical patterns. Specifically, we find the magnitude of the Shari'ah effects to be trivial, across most of the industries. Consistent with the theory and recent findings, our sectoral analysis results indicate that firms become less flexible in smoothing their dividends via debt due to the restrictions of SCR. After being Shari'ah compliant, for most of the sectors, smoothing patterns of net income by payout changed from negative figure to positive by an average of 3%.

We further analysed a complete assessment of payout smoothing by a joint examination of risk sharing and intertemporal smoothing hypotheses. Payout and long term income growth correlation has become increasingly significant even more when the firms become Shari'ah compliant. This is quite intuitive since the firms would like to become less risky as they have limited ability to borrow loans and financial distress is avoidable. Secondly, they are not able to finance payout through extra debt after becoming Shari'ah compliant. Lastly, consonant with Darling

(1957) and lending support to the permanent income hypothesis, payouts would not be decided on short-term income flows but in line with long term income growth. Last but not least, aggregate income growth among firms is also correlated with payout growth. We found that SC makes firms less capable to leverage and more reluctant to adjust the payouts in a reacting against other firms aggregate income growth.

In essay three, we extend the literature on political risk by using a novel dataset to evaluate the impact of firm level political risk on implied cost of equity and dividend payout policy of firms. Our estimations also include Shari'ah dummy variable to account for Shari'ah compliance-specific patterns being reflected in the mitigating the frim level political risk. Our study was motivated by the proposition that adoption of Shari'ah compliance points to general advantages. A lower-risk environment with lower leverage and other screening measures are among these advantages. Since firm-level political risk is an avoidable risk, this study provides useful insights and some empirical evidence on the political risk in the light of Shari'ah equity developments.

Our benchmark results show that 1% increase in the exposure of political risk contributes to a rise in its cost of equity capital by 0.2% and in dividend payout by 13%. Consistent with the literature, this is due to investors in stock markets requiring a premium to compensate them for bearing additional political risk (Belkhir, Boubakri & Grira, 2017; Pastor & Veronesi, 2013) and firms facing firm-level uncertainty try to send positive signal to the markets Huang et al. (2015). When the both models are checked to account for Shari'ah compliance, we find that Shari'ah compliance will eventually lead to a fall in cost of equity and rise in

dividend payouts despite exposure of the firm to political risk.

We further augmented our models with two-stage regression by including some instrumental variables in order to remedy endogeneity. Implied cost of equity 2SLS models reveal similar coefficients and signs of all variables. The political risk and Shari'ah interaction variable reveal negative coefficients on both COE and dividend payouts, which reveals that political risk has negative effect on both cost of equity and dividend payouts after the Shari'ah compliance announcement.

Together with providing a novel approach to shed light on recent Islamic equity developments, our studies also open up a number of avenues for future research. For example, there are some more factors in the variance in firm-level cost of equity remains to be explained. In order to refine our estimates further, other factors could be considered (for example differences in regulatory environments and personal taxes). By incorporating proxies for other factors in future work, we might shed further light on the cost of equity for Shari'ah compliant equities. In addition to these factors, model also can be tested by alternative equity valuation models in future studies.

In regard with payout policy study, there are a number of avenues for future research. Unexplored relation between managerial compensation and firm payouts still remains open. In addition to managerial compensation, tax (both personal and corporate) implications on dividend payout is another topic for future study.

Last but not least, there are also some avenues for future studies with regard firm level political risk. One such avenue might be to apply our study to test the effect of firm level political risk to other corporate financial indicators such as investment, net working capital and etc.

Together with specific future avenues for each study, all studies could also be extended to investigation of SCR effects across global markets and international country-levels. It would be interesting to compare and contrast global trends in the corporate response to Shari'ah equity market developments in different regions, with varying economic conditions and diverse market structures. Additionally, further tests with longer time trend will give opportunity to see behaviour of Shari'ah compliant firms over the long term.

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