Essays in Ethical Finance

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- Country index-based momentum
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- Co-opted board
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Abstract

This dissertation consists of an introductory chapter and three independent essays on ethical finance. The first essay studies the impact of Shariah screening on the performance of stocks listed on the ASX 200. The analysis is carried out with a focus on screening criteria employed by 12 Shariah screening methods. The empirical results suggest that the performance of stocks is driven by the choice of the screening method used. Furthermore, the empirical results imply that the restriction imposed on the financial leverage of Shariah compliant stocks (SCs) is associated with decreased performance, whereas the restriction towards investing in firms with liquid assets tends to have a positive impact on the performance of SCs. The second essay analyses the impact of country index-based momentum strategies on the performance of Islamic mutual funds during up and down markets. It examines whether this type of momentum strategies comes with occasional crash, have exposure to a) funds investment styles, b) global financial crisis, c) screening intensity, and d) funds characteristics. It also provides unprecedented evidence on the relationship between crash risk of momentum strategies and funds investment styles. Our analysis is based on a dataset of funds operating in 24 countries for the period from January 2000 to December 2016. We identify a country index-based momentum strategy, which significantly improves the performance of funds and is robust during up and down markets. Results also show that higher momentum exposure to crashes is mainly driven by shorter holding period strategies. The GFC and screening intensity have respectively a negative and positive effects on momentum returns. Indeed, investment styles are driven by the formation and holding periods of country index-based momentum strategies. Investments with exposure to small and value stocks are positively associated with momentum crash risk. The final essay examines the impact of board characteristics on Shariah compliant firms' (SCFs) corporate social responsibility (CSR) score. Using multiple measures of board characteristics including measures of co-opted directors across 1379 SC US firms from 2001 to 2016, the chapter finds strong evidence that board independence, female director on board, CEO duality, the size of the board and the age of directors are positively associated with CSR score. We then identify board characteristics which are associated with the individual components of the CSR score. We find that directors' independence, female on board, CEO duality, and board size are positively associated

with the environment, the community, and the diversity components of SC firms' CSR. Tenure and board size are negatively associated with the environment and the product components, respectively. Furthermore, results show that the more co-opted directors on board the less the CSR score of these firms. Our results remain robust using different measures of co-option and different endogeneity tests.

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List of Abbreviations

AAOIFI	Accounting and Auditing Organisation for Islamic Financial Institutions
AMEX	American Stock Exchange
AMV	Average market value
AR	Accounts receivable
ARCCE	Accounts receivable and Cash and cash equivalents
ASX	Australian stock exchange
AUM	Asset under management
CAPM	Capital asset pricing model
CCE	Cash and cash equivalents
CEO	Chief Executive Officer
CMOM	Country momentum
CRSP	Center for Research in Security Prices
CSR	Corporate social responsibility
D	Debt
DIB	Dubai Islamic bank
DID	Difference in difference
DJMI	Dow Jones Islamic Market Index
EMU	European Monetary Union
ESG	Environmental, social, and governance
FE	Fixed effect
FTSE	Financial Times Stock Exchange Global Islamic Index
GFC	Global financial crisis
GMI	Governance metrics international
GMM	Generalized method of moments
HML	High book-to- market ratio Minus Low
HSBC	Hongkong and Shanghai Banking Corporation
IEF	Islamic equity fund
IMF	Islamic mutual fund
KLCI	Kuala Lumpur Composite Index
KLD	Kinder, Lydenberg, Domini
KLSI	Kuala Lumpur Shariah Index
MKT	Market
MSCI	Morgan Stanley Capital International Global Islamic Index
MSCI AC	Morgan Stanley Capital International All Country World Index
MV	Market value
NPI	Non-permissible income
NYSE	New York Stock Exchange
PBUH	Peace be upon Him
R&D	Research and development
RE	Random effect
S/K	Skewness/Kurtosis
S	Strategy
S&P	Standard & Poor’s Shariah Index
SC	Shariah compliant
SCs	Shariah compliant socks
SCFs	Shariah compliant firms
SCM	Securities Commission of Malaysia

SD	Standard deviation
SIRCA	Securities Industry Research Centre of Asia-Pacific
SMB	Small Minus Big
TA	Total assets
TM	Treynor and Mazuy
TW	Tenure weighted
UAE	United Arab Emirates
UK	United Kingdom
US	United States of America
VIF	Variance inflation factor
WRDS	Wharton Research Data Services

STATEMENT OF AUTHORSHIP

February 2020

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No other person's work has been used without due acknowledgment in the main text of the thesis.

This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution.

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Chapter 1 : Introduction

The last three decades of Islamic finance studies concentrate on contributing to the literature based on empirical findings without in-depth inferences and analogical development of the analytical framework. Hassan and Sirajo (2017) noted that "Failure to continue developing normative Islamic financial theories, analytical and conceptual frameworks stagnate other innovations and expansion in Islamic finance". The desertion of analytical and theoretical studies which relate to both the Shariah paradigm and to contemporary situations restrains new insight that will pave ways to innovations and new frameworks that will guide future empirical studies. However, progressive empirical evaluations of contemporary situations will again not only guide policymakers' decisions, but will also provide the untapped gap that requires the attention of scholars thorough empirical investigations using real life data to understand the differences between Shariah compliance heterogeneity and market segmentation (Berg et al., 2016).

This dissertation contributes to the literature by addressing issues or questions left unattended in Islamic finance studies. Despite the increasing number of Shariah service providers that screen investments for compliance, it is acknowledged that it is important to develop a standardized screening framework which takes into account the existing Shariah guidelines, produces a controlled, unified and understandable classification of assets, by which the credibility and consistency of Islamic equity products is enriched and the performance of compliant investments is increased. Chapter 2 of this thesis provides an empirical examination of the different screening methods. In general, chapter 2 focuses on the contribution made by each screening method to the performance of stocks and investigates the impact of each financial screen on the performance. The empirical evidence would contribute to the process of standardising Shariah screening by identifying and bridging the compliance gaps.

Furthermore, the literature on Islamic mutual funds provides mixed evidence on their performance as compared to market benchmarks or to conventional counterparts. However, such studies do not sufficiently explore factors that might increase profitability of IMFs. Chapter 3 of this thesis investigates country-index based momentum strategies and their relationships to IMFs profitability. To fill this gap, we construct several country index-based momentum factors and include the most profitable one in the performance evaluation of Islamic mutual funds. For an evaluation period from January 2000 to December 2016, we apply pure

index-based factor models and find that country momentum clearly affect the performance of IMFs.

Moreover, Islamic finance has a role in promoting sustainable development and corporate social responsibility goals through financial and non-financial decisions made by board members. Nonetheless, the empirical link between board characteristics of Shariah compliant firms and CSR is not yet addressed in the literature. Chapter 4 examines the association between boards characteristics firms mainly directors' independence and tenure, women on boards, co-opted directors, and CEO duality and the CSR score of Shariah compliant. Chapter 4 provides the first empirical evidence in this context.

In particular, this thesis seeks to answer the following questions: i) what impact do various screening methods have on the performance of stocks? ii) What impact do country index-based momentum strategies have on the performance of Islamic Mutual funds? iii) What impact do board characteristics have on the CSR score of SCFs? Each of these questions forms the basis of the three self-contained essays that make up the following three chapters of the thesis.[1] Section 1.1 provides an overview of these three essays, Section 1.2 presents relevant background on Islamic finance and Shariah law and motivations, and Section 1.3 outlines the remaining chapters of this thesis.

1.1 Summary of Research Questions and Contribution

1.1.1 Chapter 2: Stock performance under alternative Shariah screening methods: evidence from Australia

Chapter 2 examines the impact of 12 different screening methods on the performance of stocks listed on the ASX 200. This essay contributes to the literature by providing new evidence on the impact of multiple screening methods on the performance of SCs. It also provides evidence on the relationship between the financial performance of stocks listed on the ASX 200 and ethical screening, with particular reference to the financial ratios used in the quantitative stage of the screening, to evaluate the differences in compliant universes and performance based on the screening method used. The results show that the performance of stocks is driven by the chosen screening method. Moreover, the restriction of financial leverage affects performance

[1] This dissertation is a collection of three separate essays. Thus, there is inevitably some repetition, mostly with regard to clarifying the basics or the principles of Islamic finance. However, these repetitive passages help the reader to be able to read the separate studies on a stand-alone basis without having to necessarily consult other sections of the dissertation.

negatively for SCs, whereas the restriction towards investing in firms with liquid assets tends to have a positive impact on the performance of SCs. Investing in non-permissible activities also negatively affects the performance of SCs.

1.1.2 Chapter 3: Country index-based momentum in Islamic mutual funds: performance and crash risk

Chapter 3 investigates the impact of country index-based momentum strategy on the performance of Islamic mutual funds (IMFs). Country index-based momentum strategy can be defined as buying stocks/funds in the winning country and short-selling funds from the losing country based on the sorted cumulative returns of countries' indices over the past few months before holding this portfolio for several months. This essay contributes to the IMF literature in a number of important ways. First, it expands the existing literature by including a constructed country index-based momentum factor in the Fama and French (1993) three factor model. It then examines whether country index-based momentum strategies can experience infrequent and persistent strings of negative returns, known as momentum crashes. It also investigates whether the returns of country index-based momentum strategies have exposure to the GFC and fund investment styles and are associated with screening intensity and fund characteristics. Moreover, it provides new evidence on the relationship between crash risk of country index-based momentum strategies and chosen fund investment styles. The results show that including country index-based momentum strategy improves the performance of IMFs and the explanatory power of Fama and French three factor model. Focusing on variables such as country index-based momentum strategies' crashes, investment styles, fund characteristics, option-like behaviour, exposure to market volatility, exposure to investment styles, and fund characteristics reveals that the relationship between the returns of country index-based momentum strategies and these variables is driven by periods of ranking and performance of the individual country index-based momentum strategy. Interestingly, screening intensity increases the performance of momentum strategies, and a negative relationship is identified between the crash risk of momentum strategies and the market factor; however, a positive relationship emerges between crash risk and SMB and HML factors.

1.1.3 Chapter 4: Board Characteristics of Shariah Compliant Firms and Corporate Social Responsibility

Chapter 4 examines the relationship between board characteristics and CSR in Shariah compliant firms. In particular, the chapter focuses on the impact of the board characteristics, namely independence, tenure (experience), multiple directorships (busyness), gender (female directors), and CEO duality on the overall CSR score of SCFs and the score of its individual CSR component, namely environment, community, diversity, employee, product and human rights components. This essay also investigates the association between board co-option measures and SCFs' CSR score. Co-option is the fraction of the board comprised of directors appointed after the CEO assumed office. Since CSR is widely perceived as a strategy, it is crucial to explore how board characteristics, in particular decision-making processes, with regard to CSR score are taking place in SCFs. The empirical results show strong evidence that board independence, female directors on the board, CEO duality, the size of the board, and the age of directors are positively associated with CSR score. We then identify board characteristics that are associated with the individual components of the CSR score. We find that directors' independence, female directors on the board, CEO duality, and board size are positively associated with the environment, community, and diversity components of SCFs' CSR. Tenure and board size are negatively associated with the environment and product components, respectively. Furthermore, the results show that more co-opted directors on the board leads to a reduced CSR score.

1.2 Background and Motivations

1.2.1 Derivation of Islamic finance

Prior to the global financial crisis (GFC) in 2008-2009, the consideration of ethics in business practices was considerably modest. The concept of ethics has emerged with the explanation of factors driving the crisis. Studies by Hawtrey and Johnson (2010) and Graafland and van de Ven (2011) show that moral dimensions were present in the crisis and the principle of markets and morality was lost in the GFC. Therefore, since there is still no ultimate solution to prevent future financial crisis, the call for renewing the existing finance system, and restructuring and regulating the financial markets seem necessary in order to maintain the worldwide financial system and satisfy investors. Ethics in finance can contribute to this necessity since it implies practices that are accepted publicly and enhances the level of trust in the fairness of the global financial market since confidentiality and transparency are required at any time within a

business environment.

The scope of ethical finance is as wide as the term "ethics" which means different things to different people and jurisdictions. This thesis explores Islamic finance, an alternative financial system that subscribes to the notion of ethics defined by the Shariah, which traces its roots to Abrahamic faith like Christianity and Judaism. It refers to transactions that should conform to certain ethical standards and are consistent with the principles of Shariah or Islamic law (Ayub, 2007). These standards and principles are based on ethical considerations, such as ethically oriented trade, social and responsible investment, sustainable finance and banking, and a highly regulated finance system; thus, Islamic finance can be considered a form of ethical finance.

Islamic finance is also defined as the provision and use of financial services and products that comply with the tenets of Shariah (Čihák & Hesse, 2010). The first modern experiment with Islamic finance, in particular Islamic banking, commenced in Egypt in 1963 when Mit Ghamar interest free saving bank was established with the purpose of administering the majority of Muslims' savings based on Shariah principles in order to derive halal returns. This was followed by the formation of the Dubai Islamic Bank (DIB) in 1975, which has applied the principles of Shariah in all its banking practices with the objective of promoting the economic development of Muslim communities in accordance with Shariah. Recently, Islamic finance has become an important area of the global financial system due to ongoing changes in the global economy, with individuals and institutions seeking alternative financial and ethical investment privatisation.[2]

The Islamic finance system is widely believed to have demonstrated resilience during the recent GFC, which contributed towards its increasing popularity after the GFC. It is argued that most of the factors responsible for the GFC are prohibited by Islamic finance. Such factors include high leverage, dealing with interest, speculation, and uncertainty. Therefore, the principles of Islamic finance can be beneficial in rethinking of the global financial architecture and reducing the severity of potential financial crisis (Ejaz & Khan, 2013).

The Islamic financial system derived from the Shariah law has a set of principles. The following section provides a succinct disclosure of the definition of sources of Shariah law, its principles, contracts, and the components of Islamic finance and its growth. This serves as a suitable

[2] According to Ayub (2007), Islamic banking and finance is being practised in over 75 countries around the world, with about 550 Islamic institutions in the field.

starting point to understand all aspects of Islamic finance before navigating to each chapter of the thesis.

1.2.2 Sources of Shariah law

Shariah law, simply defined as Islamic law, presents a complete legal framework for all aspects of Muslim life (Millar & Anwar, 2009). It provides comprehensive guidance in areas such as politics, business, economics, law, and religion. It also defines the Shariah compliant financial practices. Shariah principles are based on primary and secondary sources (Elasrag, 2011). Anwar (2008) lists a number of primary sources of Shariah, which include:

a) The Holy Qur'an

The Holy Qur'an is the primary source of Islamic principles. It contains the original words of God as uncovered to the Prophet Mohammad (PBUH).

b) The Sunnah/Hadith (Acts and Practices)

The Sunnah is the second primary source of Shariah. The translation of the word Sunnah from the Arabic language lexically means "road" or "practice". It is an interpretation of the Islamic principles that guide practice and provide highlights of the way of life of the Prophet Mohammad in term of teachings, traditions, and actions. Hadith is very similar to Sunnah but not identical. It is a narrative report including the sayings and all aspects of the life of the Prophet and is considered a narration of the Sunnah. However, the difference between the Sunnah and the Hadith is that the established Sunnah is as reliable as the Qur'an while the Hadith always needs verification under the light of the Qur'an and the Sunnah.

Secondary sources of Shariah consist of Qiyas, Ijma'a and Ijtihad. The importance of these secondary sources is to facilitate the understanding and identification of Islamic rules and principles since they are not tackled in a simple and obvious way within the context of primary sources. Ayub (2007) defines these secondary sources as follows:

a) Qiyas (Analogy): The act of intellectual thinking or reasoning by analogy when an existing Islamic principle is connected to an inexplicit action is called Qiyas. In other words, Qiyas is based on detecting similarity between new situations and relative treatment based on the Prophet's practices. Wine drinking, for example, is prohibited explicitly in the Holy Qur'an. This is because of the intoxicating effect that removes Muslims from mindfulness of God.

Hence, any beverage containing intoxicating substances is considered Haram (Unlawful) regardless of its name. This is because of the Qiyas to wine (Farooq, 2011).

b) Ijma'a (Consensus): "Ijma'a is the lawful interpretation of the Holy Qur'an and the Sunnah. It is a legal process of creating a norm or a rule based on a consensus between specialists of the problem to solve". It represents the approval of a practice or belief given by various Islamic communities and different Islamic scholars. The agreement between Muslim scholars and jurisprudents to compile the Quran in a single volume is an example of Ijma'a.

c) Ijtihad: Ijtihad lexically means "striving". Technically, it represents the process of deriving an independent explanation of Shariah Law from the Qur'an, Sunnah, and Hadith without considering other interpretations. Gait and Worthington (2007) define Ijtihad as the application of Shariah law through autonomous thinking in cases not directly mentioned in the primary sources of Shariah. The debate over Ijtihad considers the qualification and the performance of Islamic scholars. Ijtihad is only acceptable if its decisions come from an appropriately enlightened and trained Islamic scholar who is competent in interpreting Shariah by Ijtihad known as al Mujtahid (Anwar, 2008). Ijtihad plays a significant role especially in the development of the modern Islamic finance system since implementing new financial practices or products requires an effort to understand and interpret the Shariah law through Ijtihad.

Qiyas, Ijma'a, and Ijtihad are based on Islamic scholars' explanation and interpretation. Since there exist different schools of thought of Muslims scholars or bodies and Islamic juridical views, there are different means of interpretation. These different approaches affect the application process of Shariah law and lead to major discrepancies, inconsistencies, and uncertainty of the application of Shariah law across the Islamic world. However, Shariah rules are mainly divided into Dos (orders to undertake any act) and Don'ts (prohibition from some acts). Allowed and prohibited acts are outlined by the Shariah principles stemming from the sources of Shariah.

1.2.3 The basic Shariah principles applied to Islamic finance

The principles of Islamic finance are based on Islamic (Shariah) law that prohibits certain business practices applied by the conventional finance system. These principles represent the

basis for the practice of Islamic finance. Obaidullah (2005) asserts that comprehensive compliance with Shariah principles would bring confidence to the general public and financial markets regarding the credibility of Islamic finance operations. These principles include:

a) **The prohibition of Riba:** The Qur'an and the Sunnah as primary sources of Shariah strictly insist on the prohibition of Riba[3] in economic and financial transactions. This includes, but is not limited to, any type of interest. There is an ongoing debate and deliberation among Islamic scholars as to what defines the term "Riba" (Siddiqi, 2004). A minority believes that it only applies to usury or excessive compound interest (Metwally, 1997). This prohibition further implies the following interrelated principles:

- Money does not have an intrinsic value since it is not an asset but only a medium of exchange.
- Money cannot earn money without making any real contribution. Money when directly exchanged with money must be one-to-one. Thus, the reliance should be on an asset or a service-based transaction, not on money. This is why Shariah-compliant transactions are also referred to as asset-backed transactions.
- Debt to be traded at par: debt in Islam is considered as money and can be traded only at par, even though it might be a result of a real exchange of money for something else.
- Risk Sharing: Sharing the profit and the loss is a master requirement under Shariah law (Warde, 2010). All parties must share returns (profit or loss) generated by the underlying real economic activity, as specified in the underlying Shariah compliant contract. This principle contradicts the conventional finance principle where the risk lies upon one party only. Seccombe (2012) notes that "risk, incidentally, is an Arabic word, referring to where you lend money to others without requiring a return unless there is profitable growth".

b) Prohibition of Gharar (Uncertainty) and Maysir (Speculation)

Islamic finance prohibits uncertainty and speculation (El-Gamal, 2006). Shariah prohibits realising an unfair gain from speculation or gambling activities. This principle is often related to transparency and disclosure in conventional finance. The scope of this principle is expanded to include transactions wider than the terms themselves, such as short selling transactions and gambling. Ambiguity in the implication of terms and conditions of exchange contracts is

[3] The Qur'an, Surah al-Baqarah, verses 275-281.

referred to as Gharar (Iqbal & Molyneux, 2005). Metwally (1997) also argues that Gharar are speculative transactions that are harmful to society. Any form of deception, resulting in an uncertainty in the main features of commercial transactions such as grounds, timing, quantity, quality, and existence of goods and payments, is considered as Gharar and consequently banned by Shariah law. The Holy Qur'an (5:90) defines Maysir as an abomination of the Devil's handiwork. Therefore, it is forbidden under Shariah law. The majority of Islamic scholars refer to Maysir as a bet on the occurrence of a future event that involves the principle of "taking a risk"; it is a desire to realise a gain by deliberately taking a risk (Al-Saati, 2003). Maysir and Gharar share a common factor, which is significant risk and uncertainty. The general consensus in Islam is that realising a profit or a gain should be derived from legitimate commercial sources. Therefore, risk and speculation should be avoided in any type of signed contracts or arrangements between two participants in any kind of commercial and financial transactions. For example, financial instruments such as forward contracts, futures contracts, options, and swaps are not permitted under Shariah law because of the involvement of speculation, risk, and interest in their commercial nature.

c) A ban on investing in harmful business activities

According to the doctrine of Shariah, the source of income or profit should be derived from Halal or permissible activities. "Activities that are not Halal (permissible) in Islam are therefore not permissible to be involved in economic transactions" (Anwar, 2008). Activities such as gambling, drugs, entertainment, alcohol, pork-related products, conventional financial services, tobacco, weapons, and defense are prohibited in Islam. In addition, Islamic banks are not allowed to trade in or finance these sorts of businesses (Lewis & Algaoud, 2001). The primary reason behind this ban is to protect society and individuals from certain undesirable outcomes related to those prohibited activities.

d) Purification of Income (Zakat or donation)

Zakat represents one of the five pillars in Islam. By definition, it is an obligatory payment in the form of donations or assistance imposed annually on the individual's wealth to assist the poor (Metwally, 1997). Shariah also allows investments in illegitimate activities only in instances where it is possible to detach such activities from its effective cause of prohibition and associate clear returns to society or individuals in form of Zakat or purification of Income.

1.2.4 Motivations: Islamic finance components and growth

Islamic finance can be broadly divided into three main components: banking (Islamic banks), insurance (Takaful), and capital markets (Shariah compliant stocks, Islamic funds, and the Islamic equivalent of bonds, called Sukuk).[4] This thesis examines the performance of both Shariah compliant stocks and Islamic mutual funds, providing insights into these two components and their growth.

The development of screening methods for listing a stock as a Shariah-compliant stock and construction of Islamic stock market indices by index providers reflects the increasing demand for Shariah compliant stocks as an investment asset. Shariah investing differs from conventional investing because it excludes certain sectors/companies from their investment universe. Stocks are considered compliant if they pass two successive screening stages known as qualitative screens (stage 1) and quantitative screens (stage 2). The qualitative screens in stage 1 are derived from Shariah principles, which prohibit any firm from dealing with interest or conducting unethical practices (such as alcohol or any speculative activities). In stage 2, stocks are excluded if they do not meet certain financial criteria related to levels of leverage[5], liquidity, and income derived from non-permissible activities. Still, there is no consensus on screening standards among the multiple Shariah screening providers and on the association between ethical screening and financial performance of compliant stocks. With regard to Islamic funds, this subject has gathered growing popularity since the industry began in the 1990s. This industry has become increasingly attractive because of the strong demand for Shariah-compliant products, continuing strength of the legal and regulatory framework of Islamic finance, demand from conventional investors, and the ability of the industry to develop innovative financial instruments that meet investors' needs (Hasan & Dridi, 2011). All Islamic funds are managed according to the principles of Shariah and the investments made by each fund should be compliant. Still, the performance of Islamic mutual funds remains a debatable issue in the literature and there still a lack of empirical evidence on what factors can influence the performance of these type of funds.

Global Islamic investment continues to grow due to the growing demand for Shariah-compliant investment supported by an increasing range of Islamic financial assets available in the market.

[4] Leaving aside regulators, brokers, and other intermediaries.
5 For example, total debt/total asset ratio should be less than 33%.

For instance, recent reports indicate that Islamic finance assets have grown significantly during the past decade, from about USD $200 billion in 2003 to an estimated USD$1.8 trillion at the end of 2013.[6] Indeed, more than 500 financial institutions offering Islamic financial products were established in more than 50 countries[7], and the total global Islamic assets under management (AuM) as of the end of Q1 2017 were USD 70.8 billion and the number of Islamic funds stood at 1,535.[8] The main drivers of this growth can be explained by the following factors:

- Islamic investment opportunities are now accessible to institutional investors as well as non-Muslim investors to diversify their investments through Shariah-compliant investments.
- The increasing size of Muslim clients who are looking to invest in Islamic financial markets. According to new population projections by the Pew Research Center's Forum on Religion & Public Life[9], The world's Muslim population is expected to increase by about 35% in the next 20 years, rising from 1.6 billion in 2010 to 2.2 billion by 2030. This represents twice the rate of the non-Muslim population over the next two decades (1.5% versus 0.7% per year).
- The growth of Muslims' wealth and purchasing power. There are about 600,000 High Net Worth Individuals (HNWIs) in the Middle East, with an estimated wealth of about 2.4 trillion USD (Capgemini & RBC Wealth Management, 2017). In addition, Muslims predominantly live in countries with relatively high GDP per capita growth. These countries are projected to see GDP per capita grow at above average levels, which over the long term will create a sizable middle class.[10] Currently, the development of the Islamic financial system is predominantly in continental Europe, the UK, the US, South Africa, and other regions, in addition to the Middle East and Southeast Asia (with Malaysia as the biggest hub).

1.2.5 Motivations: Corporate Social responsibility and board characteristics of Shariah Compliant firms

Corporate social responsibility is defined as the "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (McWilliams & Siegel, 2001). These actions cover all the surrounding attributes of the firm including, but not

6 Islamic Finance and the role of IMF, Feb 2017. Accessible http://www.imf.org/external/themes/islamicfinance/
7 (Ernst & Young, 2013)
8 Thomson Reuters, MIFC estimate.
9 See: http://www.pewforum.org/2011/01/27/the-future-of-the-global-muslim-population/.
10 The IMF projects average GDP per capita growth of 7.7%, 5.3%, and 5.2% for India, Indonesia, and Pakistan, respectively (IMF World Economic Outlook 2017, accessible via http://www.imf.org/~/media/Files/Publications/WEO/2017/April/pdf/c1.ashx

restricted to, the community where the firm operates, the environment, and the diversity and the firm's treatment of employees, suppliers, and customers. Nowadays, corporate social responsibility has received a high volume of followers including policy makers and academics. This is due to an increasing societal and investor demand for managers to disclose and address the corporate social responsibility behaviours of firms. Jha and Cox (2015) report that $15.2 billion was spent on CSR by U.S and U.K. firms in the Fortune Global 500 in 2014 and $3.07 trillion of the professionally managed U.S. assets was tied to socially responsible investing.

Although CSR is becoming increasingly significant, no research has yet studied the association between CSR and board characteristics of Shariah compliant firms (SCFs). The responsibility of SCFs towards society stems from the sources and principles of Shariah discussed above, and hence there seems to be high motivation for compliant firms to address social responsibility and disclose related information to their shareholders. The board of directors plays an important role in ensuring that companies meet CSR objectives (Mackenzie, 2007). The majority of research on board characteristics has investigated their impact on CSR reporting and rating in conventional companies. For instance, Post et al., (2011) and Jo and Harjoto (2012) indicate that independent directors possess superior monitoring ability, unbiased interest, high concern for their reputation and unique experience and expertise, and ultimately can have a positive influence on CSR aspects of corporations. However, no study has yet examined the impact of board characteristics on the CSR score of Shariah compliant firms.

1.3 Thesis outline

The rest of the thesis is organised as follows. Chapter 2 examines the impact of Shariah screening methods on the performance of stocks listed on the ASX 200. Chapter 3 investigates the impact of country index-based momentum on the performance of Islamic mutual funds, and Chapter 4 studies the impact of board characteristics on Shariah compliant firms' CSR score. Chapter 5 concludes the thesis.

Chapter 2 : Stock performance under alternative Shariah screening methods: evidence from Australia

2.1 INTRODUCTION

Ethical or socially responsible investments are increasingly attracting the interest of investors, practitioners, and academics (Puaschunder, 2016). Unlike conventional investments, these investments involve the consideration of ethical principles as part of asset selection in addition to the usual consideration of risk and return relationships. Ethical investing thus involves employing a set of screens to exclude or include stocks on the basis of criteria such as environmental, social, or religious guidelines; they therefore allow investors to regulate their investments in accordance with their personal ethical guidelines, accounting for their morality and beliefs. Ethical investments also consist of "impact investments" and "Shariah investments" as two emerging asset classes. Impact investments are investments designed to create positive impact beyond financial return, specifically social and environmental impact (O'Donohoe et al., 2010). It is viewed by some as an alternative middle ground between investing for maximum profit at minimum risk and donating for social and environmental purposes (O'Donohoe et al., 2010); (Bugg-Levine and Emerson, 2011). Whereas, Shariah investments are investments based on Islamic beliefs, in which asset selection is driven by the principles of Islamic or Shariah law (Ashraf and Khawaja, 2016).

The question related to ethical investments is whether investing ethically is costly for all investors or actually increases their profits in the long run. Research based on investors behaviour has demonstrated that while investors care about the maximization of their profits, they increasingly also care about other social issues that their investments may one way or another influence (De George, 2011). A number of studies that are based on investors' investment decision making style have indicated that socially responsible investors' are

interested in both promoting the wellbeing of the planet in addition to wealth creation (McLachlan and Gardner, 2004). Other studies have also showed that ethical investors are committed towards their values and beliefs and are willing to sacrifice some financial returns for the sake of ethical investments (Webley et al., 2001); (Pasewark and Riley, 2010). This theoretical background is relevant to our study on the performance of Shariah compliant stocks under alternative Shariah screening methods. It is appealing to all investors not only Islamic investors to depict the screening criteria employed by a screening method that contributes positively to maximising their profits along with preserving their moral and ethical values.

Islamic finance is one form of ethical investment, in which asset selection is driven by the principles of Islamic or Shariah law. The last decade has witnessed phenomenal growth in both the number and complexity of Islamic financial products, with more than 1,389 full-fledged Islamic financial institutions and windows offering Islamic financial products being established worldwide (Thomson Reuters, 2018). The growth rate of Islamic assets under management has also been significant, exceeding US$ 2 trillion by 2017; this is further expected to grow to more than US$3.8 trillion by the end of 2023 (Thomson Reuters, 2018). Islamic investments, in adhering to the principles provided by Islamic or Shariah law, are derived from Islamic values, which prohibit business practices or financial transactions that may harm society from an Islamic perspective. Shariah law thus imposes a ban on business activities involving pornography, alcohol consumption, armaments, *Riba* (interest-based loans), *Gharar* (contractual uncertainty), and *Maysir* (gambling).

An important development in the Islamic finance industry has been Shariah screening, which allows Islamic investors to invest in conventional stocks that have been screened to remove non-Shariah compliant activities. In practice, however, a great deal of inconsistency exists between the Shariah screening criteria used by Shariah screening providers, especially in terms of the thresholds applied to financial ratios used in quantitative screening. These thresholds are exogenously set by independent Shariah (religious) scholars or Shariah boards rather than being derived as a result of any objective scientific analysis. Further, Muslim scholars use personal interpretation known as "Qiyas"[11] to derive these thresholds, which are not explicitly described in the Quran or the Hadith.[12] The arbitrary nature of these exogenous thresholds

[11] See Chapter 1 for more detail.
[12] See Chapter 1 for more detail.

increases issues with the reliability of such rulings because it is not clear whether the application of Shariah screening[13] has any impact on stock performance.

Empirically, several studies have compared the performance of conventional and Shariah-compliant investments, such as Ashraf et al. (2017); Akhtar and Jahromi (2017); Al-Khazali et al. (2014); Ho et al. (2014), Reddy and Fu (2014) and Jawadi et al. (2014). However, the contribution of the current chapter lies mainly in its novel approach. Its approach differs from that of Reddy and Fu (2014), which uses a single general screening criterion to screen stocks to examine any differences in the performance between Shariah-compliant stocks and conventional stocks listed on the Australian Stock Exchange (ASX). The current chapter adopts a more rigorous approach, it screens a number of stocks listed on the ASX 200 for Shariah compliance from 2000 to 2012 using the screening criteria used by 12 different screening providers to create a universe of Shariah-compliant stocks. This means that each of the 12 screening criteria sets are used, and the results are quantified as a separate compliant universe. Each screening method is then categorised by its degree of conservatism in terms of the impact on the comparative size of the resulting Shariah-compliant universe. The impact of these different screening methods on SCs' performance is then examined, with the performance of each judged relative to all stocks in the sample, the overall market benchmark, and their non-compliant counterparts. The impact on SCs' performance of the different financial ratios used in screening is also examined. In this context, our approach is different to Ashraf et al. (2017) that use one general measure for leverage and liquidity. In this chapter, we test directly the impact of various financial ratios used by various Shariah screening providers on the performance of SCs.

This chapter also has two main objectives that differentiate it from other studies. The first is to examine whether the application of screening makes any significant contribution to the performance of the resulting stocks. The second is to examine the relationship between the financial performance of stocks listed on the ASX 200 and ethical screening, with particular reference to the financial ratios used in the quantitative stage of the screening, to evaluate the differences in compliant universe performance based on the screening method used. To the

[13] Starting with the Dow Jones and FTSE in 1999, several major market players have begun to provide Shariah screening services. These providers include index providers (e.g., Morgan Stanley and the FTSE), Shariah users (e.g., Shariah Capital and Al Meezan), and banks (e.g., HSBC Amanah and Dubai Islamic Bank).

best of the authors' knowledge, this is the first study to examine the impact of multiple screening methods on the performance of stocks.

We find the size of the resultant Shariah-compliant universe varies significantly across the different screening methods, and mixed results are documented in relation to the contribution of screening methods to the performance of stocks. Moreover, the restriction of financial leverage affects performance negatively for compliant stocks, whereas the restriction towards investing in firms with liquid assets tends to have a positive impact on the performance of compliant stocks. Investing in non-permissible activities tends to negatively affects performance of compliant stocks, and fully compliant stocks underperform the market and their peers when screening methods that use market value of equity are applied; however, compliant stocks perform similarly to the market and to non-compliant stocks when screening methods that use total assets are applied.

This chapter is organised as follows. Section 2.2 provides an overview of the literature, while Section 2.3 provides details on the qualitative and quantitative screens applied by the different screening methods used. Section 2.4 presents the hypotheses development for the current chapter, and Section 2.5 presents the sample and models. Section 2.6 offers the resulting compliant universes and the relevant descriptive statistics, and Section 2.7 presents both empirical results and a discussion of those results. Finally, Section 2.8 concludes the chapter, followed by appendices in Sections 2.9 and 2.10.

2.2 LITERATURE REVIEW

Empirical studies show mixed evidence in relation to the performance of Shariah-compliant investments compared to non-compliant investments. In this section, we review these mixed findings from past studies by categorizing them into three sub-sections as follow:

2.2.1 Performance of compliant stocks vs. non-compliant stocks

Ashraf et al. (2017) create a unique set of Islamic equity portfolios constructed from the constituents of three major international stock indices, namely the S&P 500, S&P Europe 350, and S&P Japan 500, following the Shariah screening standards used by AAOIFI and MSCI and based on monthly prices for the period January 2000 to December 2013. The authors used the standard CAPM and Carhart models, including the benchmark market portfolio, in the three respective markets, adding additional factors such as leverage, investment in real assets, and a

dummy variable capturing the effect of the recent global financial crisis (GFC). To construct the leverage and investment in real assets factors, they respectively sorted all of the equities in the conventional indexes based on leverage (long term borrowings/total assets) and ratio of investment [total assets − (cash + account receivables + intangibles)] to total assets for each month. They then calculated the return difference between those firms with the highest ratio of both leverage and investment in real assets and those with the smallest ratios. The authors find that portfolios compliant under the MSCI screening method underperform the benchmark in Europe and Japan, whereas portfolios compliant under the AAOIFI screening method underperform the benchmark in Japan only. They also find that the leverage factor's impact on returns varies between MSCI (negative) and AAOIFI (positive) protocols. They argue that dynamic adjustment of the denominator based on market value of equity might be able to drop poorly performing leveraged stocks and thus contribute positively to the returns of Islamic equity portfolios. With respect to investment in real assets, the authors document a statistically significant and negative relationship between this factor and the performance of Islamic portfolios following MSCI criteria, but an insignificant effect when following AAOIFI criteria. They argue that investors in Islamic portfolios following MSCI criteria incur a sacrifice cost for investing in companies with higher investments in physical assets. Irrespective of the Shariah screening method used, they also find that compliant portfolios in Japan only performed better during the GFC.

Setiawan and Oktariza (2013) similarly examine the performance of Shariah stocks compared to conventional stocks, all of which were selected from Mining, Trade, and Services and the Consumer Goods sectors as publicly listed on the Indonesia Stock Exchange (IDX) during the period 2009 to 2011 using risk-adjusted return measurements including the Sharpe ratio, Treynor ratio, and Jensen's alpha. The results reveal no significant difference in performance when the Sharpe ratio and Jensen's Alpha are used, whereas the Treynor ratio indicates that the Shariah stocks portfolio has a lower risk-adjusted return than the conventional stocks portfolio. Akhtar and Jahromi (2017) test for differences in returns, risk, and mean–variance efficiency between Islamic and non-Islamic stocks using monthly data from Malaysian stocks from June 2002 through June 2014. They used two approaches to segregate stocks into Islamic and non-Islamic portfolios, one based on a list of Islamic stocks as provided by the Shariah Advisory Council (SAC) of Malaysia, and the other based on Shariah screening of all individual stocks in Malaysia using the Dow Jones Islamic Market Index (DJIM) screening method. To test for differences in risk and return, the authors calculated Sharpe ratios for each

portfolio and ran stacked regressions; two statistical tests, based on a multivariate F-test and GMM, were then used to examine the mean–variance efficiency of each of the Islamic, non-Islamic, and market portfolios. Their findings indicate that Islamic stocks provide similar returns to non-Islamic stocks at lower risk; the Islamic portfolio is closer to the mean–variance efficient frontier and the minimum variance portfolio than the non-Islamic portfolio. Additionally, to identify the factors that drive differences in risk and return characteristics in Islamic and non-Islamic stocks, they constructed variations on the Islamic portfolio by applying subsets of screens such as: (i) six business activity screens; (ii) using all three financial ratio screens; and (iii) applying only one screen at a time. When the financial screens of DJIM are applied, the compliant portfolio displays similar performance to the non-compliant portfolio. However, compliant portfolios underperform their peers when qualitative screens are applied.

2.2.2 Performance of compliant stocks vs. non-compliant stock indices

Many previous studies have investigated the performance of Shariah stock indices versus conventional stock indices using a number of performance measures such as the CAPM, and the Sharpe and Treynor ratios. Hussein (2004) shows that the FTSE Global Islamic index performed similarly to the FTSE All-World index during the period 1996 to 2003. However, the FTSE Global Islamic Index outperforms its counterpart in a bull market period (July 1996 to March 2000), while underperforming the FTSE global conventional index in the bear market period (April 2000 to August 2003). The author argues that the Islamic index outperforms its conventional index counterparts due to the fact that all firms included in the FTSE Global Islamic index have low leverage ratios. Girard and Hassan (2005), however, find no difference between Islamic and non-Islamic indexes when examining the performance of seven indexes chosen from the Dow Jones Islamic Market Index (DJIM) against their non-Islamic counterparts for the period January 1996 to December 2005. They use a variety of measures including the Sharpe and Treynor ratios, Jensen and Fama's selectivity, net selectivity, and diversification. These authors further divided the sample period into two sub-periods of January 1996 to December 2000 and January 2001 to December 2006 to examine performance differences during bull and bear periods, finding that Dow Islamic indexes outperformed their conventional counterparts from 1996 to 2000 and underperformed them from 2001 to 2005. Albaity and Ahmad (2008) examine the performance of the Kuala Lumpur Shariah Index (KLSI) versus the Kuala Lumpur Composite Index (KLCI) for the period 1999 to 2005 in Malaysia, employing risk-adjusted performance measurement, causality, and the Johansen co-

integration test, concluding that that there were no statistically significant differences between the returns of both indices.

However, other studies present evidence that Shariah stock indices outperform their peers, especially during periods of financial uncertainty and crises. Al-Khazali et al. (2014) use measures such as CAPM, the Sharpe Ratio, the Treynor Index, and Jensen's Alpha alongside stochastic dominance analysis to examine whether Islamic stock indexes outperform conventional stock indexes. They compared nine Dow Jones Islamic indexes to their Dow Jones conventional counterparts, namely the Asia Pacific, Canadian, Developed Country, Emerging Markets, European, Global, Japanese, UK, and US indexes for the periods 1996 to 2012 and 2001–2006. Their results indicate that conventional indexes stochastically dominate the Islamic index in all markets except the European market for the period 1996 to 2012. However, the Global, European, and the US Islamic indexes dominated their conventional counterparts during 2007 to 2012. Importantly, they find that Islamic indexes particularly outperformed their conventional peers during the last global financial crisis. Ho et al. (2014) and Jawadi et al. (2014) draw similar conclusions when comparing the financial performance (Sharpe ratio, Treynor ratio, and Jensen's alpha) of worldwide Islamic and conventional indexes during the period 2000 to 2011. After using monthly price data from June 2002 to May 2012 on global and regional Islamic equity indices and their conventional counterparts, Ashraf and Mohammad (2014) further report that Islamic equity indices perform better than conventional indices. Bousalam and Hamzaoui (2016) construct four Islamic weighted indexes by applying four different Shariah screening methods (Dow Jones, FTSE, S&P, and MSCI) to publicly listed companies on the Casablanca Stock Exchange, comparing the resulting indexes with non-compliant Moroccan indices by means of daily log returns. They report that the constructed indices outperformed the broad-based Moroccan All Shares Index (MASI) during the period of analysis, January 2013 to December 2014.

Conflicting empirical evidence has been documented by Farooq and Alahkam (2016), however. These authors investigate the difference between the performance of Shariah-compliant stocks and that of non-Shariah-compliant firms in the MENA region during the period 2005 to 2009, using market-adjusted returns as a proxy for performance; they find that compliant stocks significantly underperform their non-compliant counterparts. They argue that it is the financial characteristics of non-compliant firms, such as high leverage and high cash holdings, which enhance the performance of these firms relative to Shariah-compliant firms.

2.2.3 Alternative Shariah methods and the resulting compliant universes

Previous research has provided several comparative analyses of screening methods by studying the differences and similarities between the screening methods used and their impact on the resultant size of the Shariah compliant stocks universe. Derigs and Marzban (2008) show that the use of nine different Shariah screening methods (DJMI, FTSE, S&P, MSCI, HSBC, AMIRI, DIB, AZZAD, and Almeezan) results in asset universes that differ significantly in size as well as constituent stocks. Pok (2012) examines the impact of applying the Shariah screening method used by the Securities Commission of Malaysia (SCM) on the resulting stocks' universe. The results reveal that the SC screening method results in a larger universe than that ensuing when DJMI screening is used. Ho (2015) reviews the Shariah investment screening methodologies of 34 prominent global Islamic finance users, including index providers, Shariah service providers, Islamic banks, a regulator, an association body, and fund managers, finding that some Shariah screening providers, such as DJMI and Azzad, are more specific in terms of their qualitative screening when classifying Shariah-prohibited activities, while others are more liberal in terms of allowing more business activities to be considered compliant. However, in terms of quantitative screens, the range of allowable threshold ratios and the use of non-permissible criteria (NPI) differ only slightly between these providers. A recent study by Clarke (2015) further highlights the inconsistencies between the screening methods of Islamic funds and the indices applied to the FTSE 250, showing that the use of the MSCI and FTSE methods result in larger asset universes than the use of HSBC, DJIMI, and S&P.

This chapter is the first of its kind. It examines the impact of 12 different Shariah screening methods on the performance of stocks listed in the Australian market. Reddy and Fu (2014) uses only a single screening method to compare the performance of Australian stocks relative to their counterparts. Further, it investigates directly the impact of financial ratios used in the quantitative screening stage on the performance of compliant stocks. Our approach differs to Ashraf et al. (2017) which use single proxies for leverage and investment in real assets.

2.3 SHARIAH SCREENING

There exist a large number of Shariah service screening providers as a result of various interpretations of Shariah compliancy by each individual Shariah service screening provider's board. While some of these providers resemble in their applied screening criteria, wide divergence exists in screening methodologies applied by other screening providers. Derigs and Marzban (2008) and Ho (2015) provided a detailed comparative analysis to highlight the

variances of the Shariah screening methods and principles practiced by these Shariah service screening providers. In our analysis, we rely on these studies to identify only those that differ largely in terms of screening criteria applied to highlight the discrepancies amongst their employed screening criteria including (the type of denominator used, thresholds, screening for NPI) and then examine their impact on the performance of stocks. Our 12 screening methods consist of a regulator (AAOIFI), commonly used international index providers (DJMI, S&P, MSCI and FTSE), Shariah service providers (AZZAD, SHARIAH CAPITAL and Almeezan) and banks (HSBC and DIB).

To be qualified as SC, stocks must pass both qualitative and quantitative screens set by Shariah boards. The qualitative screens, also known as business screens, exclude stocks for firms that undertake core business activities prohibited by Shariah law. Stocks thus cannot reflect a prohibited core business, or one involved in any major way in impermissible activities. After passing these qualitative screens, the remaining stocks are passed through quantitative screens, also known as financial ratio screens, which require debt, cash and cash equivalents, accounts receivable, and income from non-permissible activities to be below or equal to certain threshold values. In this chapter, 10 Shariah screening methods are engaged, as employed by a regulator, four index providers, three Islamic service providers, and two banks[14]. Shariah Capital and Dubai Islamic bank use both total assets (TA) and the 12-month average market value (AMV) of equity as denominators for financial ratios in their quantitative screens. Each of these is thus considered as a separate screening method, bringing the total number of screening methods to 12.

The qualitative screening methods are categorised into two groups: one group includes those that screen for prohibited core businesses and the other group includes those that screen for any involvement in prohibited business activities.

[Insert Table 2.1]

Table 2.1 shows that four out of the 10 Shariah qualitative screening methods examined screen for involvement in prohibited activities, while the remainder screen for prohibited core business activity. It should be noted that only minor differences exist with respect to qualitative sector screens. An example of a minor difference among the providers is whether media agencies,

[14] Refer to the Appendix for more details.

meat production, biotechnology, and trading in gold and silver as cash are considered Shariah compliant or not. However, large differences exist between the quantitative financial screens used by the different screening methods, as shown in Table 2.2.

[Insert Table 2.2]

These major differences include:

i) The use of average market value of equity (AMV) versus total assets as the ratio divisor: Some screening methods use market value of equity as it allows continuous Shariah screening, as market value is independent from the publication of financial statements and can be directly calculated from market prices. This divisor can also be set to any of 12m, 24m, or 36m AMV. Other screens use total assets as a divisor, however, arguing that this is the more appropriate measure as it ensures that companies are valued from a trusted accounting perspective and that each measurement is independent of any external market influences or speculation (Derigs & Marzban, 2008).

ii) The range of threshold values: Table 2.2 shows that screening methods differ in terms of the thresholds used to restrict ratios.[15] However, the most frequently applied threshold used for both debt (D) and interest (CCE) ratios is 33 percent. Obaidullah (2005) explains this level based on the Hadith of the Prophet PBUH[16]: "One third is too much", and the Fiqh rule[17]: "Whether a commodity that is part gold and part brass qualifies as gold for purposes of applying the rules of Riba is resolved by the percentage of gold in the commodity, e.g., if greater than a third, it is gold". With respect to accounts receivable (AR), a larger threshold dispersion, ranging from 33 to 80 percent, is found among the different screening methods. Usmani (2002) provides some of the reasoning behind this large range, relying on the Hadith as above to explain the 33 percent level, but arguing that for the liquidity thresholds between 45 and 50 percent, some Shariah screening boards are of the opinion that the proportion of illiquid assets must be larger than that of liquid assets, based on the juristic principle: "The majority deserves to be treated as the whole thing". For liquidity thresholds above 70 percent, he asserts that Shariah scholars from Pakistan and India who follow the Hanafi school[18] of thought argue that the portion of liquid or illiquid assets to total assets is not critical if, and only if, the illiquid

[15] See Appendix A (Section 2.9) for more details on the financial ratios used in screening.
[16] Peace Be Upon Him.
[17] Fiqh is the Arabic word for knowledge derived from Shariah.
[18] A major Islamic school of thought in the Arabian Peninsula.

portion of total assets is not an insignificant quantity (in the case of Almeezan, this is deemed to be at least 20 percent).

2.4 HYPOTHESES DEVELOPMENT

Research on Shariah investment screening, in particular the impact of screening methods on stock performance, is scarce. Based on an ethical framework drawing from Shariah principles, Islamic investment experts suggest that compliant stocks may perform better than conventional stocks, as firms involved in highly leveraged debt, speculative, and unsound activities that are not backed up by real assets will be automatically excluded from the resulting investment universe. Advocates for Islamic finance argue that the unique requirements necessary for firms to be considered Shariah compliant, such as low debt and business activity selection, could contribute to better performance (McGowan & Junaina, 2010). Further, scholars claim that even though the quantitative thresholds are exogenously identified by a Shariah board, Shariah screening should be positively related to performance. Pepis and de Jong (2019) find that Shariah-compliance has a positive impact on the overall financial performance of firms. The authors attribute this positive performance to the Shariah quantitative screens, arguing that these screens could be considered extensions of sound business practices that promote accountability, transparency, and fairness. Ashraf and Mohammad (2014) find that Shariah-compliant equities tend to outperform their conventional counterparts in periods of market downturn. The authors attribute this phenomenon to the unique leverage and lending restrictions imposed by Shariah law. Ahmed (2010) argues that, in Islamic investments, financial flow (profit) and productivity are particularly strongly linked, where productivity refers to reliance on internal business activities and financing to produce profit. Thus, limiting the level of debt, the income reaped from interest, and the level of liquid assets should have a positive impact on performance. These fundamental characteristics of Shariah-screened investments may also contribute towards encouraging transparent and real business activities and isolating firms from potential risks and downturns such as general financial crises. In this way, they may contribute positively to the performance of stocks. However, Akhtar and Jahromi (2017) argue that restricting an asset universe will have a negative impact on performance as Islamic portfolios tend to exclude stocks of types which have been shown to have high returns.

One obvious question is whether different Shariah screening result in differences in portfolio constituents and performance. Ashraf and Khawaja (2016) noted that the difference of opinion

based on qiyas, an independent opinion of a scholar or group of scholars, may have different practical implications such as the availability of several different Shariah guidelines for equity screening. Therefore, screening methods differ in their screening criteria applied as highlighted in section 2.3 in page 33. In addition, empirical evidence signals that the screening criteria applied may have an influence on the performance of compliant stocks. For example, Ashraf et al. (2017) find that portfolios compliant under the book-value based MSCI screening method underperform the benchmark in Europe, whereas portfolios compliant under the market-value based AAOIFI screening method perform similar to the benchmark in Europe. Ashraf et al. (2017) also show that restrictions on leverage and liquidity affect the performance of Islamic Equity Performance. Therefore, our study concentrate on adding value to the literature by examining whether various screening criteria employed by multiple screening methods differ in their impact on the performance of compliant stocks.

On the basis of these various lines of reasoning, the following main hypothesis is thus formulated in relation to the impact of screening on stocks' performance:

Hypothesis 1: There is a relationship between Shariah screening and the performance of stocks.

This chapter also examines the impact of different screening variables (quantitative ratios) on the performance of compliant stocks, based on the expectation of a negative relationship between the debt ratios used in the quantitative screening and compliant stocks' performance. This is based on the argument that limiting the ability of compliant stocks to achieve external financing will have an adverse impact on the performance of such stocks.

Numerous studies have been conducted to examine the relationship between financial leverage and firm performance. However, empirical evidence regarding this relationship remains, at best, mixed, and it is often contradictory. Researchers explain the gains and costs of debt financing in general terms using two dominant theories: trade-off and pecking order. According to trade-off theory, balancing the different benefits and costs associated with debt financing should determine the optimal capital structure of a firm. Modigliani and Miller (1963) propose that a firm can benefit from debt financing through the creation of tax shields (saving) generated by the deductibility of interest expenses from the pre-tax income of such firms. Williams (1987) proposes that a firm can benefit from debt financing by reducing agency costs based on the threat of liquidation, which would cause personal losses to managers with respect

to salaries, reputation, and perquisites, thus leading to an increased need to generate cash flow to pay interest payments. Jensen (1986) points out that high leverage can also enhance a firm's performance by mitigating conflicts between shareholders and managers concerning free cash flow. In addition, issuing risk-free debt will increase the present value of firms by inducing optimal investment strategies, according to Myers (1977) and Jensen and Meckling (1976).

Debt costs include direct and indirect bankruptcy costs, and the bankruptcy likelihood of a firm, namely its probability of defaulting on its commitment to pay back any periodic interest and the principal borrowed, increases with debt level, which increases the fear that the company might not be able to generate enough future cash flows to meet its liabilities. However, several researchers suggest that the tax savings associated with debt override the relatively small bankruptcy costs (Miller, 1977; Gruber & Warner, 1977). Thus, according to trade-off theory, more profitable firms have higher incomes to shield and thus should borrow more to take advantage of tax breaks. Consequently, leverage and firm performance are expected to be positively correlated, and several empirical studies provide evidence supporting this positive relationship between debt level and firm performance (Roden & Lewellen, 1995; Champion, 1999; Hadlock & James, 2002; Berger & Di Patti, 2006).

The need to balance the gains and costs of debt financing is also relevant to the pecking order theory developed by Myers (1984) and Myers and Majluf (1984), which is expressed based on the notion of asymmetric information. This theory points out that the existence of information asymmetries between managers and investors with regard to investment opportunities causes the market to undervalue a firm's new shares compared to the value at which a firm would be assessed if managers revealed all information about their firm's investment opportunities to the market. This means that issuing new shares may harm existing shareholders through value transfer from old to new shareholders, however, and managers thus prefer to rely on internally generated profits such as retained earnings, where there is no existence of information asymmetry, seeking external financing via debt if additional funds are needed; only then will they issue equity to cover any remaining capital requirements. Thus, according to the pecking order theory, there is a hierarchy of firm preferences with respect to the financing of their investments. Firms that are profitable (and therefore generate high earnings to be retained) are expected to use less debt in their capital structures than those that do not generate high earnings, as the former are able to finance their investment opportunities with retained earnings. Consequently, leverage and firm performance are expected to be negatively correlated. Several

researchers have investigated the effects of profitability on firm leverage and there is some empirical evidence to support this negative relationship between debt level and firm performance or profitability (Rajan & Zingales, 1995; Fama & French, 1998; Booth et al., 2001; Wald, 1999).

In this context, Lamont et al. (2001) find that financial constraints such as the inability to borrow do affect firm value and that firms constrained in such a manner earn lower returns that unconstrained firms. Ashraf et al. (2017) similarly find that the coefficient of the leverage factor for Islamic equity portfolios for the USA and Japan that follow the MSCI screening criteria is negative and significant. The authors thus argue that investors following the MSCI criteria have, on average, diminished returns performance due to the avoidance of leverage. This leads to the following hypothesis:

Hypothesis 2: The restriction of financial leverage affects performance negatively for compliant stocks.

A positive relationship between the liquidity ratios (AR, CCE, and ARCCE) and the performance of compliant stocks is also predicted, based on the argument that investing in liquid assets to a certain portion of total assets or market value of equity will boost the performance of compliant stocks.

Prior studies have also tested the relationship between working capital management and firm performance with mixed evidence emerging to support three views of working capital investment. One view suggests that higher working capital levels can enhance firm value by increasing sales and generating greater discounts for early payments (Deloof, 2003). However, the second view proposes that higher working capital levels require financing and that consequently, firms incur additional financing expense which can distort value in cases where firms default on their liabilities (Kieschnick et al., 2013). The third view suggests that there exists an optimal level of investment in working capital that balances costs and benefits and thus also maximizes a firm's value (Baños-Caballero et al., 2014).

The question of whether holding cash is profitable for firms is also been a debatable issue amongst academics. Academics have two competing views, which are traceable to agency theory and behavioural theory and to empirical studies on both cash specifically and slack more generally. Under one view, holding more cash than necessary for transactional needs makes

no financial contribution to firm value as it incurs large opportunity costs and earns very low measurable returns; it is therefore seen as symptomatic of managerial inefficiency or self-serving behaviours (Jensen, 1986; Leibenstein, 1966). On the other hand, other scholars have identified strategic benefits to holding slack generally, and cash more specifically, such as George (2005), O'Brien and Folta (2009), and Kim and Bettis (2014). Kim and Bettis (2014) in particular find that shareholders can benefit from high levels of cash holdings as firms' returns to cash continue to increase far beyond transactional needs. Ashraf et al. (2017), however, find a negative and significant relationship between investment in real assets and the performance of Islamic equity portfolios (IEPs) following MSCI criteria. They argue that investors in IEPs incur a sacrifice cost for investing in companies with higher investment in physical assets. The following hypothesis thus emerges:

Hypothesis 3: The restriction on investing in firms with liquid assets is expected to affect performance positively for compliant stocks.

No relationship is expected between the NPI ratio and the performance of compliant stocks, based on the argument that the business structure of compliant stocks relies mainly on real business activities for the derivation of income and generation of profit. This gives less priority to and concentration on income derived from risky activities such as speculation or high return-high risk investments. Consequently, this will not contribute much to the overall performance of compliant stocks, leading to the following hypothesis:

Hypothesis 4: The restriction on investing in prohibited business activities is expected to have no significant impact on the performance of compliant stocks.

2.5 SAMPLE AND MODELS

2.5.1 Sample

The dataset used consists of traded prices and financial ratios for a number of stocks listed on the ASX 200 as obtained from the Securities Industry Research Centre of Asia-Pacific (SIRCA) database for 2001 to 2012. SIRCA provides comprehensive data collections that cover all financial aspects including financial and accounting attributes of a company with common identifiers from Australia, New Zealand, and USA. Also, we manually collected data on stocks' core business activities and some financial ratios using Morningstar "Data Analysis Premium". For each year, the financial ratios are calculated based on the figures disclosed in semi-annual

and annual financial reports, and the subsequent screening is performed using each of the screening criteria outlined by the selected Shariah service providers (see Tables 2.1 and 2.2 in Section 2.3). The total number of stocks is 437 with 10,488 observations in our panel data.

The ASX200 constituents were chosen primarily for the following reasons:

1. The ASX200 represents the major component of the Australian market. Although Australia is not an Islamic country, the trend shows that investors are seeking alternative types of investment that are either ethical or have potential to hedge against risk. Therefore, our study has potential to benefit the regulators, fund managers, investment analysts, and general investors in terms of gaining better understanding of the similarities and differences between the conventional and Islamic stocks

2. No study has yet examined the impact of screening methods on the performance of compliant stocks using an Australian based data.

Semi-annual figures are collected on 31st of December of each year whereas annual figures are collected on 30th of June of each year. Accounting for semi-annual and annual figures provides a detailed analysis by allowing the compliance status of each stock to be monitored every six months. Even in a case of overlap, this issue is accounted for. For instance, a stock might be compliant up to the first half and turns to be non-compliant at the end of the year. The opposite is also true.

2.5.2 Models

In this chapter, ROE is used as an accounting measure, while excess returns and the Sharpe ratio are used as market measures for the performance of stocks. Accordingly, the following regression model applies when ROE is used:

$$ROE_{i,t} = \alpha + \gamma X'_{i,t} + \delta D'_{i,t} + \varepsilon_{i,t} \quad (2.1)$$

where ROE = $\frac{\text{Net Income}}{\text{Total common shareholders Equity}}$; α is the constant term; $X'_{i,t}$ is the set of all of the different ratios used in quantitative screening; $D'_{i,t}$ is the set of all of the different screening dummies applied; and ε_{it} is the error term. This performance measure is the most widely used measure of corporate financial performance, as seen in Rappaport (1986), Stowe et al. (2002), Correia et al. (2003), Firer et al. (2004), and Monteiro (2006). γ captures the potential impacts

of various financial ratios on the performance measure and δ captures the potential impacts of various screening methods on the performance measure.

The standard CAPM model used by Sharpe (1964) and Lintner (1965) assumes that investors possess efficient diversified portfolios; hence, idiosyncratic risk is not priced. The model therefore provides no predictions in relation to idiosyncratic risk effects due to restrictions applied to Shariah-constrained investments that prohibit investors from forming diversified investments. The screening variables used in the Shariah screening process are thus added to the standard CAPM model to control for such impact and to allow analysis of the performance of compliant stocks relative to their non-compliant counterparts.

The following equations are applied when market measures are used:

$$Excess\ Return_{i,t} = \alpha + \beta(R_{mt} - R_{ft}) + \gamma X'_{i,t} + \delta D'_{i,t} + \varepsilon_{i,t} \quad (2.2)$$

$$Sharpe\ Ratio_{i,t} = \alpha + \gamma X'_{i,t} + \delta D'_{i,t} + \varepsilon_{i,t} \quad (2.3)$$

Where Excess Return = $R_{i,t}$ - R_{ft} and SR= $\frac{R_{i,t} - R_{ft}}{\sigma_{i,t}}$; $R_{i,t}$ is the stock's monthly return at time t, calculated as $R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$, $P_{i,t}$ is the company's adjusted price at time t, $P_{i,t-1}$ is the company's price at t -1, and $\sigma_{i,t}$ is the standard deviation calculated using a rolling window of 12 months of monthly returns; α is the relative abnormal return of the ith stock; R_{mt} is the monthly return of the ASX 200; R_{ft} is the risk-free rate, proxied by 1-month bank acceptable bills; $X'_{i,t}$ is the set of all ratios used in quantitative screening; $D'_{i,t}$ is the set of all of the different screening dummies; and $\varepsilon_{i,t}$ is the error term. β, γ and δ are the unknown parameters to be estimated.

2.6 COMPLIANT UNIVERSES AND DESCRIPTIVE STATISTICS

2.6.1 Screening methods and the size of Shariah-compliant universes

The core business activity for each firm is identified so that qualitative screening can be applied as per each Shariah screening method (Table 1, Section 2.3). The core business activity thus acts as a screen through which Shariah can exclude companies operating mainly within non-permissible business areas. A company is automatically dropped from the qualitatively compliant universe if it mainly derives its income from prohibited business activities. The different types of financial ratios used in the quantitative screening of each screening method

are also calculated so that screening may be performed using each of the screening criteria outlined by the individual Shariah service providers (Table 2.2, Section 2.3). It is most likely that the business activities and structure of stocks may change during a year. Thus, we repeat the screening every six months throughout the sample to account for any changes, and a dummy variable is allocated for each screening method. This takes a value of 1 if the stock passes the screening for a given Shariah service provider or a value of 0 if the stock does not pass such screening.

[Insert Table 2.3]

Table 2.3 presents the compliant universes and rankings derived from the various Shariah screening methods. We use the same terminology used in the literature to classify screening methods as conservative or liberal.[19] Four groups of screening methods are then identified according to the size of their universes from the total number of stocks in our sample (column 7, Table 2.3): most conservative (universe of less than 30%); conservative (universe of between 30% and 50%); liberal (universe of between 50% and 70%), and most liberal (universe greater than 70%)**.**

The table reveals that different screening methods produce different-sized compliant universes. Specifically, the results indicate that screening methods that do not screen for NPI ratio are more liberal, resulting in an average universe size of 53.68% of the total number of firms, while screening methods that use the NPI ratio may be most conservative, conservative, or liberal resulting in an average universe size of 42.10% of the total number of firms. Excluding AAOIFI, it is obvious that the NPI ratio has an adverse effect on the size of the resultant stock universe. An example can be drawn by comparing SP (34.9%) and HSBC (51.85%), which use similar thresholds and denominators; unlike HSBC, SP screens for NPI. However, using total assets or market value in the financial ratios appears to have no impact on the size of the resultant universe; thus, DJMI (24m AMV), HSBC (36m AMV), Shariah Capital (12m AMV), and Shariah Capital (TA) are all liberal in terms of the size of their compliant universes despite the fact that they all use different denominators. Furthermore, the statistics reveal that differences in debt, receivables, and C&CE ratios have relatively small impacts on the resulting universes; thus, even though these screens vary significantly across the most conservative, conservative, and liberal methods, their impact is relatively small. The difference between the

[19] Derigs and Marzban (2008, 2009) analyse the impact of different screening methods on the compliant universe size and use classifications from very conservative to more liberal.

smallest universe of a conservative method (SP) and the universe of the single most conservative method (MSCI) is only 6.08% (34.91% – 28.83%). Similarly, the range of conservative methods' universes is 2.1% (FTSE 37.01% – SP 34.91%); the range of liberal methods' universes is 7.47% (Shariah capital MV 59.07% – DJMI 51.60); and the difference between the smallest universe for a liberal method (DJMI) and the largest universe of a conservative method (FTSE) is just 14.59% (51.60 – 37.01). Overall, it seems that Shariah capital (MV) and AAOIFI with 12 months' averaging allow larger universes to be developed as compared to other methods such as MSCI. However, it remains important to analyse the impact of these methods on stock performance in order to investigate whether or not the difference in the size of the universe have any implications for performance.

2.6.2 Difference in means

D, AR, CCE and AR&CCE of compliant stocks are subject to thresholds applied by different screening methods employed in our chapter. For instance, a stock is compliant under DJMI if D<33%, AR<33% and CCE <33%. Therefore, complaint stocks' ratios certainly differ in their means as compared to non-compliant stocks. We perform a t-test to test for equality in means of these ratios between the compliant and no-compliant stocks by each screening methods. Results indicate that Shariah screening methods differ significantly in their criteria applied to financial ratios (Refer to Table 2.12 in Appendix A).

2.6.3 Descriptive Statistics

Table 2.4 shows the descriptive statistics for ROE, Excess returns, and Sharpe ratio for the full sample and compliant and non-compliant stocks under each screening method used in the chapter. Overall, this shows that stocks in the sample have, on average, a positive ROE (0.062), with negative excess returns (-0.053) and Sharpe ratios (-0.015), as seen in Panels A, C, and B, respectively. Further, the statistics in Panel A indicate that the mean and median values of compliant stocks' ROEs are different from those of non-compliant stocks. For instance, Panel A shows that compliant stocks under FTSE, MSCI, Almeezan, and Shariah Capital (TA) display more important ROE differences at smaller standard deviations than non-compliant stocks, while compliant stocks under AAOIFI, AZZAD, and SP display more important ROEs at greater standard deviations than non-compliant stocks. However, compliant stocks under HSBC, DJMI, DIB(TA), DIB(MV), and Shariah Capital (MV) show smaller ROEs than non-compliant stocks at larger standard deviations. Furthermore, the results show some variation in

compliant stocks' ROEs from one screening method to another. On average, compliant stocks under the FTSE criteria show a ROE of 0.101, which is smaller than Almeezan at 0.129 and AZZAD with 0.134, but greater than those compliant under the remaining screening methods.

[Insert Table 2.4]

The results in Panels B and C confirm that compliant and non-compliant stocks also differ in their excess returns and Sharpe ratios from one screening method to another. The skewness and kurtosis of the three performance measures for compliant and non-compliant stocks under the various screening methods can also be seen, and there is at least some deviation from the normal distribution for each performance measure under each screening criterion. In general, Table 2.4 indicates that the excess returns of compliant stocks in Panel C have a negatively skewed distribution, while a positively skewed distribution is seen for compliant stocks' ROEs and Sharpe ratios in Panels A and C. All three measures under each screening method also show excessive kurtosis, implying fat-tailed distributions. A test for non-normality is conducted, but its details are not reported for simplicity. The general outcome of these primary results is that there is a difference in performance between compliant and non-compliant stocks.

2.6.4 Multicollinearity

We have checked for multicollinearity issues given the fact that financial ratios are used over the years using the variance inflation factor (VIF). VIF measures the degree of multi-collinearity of the independent variable with the other independent variables. Most commonly, the rule of 10 associated with VIF is regarded by many practitioners as a sign of severe or serious multi-collinearity (Miles, 2014). Results indicate that the VIF for all variables is less than 10 indicating no multicollinearity issues (Refer to Table 2.13 in Appendix A).

2.7 EMPIRICAL RESULTS AND DISCUSSION

This section focuses on the empirical results of panel regression analysis. Return on equity (ROE), excess returns, and Sharpe ratio are used as measures of performance in the models, acting as dependent variables. The independent variables are: a) the screening variables, which include the ratios used in quantitative screening; and b) the allocated screening dummy for each screening method used in the chapter. To distinguish between the random effects and fixed effects model, the (Hausman, 1978) specification test is applied. Hausman test decided fixed effect for our panel analysis. Specifically, the fixed effect absorbs the time invariant characteristics of the firm, which mitigates endogeneity (Wooldridge, 1995). We also perform our analysis using clustered standard errors by stock. Clustering tends to correct for

heteroscedasticity and serial correlation ((Arellano, 1987); (White, 2014)). Regression models are estimated for the whole sample, as well as for the compliant and non-compliant sub-samples. For the full sample, multiple estimations are performed by substituting in different financial ratios with their respective screening methods (dummy) for various regressions[20] (Table 2.2 presents the criteria for each screening method).

For the compliant and non-compliant sub-samples, each performance measure is regressed on the financial ratios employed by each screening method in a separate estimation. The NPI ratios are only used in regressions with compliant stocks. The results are then divided into three sections, one for each performance method used. The same style of reporting results is maintained throughout.

2.7.1 Performance analysis using ROE

2.7.1.1 Shariah service providers using TA

Table 2.5 shows the coefficient estimates for the regression models using ROE as a dependent variable. The results are shown in the three panels of the table. Panel A presents estimates for the whole sample, including compliant and non-compliant stocks; Panel B shows results for the fully compliant stocks by screening method; and Panel C shows results for their non-compliant counterparts. Those results that are statistically significant at the 10 percent level or lower are then discussed.

[Insert Table 2.5]

The results reported in models 1 and 2 in Panel A show a positive relationship between the FTSE and Almeezan screening methods and the ROE of the entire sample of stocks. Compliant stocks under the screening criteria used by FTSE and Almeezan can increase their ROE by around 2 percent relative to the sample average. In contrast, models 1 and 2 also show a negative relationship between MSCI and DIB (TA) and ROE for all stocks. Based on these results, the null hypothesis under Hypothesis 1 is rejected. On average, compliant stocks following the criteria of these screening methods will show diminished values of -1.9 percent and -1.5 percent, respectively, in their ROEs relative to the all-stocks average. The Shariah capital (TA) screening dummy is found to be statistically insignificant, thereby we cannot reject

[20] Shariah service providers that use the same denominator and the same quantitative ratios are grouped into a single regression. For example, FTSE, MSCI, and Almeezan use the same set of financial ratios at different thresholds, and these are therefore grouped into one regression (model 1 of Table 4).

the null of hypothesis 1. This implies that there is no difference in performance between fully compliant stocks following the screening criteria of Shariah capital (TA) and the performance of all listed stocks. These findings reflect the ongoing debate in the literature about the relative performance of Shariah compliant investments against conventional investments. In terms of stocks, Farooq and Alahkam (2016) find that compliant firms in the Mena region significantly underperform their non-compliant counterparts.[21] Setiawan and Oktariza (2013) and Akhtar and Jahromi (2017) find no statistical differences between the performance of compliant and non-compliant stocks, however. The current results show that this variation in performance of Shariah compliant stocks is driven by the choice of Shariah screening method.

In relation to financial ratios, the main independent variable, debt to total assets (D), is negatively and significantly associated with the ROEs of all Australian stocks in the sample. The significant coefficients of D in models 1 and 2 show that an increase in debt ratio has a negative impact on the ROE of all stocks by -7 percent to -10 percent. This suggests that the costs related to high leverage can have an adverse impact on the performance of stocks in the sample. With respect to liquidity ratios, the accounts receivable (AR) and cash and cash equivalents (CCE) to total asset ratios are found to be positively and significantly associated with the ROEs of all Australian firms in the sample. An increase in AR in model 1 positively influences the ROE of all stocks by 12.1 percent, while an increase in the CCE ratio positively contributes to all-stock performance by 7.8 percent; an increase in the combined ratio (AR&CCE) as seen in model 2 is associated with an increase in the whole sample's ROE of 6.6 percent. These findings suggest that that higher working capital and cash levels can enhance stock performance. Detailed discussion on theoretical views and on the literature studying the relationship between both leverage and liquidity and performance is presented in section 2.4.

In Panel B, the coefficient of debt ratios (D) for the compliant stocks in models 3, 4, 6, and 7, following the screening criteria of FTSE, MSCI, Shariah capital (TA), and DIB (TA), respectively, are negative and significant at the 5 percent level, thereby rejecting the null of hypothesis 2. This implies that the inability of compliant stocks that follow these screening methods to borrow additional money results in a decrease in their ROE by between 12 and 18 percent. The restriction offered by the one third threshold on debt financing applied by these

[21] Other studies conducted by Al-Khazali et al. (2014), Ho et al. (2014), Jawadi et al. (2014), and Ashraf and Mohammad (2014) on Islamic indexes report that Islamic stock indexes outperform their peers.

methods appears to limit the ability of compliant stocks to access external funds, consequently leading to lower ROEs.

With respect to the liquidity ratios, the coefficient of AR ratios for compliant stocks following the screening criteria used by FTSE, MSCI, Almeezan, and Shariah capital (TA) in models 3, 4, 5, and 6 are positive and significant at the 1 percent level, though only the coefficient of CCE ratio for compliant stocks following the FTSE screening criteria is positive and significant at the 10 percent level. Based on these results, we can reject the null of hypothesis 3. These results imply that limiting liquid assets below the threshold applied by screeners enhance the profitability of compliant stocks. The results also reveal that allowing a large portion of investment to be held in liquid assets, as in the case of Almeezan (80 percent), fails to add additional value to compliant stock performance relative to the more stringent restrictions applied on liquidity ratios by the other screening methods. The AR ratio with a threshold of 33 percent, as per the MSCI screening criteria, contributes 28.2 percent to the ROE of compliant stocks as compared to the 26.1 percent seen with Almeezan's threshold of 80 percent. Models 3, 4, and 5 in Panel B also indicate significant and negative coefficients of NPI ratios for compliant stocks following FTSE, MSCI, and Almeezan criteria, thereby rejecting the null of hypothesis 4. This implies that the restriction on investing in prohibited business activities incurs a cost that negatively affects the performance of compliant stocks. The general significance of financial ratios suggests that the financial screening criteria do have an impact on the performance of compliant stocks.

In Panel C, for non-compliant stocks identified using the screening criteria of FSTE, MSCI, Shariah capital (TA), Almeezan, and DIB (TA), the coefficients of debt ratios in models 8, 9, 10, and 12 are negative and significant, while the coefficients of AR ratios in models 8, 9, 10, and 11 are positive and significant. This indicates that releasing limits on the access firms have to external financing has a negative impact of between 7 to 8 percent on their performance. However, the opposite applies to investing in liquid assets, which boosts ROE by 10 percent.

2.7.1.2 Shariah service providers using MA

Table 2.6 presents the regression results for the various Shariah screening providers that use market value of equity as the denominator for screening ratios. Similar to the results described in Section 2.7.1.1, the relationship between each of these screening methods and accompanying

ratios and stock ROEs is examined. The regression models in this section also follow the same regression model style seen in the previous subsection, here being numbered from 1 to 20.

[Insert Table 6]

Panel A of the table shows HSBC to have a significant and negative coefficient of -2.4 percent in model 1, and S&P and AZZAD to have significant and positive coefficients of 3 percent in model 1 and 2.9 percent in model 3, respectively, at the 1 percent level of significance, thereby rejecting the null of hypothesis 1. This implies that fully compliant stocks following the HSBC screening criteria underperform the all-stocks from the sample, whereas those that are fully compliant under the screening criteria of S&P and AZZAD perform better than average. However, the coefficients of DJMI, Shariah capital (MV), AAOIFI, and DIB (MV) are insignificant, suggesting that compliant stocks following the screening criteria of these screening methods perform similarly to the all-stocks sample. This again supports the view that the performance of compliant stocks is driven by the choice of screening method. The results in Panel A also show a negative and significant relationship between the ROE of the sample and debt to 36m AMV (in model 1), debt to 24m AMV (in model 2), and debt to 12m AMV (in models 3 to 6) at the 1 percent level of significance**.** The negative economic impact varies from 10 percent to 13 percent, suggesting that an increase in firms' leverage level will have an adverse impact on their profitability. The results suggest that the issuing of more debt will harm the ROE of most Australian firms in the sample. The results in models 1 and 2 of Panel A also show that the AR to either 36m or 24m AMV is positively and significantly correlated with the ROE of all stocks at the 1 percent level of significance, indicating a positive contribution of 12.9 percent and 11 percent, respectively, to stocks' ROE. The CCE to 36m AMV is also positive and significant at the 10 percent level.

For the fully compliant stocks seen in Panel B, debt to various denominator ratios are found to be negatively associated with the ROEs of compliant stocks following the screening criteria of each screening method examined in models 7 to 13. Moreover, the coefficient of debt to 12m AMV ratio for compliant stocks has a higher impact than debt to either 36m AMV or 24 m AMV. In contrast, CCE to either 36m AMV, as seen in models 7 and 8, or 24m, as in model 9, is found to be strongly significant and positively associated with the profitability of compliant stocks following HSBC, S&P, and DJMI. However, the results offer only weak statistical evidence in relation to the coefficient of CCE in model 11 for compliant stocks following Shariah capital (MV) and the coefficient of ARCCE in model 13 for compliant stocks following

DIB (MV). As with the results in Section 2.7.1.1, these results imply that compliant stocks following all screening methods that use average market value of equity as a denominator have, on average, diminished performance due to avoidance of leverage. However, compliant stocks benefit from investing in liquid assets and slack resources, including cash, when allowed a threshold level of between 33 and 49 percent. The coefficient of NPI in model 13 is negative and significant for compliant stocks following DIB (MV) screening criteria, suggesting that the restriction on investing in non-permissible activities incurs a cost that negatively affects the performance of compliant stocks. Based on these results, we reject the null of hypotheses 2, 3 and 4. For the non-compliant stocks seen in Panel C, the results strongly confirm the negative impact of debt over various denominators on the ROE of non-compliant stocks. Mixed evidence relating to liquidity ratios is also found. The CCE to 36m AMV in model 14 is significantly positively related to the ROE of non-compliant stocks following HSBC screening at the 10 percent level, while the CCE to 12m AMV in model 18 is negatively related to the ROE of non-compliant stocks following Shariah capital (MV) screening rules. It appears that the adjustment from 36m (HSBC) to 12m (Shariah capital (MV)) in the denominator, based on the market value of equity, may allow the acquisition of poorly performing liquid stocks that contribute negatively to the performance of non-compliant stocks. Similar reasoning may apply to the ARCCE seen in model 20. Further discussion on the relationships between leverage, working capital, financial slack, and the performance of firms is provided in Section 2.4.

The overall empirical results of this subsection indicate that the choice of screening methods has some impact on the performance of compliant stocks. Consistent with the previous subsection, avoidance of leverage and investment in prohibited activities tend to have an adverse impact on the performance of compliant stocks in contrast to the positive impact of investing in non-real (liquid) assets. Ashraf et al. (2017) define real assets as physical assets calculated as [Total assets − (cash + account receivables + intangibles)]. We meant by non-real assets (liquid) assets are those non-physical assets. In other words, liquid assets such as AR and CCE.

2.7.2 Performance analysis using excess returns

2.7.2.1 Shariah service providers using TA

Table 2.7 provides the results for the CAPM model with dependent variables when TA is used as a denominator by Shariah screening providers.

[Insert Table 2.7]

Panel A in the table shows a negative and significant coefficient for MSCI of -4 percent at the 5 percent level, thereby we can reject the null of hypothesis 1. However, the remaining screening dummy variables are statistically insignificant, thereby we cannot reject the null of hypothesis 1. These results supports Ashraf and Khawaja (2016), who find that the Shariah screening standards are insignificant in terms of their effects on returns performance. Compliant stocks following MSCI screening criteria underperformed all listed stocks, which again supports the view that being ethical does not provide additional value to performance. The screening criteria applied by MSCI is picking a portfolio of stocks that is different in its structure from a portfolio picked by other screening methods. Empirical evidence shows that the application of different screening criteria employed by various screening methods to same universe of stocks results in different composition of portfolio under each different screening methods (Derigs and Marzban, 2008); (Ho, 2015). This holds consistent in our study and leads as per our findings to different impact on performance.The results in Panel A also show insignificant Jensen alphas, indicating no significant difference in performance compared to the market overall. Models 1 and 2 show positive and significant betas, suggesting positive exposure to market benchmarks. With respect to the screening variables, the coefficients of AR to total assets in model 1 and AR&CCE in model 2 are positive and significant, indicating positive impacts of 32 percent and 18 percent, respectively, on the excess returns of all stocks.

For the compliant stocks in Panel B, the results reveal a negative and significant coefficient of debt to total assets for those following FTSE, Shariah capital (TA), and DIB (TA) screening criteria, while this effect is insignificant for compliant stocks following MSCI and Almeezan screening criteria. However, the signs and the level of significance are notably different for all AR ratios in all models in Panel B, with AR and AR&CCE positive and significant at the 1 percent level. In a similar context, Ashraf et al. (2017) find a negative and significant relationship between the returns of Islamic equity portfolios following MSCI criteria and investing in physical assets, arguing that investors in IEPs incur a sacrifice cost for investing in companies with higher levels of investment in physical assets.

Consistent with the results in the previous section, the coefficient of NPI is also negative and significant, and the same conclusion as seen in the previous section can be drawn in relation to restricting debt and investment in non-permissible activities and allowing investment in firms with liquid assets and the associations of these factors with the performance of compliant

stocks. Panel C shows weak statistical evidence for a relationship between debt ratios and the performance of non-compliant stocks in models 8, 9, and 10; however, the results reveal a strongly significant relationship between AR and ARCCE and the returns performance of non-compliant stocks. A negative sign to the debt ratio is found in prior studies by Penman et al. (2007), Dimitrov and Jain (2008), George and Hwang (2010), and Cai and Zhang (2011), who investigate the relationship between leverage and stock returns; however, other studies by Bhandari (1988) and Sivaprasad and Muradoglu (2009) find that returns increase with leverage.

2.7.2.2 Shariah service providers using MA

[Insert Table 2.8]

Panel A in Table 2.8 shows a negative and significant coefficient of DJMI at the 5 percent level, indicating a negative contribution to the excess returns of all listed stocks. The other dummy variables are statistically insignificant. The constant term in models 3 to 6, where all screening methods use the 12-m AMV as a ratio divisor, is positive and significant, indicating that all listed stocks outperform the market benchmark. There is also an obvious negative impact from various debt ratios on the return performance of all stocks, whereas a statistically positive impact can be observed from AR, CCE, and ARCCE. The results in Panels B and C show negative and statistically significant coefficients of debt ratios for compliant and non-compliant stocks following each screening method, while the coefficients of AR, CCE, and ARCCE are positive and statistically significant. Again, similar conclusions can be drawn with respect to restrictions applied on financial ratios and the returns performance of compliant and non-compliant stocks.

2.7.3 Performance analysis using the Sharpe ratio

In this section, the performance of all stocks in the sample, compliant stocks, and non-compliant stocks are assessed per unit of risk using the Sharpe ratio as the dependent variable. The performance of all stocks in the sample, compliant stocks, and non-compliant stocks are compared against the market benchmark and the financial screens and screening methods (dummies) used in this chapter.

2.7.3.1 Shariah service providers using TA

Table 2.9 shows the estimation results for the full sample (Panel A) and for compliant and non-compliant stocks in Panels B and C, respectively.

[Insert Table 2.9]

Model 1 in Panel A shows a positive and significant coefficient for Almeezan (0.0115) at the 5 percent level and for DIB(TA) (0.0716) at the 1 percent level, whereas the coefficients of the remainder of the screening dummy variables are insignificant. This implies that compliant stocks following Almeezan and DIB(TA) screening criteria acquire respectively 0.0115 and 0.0716 additional profit per one unit of risk relative to all stocks in the sample, thereby rejecting the null of hypothesis 1. However, compliant stocks following the screening criteria of the other screening methods show similar profits per unit of risk as in the sample overall, thereby supporting the null of hypothesis 1. Model 1 also illustrates a positive and significant relationship between AR and the Sharpe ratio of all stocks. An increase in AR by 1 percent will lead to an increase of 0.054 in the profit per unit of risk of all stocks in the sample. For the compliant and non-compliant stocks in Panels B and C, respectively, the coefficient of AR to total assets is positive and significant in all models in Panels B and C, rejecting the null of hypothesis 3, suggesting that restrictions on investing in liquid assets to a certain threshold can enhance the profit per unit of risk for compliant stocks if following the screening criteria of all screening methods using total assets as a denominator. Similar findings as observed in the previous sections are also apparent in models 3, 4, and 7 of Panel B with respect to the negative and significant coefficient of NPI. This again suggests that the restrictions applied to investing in non-permissible activities incur a sacrifice cost, affecting the returns of compliant stocks.

2.7.3.2 Shariah service providers using MA

Table 2.10 shows that none of the screening dummy variables' coefficients are statistically significant. This indicates that compliant stocks following the screening criteria of the screening methods that use average market value of equity as a denominator have the same profit per unit of risk as all stocks in the sample. Models 3 to 6 in Table 2.10 show debt to 12m AMV is negatively associated with the stocks' Sharpe ratio while accounts receivable to 36m (model 1), 24m (model 2), and 12m in models 3 and 4 are found to be positively associated with the profit per unit of stocks.

[Insert Table 2.10]

The results in Panel B show that the AR in models 7 and 9 have a positive and significant coefficient, which suggests that allowing stocks to invest in liquid assets such as AR to a threshold of equal to or less than 33 percent, following the criteria of HSBC, and equal to or

less than 49 percent, following the criteria of DJMI, can boost the profit per unit of risk of compliant stocks by 0.18 and 0.16 respectively. Only CCE to 12m of AAOIFI in model 12 is similarly significant, indicating that compliant stocks can benefit from slack resources if allowed to invest in cash to a threshold of 30 percent.

With respect to debt ratios, Panel B shows multiple insignificant coefficients, with only the coefficient of debt to 12m for compliant stocks following the screening criteria of DIB (MV) being significant at the 10 percent level. This suggests that the inability of compliant stocks to borrow more than 37 percent of the 12m AMV diminishes their profit per unit of risk by almost 0.09. Panel C shows that the debt to 12m ratios in models 17 to 20 also have significant negative coefficients, whereas the AR to 36m in model 14 has a significant and positive coefficient.

2.7.4 Robustness Checks

2.7.4.1 Time fixed effects

Controlling for variables that are constant across entities, but which vary over time, can be achieved by including time fixed effects within the regression analysis. As a consequence, the model eliminates any omitted variable bias caused by excluding unobserved variables that evolve over time but are constant across entities. Thus, all models performed in Sections 2.7.1 to 2.7.3 were re-estimated taking this into account to validate the findings by controlling for time fixed time effects. The results are robust under such examination (Refer to Appendix B, Section 2.10).

2.7.4.2 Attrition Effect

The constituent members of ASX 200 were changing from 2000 to 2012 with a number of stocks dropped off and replaced by new stocks. Consequently, the number of SCSs was also changing not only every year but also every single data point being semi-annual and annual data. Throughout our testing and analysis, we perform a robustness test by controlling for this attrition effect. We calculate the changes in the number of stocks in year n relative to the number of stocks in n-1 and tested whether this attrition effect has any impact on our results. Results remain consistent (Refer to Appendix B, Tables 2.20 and 2.21, Section 2.10).

2.7.4.2 Macro-economic factors

The conclusions based on the hypotheses may be influenced by macro-economic factors. We address this issue by including factors such as change in GDP, interest rate, inflation rate and

firm size in our regressions. Results are valid and consistent with initial analysis (Refer to tables in Appendix C).

2.8 CONCLUSION

Shariah screening providers implement different screening criteria, and as a consequence, different thresholds are employed for the financial ratios used in such screening, in particular for leverage, liquidity, and non-permissible income ratios. These ratios can therefore be considered to be the determinants of each screening method; investigating the impact of each screening method on the performance of compliant stocks thus involves examining the relationship between each of these ratios and ensuing performance. This chapter investigates whether there is a relationship between Shariah screening methods and the performance of compliant stocks. It further examines whether the restrictions applied by different screening methods with regard to financial leverage (debt ratios), investments in liquid assets (liquidity ratios), and investments in non-permissible activities (NPI ratios) affect returns performance of compliant stocks in equally weighted portfolios. Multiple screening methods are examined with regard to their impact on Australian stocks' performance using a dataset of individual stocks**.** The impact of each screening dummy (Dummy Coef) on the performance of stocks is summarised in Table 2.11**.**

[Insert Table 2.11]

These results indicate that some screening methods, namely FTSE, Almeezan, S&P, AZZAD, and DIB(TA) have a positive impact on the performance of stocks. In contrast, other screening methods, namely MSCI, HSBC, and DJMI, are found to have a negative relationship with performance. The remaining screening methods have insignificant contributions.

This reveals that the screening criteria employed by screening methods play an important role in driving the performance of compliant stocks and thus have distinct influence on the performance of stocks. In relation to the impact of restrictions on financial ratios, the empirical evidence shows that the restriction of financial leverage and NPI affects performance negatively for compliant stocks' ratios using either total assets or average market value. However, restrictions on investing in firms with liquid assets generally affects performance positively for compliant stocks.

Overall, the results show that the criteria employed by Shariah screening do influence the performance of compliant stocks. This chapter contributes to assuaging the growing interest in ethical investments, especially Islamic investments, and the findings will be useful for investors seeking to evaluate the screening criteria currently used, as well as having relevance for scholars working on standardising such screening criteria.

Table 2.1: Qualitative Screens by different screening methods

Decision Rule	**Any Involvement**				**Core Business**					
Business Sectors	**AAOIFI**	**SP**	**DJMI**	**AZZAD**	**HSBC**	**MSCI**	**FTSE**	**DIB**	**AL Meezan**	**Shariah Capital**
Conventional financial Services	x	x	x	x	x	x	x	x	x	x
Alcohol	x	x	x	x	x	x	x	x	x	x
Pork - Related Products	x	x	x	x	x	x	x	x	x	x
Entertainment	x	x	x	x	x	x	x	x	x	x
Media Agencies (except newspapers)	x	x	x	x	x				x	
Tobacco	x	x	x	x	x	x	x	x	x	x
Insurance	x	x	x	x	x	x	x	x	x	x
Gambling	x	x	x	x	x	x	x	x	x	x
Hotels	x	x	x	x		x	x	x		x
Meat Production	x			x						
Biotechnology (cell research and cloning)	x	x			x					
Weapons and defense	x		x	x	x	x	x	x		x
Trading of Gold & Silver as Cash	x	x								

The decision rule of the qualitative process varies amongst screening providers. While some screening providers screen for any involvement (business transactions) of a company in listed prohibited business sectors, others only screen for prohibited core businesses only.

Table 2.2: Financial Screening criteria for each Shariah screening method

	Debt ratio	**Liquidity ratios**			**NP Income ratio**
Shariah Service Providers	**(D)**	**(AR)**	**(CCE)**	**Denominator**	**NPI**
With Market Value as Ratio Divisor					
DJIM	< 33%	< 33%	< 33%	24m AMV	-
S&P	< 33%	< 49%	< 33%	36m AMV	< (5%)/TR
HSBC Amanah Saudi	< 33%	< 49%	< 33%	36m AMV	-
AZZAD	< 30%	< 45%	-	12m AMV	< (5%)/TR
Shariah Capital*	< 33%	< 45%	< 33%	12m AMV	-
AAOIFI	< 30%	-	< 30%	12m AMV	< (5%)/TR
DIB*	< 30%	< 70%		12m AMV	< (5%)/OR
With Total Assets as Ratio Divisor					
FTSE	< 33%	< 50%	< 33%	Total Assets	< (5%)/TR
MSCI	< 33%	< 33%	< 33%	Total Assets	< (5%)/TR
Shariah Capital*	< 33%	< 45%	< 33%	Total Assets	-
AL Meezan	< 37%	< 80%	< 33%	Total Assets	< (5%)/TR
DIB*	< 30%	< 70%		Total Assets	< (5%)/OR

(D) refers to debt ratio; (AR) refers to Account Receivables; (CCE) refers to Cash and Cash Equivalents; NPI refers to Non-Permissible Income; TR refers to Total Revenue; and OR refers to Operating Revenue. * Shariah Service Providers are using two different Screens (dividing by 12m AMV or/and dividing by TA).

Table 2.3: Ranking of different Shariah screening methods

Shariah Service Providers	D	AR	C&CE	Denominator	NPI	Overall Universe	Average	Rank	Status after Ranking
AAOIFI	30%	-	30%	12m AMV	<5% TR	55.74%	42.10%	**2**	L
MSCI	33%	33%	30%	TA	<5% TR	28.83%		**12**	MC
S&P	33%	49%	33%	36m AMV	<5% TR	34.91%		**11**	C
AZZAD	30%	45%	-	12m AMV	<5% TR	35.02%		**10**	C
ALMEEZAN	37%	80%	33%	TA	<5% TR	35.42%		**9**	C
DIB (TA)	30%	70%		TA	<5% OR	54.19%		**4**	L
DIB (MV)	30%	70%		12m AMV	<5% OR	55.72%		**3**	L
FTSE	33%	50%	33%	TA	<5% TR	37.01%		**8**	C
DJMI	33%	33%	33%	24m AMV		51.60%	53.68%	**7**	L
HSBC	33%	49%	33%	36m AMV		51.85%		**6**	L
SHARIAH CAPITAL (TA)	33%	45%	33%	TA		52.19%		**5**	L
SHARIAH CAPITAL (MV)	33%	45%	33%	12m AMV		59.07%		**1**	L

Most Conservative	MC	< 30%
Conservative	C	30% to 50%
Liberal	L	50% to 70%
Most Liberal	ML	>70%

Conservative range (%)	28-37
Liberal Range (%)	51-59

This table provides the ranking of different Shariah screening methods. We rank them from most conservative (universe less than 30% of total stocks) to most liberal (universe greater than 70% of total stocks) on the overall universe of compliant stocks resultant from applying each screening method.

Table 2.4: Descriptive statistics of performance measures

	SAMPLE	FTSE		MSCI		ALMEEZAN		CAPITAL (TA)		CAPITAL (MV)		DIB (TA)	
		C	NC	C	NC	C	NC	C	NC	C	NC	C	NC
Panel A: ROE													
Mean	0.062	0.101	0.051	0.094	0.057	0.129	0.042	0.068	0.063	0.063	0.065	0.049	0.075
Median	0.066	0.086	0.060	0.081	0.064	0.100	0.056	0.070	0.065	0.073	0.065	0.066	0.067
SD	0.318	0.208	0.345	0.221	0.335	0.224	0.338	0.215	0.363	0.396	0.234	0.304	0.321
Skewness	5.030	5.348	5.225	5.878	5.233	7.111	5.242	2.311	5.370	6.674	-0.675	2.763	6.796
Kurtosis	146.893	146.075	138.648	145.323	144.088	142.999	146.595	103.676	132.202	134.139	72.247	96.383	181.990
Min	-3.369	-1.633	-3.369	-1.633	-3.369	-1.420	-3.369	-2.184	-3.369	-2.754	-3.369	-3.334	-3.369
Max	7.915	4.781	7.915	4.781	7.915	4.781	7.915	4.781	7.915	7.915	3.905	6.216	7.915
Panel B: Excess Return													
Mean	-0.053	-0.043	-0.056	-0.048	-0.053	-0.028	-0.061	-0.044	-0.058	-0.049	-0.056	-0.038	-0.062
Median	-0.019	-0.021	-0.019	-0.023	-0.019	-0.008	-0.022	-0.019	-0.019	-0.012	-0.022	-0.010	-0.022
SD	0.308	0.279	0.312	0.277	0.310	0.270	0.314	0.290	0.312	0.351	0.270	0.316	0.294
Skewness	-1.815	-1.045	-2.037	-1.079	-1.976	-0.879	-2.027	-0.904	-2.272	-2.122	-1.297	-0.900	-2.599
Kurtosis	18.431	8.382	21.309	8.777	20.595	8.545	20.640	7.100	24.166	20.427	11.552	7.036	29.012
Min	-4.530	-1.798	-4.530	-1.798	-4.530	-1.798	-4.530	-1.798	-4.530	-4.530	-2.320	-2.280	-4.530
Max	1.675	1.075	1.675	1.075	1.675	1.192	1.675	1.208	1.675	1.192	1.675	1.192	1.675
Panel C: Sharpe Ratio													
Mean	-0.015	-0.008	-0.017	-0.006	-0.017	-0.004	-0.019	-0.010	-0.017	-0.003	-0.021	-0.006	-0.018
Median	-0.005	-0.007	-0.004	-0.007	-0.005	-0.004	-0.006	-0.006	-0.005	-0.005	-0.005	-0.006	-0.005
SD	0.120	0.116	0.122	0.119	0.121	0.153	0.102	0.107	0.127	0.152	0.097	0.108	0.126
Skewness	-7.425	-7.198	-7.534	-8.679	-7.059	-13.000	-2.325	-7.582	-7.322	-13.207	-6.346	-8.970	-6.951
Kurtosis	232.323	114.681	273.148	122.030	265.687	241.051	90.841	134.314	252.712	229.238	67.177	137.829	252.161
Min	-1.333	-0.816	-1.333	-0.552	-1.333	-0.816	-1.333	-0.816	-1.333	-0.511	-1.333	-0.552	-1.333
Max	2.890	1.526	2.890	1.526	2.890	2.890	1.521	1.526	2.890	2.890	0.530	1.526	2.890

Continued Table 2.4

	DIB (MV)		AAOIFI		HSBC		DJMI		AZZAD		S&P	
	C	NC	C	NC	C	NC	C	NC	C	NC	C	NC
Panel A: ROE												
Mean	0.044	0.078	0.096	0.045	0.054	0.071	0.056	0.069	0.134	0.041	0.109	0.049
Median	0.063	0.069	0.085	0.060	0.068	0.067	0.070	0.067	0.114	0.057	0.097	0.061
SD	0.424	0.212	0.386	0.253	0.434	0.214	0.432	0.216	0.374	0.286	0.403	0.276
Skewness	5.828	-1.138	7.769	-1.185	5.724	-0.128	5.879	-0.420	8.534	3.118	6.690	3.675
Kurtosis	109.500	86.586	152.160	59.163	109.898	67.647	112.058	66.592	158.877	142.020	126.109	155.513
Min	-2.754	-3.369	-2.346	-3.369	-3.334	-3.369	-3.334	-3.369	-2.346	-3.369	-3.334	-3.369
Max	7.915	3.905	7.915	3.905	7.915	3.905	7.915	3.905	7.831	7.915	7.831	7.915
Panel B: Excess Return												
Mean	-0.051	-0.053	-0.051	-0.055	-0.090	-0.030	-0.083	-0.035	-0.049	-0.054	-0.088	-0.040
Median	-0.012	-0.022	-0.012	-0.022	-0.040	-0.011	-0.034	-0.014	-0.014	-0.020	-0.040	-0.014
SD	0.357	0.263	0.345	0.277	0.355	0.271	0.355	0.272	0.337	0.291	0.343	0.288
Skewness	-2.012	-1.390	-2.383	-1.124	-2.299	-0.995	-2.279	-1.055	-3.045	-1.171	-3.009	-1.088
Kurtosis	20.047	11.380	23.072	10.150	20.838	10.866	20.873	11.062	33.583	9.369	30.582	9.595
Min	-4.530	-2.320	-4.530	-2.320	-4.530	-2.320	-4.530	-2.320	-4.530	-2.320	-4.530	-2.320
Max	1.524	1.675	1.208	1.675	0.998	1.675	0.998	1.675	1.192	1.675	0.998	1.675
Panel C: Sharpe Ratio												
Mean	-0.003	-0.019	-0.005	-0.020	-0.012	-0.016	-0.010	-0.017	-0.001	-0.019	-0.010	-0.016
Median	-0.004	-0.006	-0.004	-0.006	-0.007	-0.005	-0.007	-0.004	-0.003	-0.006	-0.006	-0.005
SD	0.152	0.103	0.142	0.106	0.116	0.122	0.111	0.124	0.160	0.103	0.126	0.118
Skewness	-13.664	-2.616	-14.311	-2.507	-5.995	-8.029	-8.330	-7.124	-13.949	-2.444	-6.148	-7.954
Kurtosis	249.124	90.191	280.595	85.532	111.398	280.168	129.503	259.709	240.872	85.711	102.348	287.669
Min	-0.511	-1.333	-0.511	-1.333	-0.983	-1.333	-0.552	-1.333	-0.506	-1.333	-0.983	-1.333
Max	2.890	1.521	2.890	1.521	1.526	2.890	1.526	2.890	2.890	1.521	1.526	2.890

This table presents descriptive statistics for the entire sample, compliant, and non-compliant firm performance under the various screening methods. Performance measures are ROE, Excess Returns, and Sharpe ratio. C and N-C refer to compliant and non-compliant stocks, respectively.

Table 2.5: ROE versus screening methods using TA

	Panel A		Panel B					Panel C				
	Sample		Compliant stocks by:					Non-Compliant stocks by:				
			FTSE	MSCI	Almeezan	Capital TA	DIB TA	FTSE	MSCI	Almeezan	Capital TA	DIB TA
	1	2	3	4	5	6	7	8	9	10	11	12
Constant	0.0617***	0.0840***	0.0587***	0.0767***	0.0645***	0.0438**	0.0818***	0.0568***	0.0589***	0.0504***	0.0669***	0.0863***
	3.759	5.246	2.728	3.527	3.582	2.348	4.110	3.186	3.428	3.068	2.884	4.518
D	-0.0742**	-0.101***	-0.123**	-0.179**	-0.0725	-0.130**	-0.180**	-0.0710*	-0.0719*	-0.0677*	-0.0730	-0.0860**
	-2.037	-2.647	-2.203	-2.595	-1.483	-2.361	-2.570	-1.816	-1.927	-1.775	-1.535	-2.043
AR	0.118***		0.243***	0.282***	0.261***	0.238***		0.101***	0.111***	0.0959***	0.104***	
	3.754		2.761	2.762	4.187	3.047		2.954	3.280	2.694	2.962	
CCE	-0.00436		0.141*	0.0447	0.0449	0.0124		0.00114	-0.00230	-0.00281	0.00798	
	-0.191		1.839	0.543	1.000	0.197		0.0465	-0.0979	-0.111	0.274	
AR&CCE		0.0490***					0.0336					0.0410*
		2.683					1.046					1.900
NPITR			-0.222**	-0.232**	-0.264**							
			-2.131	-2.209	-2.024							
NPIOR							0.00684					
							0.608					
FTSE	0.0224**											
	2.033											
MSCI	-0.0195*											
	-1.962											
Almeezan	0.0201**											
	2.154											
Capital TA	-0.0119											
	-1.299											
DIBTA		-0.0150**										
		-2.384										
R-squared	2.11%	1.45%	4.65%	3.70%	5.96%	2.96%	1.24%	1.35%	1.51%	1.10%	1.41%	1.14%
Hausman test	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Observations	5,797	5,817	1,890	1,490	1,746	2,595	2,418	3,911	4,307	4,055	3,231	3,399
# stocks	368	369	223	204	157	254	264	357	360	357	325	344

The table presents regression estimates for screening variables (ratios) and screening methods using total assets (TA) as the ratios' denominator, first for the entire sample, second for compliant firms, and third for fully non-compliant firms. The compliant status refers to whether firms pass the qualitative and quantitative screens. We regress ROE on each screening dummy and its employed set of ratios. Unless screening methods use the same set of ratios and same denominator, we group them into one regression such as in (1). The Hausman test is used to decide between the random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.6: ROE versus screening methods using MV

	Panel A					
	Sample					
Denominator	36m	24m	12m	12m	12m	12m
	1	2	3	4	5	6
Constant	0.0811***	0.0947***	0.0912***	0.117***	0.110***	0.119***
	8.934	10.85	15.75	13.27	13.77	17.04
D	-0.116***	-0.134***	-0.106***	-0.134***	-0.110***	-0.119***
	-6.450	-6.831	-5.986	-6.544	-6.140	-6.492
AR	0.129***	0.111***	0.0255	0.0246		
	4.814	4.133	1.026	0.954		
CCE	0.0378*	0.00829		-0.0572	-0.0443	
	1.821	0.385		-1.429	-1.208	
AR&CCE						-0.0225
						-1.215
HSBC	-0.0241**					
	-2.435					
SP	0.0301***					
	2.996					
DJMI		-0.00429				
		-0.484				
AZZAD			0.0289***			
			4.040			
CAPITALMV				-0.00632		
				-0.767		
AAOIFI					0.00236	
					0.343	
DIB MV						-0.00980
						-1.273
R-squared	2.39%	2.10%	2.90%	2.60%	2.40%	2.33%
Hausman test	FE	FE	FE	FE	FE	FE
Observations	4,500	4,574	4,952	4,916	5,036	5,074
# stocks	331	332	354	353	354	355

The table presents the regression estimates for screening variables (ratios) and screening methods using MV for the sample. The ratios denominator refers to ratios' denominator applied by each screening method. We regress the ROE on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Continued Table 2.6

	Panel B							Panel C						
	Compliant Stocks by:							Non- Compliant Stocks by:						
	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV
Denominator	36m	36m	24m	12m	12m	12m	12m	36m	36m	24m	12m	12m	12m	12m
	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Constant	0.104***	0.0671***	0.0560***	0.167***	0.0943***	0.125***	0.0874***	0.0646***	0.112***	0.0979***	0.0860***	0.132***	0.107***	0.129***
	7.547	5.953	4.633	15.61	10.11	10.77	8.649	8.009	12.66	10.06	14.84	13.65	13.69	18.27
D	-0.296***	-0.257***	-0.184***	-0.429***	-0.252***	-0.286***	-0.319***	-0.0931***	-0.133***	-0.110***	-0.102***	-0.121***	-0.0996***	-0.0859***
	-3.974	-4.041	-2.963	-4.754	-4.338	-4.280	-4.560	-5.048	-5.209	-5.607	-5.194	-4.940	-4.888	-4.358
AR	0.102	0.206*	0.0997	0.0355	0.0390			0.124***	0.115***	0.124***	0.0216	0.0248		
	1.140	1.884	1.189	0.505	0.630			4.439	4.197	4.191	0.827	0.955		
CCE	0.214**	0.148**	0.234***		0.110*	0.0583		0.0384*	-0.0114	0.0114		-0.0793*	-0.0440	
	2.354	2.247	3.215		1.663	0.730		1.779	-0.466	0.554		-1.801	-1.174	
AR&CCE							0.0829*							-0.0450**
							1.957							-2.111
NPITR	-0.0113			0.118		-0.147								
	-0.0778			0.532		-0.158								
NPIOR							-0.0189**							
							-2.024							
R-squared	2.60%	1.69%	1.58%	4.04%	1.70%	1.90%	2.27%	2.20%	3.70%	3.20%	1.90%	3.70%	2.50%	3.26%
Hausman test	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Observations	1,549	2,099	2,134	1,581	2,460	2,182	2,033	2,951	2,475	2,376	3,371	2,456	2,854	3,041
# stocks	221	237	235	219	259	243	251	323	285	281	346	294	322	324

The table presents the regression estimates for screening variables (ratios) and screening methods using MV, first for the fully compliant firms and second for non-compliant firms. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress ROE on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.7: Excess return versus screening methods using TA

	Panel A		Panel B					Panel C				
	Sample		Compliant Stocks by:					Non-Compliant Stocks by:				
			FTSE	MSCI	Almeezan	Capital TA	DIB TA	FTSE	MSCI	Almeezan	Capital TA	DIB TA
	1	2	3	4	5	6	7	8	9	10	11	12
Constant	0.00754	-0.000414	0.00108	0.00762	-0.0200	0.00574	0.0268	0.00836	0.0155	0.00101	0.0102	-0.000877
	0.279	-0.0162	0.0276	0.161	-0.458	0.181	0.769	0.293	0.547	0.0382	0.306	-0.0309
MKT	1.269***	1.279***	1.432***	1.281***	1.287***	1.141***	1.234***	1.175***	1.264***	1.277***	1.393***	1.299***
	13.30	13.55	7.799	6.970	7.717	7.500	7.635	10.63	11.50	11.11	11.81	11.11
D	-0.0852	-0.0624	-0.209*	-0.186	-0.0294	-0.231**	-0.339***	-0.100*	-0.106*	-0.104*	-0.0641	-0.0137
	-1.451	-1.041	-1.844	-1.327	-0.246	-2.448	-2.949	-1.675	-1.814	-1.667	-0.931	-0.223
AR	0.325***		0.577***	0.539**	0.444***	0.442***		0.304***	0.304***	0.316***	0.264***	
	5.041		3.947	2.398	4.304	3.129		4.110	4.211	4.122	3.334	
CCE	0.0400		0.125	0.111	0.0552	0.00918		0.0225	0.0238	0.0566	0.0726	
	0.827		0.560	0.370	0.639	0.0504		0.434	0.469	1.031	1.238	
AR&CCE		0.182***					0.254***					0.150***
		4.888					4.643					3.297
NPITR			-0.561***	-0.441**	-0.640***							
			-2.699	-2.433	-2.930							
NPIOR							-0.0604**					
							-2.110					
FTSE	0.0164											
	0.635											
MSCI	-0.0408**											
	-2.031											
Almeezan	0.00852											
	0.407											
Capital TA	0.00129											
	0.0716											
DIBTA		0.00943										
		0.725										

R-squared	6.40%	5.98%	9.85%	7.60%	8.50%	5.59%	7.67%	5.38%	5.91%	6.00%	6.71%	6.00%
Hausman test	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Observations	5,488	5,508	1,817	1,434	1,667	2,478	2,304	3,675	4,054	3,825	3,035	3,204
# stocks	365	366	222	202	155	250	261	352	355	351	321	339

The table presents regression estimates for screening variables (ratios) and screening methods using TA, first for the entire sample, second for compliant firms, and third for non-compliant firms. The compliant and non-compliant status refers to whether stocks pass the qualitative and quantitative screens. We regress the excess return on the market and on each screening dummy and its employed set of ratios. Unless screening methods use the same set of ratios and the same denominator, we group them into one regression, such as in (1). The Hausman test is used to decide between the random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.8: Excess return versus screening methods using MV

	Panel A					
	Sample					
Denominator	36m	24m	12m	12m	12m	12m
	1	2	3	4	5	6
Constant	-0.0273	0.00916	0.103***	0.0922***	0.106***	0.0814***
	-1.201	0.424	5.592	4.076	5.328	3.912
MKT	1.195***	1.175***	1.184***	1.163***	1.200***	1.195***
	11.45	11.44	12.61	12.40	12.63	12.65
D	-0.139***	-0.166***	-0.247***	-0.248***	-0.193***	-0.206***
	-3.714	-3.771	-6.436	-5.983	-4.519	-5.243
AR	0.449***	0.409***	0.219***	0.184***		
	6.779	6.010	3.380	2.745		
CCE	0.324***	0.288***		0.146**	0.191***	
	6.501	5.562		2.442	3.214	
AR&CCE						0.155***
						3.977
HSBC	-0.00456					
	-0.201					
SP	-0.0142					
	-0.652					
DJMI		-0.0395**				
		-2.506				
AZZAD			-0.0219			
			-1.436			
CAPITAL MV				-0.0149		
				-0.864		
AAOIFI					-0.0139	
					-1.001	
DIB MV						-0.00103
						-0.0664
R-squared	8.67%	8.00%	5.30%	5.46%	5.24%	5.50%
Hausman test	FE	FE	FE	FE	FE	FE
Observations	4,354	4,416	4,750	4,723	4,830	4,861
# stocks	327	328	350	349	350	351

The table presents the regression estimates for screening variables (ratios) and screening methods using MV for the sample. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress the excess return on the market and on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Continued Table 2.8

	Panel B							Panel C					
	Compliant Stocks by:							Non-Compliant Stocks by:					
	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI
Denominator	36m	36m	24m	12m	12m	12m	12m	36m	36m	24m	12m	12m	12m
	7	8	9	10	11	12	13	14	15	16	17	18	19
Constant	-0.104***	-0.0571*	-0.102***	0.0591	0.0562	0.0717***	0.0757**	-0.0228	0.0458*	0.0250	0.115***	0.128***	0.141***
	-2.711	-1.829	-3.260	1.426	1.551	2.661	2.215	-1.089	1.842	0.970	5.915	5.716	6.498
MKT	1.257***	1.128***	1.112***	1.150***	1.159***	1.127***	1.278***	1.237***	1.306***	1.333***	1.212***	1.167***	1.268***
	6.166	7.307	7.008	5.999	7.335	7.363	6.799	9.364	9.205	9.370	10.29	9.623	9.403
D	-0.315**	-0.396***	-0.326**	-0.451***	-0.433***	-0.263*	-0.575***	-0.109***	-0.174***	-0.127***	-0.228***	-0.229***	-0.204***
	-2.073	-2.804	-2.433	-2.864	-3.595	-1.836	-4.097	-2.825	-3.392	-3.142	-5.753	-5.255	-5.409
AR	0.936***	0.770***	0.873***	0.461*	0.196			0.381***	0.332***	0.324***	0.163***	0.113**	
	4.217	2.932	4.120	1.656	0.728			6.228	5.713	5.104	2.958	2.082	
CCE	0.724***	0.683***	0.725***		0.557***	0.482***		0.304***	0.193***	0.219***		0.0245	0.0879
	4.971	4.315	4.947		3.285	2.814		5.818	3.362	4.114		0.431	1.482
AR&CCE							0.367***						
							2.839						
NPITR	0.0625			0.615		-2.390							
	0.360			1.115		-1.524							
NPIOR							0.0114						
							0.257						
R-squared	9.00%	6.00%	7.10%	4.40%	4.90%	3.96%	5.79%	9.50%	9.30%	10.40%	6.20%	8.04%	7.42%
Hausman test	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Observations	1,522	2,047	2,090	1,546	2,379	2,118	1,958	2,832	2,369	2,273	3,204	2,344	2,712
# stocks	218	234	232	215	256	240	247	317	272	272	337	282	311

The table presents the regression estimates for screening variables (ratios) and screening methods using MV, first for the compliant firms, and second for non-compliant firms. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress the excess return on the market and on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.9: Sharpe ratio versus screening methods using TA

	Panel A		Panel C					Panel C				
	Sample		Compliant stocks by:					Non- Compliant stocks by:				
			FTSE	MSCI	Almeezan	Capital TA	DIB TA	FTSE	MSCI	Almeezan	Capital TA	DIB TA
	1	2	3	4	5	6	7	8	9	10	11	12
Constant	-0.0207**	-0.0229**	-0.0336***	-0.0316**	-0.0300**	-0.0261*	-0.0169*	-0.0115	-0.0128	-0.0178*	-0.0117	-0.0168
	-2.415	-2.521	-2.91	-2.392	-2.548	-1.802	-1.71	-0.941	-1.148	-1.865	-0.982	-1.436
Debt	-0.0101	0.00377	-0.0666*	-0.057	-0.0433	-0.0543	-0.0658	-0.0138	-0.0158	-0.0051	-0.0126	-0.00457
	-0.547	0.181	-1.853	-1.371	-1.165	-1.395	-1.651	-0.617	-0.754	-0.258	-0.686	-0.213
AR	0.0559***		0.158***	0.169**	0.133***	0.113*		0.0291	0.0327	0.0441**	0.0223	
	2.758		2.85	2.451	4.047	1.837		1.303	1.453	2.008	1.111	
CCE	-0.00791		0.0493	0.0444	0.0288	0.00129		-0.00549	-0.00386	-0.00778	0.00201	
	-0.424		0.547	0.422	1.071	0.0177		-0.238	-0.189	-0.363	0.0904	
AR&CCE		0.0177					0.0490***					0.0141
		1.355					2.686					0.82
NPITR			-0.221**	-0.302*	-0.728							
			-2.039	-1.995	-1.432							
NPIOR							-0.0279**					
							-2.226					
FTSE	-0.0085											
	-1.412											
MSCI	0.00314											
	0.575											
Almeezan	0.0115**											
	2.335											
Shariah Capital TA	0.00004											
	0.00612											
DIBTA		0.0716*										
		1.738										
R-squared	1.24%	2.70%	4.30%	4.26%	4.23%	2.30%	3.17%	3.87%	5.31%	6.35%	3.21%	2.78%

Hausman test decision	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Observations	1,490	1,494	531	444	536	636	546	959	1,046	954	859	948
Number of stocks	117	117	63	54	52	63	68	105	109	104	98	105

The table presents regression estimates for screening variables (ratios) and screening methods using TA, first for the entire sample, second for compliant firms, and third for non-compliant firms. The compliant and non-compliant status refers to whether stocks pass the qualitative and quantitative screens. We regress the Sharpe ratio on each screening dummy and its employed set of ratios. Unless screening methods use the same set of ratios and the same denominator, we group them into one regression, such as in (1). The Hausman test is used to decide between the random and fixed effect in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.10: Sharpe ratio versus screening methods using MV

	Panel A					
	Sample					
Denominator	36m	24m	12m	12m	12m	12m
	1	2	3	4	5	6
Constant	-0.0261***	-0.0130**	-0.00248	0.000264	-0.00368	-0.00425
	-3.694	-1.996	-0.539	0.0411	-0.739	-0.812
Debt	-0.0164	-0.0281	-0.0477***	-0.0507***	-0.0315**	-0.0370**
	-0.919	-1.377	-2.652	-2.67	-2.193	-2.09
AR	0.0887***	0.0689***	0.0333**	0.0305*		
	4.212	3.471	2.071	1.852		
CCE	0.014	-0.00328		0.000932	0.0131	
	0.791	-0.214		0.0468	0.629	
AR&CCE						0.0139
						1.376
HSBC	0.00543					
	0.871					
SP	-0.0001					
	-0.011					
DJMI		-0.00321				
		-0.611				
AZZAD			-0.000635			
			-0.128			
CAPITALMV				-0.00371		
				-0.567		
AAOIFI					0.00219	
					0.554	
DIB MV						0.00199
						0.373
R-squared	2.40%	1.40%	1.65%	1.70%	1.20%	1.40%
Hausman test decision	FE	FE	FE	FE	FE	FE
Observations	1,182	1,169	1,286	1,283	1,304	1,309
Number of stocks	103	103	111	111	112	112

The table presents the regression estimates for screening variables (ratios) and screening methods using MV for the entire sample. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress the Sharpe ratio on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Continued Table 2.10

	Panel B							Panel C						
	Compliant stocks by:							Non- Compliant stocks by:						
	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV
Denominator	36m	36m	24m	12m	12m	12m	12m	36m	36m	24m	12m	12m	12m	12m
	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Constant	-0.0404***	-0.0164	-0.0371***	-0.00382	0.00139	-0.00309	0.00214	-0.0247***	-0.0153**	-0.0238***	-0.00112	0.00215	0.00143	-0.000617
	-4.51	-1.349	-4.2	-0.531	0.132	-0.41	0.177	-3.84	-2.136	-2.948	-0.229	0.396	0.272	-0.139
Debt	-0.0114	-0.028	-0.0119	-0.0405	-0.0493	-0.0771	-0.0930*	-0.00221	-0.0091	0.00176	-0.0423*	-0.0457**	-0.0300**	-0.0296*
	-0.241	-0.74	-0.232	-0.839	-1.342	-1.386	-1.79	-0.129	-0.391	0.0918	-1.924	-2.115	-2.156	-1.672
AR	0.197***	0.0339	0.165***	0.0028	-0.0425			0.0632***	0.0465*	0.0516**	0.0232	0.0254		
	3.973	0.341	3.664	0.0574	-0.668			2.889	1.671	2.243	1.02	1.029		
CCE	0.0663	0.0433	0.0731		0.0227	0.0992***		0.0108	-0.00728	0.00907		-0.00835	-0.00627	
	1.448	0.797	1.605		0.452	2.738		0.543	-0.443	0.426		-0.431	-0.334	
AR&CCE							-0.000328							0.00268
							-0.00538							0.228
NPITR	-0.0059			0.219		-0.368								
	-0.637			0.369		-0.959								
NPIOR							-0.0104							
							-1.564							
R-squared	6.96%	3.40%	5.13%	4.46%	4.17%	3.88%	5.85%	6.60%	2.73%	3.13%	3.43%	3.75%	2.91%	2.90%
Hausman test decision	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Observations	410	475	504	405	553	515	417	772	694	678	881	730	789	892
Number of stocks	57	58	58	59	67	65	61	90	80	80	103	86	93	98

The table presents the regression estimates for screening variables (ratios) and screening methods using MV, first for the compliant firms, and second for non-compliant firms. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress the Sharpe ratio on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively

Table 2.11: The relationship between screening dummies and stocks' performance measures

Variables	ROE		Excess Returns		Sharpe ratio	
	Dummy Coef	Status	Dummy Coef	Status	Dummy Coef	Status
FTSE	0.0224**	(+) Contribution	0.0164	No Difference	-0.0085	No Difference
MSCI	-0.0195*	(-) Contribution	-0.0408**	(-) Contribution	0.00314	No Difference
Almeezan	0.0201**	(+) Contribution	0.00852	No Difference	0.0115**	(+) Contribution
Capital TA	-0.0119	No Difference	0.00129	No Difference	0.0004	No Difference
DIBTA	-0.0150**	(-) Contribution	0.00943	No Difference	0.0071*	(+) Contribution
HSBC	-0.0241**	(-) Contribution	-0.00456	No Difference	0.0054	No Difference
SP	0.0301***	(+) Contribution	-0.0142	No Difference	-0.0011	No Difference
DJMI	-0.00429	No Difference	-0.0395**	(-) Contribution	-0.00321	No Difference
AZZAD	0.0289***	(+) Contribution	-0.0219	No Difference	-0.00609	No Difference
CAPITAL MV	-0.00632	No Difference	-0.0149	No Difference	-0.00371	No Difference
AAOIFI	0.00236	No Difference	-0.0139	No Difference	0.00219	No Difference
DIB MV	-0.00980	No Difference	-0.00103	No Difference	0.00200	No Difference

This table presents a summary of results on the impact of different screening methods on stocks' performance. We refer to the status of the impact as 'No Difference' if results are statistically insignificant; '(-) contribution' if results are statistically negative; and '+ contribution' if results are statistically positive.

2.9 Appendix A: Shariah screening

Shariah screening providers:

Regulator: AAOIFI: Accounting and Auditing Organisation for Islamic Financial Institutions (AAOIFI, 2013)

Index Providers:

DJMI: Dow Jones Islamic Market Index (DJMI, 2013)

S&P: Standard and Poor's Shariah Index (S&P, 2013)

MSCI: Morgan Stanley Capital International Global Islamic Index (MSCI, 2011)

FTSE: Financial Times Stock Exchange Global Islamic Index (FTSE, 2012)

Shariah Service Providers:

AZZAD Funds: Azzad Asset Management from USA (AZZAD, 2012)

Shariah Capital: USA Company that screens universal assets for global investments (Capital, 2011)

Al – Meezan: Al Meezan investment management is a Partnership between Pak Kuwait Investment firm in Pakistan and Meezan Bank (Almeezan, 2013)

Banks:

HSBC Amanah Saudi Industrials companies fund (HSBC, 2013)

DIB: Dubai Islamic Bank (DIB, 2013)

The quantitative screens used by Shariah service providers are:

- Debt ratio ($\mathbf{D}$) $= \frac{\text{Short Debt+Long Debt}}{\text{Total Assets or Market Value of Equity}}$

- Liquidity ratio ($\mathbf{AR}$) $= \frac{\text{Accounts Receivable}}{\text{Total Assets or Market Value of Equity}}$

- Liquidity ratio ($\mathbf{CCE}$) $= \frac{\text{Cash \& Cash Equivalents}}{\text{Total Assets or Market Value of Equity}}$

- Liquidity ratio ($\mathbf{ARCCE}$) $= \frac{\text{Accounts Receivable+Cash \& Cash Equivalents}}{\text{Total Assets or Market Value of Equity}}$

- Non-permissible income ratio ($\mathbf{NPITR}$) $= \frac{\text{Interest Revenue+Other suspect Income}}{\text{Total Revenue}}$

- Non-permissible income ratio ($\mathbf{NPIOR}$) $= \frac{\text{Interest Revenue+Other suspect Income}}{\text{Operating Revenue}}$

Table 2.12: Difference in mean (t-tests) between Shariah compliant and non-compliant stocks financial screens

	Total Assets Based Screening Methods				Average Market Value Based Screening Methods									
	D	AR	CCE	ARCCE	D36	AR36	CCE36	D24	AR24	CCE24	D12	AR12	CCE12	ARCCE12
FTSE	0.096***	0.082***	0.174***											
MSCI	0.079***	0.139***	0.166***											
Almeezan	0.062***	0.034***	0.099***											
Shariah Capital TA	0.132***	0.142***	0.209***											
DIB TA	0.172***			0.052***										
HSBC					0.329***	0.159***	0.179***							
SP					0.240***	0.090***	0.142***							
DJMI								0.310***	0.171***	0.167***				
AZZAD											0.223***	0.066***		
Shariah Capital MV											0.344***	0.163***	0.113***	
AAOIFI											0.303***		0.116***	
DIB MV											0.286***			0.183***

This table reports the difference in mean in financial screens for compliant and non-compliant stocks. We use t-test to test for equality in means between the two group by each screening methods. Our null hypothesis: there is no difference in means. We reject the Null if p-value is less than 5%. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.13: VIF Test

Variables	VIF
Debt to TA	1.14
AR to TA	1.07
CCE to TA	1.25
ARCCE to TA	1.13
NPI to Total Return	1.14
NPI to operating Return	1.06
Debt to 24m AMV	1.18
AR to 24m AMV	1.19
CCE to 24m AMV	1.02
Debt to 36m AMV	1.19
AR to 36m AMV	1.23
CCE to 36m AMV	1.05

Debt to 12m AMV	1.16
AR to 12m AMV	1.20
CCE to 12m AMV	1.04
ARCCE to 12m AMV	1.08

2.10 Appendix B: Results after controlling for time fixed effects

Table 2.14: ROE versus screening methods using TA

	Panel A		Panel C					Panel C				
	Sample		Compliant stocks by:					Non- Compliant stocks by:				
			FTSE	MSCI	Almeezan	Capital TA	DIB TA	FTSE	MSCI	Almeezan	Capital TA	DIB TA
	1	2	3	4	5	6	7	8	9	10	11	12
Constant	0.0225	0.0410**	0.0428	0.0554*	0.0218	0.00582	0.0597**	0.00980	0.0142	0.00861	0.0258	0.0410**
	1.311	2.460	1.541	1.905	1.022	0.256	2.560	0.527	0.797	0.481	1.098	2.099
Debt	-0.0835**	-0.103***	-0.166***	-0.226***	-0.106**	-0.147**	-0.212***	-0.0733*	-0.0747**	-0.0702*	-0.0764*	-0.0833**
	-2.333	-2.756	-2.888	-3.077	-1.992	-2.572	-2.971	-1.932	-2.054	-1.899	-1.673	-2.062
AR	0.105***		0.212**	0.257**	0.237***	0.240***		0.0952***	0.105***	0.0906***	0.0831**	
	3.371		2.360	2.534	4.007	3.067		2.902	3.207	2.597	2.462	
CCE	-0.0110		0.177**	0.0742	0.0424	-0.00549		-0.00411	-0.00667	-0.00756	0.00451	
	-0.477		2.491	0.939	0.940	-0.0919		-0.167	-0.283	-0.307	0.158	
AR&CCE		0.0422**					0.0199					0.0333
		2.320					0.608					1.567
NPITR			-0.313***	-0.317***	-0.326*							
			-3.019	-2.831	-1.917							
NPIOR							0.00897					
							0.745					
FTSE	0.0270**											
	2.488											
MSCI	-0.0197**											
	-1.999											
Almeezan	0.0228**											
	2.405											
Shariah Capital TA	-0.0173*											

	-1.904											
DIBTA		-0.0124**										
		-1.980										
Time Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R-Squared	8.04%	7.07%	17.20%	15.20%	24.20%	9.57%	6.36%	6.52%	7.03%	5.38%	8.14%	8.70%
Hausman test	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Observations	5,797	5,817	1,890	1,490	1,746	2,595	2,418	3,911	4,307	4,055	3,231	3,399
# of stocks	368	369	223	204	157	254	264	357	360	357	325	344

The table presents regression estimates for screening variables (ratios) and screening methods using total assets (TA) as the ratios' denominator, first for the entire sample, second for compliant firms, and third for fully non-compliant firms. The compliant status refers to whether firms pass the qualitative and quantitative screens. We regress ROE on each screening dummy and its employed set of ratios. Unless screening methods use the same set of ratios and same denominator, we group them into one regression such as in (1). The Hausman test is used to decide between the random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.15: ROE versus screening methods using MV

	Panel A					
	Sample					
Denominator	36m	24m	12m	12m	12m	12m
	1	2	3	4	5	6
Constant	0.0317**	0.0445***	0.0426***	0.0691***	0.0606***	0.0680***
	2.286	3.235	4.262	5.873	5.771	6.492
Debt	-0.112***	-0.125***	-0.0914***	-0.121***	-0.0929***	-0.102***
	-6.145	-6.415	-5.073	-5.928	-5.119	-5.503
AR	0.135***	0.123***	0.0343	0.0316		
	4.819	4.252	1.295	1.129		
CCE	0.0292	0.00505		-0.0538	-0.0347	
	1.428	0.236		-1.350	-0.955	
AR&CCE						-0.0161
						-0.874
HSBC	-0.0292***					
	-2.914					
SP	0.0373***					
	3.674					
DJMI		-0.00437				
		-0.509				
AZZAD			0.0333***			
			4.673			
CAPITALMV				-0.00569		
				-0.700		
AAOIFI					0.00528	
					0.765	
DIB MV						-0.00474
						-0.618
Time fixed effect	YES	YES	YES	YES	YES	YES
R-squared	8.67%	7.88%	8.41%	8.00%	7.77%	7.54%
Hausman Test	FE	FE	FE	FE	FE	FE
Observations	4,500	4,574	4,952	4,916	5,036	5,074
# of stocks	331	332	354	353	354	355

The table presents the regression estimates for screening variables (ratios) and screening methods using MV for the entire sample. The ratios denominator refers to ratios' denominator applied by each screening method. We regress the ROE on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Continued Table 2.15

	Panel B							Panel C						
	Compliant stocks by:							Non- Compliant stocks by:						
	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV
Denominator	36m	36m	24m	12m	12m	12m	12m	36m	36m	24m	12m	12m	12m	12m
	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Constant	0.0547	0.00653	0.0148	0.0950***	0.0377*	0.0714***	0.0394*	0.0201	0.0662***	0.0459***	0.0433***	0.0833***	0.0598***	0.0878***
	1.587	0.264	0.564	3.211	1.787	3.095	1.699	1.597	4.915	3.365	4.272	7.129	6.012	9.388
Debt	-0.321***	-0.267***	-0.206***	-0.410***	-0.243***	-0.278***	-0.301***	-0.0860***	-0.121***	-0.0982***	-0.0923***	-0.107***	-0.0852***	-0.0725***
	-4.463	-4.357	-3.400	-4.758	-4.276	-4.205	-4.379	-4.668	-4.886	-4.993	-4.496	-4.473	-4.147	-3.650
AR	0.106	0.211*	0.112	0.0457	0.0478			0.133***	0.125***	0.128***	0.0310	0.0266		
	1.099	1.932	1.224	0.642	0.750			4.344	4.158	3.911	1.134	0.957		
CCE	0.220**	0.162**	0.220***		0.140**	0.0777		0.0334	-0.00800	0.00746		-0.0725	-0.0345	
	2.519	2.495	3.025		2.036	0.921		1.548	-0.325	0.365		-1.636	-0.928	
AR&CCE							0.102**							-0.0433**
							2.359							-2.057
NPITR	-0.0275			-0.0748		-0.815								
	-0.165			-0.348		-0.785								
NPIOR							-0.0164							
							-1.643							
Time fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	12.70%	7.50%	6.48%	17.10%	7.44%	10.10%	7.10%	8.50%	13.30%	14.30%	5.82%	12.50%	7.55%	11.50%
Hausman Test	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
Observations	1,549	2,099	2,134	1,581	2,460	2,182	2,033	2,951	2,475	2,376	3,371	2,456	2,854	3,041
# of stocks	221	237	235	219	259	243	251	323	285	281	346	294	322	324

The table presents the regression estimates for screening variables (ratios) and screening methods using MV, first for the fully compliant firms and second for non-compliant firms. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress ROE on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.16: Excess return versus screening methods using TA

	Panel A		Panel C					Panel C				
	Sample		Compliant stocks by:					Non- Compliant stocks by:				
			FTSE	MSCI	Almeezan	Capital TA	DIB TA	FTSE	MSCI	Almeezan	Capital TA	DIB TA
	1	2	3	4	5	6	7	8	9	10	11	12
Constant	-0.218***	-0.226***	-0.317***	-0.356***	-0.235***	-0.315***	-0.278***	-0.173***	-0.160***	-0.208***	-0.129**	-0.132***
	-5.408	-5.958	-5.545	-5.760	-4.224	-5.970	-4.630	-3.484	-3.343	-3.986	-2.494	-2.932
MKT	-2.729***	-2.759***	-5.112***	-6.070***	-2.946**	-4.468***	-3.659***	-1.795**	-1.615*	-2.345**	-1.205	-1.441*
	-3.586	-3.711	-3.815	-3.999	-2.052	-3.772	-2.766	-2.110	-1.902	-2.398	-1.364	-1.736
Debt	-0.0932**	-0.0731*	-0.139	-0.0506	-0.0441	-0.108	-0.216**	-0.101***	-0.112***	-0.0866**	-0.0991**	-0.0662
	-2.205	-1.743	-1.518	-0.476	-0.523	-1.478	-2.449	-2.603	-2.907	-2.024	-2.134	-1.597
AR	0.165***		0.238***	0.0963	0.234***	0.135*		0.150***	0.155***	0.158***	0.164***	
	3.705		2.827	0.642	3.252	1.649		3.096	3.373	3.063	3.179	
CCE	0.00895		0.235*	0.292	-0.0268	0.104		-0.000921	-0.00782	0.0193	0.0123	
	0.311		1.695	1.570	-0.487	0.941		-0.0314	-0.277	0.659	0.348	
AR&CCE		0.0875***					0.123***					0.0545**
		3.502					3.014					2.151
NPITR			-0.479***	-0.424***	0.0899							
			-3.355	-3.161	0.280							
NPIOR							0.0342					
							0.870					
FTSE	0.0120											
	0.518											
MSCI	-0.0437**											
	-2.315											
Almeezan	0.0230											
	1.424											
Shariah Capital TA	0.00137											
	0.0909											
DIBTA		0.00711										
		0.681										

Time fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	2.01%	2.00%	4.83%	5.59%	3.85%	2.58%	1.05%	3.61%	4.54%	5.81%	3.56%	9.12%
Hausman test	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Observations	5,488	5,508	1,817	1,434	1,667	2,478	2,304	3,675	4,054	3,825	3,035	3,204
# of stocks	365	366	222	202	155	250	261	352	355	351	321	339

The table presents regression estimates for screening variables (ratios) and screening methods using TA, first for the entire sample, second for compliant firms, and third for non-compliant firms. The compliant and non-compliant status refers to whether stocks pass the qualitative and quantitative screens. We regress the excess return on the market and on each screening dummy and its employed set of ratios. Unless screening methods use the same set of ratios and the same denominator, we group them into one regression, such as in (1). The Hausman test is used to decide between the random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.17: Excess return versus screening methods using MV

	Panel A					
	Sample					
Denominator	36m	24m	12m	12m	12m	12m
	1	2	3	4	5	6
Constant	-0.300***	-0.304***	-0.234***	-0.264***	-0.248***	-0.260***
	-7.303	-7.382	-5.928	-6.569	-6.502	-6.889
MKT	-2.874***	-3.387***	-3.398***	-3.543***	-3.520***	-3.416***
	-3.460	-4.176	-4.409	-4.613	-4.632	-4.561
Debt	-0.0544*	-0.0613*	-0.115***	-0.0985***	-0.0628**	-0.0837***
	-1.800	-1.857	-4.370	-3.481	-2.033	-2.987
AR	0.302***	0.277***	0.181***	0.153***		
	6.351	6.006	4.508	3.656		
CCE	0.241***	0.227***		0.167***	0.198***	
	6.803	6.311		3.804	4.380	
AR&CCE						0.148***
						4.993
HSBC	-0.00243					
	-0.130					
SP	-0.0150					
	-0.803					
DJMI		-0.0224*				
		-1.752				
AZZAD			-0.0262**			
			-2.008			
CAPITALMV				-0.00592		
				-0.446		
AAOIFI					-0.0104	
					-0.841	
DIB MV						-0.000940
						-0.0760
Time fixed effect	YES	YES	YES	YES	YES	YES
R-squared	6.42%	2.76%	1.73%	1.32%	1.64%	1.81%
Hausman Test	RE	RE	RE	RE	RE	RE
Observations	4,354	4,416	4,750	4,723	4,830	4,861
# of stocks	327	328	350	349	350	351

The table presents the regression estimates for screening variables (ratios) and screening methods using MV for the entire sample. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress the excess return on the market and on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Continued Table 2.17

	Panel B							Panel C						
	Compliant stocks by:							Non- Compliant stocks by:						
	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV
Denominator	36m	36m	24m	12m	12m	12m	12m	36m	36m	24m	12m	12m	12m	12m
	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Constant	-0.264***	-0.284***	-0.315***	-0.216***	-0.286***	-0.284***	-0.298***	-0.346***	-0.314***	-0.293***	-0.251***	-0.203***	-0.244***	-0.208***
	-4.455	-4.914	-5.768	-2.953	-4.679	-4.590	-4.381	-7.034	-5.731	-5.203	-5.473	-4.261	-5.136	-4.872
MKT	-0.113	-1.213	-1.498	-1.580	-2.758**	-3.482***	-2.916**	-4.209***	-4.920***	-4.176***	-3.894***	-3.799***	-4.199***	-3.344***
	-0.0747	-0.933	-1.188	-0.968	-2.202	-2.627	-2.088	-4.677	-5.193	-4.300	-4.626	-4.173	-4.563	-4.120
Debt	-0.0288	-0.0191	0.0247	-0.200	-0.0901	-0.0327	-0.203*	-0.0377	-0.0790**	-0.0761**	-0.0888***	-0.122***	-0.0812***	-0.0783***
	-0.276	-0.202	0.270	-1.585	-0.976	-0.315	-1.904	-1.300	-2.173	-2.376	-3.296	-4.161	-3.119	-2.786
AR	0.556***	0.387***	0.478***	0.434***	0.159			0.240***	0.206***	0.208***	0.131***	0.0972***		
	4.959	2.738	4.957	2.752	1.148			5.860	5.458	5.159	3.930	2.781		
CCE	0.631***	0.573***	0.574***		0.558***	0.662***		0.222***	0.158***	0.177***		0.0540	0.111***	
	5.547	4.754	5.343		4.220	4.287		6.016	4.454	4.780		1.337	2.618	
AR&CCE							0.339***							0.0774***
							3.568							3.024
NPITR	-0.128			0.222		-0.335**								
	-1.041			0.360		-2.570								
NPIOR							0.0182							
							0.408							
Time fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	18.00%	8.10%	13.10%	4.94%	3.47%	5.58%	2.58%	11.80%	8.93%	14.90%	6.75%	7.81%	3.18%	2.90%
Hausman Test	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Observations	1,522	2,047	2,090	1,546	2,379	2,118	1,958	2,832	2,369	2,273	3,204	2,344	2,712	2,903
# of stocks	218	234	232	215	256	240	247	317	272	272	337	282	311	314

The table presents the regression estimates for screening variables (ratios) and screening methods using MV, first for the compliant firms, and second for non-compliant firms. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress the excess return on the market and on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.18: Sharpe ratio versus screening methods using TA

	Panel A		Panel C					Panel C				
	Sample		Compliant Stocks by:					Non- Compliant Stocks by:				
			FTSE	MSCI	Almeezan	Capital TA	DIB TA	FTSE	MSCI	Almeezan	Capital TA	DIB TA
	1	2	3	4	5	6	7	8	9	10	11	12
Constant	-0.00429	-0.00668	0.00165	0.00872	-0.00314	0.00255	0.00455	-0.00041	-0.00246	-0.00377	-0.00269	-0.00322
	-0.519	-0.751	0.111	0.515	-0.204	0.178	0.315	-0.0467	-0.281	-0.446	-0.278	-0.323
Debt	-0.00236	0.00602	-0.0304	-0.0283	-0.0251	-0.0232	-0.0449	-0.00347	-0.00389	0.0023	-0.0032	0.000114
	-0.183	0.412	-1.032	-0.826	-0.782	-0.809	-1.248	-0.254	-0.313	0.19	-0.245	0.00813
AR	0.0319***		0.0124	-0.0136	0.0393	-0.00781		0.0265***	0.0275***	0.0291***	0.0321***	
	3.227		0.543	-0.307	1.619	-0.32		2.735	2.906	3.092	3.312	
CCE	0.00413		0.0407	0.0633	0.0286*	0.0512		0.00339	0.00325	0.00378	0.0047	
	0.419		1.198	1.359	1.779	1.592		0.325	0.355	0.397	0.379	
AR&CCE		0.0160**					0.0199**					0.0139*
		2.425					2.05					1.733
NPITR			-0.0561	-0.0311	-0.212							
			-0.153	-0.0723	-0.501							
NPIOR							-0.00745					
							-1.241					
FTSE	-0.000386											
	-0.06											
MSCI	-0.00227											
	-0.347											
Almeezan	0.00722*											
	1.771											
Shariah Capital TA	-0.0029											
	-0.553											
DIBTA		0.00384										
		1.166										
Time fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	8.19%	7.60%	9.84%	17.60%	3.13%	10.20%	12.60%	13.70%	15.60%	13.70%	16.50%	21.70%
Hausman test	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE

Observations	1,490	1,494	531	444	536	636	546	959	1,046	954	859	948
# of stocks	117	117	63	54	52	63	68	105	109	104	98	105

The table presents regression estimates for screening variables (ratios) and screening methods using TA, first for the entire sample, second for compliant firms, and third for non-compliant firms. The compliant and non-compliant status refers to whether stocks pass the qualitative and quantitative screens. We regress the Sharpe ratio on each screening dummy and its employed set of ratios. Unless screening methods use the same set of ratios and the same denominator, we group them into one regression, such as in (1). The Hausman test is used to decide between the random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.19: Sharpe ratio versus screening methods using MV

	Panel A					
	Sample					
Denominator	36m	24m	12m	12m	12m	12m
	1	2	3	4	5	6
Constant	-0.00263	0.00638	0.0124***	0.0141***	0.0117***	0.0110**
	-0.435	1.171	3.365	3.066	2.598	2.541
Debt	-0.00707	-0.0181	-0.0198**	-0.0221**	-0.0169*	-0.0181*
	-0.592	-1.293	-2.129	-2.102	-1.848	-1.787
AR	0.0498***	0.0364***	0.00904	0.00561		
	3.837	2.867	1.096	0.665		
CCE	0.0122	0.000221		0.00619	0.00962	
	1.047	0.0197		0.508	0.817	
AR&CCE						0.00618
						1.086
HSBC	0.00113					
	0.187					
SP	0.00131					
	0.234					
DJMI		-0.00386				
		-0.843				
AZZAD			0.000847			
			0.217			
CAPITALMV				-0.00189		
				-0.423		
AAOIFI					0.000852	
					0.272	
DIB MV						0.00169
						0.383
Time fixed effect	YES	YES	YES	YES	YES	YES
R-squared	5.15%	1.22%	7.67%	8.00%	3.63%	3.52%
Hausman Test	RE	RE	RE	RE	RE	RE
Observations	1,182	1,169	1,286	1,283	1,304	1,309
# of stocks	103	103	111	111	112	112

The table presents the regression estimates for screening variables (ratios) and screening methods using MV for the entire sample. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress the Sharpe ratio on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Continued Table 2.19

	Panel B							Panel C						
	Compliant stock by:							Non- Compliant stocks by:						
	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV	HSBC	SP	DJMI	AZZAD	CAPITALMV	AAOIFI	DIB MV
Denominator	36m	36m	24m	12m	12m	12m	12m	36m	36m	24m	12m	12m	12m	12m
	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Constant	-0.0165**	-0.00392	-0.0127*	0.000906	0.0135*	0.00881	0.0129	0.00364	0.00947	0.00432	0.0164***	0.0164***	0.0142***	0.0138***
	-2.099	-0.517	-1.879	0.124	1.727	1.346	1.379	0.580	1.403	0.596	3.878	3.260	2.833	3.426
Debt	-0.00413	-0.00482	-0.00793	-0.00767	-0.0224	-0.0391	-0.0505	-1.00e-05	-0.00747	0.00232	-0.0167*	-0.0195*	-0.0168*	-0.0131
	-0.124	-0.173	-0.255	-0.221	-0.911	-1.173	-1.440	-0.000993	-0.574	0.206	-1.895	-1.909	-1.960	-1.590
AR	0.0771**	-0.0130	0.0598*	-0.0169	-0.0274			0.0303**	0.0195	0.0249**	0.00575	0.00226		
	2.099	-0.246	1.941	-0.538	-0.748			2.541	1.625	2.266	0.703	0.256		
CCE	0.0556*	0.0631	0.0706**		-0.00248	0.0411		0.00974	-0.00238	0.00683		0.00370	0.00376	
	1.951	1.540	2.399		-0.0622	1.247		0.824	-0.220	0.589		0.303	0.326	
AR&CCE							-0.00261							-0.000448
							-0.0744							-0.0878
NPITR	0.0137			0.394		-0.00309								
	1.432			1.055		-0.0113								
NPIOR							-0.00392							
							-0.785							
Time fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	1.21%	3.43%	2.93%	1.56%	1.80%	1.59%	2.18%	1.10%	4.71%	0.60%	1.72%	1.64%	5.30%	1.27%
Hausman Test	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
Observations	410	475	504	405	553	515	417	772	694	678	881	730	789	892
# of stocks	57	58	58	59	67	65	61	90	80	80	103	86	93	98

The table presents the regression estimates for screening variables (ratios) and screening methods using MV, first for the compliant firms, and second for non-compliant firms. The ratios denominator refers to ratios' denominator applied by each screening method except NPIOR and NPITR. We regress the Sharpe ratio on each screening dummy and its employed set of ratios. The Hausman test is used to decide between random and fixed effects in the panel data. The symbols ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

Table 2.20: Number of SC firms in each data point.

	DJMI	SP	HSBC	AZZAD	Capital MV	AAOIFI	Capital TA	FTSE	MSCI	Almeezan	DIB TA	DIB MV
1	47.49	39.72	52.97	38.79	53.88	50.93	49.32	44.24	38.25	51.61	53.18	51.36
2	42.47	22.33	43.84	21.40	48.40	46.33	48.89	26.36	21.36	21.36	52.73	49.55
3	45.22	33.48	46.52	33.04	54.35	54.67	53.98	37.17	27.43	31.86	51.98	50.22
4	46.22	27.35	47.56	30.49	54.67	50.88	49.15	33.04	25.22	26.96	48.92	50.22
5	49.79	34.33	50.63	35.19	56.49	57.02	49.59	37.39	29.83	34.45	53.14	50.21
6	48.03	30.53	50.22	26.55	51.53	51.52	53.91	36.13	26.89	32.35	53.78	53.36
7	46.43	33.33	47.22	37.80	63.49	58.63	50.39	38.80	28.80	34.40	53.60	54.80
8	45.87	25.42	43.80	31.25	59.50	55.06	50.98	36.00	27.60	30.40	51.39	43.82
9	55.86	37.01	51.95	42.13	63.67	61.33	51.35	39.92	31.78	34.11	57.92	62.55
10	51.37	27.56	46.27	33.46	62.35	56.69	54.96	36.96	27.24	30.35	54.09	56.81
11	53.23	40.08	53.99	40.86	64.64	58.69	50.77	37.45	30.12	36.68	56.54	61.54
12	52.55	31.10	48.63	34.65	63.14	54.90	50.00	32.56	24.42	34.11	51.94	54.65
13	55.47	35.92	54.69	38.52	66.27	60.64	47.98	32.79	24.70	33.20	51.59	56.80
14	54.55	33.07	52.57	35.46	64.43	57.71	50.20	31.75	26.98	33.73	50.59	57.14
15	56.85	43.75	56.85	34.17	55.19	51.87	48.76	38.84	27.27	36.36	49.79	60.74
16	57.63	34.89	55.51	33.19	63.56	55.32	47.66	32.34	23.40	33.19	51.91	59.57
17	54.66	40.52	58.90	37.07	58.47	59.40	54.70	36.32	27.78	36.75	50.64	57.02
18	55.22	36.24	56.96	27.95	45.65	45.85	52.16	31.74	23.04	30.87	40.87	50.87
19	51.74	40.27	56.52	42.53	64.35	61.40	55.61	44.39	36.32	47.09	58.67	60.89
20	46.90	40.00	56.19	38.67	60.62	55.11	56.39	37.17	30.09	37.17	54.63	48.68
21	54.03	43.75	55.45	39.42	63.51	59.52	59.33	48.33	41.15	47.85	65.24	65.24
22	59.35	38.68	56.07	41.98	66.82	59.62	57.67	42.06	32.24	43.93	62.50	55.56
23	55.39	44.56	57.35	43.52	58.33	56.06	55.90	50.00	43.30	57.73	66.33	64.29
24	51.21	40.20	54.11	31.86	54.59	52.43	54.85	41.46	35.12	43.90	62.62	62.14
Average	51.56	35.59	52.28	35.41	59.08	55.48	52.27	37.63	29.60	36.68	54.36	55.75

Table 2.21: ROE versus screening methods using TA (Controlled for the attrition effect)

	1
DR	-0.080**
	-2.223
ARR	0.103***
	3.291
CCER	-0.002
	-0.010
FTSE	**0.026****
	2.443
MSCI	**-0.019***
	-1.887
Almeezan	**0.023****
	2.483
Capital TA	**-0.016***
	-1.722
FTSE D	-0.210***
	-7.737
MSCI D	-0.058***
	-3.199
Almeezan D	0.129***
	5.458
Capital TA D	0.089***
	3.580
Constant	0.065***
	4.013
R-squared	0.053
Hausman Test	FE
Observations	5,797
Number of crossid	368

2.11 Appendix C: Macro economic factors

Table 2.22: ROE versus screening methods using TA

	(1)	(2)
D	-0.141***	-0.172***
	-2.825	-3.43
AR	0.0912**	
	2.253	
CCE	-0.0145	
	-0.452	
ARCCE		0.0356
		1.529
GDP	0.595**	0.611**
	2.508	2.53
INT	0.552	0.468
	1.581	1.32
INFLA	-1.092***	-1.071***
	-3.212	-3.113
Size	-0.00161	-0.00178
	-0.742	-0.83
FTSE	0.0287**	
	2.458	
MSCI	-0.0261**	
	-2.395	
Almeezan	0.0242**	
	2.317	
Capital TA	-0.0172	
	-1.6	
DIB TA		-0.0228***
		-2.993
Constant	0.0897	0.123**
	1.636	2.295
R-SQ	0.0329	0.0269
Hausman Test	FE	FE
Observations	3,878	3,885
Number of crossid	270	270

Table 2.23: ROE versus screening methods using MV

Denominator	36m	24m	12m	12m	12m	12m
	(1)	(2)	(3)	(4)	(5)	(6)
D	-0.106***	-0.126***	-0.116***	-0.146***	-0.109***	-0.133***
	-4.752	-5.451	-5.368	-5.649	-4.836	-5.758
AR	0.132***	0.119***	0.0476	0.0402		
	4.307	3.928	1.452	1.143		
CCE	0.0689***	0.0317		-0.043	-0.0141	
	2.596	1.097		-0.768	-0.281	
ARCCE						-0.017
						-0.697
GDP	0.662***	0.608***	0.328	0.3	0.282	0.273
	2.808	2.612	1.371	1.326	1.21	1.129
INT	0.409	0.432	0.273	0.283	0.302	0.242
	1.083	1.124	0.756	0.801	0.893	0.697
INFLA	-0.897**	-0.875**	-0.727*	-0.749**	-0.704**	-0.691**

	-2.382	-2.37	-1.969	-2.078	-2.046	-1.977
Size	-0.00131	-0.000925	-0.00165	-0.00155	-0.00108	-0.00209
	-0.492	-0.37	-0.679	-0.655	-0.468	-0.9
HSBC	-0.014**					
	-2.24					
SP	0.0303***					
	2.626					
DJMI		0.00507				
		0.519				
Azzad			0.0324***			
			3.983			
Capital MV				-0.001		
				-0.115		
AAOIFI					0.00984	
					1.09	
DIB MV						-0.0145
						-1.584
Constant	0.0619	0.0692	0.101*	0.126**	0.103*	0.148***
	1.05	1.211	1.813	2.247	1.865	2.727
R-squared	0.030	0.0252	0.0358	0.0308	0.027	0.0264
Hausman Test	FE	FE	FE	FE	FE	FE
Observations	3,163	3,233	3,321	3,293	3,377	3,403
Number of crossid	255	255	259	259	260	260

Table 2.24: Excess returns VS screening methods using TA

	(1)	(2)
Constant	-0.160	-0.169
	-1.378	-1.467
MKT	1.692***	1.691***
	11.510	11.730
D	-0.165**	-0.117
	-2.032	-1.488
AR	0.387***	
	4.497	
CCE	-0.040	
	-0.628	
ARCCE		0.186***
		4.202
GDP	0.444***	0.437***
	7.690	7.675
INT	0.403***	0.399***
	6.565	6.444
INFLA	-0.312***	-0.298***
	-4.724	-4.530
Size	-0.002	-0.002
	-0.377	-0.417
FTSE	0.029	
	0.985	
MSCI	-0.0502**	
	-2.212	
Almeezan	0.011	
	0.448	
Capital TA	-0.007	
	-0.331	
DIB TA		0.016
		0.971
R-squared	0.0795	0.073
Hausman Test	FE	FE
Observations	3,634	3,640
R-squared	0.079	0.0725

Table 2.25:Excess returns vs screening methods using MV

Denominator	36m	24m	12m	12m	12m	12m
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.172	-0.171	0.043	0.027	0.024	-0.015
	-1.290	-1.265	0.325	0.201	0.184	-0.113
MKT	1.644***	1.616***	1.517***	1.514***	1.574***	1.549***
	10.530	10.450	10.580	10.540	10.900	10.810
D	-0.127***	-0.166***	-0.299***	-0.290***	-0.205***	-0.237***
	-2.782	-3.256	-6.674	-5.719	-3.794	-4.916
AR	0.514***	0.458***	0.314***	0.263**		
	6.260	5.363	3.087	2.466		
CCE	0.383***	0.353***		0.208***	0.275***	
	6.389	5.788		2.651	3.465	
ARCCE						0.208***
						3.687
GDP	0.447***	0.485***	0.362***	0.373***	0.379***	0.373***
	7.822	8.112	6.892	6.993	6.996	6.948
INT	0.461***	0.483***	0.394***	0.403***	0.376***	0.377***
	7.4	7.063	5.679	5.704	5.481	5.618
INFLA	-0.354***	-0.367***	-0.292***	-0.310***	-0.290***	-0.269***
	-5.669	-5.720	-4.323	-4.466	-4.249	-4.093
Size	-0.006	-0.004	-0.007	-0.007	-0.006	-0.006
	-0.921	-0.675	-1.218	-1.237	-1.082	-1.004
HSBC	0.005					
	0.190					
SP	-0.008					
	-0.351					
DJMI		-0.0269**				
		-2.471				
Azzad			-0.016			
			-0.952			
Capital MV				-0.005		
				-0.270		
AAOIFI					0.003	
					0.165	
DIB MV						0.010
						0.500
R-squared	0.109	0.100	0.0654	0.0702	0.0669	0.0697
Hausman Test	FE	FE	FE	FE	FE	FE
Observations	3,055	3,117	3,168	3,148	3,221	3,240
Number of stocks	250	250	255	255	256	256

Table 2.26: Sharpe ratio vs screening methods using TA

	(1)	(2)
D	-0.042	-0.016
	-1.438	-0.478
AR	0.0549**	
	2.328	
CCE	-0.0624***	
	-3.365	
ARCCE		-0.009
		-0.783
GDP	0.007	0.005
	0.046	0.033
INT	-0.219	-0.187
	-1.279	-1.038
INFLA	0.447**	0.359*
	2.008	1.800
Size	0.00372*	0.003
	1.692	1.561
FTSE	-0.010	
	-1.255	
MSCI	0.006	
	1.149	
Almeezan	0.0108*	
	1.768	
Capital TA	-0.009	
	-1.186	
DIB TA		0.00557*
		1.725
Constant	-0.0763*	-0.0780*
	-1.762	-1.760
R-squared	0.0510	0.0227
Hausman test	FE	FE
Observations	719	721
Number of stocks	66	66

Table 2.27: Sharpe ratio vs screening methods using MV

Denominator	36m	24m	12m	12m	12m	12m
	(1)	(2)	(3)	(4)	(5)	(6)
D	-0.0288	-0.0414*	-0.0606***	-0.0683***	-0.0312*	-0.0366*
	-1.3610	-1.8150	-2.9390	-3.2760	-1.9610	-1.6720
AR	0.105***	0.102***	0.0657***	0.0746***		
	4.0530	4.7500	4.1100	3.8170		
CCE	-0.0247	-0.0397**		-0.0314	-0.0088	
	-1.4770	-2.6220		-1.3510	-0.3460	
ARCCE						0.0216
						1.4350
GDP	0.0297	0.0515	0.0813	0.0518	0.0309	0.0791
	0.1780	0.3160	0.5040	0.3280	0.2030	0.5140
INT	-0.1200	-0.0761	-0.1220	-0.1480	-0.1790	-0.1090
	-0.6290	-0.3960	-0.6640	-0.7910	-0.9180	-0.5960
INFLA	0.3260	0.1720	0.2660	0.3220	0.2940	0.2070
	1.2920	0.7280	1.0500	1.2540	1.3090	0.9520

Size	0.0043	0.0038	0.0038	0.00413*	0.0035	0.0034
	1.6510	1.5390	1.5200	1.6830	1.5750	1.4220
HSBC	0.0046					
	0.7150					
SP	-0.0026					
	-0.4640					
DJMI		0.0009				
		0.1570				
Azzad			0.0015			
			0.2940			
Capital MV				-0.0011		
				-0.1680		
AAOIFI					0.0012	
					0.2620	
DIB MV						0.0040
						0.8830
Constant	-0.112**	-0.0927*	-0.0880*	-0.0884*	-0.0740*	-0.0795*
	-2.1860	-1.9830	-1.7940	-1.8980	-1.6970	-1.7150
R-squared	0.0617	0.060	0.0521	0.059	0.0300	0.0337
Hausman Test	FE	FE	FE	FE	FE	FE
Observations	612	606	632	628	644	647
Number of stocks	60	60	62	62	63	63

Chapter 3 : Country index-based momentum in Islamic mutual funds: performance and crash risk

3.1 INTRODUCTION

Jegadeesh and Titman (1993) document that momentum strategies that buy stocks with high returns over the previous 3 to 12 months and sell stocks with poor returns over the same time period earn profits of about one percent per month on average. Following this discovery, researchers have documented the profitability of stock momentum strategies outside the US and in various asset classes.[22] Moreover, the literature reports abnormal returns for momentum strategies based on country indices.[23] Advances in trading momentum strategies include country index-based momentum strategy. It can be defined as buying stocks/funds in the winning country and short-selling funds from the losing country based on the sorted cumulative returns of countries' indices over the past few months before holding this portfolio for several months. Incorporating a momentum strategy based on indices in performance analysis is justified in the literature. First, Bhojraj and Swaminathan (2006) indicate that individual stocks are regularly less liquid than indices. In contrast, stock momentum strategies frequently incorporate small illiquid stocks that attract relatively high transaction costs (Grinblatt & Moskowitz, 2004). Second, there is also empirical evidence that index momentum largely captures and absorbs stock momentum. For instance, Asness et al. (1997) observe that stock-based momentum is embedded in country momentum in an international context, while Scowcroft and Sefton (2005) find that momentum effects are primarily driven by indices rather than individual stocks. Recently, Breloer et al. (2014) find that considering a country index-based momentum factor has a significant positive impact on the performance of fund portfolios and individual funds. Yet, country index-based momentum has not been examined in the context of Islamic mutual funds (IMFs). This chapter thus fills this gap by investigating

[22] See, for example, Rouwenhorst (1998), Griffin et al. (2003), Chui et al. (2010), Hou et al. (2011), and Chang et al. (2018) that document momentum outside the US, and Asness et al. (2013) that document momentum in various asset classes.

[23] See, for example, Asness et al. (1997), Chan et al. (2000), Bhojraj and Swaminathan (2006), and Breloer et al. (2014).

whether investing in country index-based momentum stocks can enhance the performance of IMFs.

Contrary to conventional funds[24], IMFs show resilience[25] and have been characterized as outperformers under financial crises in the Islamic finance literature (e.g. Abdullah et al., 2007; Ho et al., 2014; Boo et al., 2017). In this sense, perceptions about the performance of funds differ between IMFs and conventional funds. As investor perception regarding the performance of IMFs increases, more investors consequently change their position in funds, which increases the momentum effect. Moreover, the home bias theory indicates that investors' portfolios are heavily weighted to domestic assets. Similarly, IMF investors also prefer to invest in familiar domestic assets. However, because their domestic asset allocation is restricted to those assets that comply with Shariah law, they may be more willing to consider investing in compliant assets offered in other countries. Hoepner et al. (2011) find that investing in an Islamic economy benefits Islamic funds' financial performance, and thus argue that the financial value of a stock's Shariah compliance is positively related to the influence of Shariah law on consumers in its home economy. The main implication of this is that investing in countries with more developed Islamic financial services can enhance the performance of IMFs. Adding a country index-based momentum factor as a determinant of IMF performance may contribute to this evidence by allowing evaluation of the momentum profitability in those countries where IMFs are domiciled, including those countries with Islamic cultural characteristics. Several rules-based approaches to asset allocation exist, including those based upon financial market momentum. These require managers with superior country-specific skills to implement momentum strategies in order to generate excess returns for themselves or their clients, and these skills can vary with the state of the economy of each market (Banegas et al., 2013). Hence, the main implication of the momentum strategy is that active managers should consider multiple countries consistently, using their timing abilities to add value. This allows investigation of whether IMF managers are using a top-down approach when selecting specific

[24] According to the U.S. data from Kenneth French's homepage and the German data from Brückner et al. (2014), profitable momentum strategies performed extremely poorly following the recent financial crisis. During April-September 2009, a WML strategy would have yielded a cumulative return of −50.77% in the U.S. and −42.01% in Germany. In addition, Starks and Sun (2016) provide evidence that in periods of high economic policy uncertainty, perceptions about the performance of funds decrease, and consequently investors do not change their position in funds, which decreases the momentum effect.

[25] This intrinsic property of Islamic finance contributes towards insulating it from the potential risks resulting from excess leverage and speculative financial activities which are part of the root causes of the current financial crisis (Ahmed, 2010).

countries to invest in. This is important in terms of examining whether IMFs' relative performance is due to country index-based momentum or mutual fund portfolio manager luck.

Despite general profitability, the performance of stock-based momentum strategies comes with occasional large crashes[26] as described by Daniel and Moskowitz (2016). In normal times, a winner portfolio outperforms a loser one, but during a momentum crash, the loser portfolio will outperform the winner. A momentum crash thus occurs whenever the worst performing stocks in the market, namely the loser stocks, rebound faster than the putative winners. The evidence from the literature shows that momentum crashes are thus explained by the time varying systematic risk embedded in the momentum strategy. Momentum crashes have also been documented in Grundy and Martin (2001), Cooper et al. (2004), and Ma (2014). While the profitability of country momentum strategies for IMFs is an important field of study in general, examining the behaviour of these strategies during bear markets is thus also critical given that IMFs are found to be less sensitive to market downturns.

Following the literature on Islamic funds by Hoepner et al. (2011) and Nainggolan et al. (2016), and using a sample of 490 IMFs domiciled in 24 countries within eight investment regions, we examine whether IMFs outperform the market benchmark (proxied by the MSCI All Country World index (ACWI)). We also examine if IMFs have exposure to fund investment styles, and whether IMF managers possess notable stock selectivity skills and market timing ability. Investigation into the performance of IMFs as compared to the market benchmark leads us to study if the performance of IMFs is driven by the state of the market and if managers' stock selectivity skills, market timing ability, and exposure of IMFs to investment styles are also sensitive to the state of the market. Our approach in segregating the market into upturn and downturn states differs from prior studies, which tend to use pre- and post- global financial crisis (GFC). An in-depth discussion of this is provided in Section 3.2. This chapter also contributes to the literature on IMFs by concentrating on country index-based momentum strategies. We investigate whether: (i) adopting a country index-based momentum strategy has an impact on the performance of IMFs; (ii) there is a relationship between funds' exposures to our country index-based momentum strategy and fund investment styles; (iii) the returns of country index-based momentum strategies experience infrequent and persistent strings of negative returns following market declines when market volatility is high; (iv) the returns of

[26] In 1932, the winners minus-losers (WML) strategy delivered a -91.59% return in just two months, and in 2009, momentum experienced a crash of -73.42% in three months (Barroso & Santa-Clara, 2015).

country index-based momentum strategies have exposure to the GFC and fund investment styles; and (v) the returns of country index-based momentum strategies are associated with screening intensity and fund characteristics. Lastly, we examine whether fund investment styles have an impact on the crash risk of country index-based momentum strategies. Detailed discussion on methodologies to achieve these is provided in section 3.4.

The results indicate that Islamic mutual funds outperform the market benchmark. It is also clear that managers do not generally possess market timing ability. Islamic mutual funds have positive exposure to small-cap stocks, but negative exposure to value stocks. Furthermore, the performance of mutual funds is driven by the state of the market. Outperformance in the down market relative to the market benchmark is recorded, balanced by underperformance in the up market. There is also some evidence that managers possess market timing ability in upturn markets but not in the market downturns: IMF "exposure to fund" investment styles change with the state of the market. Adding country index-based momentum improves the performance and the explanatory power of Fama and French three factor model, and sorting funds according to their country momentum exposure reveals a positive relationship between this index momentum exposure and risk-adjusted performance. On average, funds with relatively high exposure to our country index-based momentum strategy exhibit higher performance than those with low exposure to our country index-based momentum strategy, and funds with high index momentum exposure tend to invest in small value stocks. Focusing on variables such as country momentum strategies' crashes, investment styles, fund characteristics, option-like behaviour, exposure to market volatility, exposure to investment styles, and fund characteristics, the relationship between the performance of country index-based momentum strategies and these variables appear to be driven by the periods of ranking and performance of the individual country index-based momentum strategy. Interestingly, screening intensity increases momentum performance, and a negative relationship is observed between the crash risk of momentum strategies and the market factor; however, a positive relationship emerges between crash risk and SMB and HML factors. Overall, the current results suggest that managers of IMFs should consider country index-based momentum factors when evaluating fund risk-adjusted performance. However, they should also pay attention to the fact that some country index-based momentum strategies may experience crashes as they are exposed to investment styles and crash risk.

This chapter is organised as follows. Section 3.2 presents the literature review, Section 3.3 describes hypotheses development, and Section 3.4 discusses the data and methodology. Section 3.5 outlines the descriptive statistics, Section 3.6 presents and discusses the empirical results, and Section 3.7 presents robustness tests. Section 3.8 concludes the chapter.

3.2 LITERATURE REVIEW

This section reviews the literature on momentum profitability, including stock-based (Section 3.2.1) and country-index based momentum strategies (Section 3.2.2). Further, it assesses relevant literature on momentum with reference to the performance of Islamic investments (Section 3.2.3) and momentum crashes (Section 3.2.4).

3.2.1 Stock-based momentum and profitability

The profitability of stock-based momentum strategies has been widely documented in the literature since they were first proposed by Jegadeesh and Titman (1993) in the US stock market. Grinblatt et al. (1995) analyse the trading patterns of managers using 155 mutual funds over the period from 1975 to 1984. Using monthly returns of NYSE and AMEX listed stocks, they constructed a momentum measure based on the difference between two weighted portfolio returns. They showed that many fund managers follow momentum strategies with regard to their stock investments, and that an increase of one percent in stock-based momentum investing increases the returns of funds by about 1.27 percent. Carhart (1997) analyses the performance of 1,892 diversified equity funds monthly from January 1962 to December 1993, showing that adding a stock-based momentum factor that captures Jegadeesh and Titman's (1993) one-year momentum is priced into funds' adjusted returns. The profitability of stock-based momentum strategies has also been documented in markets outside of the US. Rouwenhorst (1998) shows that taking a long position in winner portfolios and a short position in loser portfolios increases the risk-adjusted return by more than one percent per month on average, based on examining monthly total returns for 2,190 firms from twelve European countries from 1978 through 1995. These portfolios are constructed based on stocks' past J-month return (J equals 3, 6, 9, or 12) and held for K subsequent months (K equals 3, 6, 9, or 12 months). Griffin et al. (2003) investigate the profitability of stock-based momentum strategies in forty countries in Africa, the Americas, Asia, and Europe using a momentum strategy based on historical 6-month returns held for a performance period of six months (a strategy denoted as 6/6). For the US

data, the stock returns of NYSE and AMEX listed firms from 1926 to 2000 were used, while for other countries, they picked those with at least 50 stocks to find significant positive momentum returns in 33 out of 40 countries. Antoniou et al. (2007) use a sample of all stocks listed in the French, German, and UK stock markets between January 1977 and December 2002 to examine the profitability of a momentum strategy based on the past 6-month returns held for a performance period of 6 months. The authors grouped stocks for each month in each country into deciles based on their 6-month past returns, and equally weighted returns were estimated for the two extreme (winner and loser) portfolios for each month. The results showed that the applied momentum strategy earns an average statistically significant monthly profits of 2.10 percent, 1.82 percent, and 1.44 percent in the UK, Germany, and France, respectively.

Using monthly returns for over 27,000 stocks from 49 countries over a three-decade period, Hou et al. (2011) similarly show that a multifactor model that includes factor-mimicking portfolios based on momentum captures significant time-series variations in global stock returns with fewer pricing errors and model rejections than both the global CAPM and a popular alternate model that uses size and book-to-market factors. Fama and French (2012) examine international stock returns to investigate whether empirical asset pricing models capture the value and momentum patterns emerging from international average returns in 23 developed markets, as combined into four regions, from November 1989 to March 2011. They found strong momentum returns in all four regions (North America, Europe, Japan, and Asia Pacific). Asness et al. (2013) examine the momentum portfolios of individual stocks globally across four equity markets, namely the United States, the United Kingdom, continental Europe, and Japan, using the common measure of the past 12-month cumulative raw returns on assets. All series used were monthly and ended in July 2011. The US and UK stock samples began in January 1972, while the European and Japanese stock samples began in January 1974. The universe of stocks in each market was limited to a very liquid set of securities that could be traded for reasonably low cost at reasonable trading volume size. The results showed consistent momentum return premiums across diverse markets and asset classes.

Overall, the literature on stock-based momentum strategies suggests that these strategies could contribute positively to performance. A momentum factor should therefore be considered in any analysis of fund performance.

3.2.2 Country index-based momentum and profitability

Several empirical studies reveal that momentum strategies based on country indices earn remarkable abnormal returns. Chan et al. (2000) examine the profitability of momentum strategies implemented on international stock market indices using a sample of 23 countries over 15 years for the period from January 1980 to June 1995. In formulating the momentum strategies, they followed the method applied in Lo and MacKinlay (1990) and Conrad et al. (1994), where the portfolio weights for the strategies are determined by the past performance of the asset relative to the average of all assets. In contrast to previous studies considering the buying or selling of individual stocks, the authors implemented momentum strategies based on individual stock market indices that showed statistically and economically significant evidence of momentum profits, especially for short holding periods of less than four weeks. They also found that in markets that experienced increased trading volume in a previous period, momentum profits were higher. Further, they showed that fund managers select countries or sectors before stock picking, taking a top-down approach to allocating clients' capital. A top-down approach is a type of active management strategies that focus on the macroeconomic environment, demographic trends, and government policies to arrive at investment decisions.[27]

Bhojraj and Swaminathan (2006) examine whether momentum in country index returns is followed by reversals by using data from 38 country stock indices from 1970 to 1999. They implemented the momentum strategies by, at the beginning of each month from January 1970 to December 1999, forming quintile portfolios based on the preceding 6-month returns of all country stock indices available at the beginning of the month. They found that past 6-month winners (that is, the country stock indices earning the highest returns) outperform past 6-month losers (the country stock indices earning the lowest returns) over the ensuing 3 to 12 months while underperforming past losers over the ensuing 2 years. Banegas et al. (2013) apply index-based size and value factors as well as an index-based momentum factor to the study of European equity funds to examine whether European investors can benefit from selecting funds based on regional, country, or sector-specific markers across several developed European markets; their aim was to identify how macroeconomic information helps to improve the

[27] CFA institute 2020, Active equity investing: strategies, viewed 21 May 2019,
< https://www.cfainstitute.org/en/membership/professional-development/refresher-readings/2020/active-equity-investing-strategies >

selection of such funds. They found that managers with superior country-specific and sector-specific skills do exist, but that levels of these skills vary with the state of the economy.

Using a data set of international and global equity mutual funds, Breloer et al. (2014) construct four country index-based momentum strategies based on multiple ranking/performance periods known as S (6,1); S (6,6); S (12,1); and S (12,6) using the monthly returns of the MSCI Investable Market Indices (IMI) of 23 developed and 22 emerging market countries from June 1994 through December 2009. Extending an international, index-based version of the Fama and French (1993) three-factor model by adding the factors of country momentum, they found that the coefficient of the country index-based momentum factor - S (12,1) - is positive and statistically significant, indicating a positive impact on the risk-adjusted performance of funds. Moreover, they found that adding the country index-based momentum factor to the three factor model created by Fama and French (1993) increases the explanatory power of its estimation.

3.2.3 Momentum and performance of Islamic investments

Despite multiple studies investigating the performance of Islamic mutual funds over the last two decades, such as Elfakhani et al. (2005), Abdullah et al. (2007), Abderrezak (2008), Hayat and Kraeussl (2011), Vandendriessche (2010), Hoepner et al. (2011), El Khamlichi et al. (2014), Nainggolan et al. (2016), El-Masry et al. (2016), and Boo et al. (2017), few studies have assessed the performance of stock-based momentum strategies within such analysis. Hoepner et al. (2011) examine the performance of 265 Islamic equity mutual funds operating in 20 countries using data from September 1990 to April 2009, estimating Carhart's (1997) model to evaluate fund performance. To calculate the momentum factor, they ranked stocks based on the previous twelve months and investigated the return difference between the top 30 percent (previous winners) and the bottom 30 percent (previous losers). They found that Islamic mutual funds have have more winner stocks than loser stocks in countries such as Singapore, Luxembourg, Germany, Bahrain, and the US, and exposure to loser stocks in Liechtenstein and the UK. El-Masry et al. (2016) similarly use the momentum factor described in Carhart's (1997) four-factor model to study the performance of 336 mutual funds in the MENA region, 105 Islamic and 231 conventional, over the period January 2006 to December 2013, which covers the global financial crisis and the ensuing recovery period. They found that Islamic funds' positive exposure to a momentum factor did not seem to differ significantly between the crisis and recovery periods. Merdad et al. (2016) investigate whether there are any costs associated with investing in mutual funds in Saudi Arabia by using a unique sample of

143 Saudi mutual funds (96 Islamic and 47 conventional) for the period July 2004 to January 2010. Their results indicated that during an overall bull market and in financial crisis periods, there is no statistical evidence that these portfolios (Islamic and conventional) are sensitive to the momentum risk factor.

Some limited research has been carried out on specific Islamic stock markets. Narayan and Phan (2017) examine the profitability of momentum strategies for 532 Islamic stocks listed in the Dow Jones Islamic United States index. They constructed a number of momentum strategies of different ranking and holding periods following the method popularised by Jegadeesh and Titman (1993), controlling for a range of stock characteristics, seasonal patterns in momentum returns, and up and down market conditions. They found that momentum profits from Islamic stocks (10.56 percent per annum) both exist and are higher than profits from non-Islamic stocks (8.88 percent per annum). They also found that these profits are stock characteristic-dependent and significantly influenced by value and size factors, among other factors. They further indicated that the up and down phases of the market offer different profits, as well as highlighting the existence of a January effect on profits. They concluded, however, that the profitability of Islamic stocks reflects compensation for increased risks and is not due to mispricing. Other studies have examined momentum profitability in Islamic markets such as Malaysia; these report that momentum strategies are profitable in such circumstances (May et al., 2014; Elias et al., 2014; Li et al., 2016).

3.2.4 Momentum crashes

Based on the prior studies discussed above, researchers have generally reached a consensus that the momentum strategy is profitable across numerous asset classes and markets. However, some recent studies report that momentum strategies can experience infrequent yet persistent strings of negative returns, which have come to be called “momentum crashes” (Daniel and Moskowitz, 2016). These momentum crashes occur particularly in financially unstable states, such as those following market declines and when market volatility is high, and they are thus contemporaneous with market rebounds.

Grundy and Martin (2001) investigate both the risks and the possible sources of reward for a short-term momentum strategy with an initial 6-month ranking period and a 1-month minimum holding period with consecutive formation periods with five-month overlaps. This strategy enters a long position in an equal weighted portfolio of winners and a short position in an equal-

weighted portfolio of losers. They thus showed that momentum has a significant negative beta following bear markets, arguing that when the market falls significantly over the momentum formation period, firms that were, and continue to be, high-beta firms naturally fall in tandem with the market, whereas low-beta firms do not. As a consequence, the momentum portfolio, which is likely to long low-beta stocks and short high-beta stocks, suffers a crash as a result of having a conditionally large negative beta resulting from the increase in betas for the past losers and decrease in betas for past winners following market declines.

Using stocks listed on the CRSP from January 1926 to December 1995 and a 6-month momentum strategy, Cooper et al. (2004) examine whether conditioning on the state of the market is important to the profitability of momentum strategies. They defined two states for the market: "UP" when the lagged three-year market return was non-negative, and "DOWN" when the three-year lagged market return was negative. They found that momentum profit depends on the state of the market, and that the momentum premium falls when the past three-year market return is negative. Stivers and Sun (2010) similarly study the intertemporal relationship between cross-sectional dispersion in stock returns and subsequent value and momentum premiums. Using a momentum strategy with 6-month ranking and holding periods for a sample of US listed stocks from 1962 to 2005, they found that the market is negatively related to subsequent momentum payoffs, and that the momentum premium is low when market volatility is high.

More recently, in a seminal study, Daniel and Moskowitz (2016) investigate the impact and potential predictability of momentum crashes in US common stocks over the period 1927–2013. They highlighted two momentum crashes, one in June 1932 to December 1939 and one in March 2009 to March 2013, both following stock market declines associated respectively with the great depression and the recent financial crisis. On studying the option-like behaviour of a momentum portfolio, they showed that the return of that momentum portfolio is significantly lower in bear markets. They thus argued that, in a bear market, the required portfolio of past losers behaves like a call option on the market and noted that the value of this option is not adequately reflected in the prices of these assets. This led to high expected returns on the losers in bear markets, and thus to low expected returns for the momentum portfolio that shorts such past losers. Further, in periods of high market stress, as indicated by bear markets and high volatility, the expected return of the momentum portfolio is smaller in value overall.

Grobys (2016) explores the optionality effect in the European Monetary Union (EMU) using S (6,2), S (12,2), and S (12,7) momentum strategies alongside the S (12,1) applied by Daniel and Moskowitz (2016). Analysing a population of 2,187 stocks over the period from January 2000 to March 2014, he found evidence of option-like behaviour in strategies based on intermediate past performance, such as S (12,2) and S (12,7), but not in momentum strategies based on recent past performance such as S (6,12).

3.3 HYPOTHESES DEVELOPMENT

3.3.1 Performance of IMFs relative to the market

The available evidence on the performance of Islamic funds relative to market benchmarks seems to confirm that IMFs generally underperform. Prior studies by Hayat and Kraeussl (2011), Abderrezak (2008), and Nainggolan et al. (2016) show that Islamic funds generally underperform their respective market benchmarks, in these cases, the Dow Jones, the S&P500, and the MSCI AC. Two major arguments are provided to explain this. The first is that this represents a cost of poor diversification due to the limited set of stocks any given Islamic fund can access, which tends to limit the opportunities for Islamic fund managers to maximise profit. The second argument is that differences exist in the cost structures of Islamic funds and other funds (Nainggolan et al., 2016). Ethical fund managers must perform screening to ensure that the businesses they invest in are compliant; as a consequence, an additional cost associated with this screening, which can be as high as 2 percent of net asset value, must be added to the standard management costs. Hence, in addition to distracting managers from the important task of generating returns for investors, screening, with its related direct costs, may reduce the net returns of Islamic funds investors.

Hoepner et al. (2011) analyse the financial performance and investment styles of 265 Islamic mutual funds from twenty countries, initially finding that more than half of the equal weighted national Islamic equity fund portfolios significantly underperformed their national equity market benchmarks. They argued that Shariah compliance distracts Islamic mutual funds from the pursuit of profit. However, when controlling for the exposure of IMFs to different national, regional, and global equity markets, they found that Islamic mutual fund portfolios from the six countries with the best developed Islamic financial markets (Bahrain, Kuwait, Malaysia, Qatar, Saudi Arabia, and UAE) do not deliver significantly negative abnormal returns; in the cases of Qatar and UAE, these even outperform international benchmarks. In contrast, Islamic funds from eight of the fourteen countries with less well-developed Islamic financial markets

(Australia, Germany, Liechtenstein, Luxembourg, Morocco, South Africa, the UK, and the US) significantly underperform their benchmarks. The authors provided two arguments in relation to these findings. The first is that the high density of intermediaries and competitors in the six Islamic financial centres has a positive effect on Islamic fund managers' learning gains and thus eventually on their funds' performance. The second is that incorporation in an Islamic economy benefits Islamic funds' financial performance as Islamic economies tend to have a home bias related to the influence of Shariah law on consumers in the home economy.

However, few studies have found that IMFs are outperformers compared to the market benchmark. Annuar et al. (1997) offer empirical evidence that Malaysian mutual funds over the period 1990 to 1995 did outperform the Kuala Lumpur Composite Index (KLCI) benchmark, with fund performance being due to managers' selectivity skills.

Based on the previous discussion, and consistent with the findings of a majority of studies, the following hypotheses are thus proposed:

Hypothesis 1. Islamic mutual funds perform better on average than the market benchmark.

To further clarify hypothesis 1 and to provide more detail on the performance of IMFs, the first step is to examine whether IMF managers are good stock pickers and market timers; the second is to investigate how IMFs perform during upturns and downturns in the market. Studies on IMFs generally find negative market timing ability, indicating a lack of timing ability among Islamic mutual fund managers (Abdullah et al., 2007; Nainggolan et al., 2016). Annuar et al. (1997) note that this negative timing ability suggests that fund managers attempt to shift their portfolio betas in ways that are not generally consistent with the direction of changes in the overall market portfolio.

Studies on IMFs generally find negative market timing ability, indicating a lack of timing ability among Islamic mutual fund managers (Annuar et al., 1997; Abdullah et al. (2007); Nainggolan et al. (2016). Abdullah et al. (2007) argue that this could be due to the fact that the investment choices of Islamic fund managers are less dependent on the fluctuation of the economy since their investments are not cyclical in nature. Islamic mutual funds (IMF) perform better than the market benchmark because of the characteristics of IMFs which comply with the Islamic principles. These principles that restricts highly leveraged and liquid stocks from the entering the pool of investment. Hoepner et al. (2011) finds that national characteristics

play an important role in deriving Islamic fund performance. For instance, the authors find that Islamic funds from the six largest Islamic financial centres in our study (the GCC countries and Malaysia) perform competitive or even outperform international equity market benchmarks. Contrary, Islamic fund portfolios from most other nations with less developed Islamic financial services significantly underperform their benchmarks.

Thus, consistent with the findings of most previous studies, the first sub-hypothesis of Hypothesis 1 emerges:

Hypothesis 1_t: Islamic fund managers possess negative market timing ability.

With respect to IMF performance during upturns and downturns of the market, prior studies show that IMFs outperform their peers during bearish markets while underperforming them during bullish markets. In many studies, bearish and bullish markets refer to the state of the market during the GFC and post GFC, respectively. Ahmed (2010) argues that IMFs provide some protection during market downturns, as the prohibition against investments in highly leveraged firms should keep Islamic funds relatively safe from credit crunches, which significantly and negatively affect many mainstream mutual funds. Companies' earnings and thus stock prices become more volatile as leverage increases, and therefore their sensitivity to market downturns increases. Abdullah et al. (2007) argues that, during market downturns, Islamic funds are rewarded with high returns because they exclude highly volatile stocks such as those involved in Riba, gambling, and uncertainty, making the investment of Islamic funds relatively less volatile during crisis periods. However, during market upturns, these excluded stocks with their high risk exposure are rewarded with high returns (reflecting the high level of risk), resulting in comparatively lower returns for Islamic funds compared to their peers. Merdad et al. (2010) show that IMFs outperform conventional funds during bearish and financial crisis periods while being underperformers during bullish periods. However, the authors note that IMFs can provide investors with hedging opportunities during economic downturns, and thus enhance their profitability overall. They also argued that, due to the restrictions applied to investing in stocks, Islamic funds exclude risky stocks that, according to risk-return trade off theory, tend to reward investors with high returns for accepting the high level of risk in bullish market states. As a consequence, conventional funds tend to outperform Islamic funds during bullish market states, though the opposite is true during bearish market states. This leads to the testing of the next two sub-hypotheses of Hypothesis 1. As previously mentioned, the current approach to distinguishing between bearish (downturn) and bullish

(upturn) differs from previous studies, with the term bearish market referring to the market's benchmark return being smaller than the risk-free rate and bullish market referring to when the market's benchmark return is greater than the risk-free rate. In segregating the market in upturn market and downturn market, we adopt the method developed by Pettengill et al. (1995) for testing the CAPM, extended by Hung et al. (2004) for testing multi-moment empirical CAPM, and more recently by Lambert and Hübner (2013) for testing multi-moment and four factor empirical CAPM. The same definition of "upturn/ downturn market" is used in these studies.

Hypothesis 1_{1d}. Islamic mutual funds perform better on average than the market benchmark during a downturn.

Hypothesis 1_{1u}. Islamic mutual funds perform worse on average than the market benchmark during an upturn.

It is also important to examine whether the market timing ability of managers is sensitive to the market state by testing the following sub-hypotheses:

Hypothesis 1_{1td}. Islamic mutual funds managers possess inferior market timing ability during a downturn.

Hypothesis 1_{1tu}. Islamic mutual funds managers possess superior market timing ability during an upturn.

3.3.2 Country index-based momentum and performance of IMFs

Investors who prefer momentum investing believe that an investment that has done well in the past will continue to perform well in the future, and vice versa. Prior studies have examined the profitability of stock-based momentum based on this theory, but until recently, few studies have addressed country index-based momentum and found it profitable. Bhojraj and Swaminathan (2006) argue that indices are regularly more liquid than individual stocks, yet stock-based momentum strategies frequently incorporate small illiquid stocks and thus attract relatively high transaction costs. Breloer et al. (2014) find a positive relationship between country momentum and the performance of funds; they also find that index-based models exhibit somewhat higher explanatory power, as measured by adjusted R-squared, compared to stock-based models. They further note that omitting any country index-based momentum factor may lead to biased findings in the evaluation of international and global fund performance.

This suggests that country-specific components may play a key role in explaining performance. Given the existence of such components, fund managers may prefer to select countries in which implementing momentum strategies is more profitable. For instance, Ejaz and Polak (2015) consider seven stock markets in the Middle East region and find significant momentum returns in these markets. They thus demonstrate that an investor can earn above average returns by using a price momentum investment strategy in the stock markets of the Middle East region by taking a long position in winner portfolios and going short in loser portfolios. This implies that ethical managers must develop superior country-specific skills in order to implement momentum strategies that generate excess returns. Furthermore, IMFs that operate in Muslim countries tend to outperform market benchmarks due to managers' superior knowledge of Shariah compliance and the influence of Shariah law on investors in such countries, as noted in Hoepner et al. (2011). The country index-based momentum factor encompasses the Shariah values prevalent in these countries, and this may be expected to enhance the performance of IMFs. Thus, the following hypothesis is posited:

Hypothesis 2. Country index-based momentum has a positive effect on the performance of IMFs.

3.3.3 Option-like behaviour (momentum crashes) and country index-based momentum returns

The study contributes to the literature in various ways. First, this is the first study to explore the profitability of country momentum-based trading strategies exclusively in the IMFs setting. In doing so, the current research is seeking to clarify whether such strategies implemented in an IMF setting yielded significant profits. Noted in section 3.4.2 that for this, we construct a panel data for country index-based momentum strategy using the monthly returns of each of the 36 different country index-based momentum strategies over the period from 2000 to 2016. We investigate whether IMF country index-based momentum strategies payoffs crash as documented in Daniel and Moskowitz (2016). This is achieved by studying the behaviour of each country index-based momentum strategy during the bear market period and the following recovery period.

In general, IMFs show resilience during market downturns. Many studies have examined the performance of IMFs in pre-, mid-, and post-financial crises periods, but so far, no study has yet examined the country index-based momentum profitability in the markets where these funds are invested during market stress periods. Recent literature has documented crashes in

stock-based momentum returns, and Daniel and Moskowitz (2016) assert that: “momentum crashes occur in panic states, following market declines, and when market volatility is high, and are contemporaneous with market rebounds”. Thus, it is important to determine whether a similar phenomenon occurs for country index-based momentum strategies in the markets where IMFs are invested.

It is likely that the state of the market plays a key role in shaping momentum profits; more specifically, markets that have an Islamic or ethical character differ from other markets in terms of their components and characteristics. For instance, profit and risk sharing in economic transactions is a fundamental principle in Islamic finance, and Ahmed (2010) notes that this principle requires a high level of disclosure and transparency to allow firms to be priced appropriately. These disclosures allow the market to assign the appropriate risk premiums to companies, thereby improving market discipline and promoting financial stability within the Islamic financial system. Nainggolan et al. (2016) argues that IEFs invest mostly in Islamic Financial Institutions (IFIs), which arguably have stronger governance systems than conventional financial institutions; thus, they may well be less affected during crisis periods. This chapter thus investigates whether or not these characteristics can lead to avoiding crashes in country index-based momentum returns.

However, all markets worldwide are connected in multiple ways both financially and economically, and even markets with an ethical character will be affected by the changes in conventional markets during times of financial stress. Therefore, momentum in these markets remains likely to display crashes in returns, and crashes in some of the country index-based momentum strategies are thus expected. More specifically, as documented by Daniel and Moskowitz (2016) and Grobys (2016), a momentum strategy is likely to have a crash if three conditions are met: first, the estimated market beta should be negative, as in bear markets; the momentum strategy behaves as if it effectively shorts a call option on the market. Second, consistent with Grundy and Martin (2001), a striking change should be evident in the market beta of the momentum portfolio in bear markets, as in terms of negative returns for the overall market, winners tend to be low-beta stocks and losers high-beta causing winner-minus-loser strategies to have negative betas. Third, when the market rebounds following a bear market, the momentum portfolio reflects these changes. This specification is similar to that used by Daniel and Moskowitz (2016) to assess the market timing ability of fund managers, and Hypothesis 3 thus consists of three combined sub-hypotheses to reflect this.

Hypothesis 3.1: there is a negative relationship between the returns of country index-based momentum strategies and the excess market returns

Hypothesis 3.2: there is a negative relationship between the returns of country index-based momentum strategies and the bear market returns

Hypothesis 3.3: there is a positive relationship between the returns of country index-based momentum strategies and the contemporaneous up market.

3.3.4 Country index-based momentum returns, the global financial crisis, investment styles, and screening intensity

If country index-based momentum strategies are found to have a positive impact on IMFs performance, then it is important to investigate what variables might have an impact on the payoffs returns of these strategies. We adopt the analysis provided in Grobys (2016) which studies the relationship between momentum payoffs of multiple momentum strategies and risk-adjustments using Fama and French three factor model and a financial crisis dummy in a European context. Similarly, we investigate the relationship with our constructed momentum strategies and risk-adjustments in H4 and H5.

Screening intensity is also found to have an impact on the performance of IMFs. We follow Nainggolan et al. (2016) to construct the screening intensity factor. Thus, it is the difference in returns between the MSCI World Islamic (MSCI Islamic) and MSCI AC World (MSCI AC). This section focuses on the question of whether or not country index-based momentum returns are affected by the GFC, dependent on funds' investment styles, or affected by screening intensity. In terms of European funds, Grobys (2016) finds no significant impact of the European debt financial crisis and size factor on the payoffs of momentum strategies such as those based on 6- and 12-month past returns held for 2 or 7 months (S (6,2), S (12,2), and S (12,7)), whereas the exposure of momentum payoffs to value stocks varies with the momentum strategy formation/performance type. Breloer et al. (2014), in contrast, find that funds in the US that have high index momentum exposure tend to be invested in small growth stocks.

A negative relationship is predicted between the recent global financial crisis (GFC) and country index-based momentum returns. All markets were adversely affected by the GFC, and as a result, the performance of winner portfolios is lower during the GFC than in normal market situations. Thus, momentum returns in these markets will be seen to decrease. With respect to investment styles, the empirical evidence shows that small and growth stocks have higher momentum profits (Breloer et al., 2014). It is therefore appropriate to test whether the profitability of country index-based momentum also depends on small growth stocks.

Furthermore, screening intensity has a positive impact on the performance of funds (Nainggolan et al., 2016), making it natural to ask whether screening intensity affects country index-based momentum profits. This leads to testing the following hypotheses:

$\boldsymbol{H_4}$**:** The GFC has a negative impact on country index-based momentum returns.

$\boldsymbol{H_5}$**:** The exposure of country index-based momentum returns is positive for small growth stocks.

$\boldsymbol{H_6}$**:** There is a positive relationship between country index-based momentum returns and screening intensity.

3.3.5 Crash risk of momentum strategies and investment styles

Grobys (2016) finds that the option-like behaviour of momentum strategies is driven by the formation and performance periods of momentum strategies. The results of his study indicated that the payoffs of a momentum strategy based on the past 12-month returns and held for 2 months (S (12, 2)) have positive exposure to value stocks. Interestingly, Grobys (2016) finds that the momentum strategy that exhibited the highest sensitivity against the value factor did not bear any crash risk. Thus, he suggests investigating the extent to which the crash risk of momentum strategies is associated with the chosen investment style. Consequently, the exposure to investment styles experienced may differ in momentum strategies that bear crash risk and those that do not bear crash risk. This leads to further study the relationship between country index-based momentum crash risk and investment styles by testing the following hypothesis:

$\boldsymbol{H_7}$**:** Small-value stocks have greater crash risk

3.4 DATA AND METHODOLOGY

The Eurekahedge Global Islamic Funds Database is used to construct panel data for the selected IMFs. The dataset includes fund name, inception date, country of domicile, investment regions, monthly returns, total assets under management (in USD million), management fees, and other fees. IMFs are examined for the period from January 2000 to December 2016. Excluding funds with no historical return data results in a final sample of 573 IMFs domiciled in 24 countries with investments in 8 regions. Funds with less than 36 observations (3 years) are then also excluded, resulting in a final sample of 490 Islamic mutual funds and 94,080 observations in

our panel data. As Eurekahedge Global Islamic Funds database covers both live and dead funds, the data is free of survivorship bias. The chapter uses monthly returns of each fund, net of management, performance, and other fees. We follow Nainggolan et al. (2016) on determining Muslim and non-Muslim domiciles. Our data sample provide data on country and region domiciles for each fund. We match our data on funds with the data on MSCI regional indices to choose the region domiciles. We relied on the data provided by Eurekahedge which provide data on whether funds are invested in global regions or other. We follow Hoepner et al. (2011) and Nainggolan et al. (2016) on keeping countries with a small number of funds.

The following subsections (Sections 3.4.1 – 3.4.6) describe the models used in this chapter.

3.4.1 Factor models

As a starting point, models used in prior studies are replicated. These include Jensen's (1968) one factor model:

$$R_{i,t} - r_{f,t} = \alpha + \beta[R_{m,t} - r_{f,t}] + \varepsilon_{i,t} \quad (3.1)$$

where R_{it} is the monthly return of funds; α is the Jensen alpha, which measures the abnormal risk-adjusted performance of fund i; β measures the exposure of funds to the market benchmark; r_f is the risk-free rate in month t proxied by one-month US treasury bills; R_m is the market return proxied by the MSCI (All Countries) World index (ACWI) and $\varepsilon_{i,t}$ is the error term. The choice of using the US treasury bill as the risk-free rate and the MSCI AC (All Countries) World index as the global market benchmark is motivated by Nainggolan et al. (2016). In order to evaluate Islamic fund managers' market timing ability and fund selectivity skills, this chapter also adopts the TM model developed by Treynor and Mazuy (1966), which is based on exponential growth in the market benchmark in the CAPM model using a quadratic regression. According to Admati et al. (1986), the TM model provides a valid measurement of market-timing performance ability. The model equation is as follows:

$$R_{i,t} - r_{f,t} = \alpha + \beta_1[R_{m,t} - r_{f,t}] + \beta_2[R_{m,t} - r_{f,t}]^2 + \varepsilon_{i,t} \quad (3.2)$$

where α measures the ability of portfolio fund managers in terms of effective skills regarding stock selection and β_2 measures the market timing expertise of each fund manager; $[R_{m,t} - r_{f,t}]^2$ is the quadratic term for the market benchmark. The other variables are defined

as in the previous equation. Positive values of α and β_2 are respectively indicative of selectivity and market timing skills among Islamic mutual funds managers.

To test the impact of size and value on performance, the Fama and French (1993) three factor-model is used.

$$R_{i,t} - r_{f,t} = \alpha + \beta_1[R_{m,t} - r_{f,t}] + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{i,t} \quad (3.3)$$

The value and growth factors are computed following Faff (2003), using the MSCI AC World style indexes MSCI AC World Value, Growth, Small Cap, and Large Cap. This allows computation of factors such as SMB = MSCI Small Cap–MSCI Large Cap and HML= MSCI Value–MSCI Growth. The same method is adopted by Nainggolan et al. (2016).

This chapter contributes to the literature by focusing on country index-based momentum. This involves incorporating the returns of country index-based momentum strategies by constructing the following four-factor asset pricing model:

$$R_{i,t} - r_{f,t} = \alpha + \beta_1[R_{m,t} - r_{f,t}] + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 CMOM_t + \varepsilon_{i,t} \quad (3.4)$$

All country index-based momentum strategies are incorporated in equation 3.4 in order to provide a comprehensive analysis of the impact of different momentum strategies on the performance of Islamic mutual funds. This model is then run 36 times, incorporating each constructed strategy separately in model 3.4 (see Table 3.3 in Section 3.5.2) to find the strategy that makes the highest contribution to performance[28]. Due to its superior four-factor beta (see Table 3.13 in the Appendix), the 3/48 strategy based on 3-month past returns held for 48 months is thus used to determine the country index-based momentum factor, CMOM.

This four-factor model is incorporated into in the setup of Treynor and Mazuy (1966) as performed by Bollen and Busse (2001) (BB model) to prevent the risk of rewarding managers for exploiting well-known anomalous returns. Hence, the equation becomes:

[28] Panel regression analysis using each country's momentum strategy is adopted to allow selection of the strategy with the highest positive and significant coefficients. The Hausman test is applied to decide on either fixed effects or random effects. Based on results in Table 3.13 (see Appendix), S (3,48) has the highest coefficient. Thus, it is used as a proxy for country index-based momentum factors in all subsequent sections.

$$R_{i,t} - r_{f,t} = \alpha + \beta_1[R_{m,t} - r_{f,t}] + \beta_2[R_{m,t} - r_{f,t}]^2 + \beta_3 SMB_t + \beta_4 HML_t + \beta_5 CMOM_t + \varepsilon_{i,t} \quad (3.5)$$

The conditional systematic relationship between the different betas and funds' realised returns is also investigated. The method developed by Pettengill et al. (1995) for testing the CAPM, as extended by Hung et al. (2004) for testing multi-moment empirical CAPM, and more recently by Lambert and Hübner (2013) for testing multi-moment and four factor empirical CAPM, is adopted. The same definition of "upturn/ downturn market" is used in these studies. This method is based on separating months into upturns and downturns. Upturn is defined as when the market risk premium is greater than 0 and downturn occurs when the market premium is less than 0. This methodological choice is guided by two factors. The first is that while studies indicate that, in general, the risk-free rate must be smaller than expected market returns, there must be some cases where the risk-free return exceeds the market return, otherwise investors would not accept the risk-free rate. In such scenarios, Lambert and Hübner (2013) observe a reverse relationship between returns and market betas. It is thus necessary to distinguish between up and down markets in panel setup in order to take this "realisation bias" into account. If this is not done, the results will be combined across the panel regression by averaging the estimated risk premiums, which could lead to an insignificant relationship between beta risk and returns being erroneously shown. The second is the fact that it is interesting to investigate the performance of Islamic mutual funds based on the phases of the market (ups or downs) in order to see if results differ according to market phase. As discussed in Section 3.2.2, IMFs have been found to perform better than market benchmarks and conventional peers in down phases. Thus, separating the market into up and down phases should provide detailed evidence in relation to the effect of country index-based momentum strategies on the performance of IMFs during both phases.

Models 1 to 4 are thus run based on these two conditions. Multiple funds are nested in regions, creating nested data with two levels. The returns of a fund over time may be correlated due to exposure to identical fund characteristics; likewise, the average returns of funds may be correlated within a region due to similarities in economic aspects. We use fixed effects. Specifically, the fixed effect absorbs the time invariant characteristics of the firm, which mitigates endogeneity (Wooldridge, 1995). We also perform our analysis using clustering standard errors by investment region and funds. Clustering tends to correct for heteroscedasticity and serial correlation (Arellano (1987); White (2014))

3.4.2 Country index-based momentum crashes

This subsection investigates whether IMF country index-based momentum strategies payoffs crash as documented in Daniel and Moskowitz (2016). This is achieved by studying the behaviour of each country index-based momentum strategy[29] during the bear market period and the following recovery period. The model equation is as follows:

$$R_{j,t} = \left(\alpha + \alpha_B I_{B,t-1}\right) + \left(\beta + I_{B,t-1}(\beta_B + I_{U,t}\beta_U)\right) R_{M,t} + \varepsilon_{j,t} \quad (3.6)$$

where $R_{j,t}$ is the return of a country-index based momentum strategy in month t; $R_{M,t}$is the MSCI AC index excess return in month t; $I_{B,t-1}$ is an ex-ante bear market indicator; and $I_{U,t}$ is a contemporaneous, i.e., not ex-ante, up market indicator. The indicators are further defined as follows:

$$I_{B,t-1} = \begin{cases} 1, \text{if the cumulative MSCI AC index return in the past 24 months is negative;} \\ 0 \text{ otherwise} \end{cases}$$

$$I_{U,t} = \begin{cases} 1, \text{if if the excess MSCI AC index return is greater than the risk} - \text{free rate in month t;} \\ 0 \text{ otherwise} \end{cases}$$

3.4.3 Market stress and country index-based momentum returns

The portfolio of past losers may behave like a call option on the market, and the value of this option may thus not be adequately reflected in the prices of these assets in a bear market. This in turn may lead to high expected returns on the losers in bear markets, and low expected returns for WML portfolios that short these past losers. This subsection thus examines the relationship between the value of an option on the market and market variance. A rolling window of 24 months (2 years) is used to construct an ex-ante estimate of market volatility over the coming month, and this market variance estimate is used in combination with the bear market indicator, $I_{B,t-1}$, to forecast future WML returns. This offers the following regression:

$$R_{j,t} = \gamma_0 + \gamma_B . I_{B,t-1} + \gamma_{\sigma_m^2} . \hat{\sigma}^2_{M,t-1} + \gamma_{\sigma_m^2} . I_B . \hat{\sigma}^2_{M,t-1} + \varepsilon_{j,t} \quad (3.7)$$

[29] We construct a panel data for country index-based momentum strategy using the monthly returns of each of the 36 different country index-based momentum strategies over the period from 2000 to 2016. From this section onwards, the analysis is performed using this panel data.

where I_B is the bear market indicator as defined previously and $\hat{\sigma}^2_{M,t-1}$ is the variance of the monthly returns of the market over the 24-month period prior to time t. The other variables are defined as in the previous equations.

3.4.4 Payoffs of country index-based momentum strategies, GFC, and investment styles

As yet, no empirical evidence has been provided on whether the global financial crisis and investment styles have any impact on the profitability of country index-based momentum trading strategies. To examine these relationships, the following regression, which includes a dummy variable (CD) for GFC with a value of 1 during the 2007 to 2009 crisis period and a value of 0 otherwise, is run:

$$R_{j,t} = \alpha + \beta_0 CD_t + \beta_1 R_{M,t} + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{j,t} \quad (3.8)$$

3.4.5 Payoffs of country index-based momentum strategies, screening intensity, and fund characteristics

To test whether there is a relationship between ethical screening intensity and country index-based momentum strategies returns, the following panel regression model is run:

$$R_{j,t} = \alpha + \beta_0 Screening\ intensity_t + \beta_1 Fund\ Characteristics_t + \varepsilon_{j,t} \quad (3.9)$$

where $R_{j,t}$ is the return on momentum strategy in month t, and Nainggolan et al. (2016) are followed in terms of the screening intensity variable. The difference in returns between the MSCI World Islamic (MSCI Islamic) and MSCI AC World (MSCI AC) are used to construct the ethical style factor, and the equation is controlled for fund characteristics such as Size, Age, Management Fees, and other Fees[30]. To allow for possible non-linearity in the size-country index-based momentum performance relationship, the squared term of Size is included in equation 3.9.

3.4.6 Crash risk of country index-based momentum strategies and fund investment styles

Option-like behaviours may differ from one country index-based momentum strategy to another. This is supported by the findings of Grobys (2016), which suggest that sensitivity to investment styles may differ between momentum strategies that bear crash risk and those that

[30] Other fees include fees related to Shariah advice and administrative fees.

do not bear crash risk. This leads to further study of the relationship between country index-based momentum crash risk and fund characteristics. Panel data using the returns of all constructed momentum strategies is thus used in this chapter, along with three measures of crash risk, constructed following the studies of Chen et al. (2001), Hutton et al. (2009), and Kim et al. (2011). The first measure of crash likelihood for each country index-based momentum in each year, denoted by CRASH, is an indicator variable that equals 1 for each momentum-year that experiences one or more crash months during the period, and 0 otherwise. The second crash risk measure, denoted by COUNT, is based on the number of crashes and the number of jumps during a year. A crash (jump) occurs when the country index-based momentum-specific monthly return moves 3.09 standard deviations from the annual mean. We follow (Hutton et al., 2009), (An and Zhang, 2013) and (Callen and Fang, 2015) in choosing 3.09 to generate 0.1% in the normal distribution.3.09 is chosen to generate frequencies of 0.1% in the normal distribution (Hutton et al., 2009). COUNT is thus defined as the number of crashes minus the number of jumps for a given year. The third measure of crash risk is the negative conditional return skewness measure, denoted by NCSKEW. $\text{NCSKEW}_{j,t}$ for a given country index-based momentum in a given year is calculated by taking the negative of the third moment of the country index-based momentum-specific monthly returns for the sample year and dividing it by the standard deviation of the country index-based momentum-specific monthly returns raised to the third power. For each country index-based momentum i in year t, NCSKEW is thus computed as:

$$\text{NCSKEW}_{j,t} = -[n(n-1)^{\frac{3}{2}}\sum w_{j,t}^3]/[(n-1)(n-2)(\sum w_{j,t}^2)^{3/2}$$

The calculation of the above crash risk measures involves the calculation of momentum-specific monthly returns for each country index-based momentum strategy. Following Hutton et al. (2009), the country index-based momentum-specific monthly return for a strategy j in month t, $W_{j,t}$ = ln(1+ $r_{j,t}$), is defined as the natural log of 1 plus the residual return of the 12-months rolling window expanded market model regression as follows[31]:

$$R_{j,t} = \alpha + \beta_1 R_{m,t-2} + \beta_2 R_{m,t-1} + \beta_3 R_{m,t} + \beta_4 R_{m,t+1} + \beta_5 R_{m,t+2} + \varepsilon_{j,t}$$

[31]The majority of the Islamic mutual funds in the chapter cover all industry sectors. No industry index return (or associated lead and lag terms) is thus included in the expanded market model, as per Hutton et al. (2009). Following Kim et al. (2011), the market index (and its lead and lag terms) are used.

where $R_{j,t}$ is the return on momentum strategy j in month t, and R_m is the return on the MSCI AC market index in month t. The lead and lag terms for the market index return are included to allow for nonsynchronous trading (Dimson, 1979). All three measures are then regressed on fund characteristics as follows:

$$CR_{j,t} = \alpha + \beta_0 R_{M,t} + \beta_1 SMB_t + \beta_2 HML_t + \varepsilon_{j,t} \quad (3.10)$$

where $CR_{j,t}$, is the country index-based momentum crash risk as previously defined.

3.5 DESCRIPTIVE STATISTICS

3.5.1 Descriptive statistics for IMFs

Table 3.1 provides the summary statistics for all Islamic mutual funds in the sample by country of domicile and investment region. This shows that Muslim countries account for more than eighty percent (411) of the sample, which are mainly in Malaysia (148), followed by Saudi Arabia (101), and Kuwait (44). The United Kingdom (31) has the largest number of Islamic funds among non-Muslim countries. About forty percent (192) of sample funds invest in the Asia Pacific region, while twenty-seven percent (135) have an orientation towards Muslim regions such as the Middle East/Africa and Gulf Cooperation Council countries. The mean fund size is relatively small, at US$ 96.5 million. Islamic mutual funds domiciled in the United States are the largest in terms of funding (US$ 445 million), followed by those in Saudi Arabia (US$ 238 million), and the United Emirates (US$ 70 million).

[Insert Table 3.1]

The Wilcoxon rank-sum (Mann-Whitney) test is used to test the null hypothesis that there is no difference between funds' age, size, and average returns between Muslim and non-Muslim domiciles and Muslim regions and other investment regions. Table 3.1 shows that funds that invest in Muslim regions are significantly (at the one percent level, see Panel G) smaller than those that invest in other regions, whereas funds domiciled in Muslim countries are significantly (at the one percent level, see Panel D) larger than those domiciled in other countries. The average age of Islamic funds in the sample is 53 months, with the older funds mostly being domiciled in non-Muslim countries and other investment regions (significant at the one percent level, see Panels D and G). The average fund monthly return is 0.33 percent, while the average monthly returns of funds domiciled in Muslim countries and invested in

Muslim regions are larger (at five percent and one percent, respectively; see panels D and G) than those funds in non-Muslim countries and other investment regions.

3.5.2 Country index-based momentum strategies

To implement country index-based momentum strategies, the approach applied in Breloer et al. (2014) is used. However, the data for MSCI Investable Market Indices (IMI) is unavailable for all countries in which IMFs are invested. As IMFs are invested across eight regions, the monthly returns of the corresponding eight MSCI regional indices from January 2000 through December 2016 are thus used[32]. The label of "country index-based momentum" is retained for consistency with prior studies, however.

[Insert Table 3.2]

Table 3.2 presents the descriptive statistics for these indices. On average, GCC countries and Middle East/Africa indices have higher mean returns, medians, and standard deviations than other regional indices such as Asia Pacific and Europe. In addition, Table 3.2 shows a positive first order autocorrelation between the returns of several MSCI indices, which might indicate that these regional indices should be considered a potential driver of momentum profits as seen in Breloer et al. (2014). Jegadeesh and Titman (1993) are followed to construct several J/K country index-based momentum strategies using the monthly returns of the MSCI indices. All country indices are first ranked according to their past J-month returns ("*Ranking Period*") and then these are divided into five portfolios based on this ranking.

[Insert Table 3.3]

These portfolios are held for K months (*Performance Period*). Thus, the indices are sorted monthly into five equally weighted portfolios based on their past J (J = 3, 6, 9, and 12) months' performance, and these portfolios are held for periods of K months (K = 1, 3, 6, 9, 12, 15, 24, 36, and 48)[33]. The portfolio holding the stocks in the top quintile is labelled as the winner portfolio (W) and the one featuring stocks in the bottom quintile is named the loser portfolio (L). The profitability of momentum trading strategies is then assessed based on taking a long position in the winner portfolio and a short position in the loser portfolio. The momentum profit

[32] Data from http://www.msci.com/products/indices

[33] Unlike in similar studies of conventional funds, n was extended to 48 as little research has been carried out for Islamic mutual funds, and a more comprehensive chapter of these momentum strategies is thus of interest.

is calculated as the difference between the winner portfolio and the loser portfolio (W–L). Table 3.3 contains the descriptive statistics for these constructed country index-based momentum strategies. On average, all of the momentum strategies yield positive mean returns. There is also evidence of a general trend in which the shorter the holding period, the higher the momentum returns and their standard deviation. The highest momentum returns and STD are delivered by the shortest holding period. In particular, the S (3,1), S (6,1), and S (9,1) strategies yield the highest average returns, exceeding one percent per month. The S/K test[34] is a test for normality based on skewness and kurtosis, which combines both results into an overall test statistic. This demands rejection of the hypothesis that the returns of a country index-based momentum strategy are normally distributed if the p-value is less than five percent. Table 3.3 shows the abnormal returns of all constructed country index-based momentum strategies.

3.5.3 Descriptive statistics for explanatory factors and cross-correlation

Table 3.4 displays the descriptive statistics for all explanatory factors used in models 1 to 4. All factors show a considerably smaller though significant mean monthly returns; this is especially true of the country index-based momentum startegy at the 0.1 percent level (t-stat: 13.93). The correlation between the applied momentum factor and the other factors is quite low (-0.193 to 0.087), but the variance inflation factor (VIF)[35] is close to 1 for each factor, indicating that multicollinearity is not present when the country index-based momentum factor is incorporated into the Fama and French (1993) three factor model.

[Insert Table 3.4]

3.6 EMPIRICAL RESULTS AND DISCUSSION

3.6.1 Panel unconditional on market state results

This section tests hypotheses 1, 1_t, and 2 using models 1 to 5 as described in Section 3.4. Hypotheses 1 and 1_t test whether IMFs outperform their market benchmarks, represented by the MSCI AC world index and whether IMF fund managers possess market timing skills, while hypothesis 2 tests whether country index-based momentum strategy S (3,48) has an impact on IMF performance. Table 3.5 shows the results for the performance of IMFs over a 16-year

[34] For more information on this test refer to https://www.stata.com/manuals13/rsktest.pdf

[35] VIF measures the degree of multi-collinearity of the independent variable with the other independent variables. Most commonly, the rule of 10 associated with VIF is regarded by many practitioners as a sign of severe or serious multi-collinearity.

period. The results show that, on average, IMFs outperform the market benchmark, represented by the MSCI AC world index, causing rejection of the null of hypothesis 1. The performance alphas in the 1F-Model, 3F-model, and 4F-model are positive and statistically significant at the one percent level. The average performance alphas of the TM model and the BB model are also positive and statistically significant at the one percent level, implying that the managers of these funds have actively managed the funds and possess superior fund selectivity. These findings contradict those of Hoepner et al. (2011) and Nainggolan et al. (2016), who find that IMFs underperform market benchmarks, as well as the results elicited by Abdullah et al. (2007) and Hayat and Kraeussl (2011), who find that IMF managers possess inferior selectivity skills. The reason for these differences in findings may be due to the use of different benchmarks and different constituents and periods in the sample. Hoepner et al. (2011) used the national equity benchmark for each country in their study, while this chapter uses the MSCI AC as a whole-market benchmark, for example, and Nainggolan et al. (2016) used a sample of Islamic funds constructed from various sources including Morningstar Direct, Eurekahedge Global Islamic Funds, and Bloomberg, while this chapter only uses the Eurekahedge Global Islamic Funds database. The sample periods for previous work also differ from the sample period of this chapter, and Abdullah et al. (2007) and Hayat and Kraeussl (2011) used a limited sample of Islamic mutual funds.

Looking at the results for factor loadings, the market betas in the 1F to BB models are positive and statistically significant at the one percent level. This indicates that, on average, IMFs have significantly positive exposure to the MSCI AC world index. The results also indicate that the IMFs have market beta values lower than one, suggesting that investment funds are less volatile, and thus lower in systematic risk, than market return. The TM and BB models report the results of coefficient estimates, $\beta_{2,}$ of the TM and BB models for all IMFs over the whole sample period. The results indicate that the coefficient estimates of β_2 are negative and statistically significant at the one percent level, rejecting the null of hypothesis 1_t. According to Treynor and Mazuy (1966), this indicates that IMF fund managers do not possess good market timing ability. This could be attributed to the conservative nature of IMFs, as Shariah prohibits investment in highly leveraged firms. In relation to Islamic mutual fund investment styles, the results from the 3F, 4F, and 5F models show positive and statistically significant coefficients for SMB, and negative and significant coefficients for HML at the one percent level. This indicates that Islamic mutual funds tend to invest more in smaller cap and growth stocks. Using a sample constructed based on the Eurekahedge database for the period from

September 1990 to April 2009, Hoepner et al. (2011) determined that IMFs tend to invest more in smaller cap and growth stocks. These authors thus argue that small-cap companies have a lower risk of generating a proportion of their revenue from prohibited activities, and that growth stocks are less leveraged than value stocks.

Most importantly, the CMOM beta size is found to be 0.310 and 0.306 in models 4F and BB respectively. Both coefficients are statistically significant at the one percent level, thereby rejecting the null of hypothesis 2. This suggests that IMFs have significant exposure to the S (3,48) country index-based momentum strategy, which means that managers can secure additional profits based on the performance of IMFs by buying winner countries and selling loser countries based on the returns of MSCI indices from the previous 3 months and holding such portfolios for 48 months. Notably, the R-squared value increases on application of the 4F and 5F models, indicating that adding a country index-based momentum factor increases the explanatory power regarding the variations in fund returns. We have performed general dominance statistics analysis to study the contribution of each variable across all possible combinations of independent variables included to R^2. Results indicate that CMOM has a significant contributing to R^2 (Refer to Table 3.15 in the Appendix). These findings present evidence that the risk-adjusted performance of IMFs can be enhanced by including this country index-based factor.[36]

[Insert Table 3.5]

3.6.2 Panel results conditional on the market state

After testing the performance of IMFs using the unconditional regression models over a 16-year period, the following hypotheses, I_{1d}, I_{1u} , I_{1td}, and I_{1tu} are further tested conditional on the market state (see Section 3.3.1). The hypotheses I_{1d} and I_{1u} reflect the performance of IMFs during downturns and upturns of the market respectively, while I_{1td} and I_{1tu} reference the market timing abilities of IMF managers in both market states. The results, presented in Table 3.6, show that the performance alphas in models 1F, 3F, and 4F are negative in upturn states (bullish markets), and positive in downturns (bearish markets). These coefficient estimates are statistically significant, rejecting the null sub-hypotheses I_{1d} and I_{1u}. This

[36] we re-estimate models 3.1 to 3.4 after controlling for Ramadan effect. We include a dummy variable that takes the value of one throughout the duration of the holy month and the days surrounding the festival that follows it and 0 otherwise. Results related to MKT, SMB, HML and CMOM remain consistent and robust with results in Table 3.5. Ramadan effect is found to be statistically insignificant. Refer to Table 3.16 in the Appendix

indicates that IMFs underperform the market benchmark under good market conditions when the market return exceeds the risk-free rate and outperform it in bad market conditions, that is, when the market return is lower than the risk-free rate. Prior studies similarly find that IMFs perform better than conventional funds during bearish economic trends such as during the GFC, while conventional funds show better performance than Islamic funds during bullish economic conditions (Abdullah et al., 2007; Nainggolan et al., 2016). This may arise as excluding non-compliant stocks through screening helps immunise IMFs against a stressful market. However, this incurs a financial cost in good market conditions, as the excluded risky stocks are also those most likely to offer higher expected returns. As a consequence, IMFs underperform conventional funds that are not constrained by similar screening in good conditions. The approach applied in this chapter differs from prior studies by comparing the performance of IMFs to the MSCI AC market benchmark and not to conventional funds to alleviate the impact of this effect.

The average performance alphas of the TM model and BB model are positive and statistically significant at the one percent level during downturns of the market, whereas in the upturns, it is statistically insignificant in both models. This indicates that IMF managers are good stock pickers in bearish markets. Table 3.6 also offers coefficient estimates, β_2, for the TM and BB models for all IMFs for each market state. The results indicate that the coefficient estimates of β_2 are negative and statistically significant at the one percent level in bearish markets, and positive and statistically significant at the one percent and five percent levels in the TM and BB models, respectively. These findings reject the null hypotheses I_{1td} and I_{1tu}, indicating that IMF managers do not possess good market timing abilities during market downturns, but appear to be more able during market upturns.

The results in Table 3.6 also show consistent positive and significant coefficients for the market benchmark factor at the one percent level in models 1F to BB. This reveals that the IMFs' exposure to the market is positive, regardless of the state of market. However, the results also show market beta values lower than one, suggesting that IMFs are less volatile and lower in systematic risk during both market states compared to the market return. With respect to IMF investment styles, both the 4F and the BB models show a negative coefficient for the SMB factor, and positive coefficients for the HML factor during both bearish and bullish periods. The coefficients are statistically significant at the one percent level in both models. This indicates that the relationship between IMF performance and investment style is driven by

market conditions, as IMFs may invest in large growth stocks when the market is down and in small value stocks when the market is up. It follows that investing in large growth stocks could keep IMFs safer during market downturns. Interestingly, the results in models 4F and BB reveal a positive and statistically significant coefficient for the country index-based momentum factor, represented by the S (3,48) strategy, at the one percent level during both bearish (downturn) and bullish (upturn) periods. This provides strong evidence that investing in country index-based momentum can enhance the performance of IMFs, particularly during bearish periods. The coefficient of CMON in the 4F and BB models is double the size during the downturn of the market compared to during the upturn of the market. Similarly, the R-squared size differs by market state. These findings support the existence of a differential effect in these market states.

[Insert Table 3.6]

3.6.3 Relationship between index momentum exposure and fund characteristics

This section examines the relationship between funds' exposure to the chosen country index-based momentum factor and fund investment styles in more detail. The funds are sorted into quintile portfolios based on the return of the country index-based momentum strategy as represented by S (3,48), generating five sorted fund portfolios. Estimates of equations 1, 3, and 5 (from Section 3.4) are then generated using the returns of each sorted portfolio. Table 3.7 reports the average alphas and betas from these estimations. Notably, funds in the top CMOM quintile exhibit higher alphas than those in the bottom quintile; the bottom CMOM portfolio exhibits an average alpha of only -0.00481 as compared to the top CMOM portfolio's alpha of 0.00985. Thus, the top portfolio is more profitable than the bottom one. Breloer et al. (2014) find a similar pattern on examining the relationship between country index-based momentum (applying S (12,1)) exposure and fund characteristics in the US. They argue that this could be related to better stock-picking skills in funds with relatively high index momentum exposure. With regards to the relationship between index momentum and fund characteristics, however, Table 3.7 shows that funds in the top CMOM quintile show the highest positive exposure to SMB and HML. The top CMOM portfolio exhibits average betas of 0.281 and 0.0652 with regard to SMB and HML factors, respectively, indicating that funds with high index momentum exposure tend to be invested in small value stocks. Notably, funds in all CMOM quintile portfolios exhibit positive and significant loading with regard to the momentum factor with the exception of the third quintile.

[Insert Table 3.7]

3.6.4 Country index-based momentum crashes

3.6.4.1 Option-like behaviour

This section tests hypothesis 3 by examining whether country index-based momentum strategies do, indeed, crash. Equation 6 (from Section 3.4) is estimated for each of the constructed 36 country-index momentum strategies (as seen in Section 3.4). As previously explained in Section 3.2.4, a crash in a momentum strategy occurs if three conditions are met; the corresponding parameter estimates are reported in Table 3.8 (Panels A to D). The results in all panels show that the risk adjusted return ($\hat{\alpha}_0$) is significantly different from zero irrespective of the momentum strategy considered. Thus, condition 1 for a crash is met. Furthermore, the loading against the market factor ($\hat{\beta}_0$) is negative and statistically significant at the one percent level in all panels. The results also reveal that the dependency of the market factor on the market state, represented by the coefficient $\hat{\beta}_B$, is driven by the momentum strategy used. For instance, the estimated parameters $\hat{\beta}_B$ for S (3,1), S (3,3), and S (3,6) momentum strategies in Panel A are negative and statistically significant, in contrast to those of the other strategies in Panels B, C, and D which are positive and statistically significant. Thus, condition 2 is met for S (3,1), S (3,3), and S (3,6). Moreover, the up-market betas $\hat{\beta}_{B,U}$ of these three strategies are positive and statistically different from zero. Thus, condition 3 is met for S (3,1), S (3,3), and S (3,6). These results indicate that these three strategies exhibit option-like behaviour during the bear market and perform better when the market rebounds following a bear market, thereby rejecting the null of hypothesis 3. These findings reveal that the momentum strategies represented by (S (3,1), S (3,3), and S (3,6)) are effectively shorting call options on the market. Most importantly, the results reveal that the ranking and holding periods of a constructed country index-based momentum strategy are linked to optionality effects: the shorter these periods are, the higher the momentum's exposure to crashes. In this case, S (3,3) exhibits an optionality effect, whereas S (6,3), S (9,3), and S (12, 3) do not. Few recent studies have examined momentum crashes using stock-based momentum strategies, though Daniel and Moskowitz (2016) find a momentum crash for the S(12,1) strategy and Grobys (2016) finds a momentum crash for the S(12,2) and S (12,7) strategies.

[Insert Table 3.8]

3.6.4.2 Market stress

The results examined in Sections 3.6.1 and 3.6.2 convey the idea that in a bear market, a portfolio of past losers generates strong profit, especially when the market conditions start to recover. In such a situation, past losers behave like a call option on the market, though the value of this option is not adequately reflected in the prices of these assets. As a consequence, past losers may experience high expected returns and strategies that short these past losers will exhibit low expected returns. This sub-section thus examines whether the expected returns of the country-index-based momentum portfolio are negatively correlated with the future variance of the market. Equation 7 (as seen in Section 3.4) is estimated for each of the constructed 36 country-index momentum strategies (see Section 3.4). Table 3.9 shows the regression results, indicating that both estimated market variance and the bear market indicator independently forecast future momentum returns. Panels A to D report the regression results for each country index-based momentum strategy separately. The results are consistent with those presented in Sections 3.6.1 and 3.6.2: in periods of high market stress, as indicated by bear markets ($\hat{\gamma}_{B}$) and high volatility ($\hat{\gamma}_{\sigma_M^2}$), future momentum returns are low. For instance, S (3,1) in Panel A, in a similar manner to many of the strategies portrayed in Panels A to D, exhibits a negative sign for both $\hat{\gamma}_{B}$ and $\hat{\gamma}_{\sigma_M^2}$, indicating a "negative impact" on future country index-based momentum returns. The negative economic impact on future country index-based momentum returns is driven by the length of ranking and performance of each country index-based momentum strategy. The results reveal that the shorter the ranking and performance periods are, the greater the impact on future country index-based momentum returns; this means that the impact of S (3,3) in Panel A is greater than the impact of S (3,6; 9; 12; 15).

[Insert Table 3.9]

3.6.4.3 Asymmetry in the optionality

We follow Daniel and Moskowitz (2016) on testing for asymmetry in the optionality. We regress the monthly excess returns of the momentum deciles portfolio and the winner minus loser (WML) portfolio on excess market returns and a number of indicator variables to study the optionality in bear and bull markets. In bear market and for each of the portfolio, we estimate equation 3.6 in p 103 . However, in bull market we estimate the same regression as per equation 3.6 but using a bull market indicator instead of the bear market indicator.

$$I_{L,t-1} = \begin{cases} 1, \text{if the cumulative MSCI AC index return in the past 24 months is positive;} \\ 0 \text{ otherwise} \end{cases}$$

We report results in Table 3.10. Panel A reports results for optionality in bear market and Panel B reports results for optionality in bull market.

The key variables here are the estimated coefficients and t-statistics on $\hat{\beta}_{L,U}$, presented in the last two rows of panel B. Unlike in panel A, no significant asymmetry is present in the loser portfolio, though the winner portfolio asymmetry is comparable to panel A. The net effect is that the WML portfolio shows no statistically significant optionality in bull market, unlike in bear market. Results hold for whichever WML strategy is used of the 36 different strategies.

[Insert Table 3.10 here]

3.6.5 Country index-based momentum strategies versus the GFC crisis and fund investment styles

Based on the results in Sections 3.6.1 and 3.6.2, country index-based momentum returns are found to be dependent on market state. Therefore, the question arises of whether the financial crisis (2007 to 2009) had any impact on the profitability of such country index-based momentum trading strategies. Moreover, the results in Section 3.6.3 indicate that there is a relationship between index momentum S (3,48) exposure and fund investment styles. Using the insights from these previous findings, hypotheses 4 and 5 of this chapter are thus tested. In this sub-section, panel data using the returns of each constructed country index-based momentum strategy in this chapter is generated, and the country index-based momentum returns on the three Fama and French (1993) factors, including a dummy variable acting as a proxy for the financial crisis, are regressed. The results are reported in Panels A to D of Table 3.11. Irrespective of which country index-based momentum strategy is considered, the coefficient of the crisis dummy is negative and statistically significant at the one percent level. This indicates that the financial crisis had a negative impact on the profitability of country index-based momentum strategies, thereby rejecting the null of hypothesis 4. Interestingly, the payoffs of all country index-based momentum strategies reveal significant loadings against size and value factors. This implies that the profitability of country-index based momentum strategies is driven by the choice of investment style. However, this exposure varies depending on the strategy used. For instance, S (3,1) has exposure to small and value stocks, S (3,3) has exposure to small and growth stocks, and S (3,12) has exposure to big and growth stocks. Surprisingly, the payoffs of country index-based momentum strategies that exhibit an option-like behaviour such as S (3,3) (see Section 3.6.4.1) differ in their exposure to investment styles

from those which show no optionality. Another noteworthy finding is that the economic magnitude of the strategies' loadings against the investment style factor varies with any increase or decrease in the ranking and performance periods of the constructed country index-based momentum strategies.

[Insert Table 3.11]

3.6.6 Country index-based momentum versus fund characteristics

This section tests hypothesis 6 of this chapter by examining whether the intensity of ethical screening, proxied by style factor loadings on non-correlated ethical benchmarks (MSCI Islamic - MSCI AC), has any impact on the profitability of country index-based momentum strategies. In addition, the relationship between the profitability of country index-based momentum strategies and a number of fund characteristics is examined. Table 3.12 shows the resulting panel regression results. The results in Panels A, B, C, and D show that there is a positive relationship between screening intensity factor and the country index-based momentum strategies. The coefficients in all specifications (1 to 36) show a strong statistical significance at the one percent level, rejecting the null of hypothesis 6. This provides strong evidence that ethical screening increases the performance of country index-based momentum strategies. With respect to fund age, younger funds are negatively associated with country index-based momentum strategies with shorter ranking and performance periods. For instance, the findings in Panel A reveal a negative relationship with the S (3,1) strategy that becomes positive as the performance period increases in S (3,24), S (3,36), and S (3,48). This trend remains consistent within the other strategies presented in Panels B, C, and D. In contrast, in most specifications, fund size has a positive relationship with momentum strategies that have shorter ranking and performance periods, and a negative relationship with momentum strategies with longer ranking and performance periods. The results also show that the coefficient of the size quadratic term is statistically significant in some cases. For instance, the coefficient is negative and significant at the one percent level in specifications 8 and 9, in Panel A, and positive and significant at the one percent level and five percent level in specifications 26 and 27 in Panel C, respectively. These results suggest that the size measure has a non-linear relationship with country index-based momentum performance. The relationship between the profitability of country index-based momentum strategies and other fees seems to be statistically insignificant, however, while the relationship between management fees and momentum is driven by the formation period of the given country index-based momentum

strategy such that an increase in management fees contributes positively to the performance of S (3,1) and S (3,3) in Panel A and negatively to the performance of S (9,6), S (9,9), S (12,3), S (12,6), and S (12,9) in Panels C and D.

[Insert Table 3.12]

3.6.7 Crash risk of country index-based momentum strategies and investment styles

This section tests hypothesis 7 of this chapter by investigating the extent to which the crash risk of momentum strategies is associated with chosen investment style. Three crash risk measures are regressed on the three factor model by Fama and French (1993), and the results are as shown in Table 3.13. These indicate that the coefficient of the market benchmark is negative and statistically significant at the one percent level in estimations 1, 2, and 3, which suggests that the probability of a country index-based momentum strategy crashing will increase during down markets. The results also show that the coefficients of SMB and HML are positive and statistically significant at the five percent and one percent levels, respectively, in the three specifications. These findings reject the null of hypothesis 7, indicating that investing in small and value stocks increases the crash risk of country index-based momentum strategies. In contrast, investing in big and growth stocks minimises the cash risk of momentum strategies.

[Insert Table 3.13]

3.7 **ROBUSTNESS: Augmented factor models**

In the previous sections, we examined the impact of country index-based momentum strategy on the performance of IMFs using an index-based four-factor model. Since our results could be driven by omitted factors, we now apply several augmented models in order to test our main results for robustness.

Based on the argument presented in Breloer et al. (2014), there exists a situation where certain country indices often outperform the overall market. Therefore, if funds tend to invest in these indices, we may measure positive CMOM exposures instead of measuring a positive exposure to the respective index. Thus, we add a country index proxied by MSCI by country indices as an additional factor to our basic four-factor model (equation 4 in Section 3.4).

Moreover, the estimated beta of the country index-based momentum (Table 3.5) could also be driven by exposure of funds to certain Islamic characteristics such as the knowledge and learning of Shariah principles found in certain countries or regions. Hence, following Renneboog et al. (2008), we calculate an Islamic factor based on Islamic indices by regions and add it to our basic four-factor model. Thus, the Islamic factor captures the excess return of the regional Islamic indices i.e. MSCI Islamic indices in excess of the risk-free rate. In doing this, we account for commonalities with the factors of market, size, and value without reducing the impact of the added factors on fund exposure to the country momentum factor.

We apply the augmented models and report results in Table 3.17 in the appendix. We estimate three specification models including MSCI by country index in specification 1, the Islamic factor in specification 2, and both together in specification 3. We repeat this analysis using each of our 36 different country index-based momentum strategies. However, we only report results using the second best country index-based momemtun strategy S(3,36) (as per Table 3.13 in the Appendix). We conclude that the country index-based momentum betas are largely robust using augmented multi-factor models which additionally cover a single country and Islamic factors. Interestingly, the coefficient estimates for the Islamic factor are positive and significant, indicating a positive impact on the performance of mutual funds which may imply a sort of compensation to investors for the associated ethical costs with this type of investment.

3.8 CONCLUSION

The literature evaluating the performance of Islamic mutual funds lacks much consideration of country index-based momentum, and while this type of factor has been applied in conventional fund analysis, no previous study has so far: a) analysed the impact of country index-based momentum on Islamic mutual funds' performance; b) examined whether these profitable momentum strategies exhibit the infrequent yet persistent series of negative returns known as momentum crashes which appear to be a response to financial instability of countries following market declines when market volatility is high that are contemporaneous with market rebounds; or c) investigated whether momentum performance is associated with fund investment style and characteristics, including examining whether momentum crash risk is related to fund investment styles.

To fill this gap, multiple index country index-based momentum strategies were constructed, with the most profitable one being incorporated into an index-based version of the Fama and

French (1993) three-factor model. The results demonstrate that when included, country index-based momentum strategy has a clear positive impact on the performance of IMFs and increases the explanatory power as measured by the R-squared value. Moreover, the positively significant impact of the momentum strategy on funds' performance is found to be consistent irrespective of whether the market is up or down.

The analysis was then extended to examine the option-like behaviour of all constructed index country momentum strategies used in this chapter. Overall, S (3,1), S (3,3), and S (3,6) strategies exhibited option-like behaviours. As supported by the findings of Daniel and Moskowitz (2016), in times of market stress, and in particular when market volatility is high, the down-market betas are negative, while the up-market betas are positive. This optionality is driven by the ranking and the performance period of each country index-based momentum strategy, and the shorter such periods are, the higher the momentum's exposure to crashes. Analysing the relationship between country index-based momentum performance and screening intensity, fund investment styles, and characteristics shows that screening intensity increases the returns of all country index-based momentum strategies. However, the impacts of fund age, size, and management fees vary with the ranking and performance periods of each momentum strategy.

Finally, this chapter produced unique results with respect to the relationship between crashes and funds' investment styles, showing that investing in both small and value stocks increases country index-based momentum crash risk.

Using a single country factor as well as an Islamic factor in augmented multi-factor models did not alter our main results, indicating that fund exposure to the country index-based momentum factor is robust. We therefore conclude that it is important to include this factor in any future studies on the performance of IMFs as omitting it may lead to biased findings.

Table 3.1: Summary statistics of Islamic equity funds by country of domicile and regional investment

	Funds			Monthly Returns			
	#funds	Age (Months)	Size($Mil)	Mean	Median	Min	Max
Panel A. Full Sample	490	53.1089	96.5608	0.0033	0.0030	-0.9909	0.4990
Panel B. Muslim Domiciles							
Malaysia	148	52.9679	48.9847	0.0032	0.0026	-0.4939	0.2216
Saudi Arabia	101	56.2107	238.0939	0.0040	0.0018	-0.9909	0.3422
Kuwait	44	54.8827	73.7589	-0.0006	0.0025	-0.5138	0.4907
United Arab Emir	31	47.5999	70.2478	0.0020	0.0029	-0.3129	0.3049
Indonesia	25	53.5803	14.5022	0.0072	0.0091	-0.4095	0.3377
Pakistan	22	49.5259	20.0821	0.0070	0.0069	-0.4011	0.2855
Singapore	13	56.1154	48.2012	-0.0010	0.0023	-0.3836	0.2583
Bahrain	8	56.8382	9.8158	0.0000	0.0032	-0.2751	0.1744
Qatar	7	6.9888	34.9164	0.0042	0.0030	-0.1401	0.1346
Egypt	5	56.1709	32.6905	-0.0017	0.0029	-0.3368	0.2366
Turkey	3	44.0000	1.9922	0.0113	0.0170	-0.2231	0.2518
Jordan	3	45.8493	6.2841	-0.0030	0.0008	-0.2563	0.0956
Morocco	1	58.5000	36.1552	0.0089	0.0075	-0.1650	0.1565
Panel C. Non-Muslim Domiciles							
United Kingdom	31	48.7888	44.3176	0.0024	0.0024	-0.3319	0.3376
United States	11	57.8143	445.7245	0.0032	0.0067	-0.2688	0.1593
Germany	11	48.8780	25.4337	0.0016	0.0067	-0.2390	0.1652
South Africa	8	48.5109	39.5799	0.0075	0.0080	-0.1832	0.1355
France	7	46.6790	37.1474	0.0058	0.0096	-0.1645	0.1032
India	4	36.5208	1.3793	0.0166	0.0149	-0.1005	0.4990
Hong Kong	2	26.3608	1.8889	0.0043	0.0089	-0.1695	0.1057
Ireland	2	56.3408	102.6993	0.0057	0.0065	-0.3543	0.1613
Canada	1	58.5000	2.2228	0.0062	0.0065	-0.0568	0.0731
China	1	49.5000	19.2396	0.0015	0.0097	-0.2171	0.1580
Australia	1	58.5000	5.3906	0.0067	0.0205	-0.1288	0.0762
Panel D. Muslim Vs. Non-Muslim Domiciles							
Mean difference		-12.924***	22.456***	1.929**			
Panel E. Muslim Investment Regions							
Middle East/Africa	133	53.8960	187.3820	0.0024	0.0021	-0.5140	0.4910
GCC Countries	2	52.0000	33.8570	0.0071	0.0006	-0.2610	0.1900
Panel F. Other Investment Regions							
Asia Pacific	192	53.1950	40.1470	0.0044	0.0041	-0.9910	0.4990
Global	123	51.8330	75.4910	0.0023	0.0023	-0.3840	0.2580
North America	18	56.7180	295.7410	0.0040	0.0063	-0.2700	0.1780
Emerging Markets	12	46.3030	27.6820	0.0047	0.0057	-0.4980	0.2710
Europe	5	58.5030	30.4560	0.0039	0.0043	-0.3440	0.1520
ASEAN	5	52.3750	66.1550	0.0017	0.0011	-0.1600	0.1300
Panel G. Muslim Vs. other Investment Regions							
Mean difference		-3.074***	-37.355***	4.909***			

This table presents summary statistics of Islamic mutual funds by country of domicile and investment regions. Size is the fund's total assets under management (in USD million); Age is measured from the inception date to the test date (in months). Wilcoxon rank-sum (Mann-Whitney) Z-tests the null hypothesis that there is no difference between funds' age, size, and average returns in Muslim and Non-Muslim domiciles and regions. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively

Table 3.2: Descriptive statistics of monthly MSCI region index returns

	Mean	Median	STD	Min	Max	ρ	N
Asia Pacific	0.0004	0.0028	0.0508	-0.2195	0.1168	0.049	191
EM ASEAN	0.0024	0.0106	0.0634	-0.3249	0.1723	0.044	191
Emerging Markets	0.0025	0.0061	0.0669	-0.3216	0.1541	-0.024	191
Europe	0.0003	0.0011	0.0564	-0.2482	0.1269	0.0153	191
GCC Countries	0.0048	0.0123	0.0649	-0.2775	0.1691	-0.143	163
Global	0.0011	0.0062	0.0471	-0.222	0.1087	0.0631	191
Middle East/Africa	0.0043	0.0119	0.0594	-0.2985	0.1263	-0.1434	163
North America	0.0018	0.0076	0.0448	-0.1993	0.1024	0.1035	191
Average	0.0021	0.0073	0.0569	-0.3249	0.1723	0.0006	

This table shows descriptive statistics for the returns of 8 MSCI regional indices from January 2000 to December 2016. Mean refers to the average monthly returns. STD refers to the standard deviation of monthly returns. ρ describes the first order auto correlation in monthly returns.

Table 3.3: Descriptive statistics of constructed country index-based momentum strategies

	Mean	Median	STD	S/K Test		N
				Chi2(2)	Prob>chi2	
Momentum Strategy						
J=3, K=1	0.0105	0.0074	0.0472	14.8600	0.0006	180
J=3, K=3	0.0082	0.0064	0.0426	28.9100	0.0000	188
J=3, K=6	0.0052	0.0021	0.0359	26.7000	0.0000	186
J=3, K=9	0.0037	0.0035	0.0314	44.3900	0.0000	183
J=3, K=12	0.0024	0.0013	0.0296	40.5200	0.0000	180
J=3, K=15	0.0015	0.0013	0.0262	35.1800	0.0000	177
J=3, K=24	0.0004	0.0022	0.0212	28.8400	0.0000	168
J=3, K=36	0.0024	0.0025	0.0197	29.9000	0.0000	156
J=3, K=48	0.0010	0.0028	0.0190	27.1900	0.0000	144
J=6, K=1	0.0115	0.0110	0.0499	6.7600	0.0341	175
J=6, K=3	0.0086	0.0067	0.0457	14.8500	0.0006	180
J=6, K=6	0.0050	0.0050	0.0426	16.1300	0.0003	183
J=6, K=9	0.0037	0.0036	0.0405	20.7300	0.0000	183
J=6, K=12	0.0017	0.0039	0.0378	17.2100	0.0002	180
J=6, K=15	0.0011	0.0043	0.0340	20.3400	0.0000	177
J=6, K=24	0.0005	0.0015	0.0292	34.9300	0.0000	168
J=6, K=36	0.0021	0.0039	0.0271	26.8800	0.0000	156
J=6, K=48	0.0006	0.0025	0.0262	30.3800	0.0000	144

J=9, K=1	0.0107	0.0112	0.0504	6.6700	0.0357	177
J=9, K=3	0.0067	0.0064	0.0483	9.9900	0.0068	178
J=9, K=6	0.0045	0.0037	0.0470	11.0100	0.0041	178
J=9, K=9	0.0025	0.0037	0.0436	13.0000	0.0015	178
J=9, K=12	0.0011	0.0056	0.0410	16.8100	0.0002	178
J=9, K=15	0.0006	0.0043	0.0363	27.4300	0.0000	177
J=9, K=24	0.0008	0.0030	0.0314	24.2900	0.0000	168
J=9, K=36	0.0021	0.0039	0.0294	27.2100	0.0000	156
J=9, K=48	0.0006	0.0022	0.0285	25.9000	0.0000	144
J=12, K=1	0.0080	0.0118	0.0500	6.0400	0.0489	175
J=12, K=3	0.0045	0.0066	0.0510	7.8800	0.0195	176
J=12, K=6	0.0025	0.0070	0.0481	12.1600	0.0023	176
J=12, K=9	0.0011	0.0063	0.0443	18.4100	0.0001	176
J=12, K=12	0.0007	0.0050	0.0415	23.5900	0.0000	176
J=12, K=15	0.0007	0.0009	0.0388	28.9800	0.0000	176
J=12, K=24	0.0012	0.0031	0.0350	24.6400	0.0000	168
J=12, K=36	0.0022	0.0041	0.0320	34.4200	0.0000	156
J=12, K=48	0.0011	0.0041	0.0307	23.4700	0.0000	144

This table shows descriptive statistics of J/K index momentum strategies. For momentum strategies, returns are derived from a long-short portfolio. J refers to the number of months of the ranking period, whereas K refers to the number of months the portfolios are held. Regional indices are ranked based on J-month lagged returns, sorted into quintile portfolios, respectively, and are held for K month(s). The return of the long-short portfolio is the difference between the average return of K top portfolio(s) and the average return of K bottom portfolio(s). Mean and median refer to mean and median of monthly US dollar return time series of strategies, respectively. STD refers to the standard deviation of monthly returns. The S/K statistics test whether the return of the J/K strategy follows a normal distribution.

Table 3.4: Descriptive statistics of explanatory factors

						Cross- correlation			
	Mean	Median	STD	T-stat Mean	VIF	MKT	SMB	HML	CMOM
MKT	-0.00031	0.0048	0.0470	-2.0172	1.70	1			
SMB	0.00429	0.0044	0.0191	68.9382	1.17	0.357	1		
HML	0.00059	-0.0020	0.0202	9.0180	1.07	0.075	-0.108	1	
CMOM	0.00099	0.0028	0.0189	13.9320	1.07	0.061	0.087	-0.193	1

This table shows descriptive statistics and a correlation matrix for the explanatory factors. The factors are based on the sample period from January 2000 through December 2016. The country momentum factor is based on a 3/48 strategy (ranking based on past local returns). STD refers to the standard deviation of the monthly returns. T-stat Mean tests whether the explanatory factors have a mean of 0. VIF refers to the variance inflation factor.

Table 3.5: Panel regression results for the unconditional models

	1F-Model	TM Model	3F-Model	4F-Model	BB-Model
Alphas	0.00185***	0.00298***	0.00114***	0.00110***	0.00170***
t-value	9.507	12.94	5.818	16.07	12.48
MKT	0.432***	0.411***	0.424***	0.418***	0.408***
t-value	27.53	27.39	27.18	28.09	28.20
MKT^2		-0.444***			-0.215***
t-value		-7.77			-4.194
SMB			0.114***	0.0754***	0.0676***
t-value			7.348	5.74	5.23
HML			-0.181***	-0.119***	-0.107***
t-value			-12.58	-9.559	-8.57
CMOM				0.310***	0.306***
t-value				8.786	12.48
R-Squared	0.080	0.078	0.087	0.249	0.25
Hausman Test	RE	RE	RE	FE	FE
Observations	51,240	51,240	51,240	47,769	47,769
Number of funds	490	490	490	490	490

This table presents panel regression analysis for models 1F to 4F. The table reports the values of the different premiums and their significance. ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively. SMB, HML, and CMOM correspond to the size, book-to-market, and the S (3,48) is the country index-based momentum risk factor. MKT stands for the market premium. $(MKT)^2$ is the squared term of MKT. The Hausman test is used to decide between random (RE) and fixed (FE) effects. Standards errors are clustered at two levels (investment regions and funds).

Table 3.6: Panel regression results for the conditional models

	1F-Model		TM-Model		3F-Model		4F-Model		BB-Model	
VARIABLES	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up
Alphas	0.00725***	-0.00135***	0.00469***	0.000712	0.00524***	-0.00142***	0.00283***	-0.000729*	0.00121*	0.000205
t-value	12.490	-3.415	6.228	1.190	6.934	-3.486	4.268	-1.772	1.831	0.331
MKT	0.512***	0.474***	0.371***	0.337***	0.488***	0.456***	0.452***	0.444***	0.360***	0.382***
t-value	25.260	25.930	15.960	9.787	24.350	25.060	24.120	24.560	15.600	11.110
MKT^2			-0.866***	1.443***					-0.585***	0.668**
t-value			-6.684	4.356					-4.708	1.982
SMB					0.0322*	0.134***	-0.0328*	0.107***	-0.0511***	0.102***
t-value					1.749	6.925	-1.703	5.613	-2.746	5.278
HML					-0.298***	0.007	-0.238***	0.0561***	-0.237***	0.0509***
t-value					-15.240	0.377	-14.600	2.950	-14.560	2.718
CMOM							0.430***	0.206***	0.417***	0.203***
t-value							12.310	5.674	12.040	5.525
R-squared	0.072	0.081	0.224	0.082	0.233	0.082	0.252	0.088	0.254	0.088
Hausman Test	RE	RE	FE	RE	FE	RE	FE	RE	FE	RE
Observations	22,900	28,340	22,900	28,340	22,900	28,340	21,241	26,528	21,241	26,528
# of funds	490	490	490	490	490	490	490	490	490	490

This table presents panel regression analysis for the conditional models 1F to 5F based on the market phases (down and up). The table reports the coefficients of the different premiums and their significance. ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively. SMB, HML, CMOM, and Islamic factor correspond to the size, book-to-market, and the country momentum risk factors of Fama–French and Carhart and an Islamic factor based on MSCI Islamic Indices by country of funds. MKT stands for the excess return of the market. $(MKT)^2$ is the squared term of MKT. The Hausman test is used to decide between random (RE) and fixed (FE) effects. Standards errors are clustered at two levels (investment regions and funds).

Table 3.7: Relationship between index momentum exposure and fund characteristics

	CMOM Quintiles				
	Bottom	2	3	4	Top
1F- Alpha	-0.00481***	-0.00146***	0.000723*	0.00614***	0.00985***
t-value	-20.85	-4.245	1.816	18.27	13.51
3F- Alpha	-0.00392***	-0.00178***	0.000529	0.00474***	0.00919***
t-value	-11.97	-4.662	1.183	12.04	52.55
4F- Alpha	0.00409***	0.00125	0.00275***	-0.00251*	0.00620***
t-value	3.701	1.462	3.428	-1.791	5.128
4F- Beta RM	0.503***	0.416***	0.447***	0.396***	0.316***
t-value	24.7	24.14	23.23	25.9	18.04
4F- Beta SMB	-0.147***	0.0597**	-0.127***	-0.0558***	0.281***
t-value	-4.032	2.246	-3.789	-2.654	12.96
4F- Beta HML	-0.155***	-0.106***	-0.130***	-0.174***	0.0652**
t-value	-5.209	-4.4	-3.489	-5.752	2.307
4F- Beta CMOM	0.361***	0.639***	-0.744***	0.922***	0.139**
t-value	6.182	4.108	-3.674	5.335	2.463

This table shows results for single sorts of Islamic funds into portfolios based on their index momentum exposure. S (3, 48) is used. Funds are allocated into quintile portfolios based on their region momentum (5 sorted portfolios). For each single portfolio, the average one-, three-, four- and five- factor alpha, and the average betas based on the five factor model are reported. Alphas and Betas are estimated for each portfolio using the multi-level regression model. ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 3.8: Option- like behaviour of country index-based momentum strategies regression results

Panel A: 3 months ranking period and K performance period										
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coefficient	Variable	S (3,1)	S (3,3)	S (3,6)	S (3,9)	S (3,12)	S (3,15)	S (3,24)	S (3,36)	S (3,48)
$\hat{\alpha}_0$	1	0.0108***	0.0103***	0.00732***	0.00641***	0.00428***	0.00214***	0.000647***	0.00193***	0.000913***
		54.52	57.89	47.68	45.61	32.56	18.34	6.483	21.56	10.87
$\hat{\alpha}_B$	$I_{B,t-1}$	-0.0104***	-0.0161***	-0.0078***	-0.0050***	-0.00098***	0.00408***	0.00408***	0.00749***	0.00631***
		-25.43	-41.89	-26.36	-20.07	-4.038	20.58	24.36	56.39	33.38
$\hat{\beta}_0$	$\tilde{R}^e_{m,t}$	-0.161***	-0.0153***	-0.0546***	-0.0569***	-0.0518***	-0.0376***	-0.0239***	-0.0321***	-0.0531***
		-29.26	-3.908	-16.79	-18.77	-18.78	-15.65	-10.02	-16.12	-30.09
$\hat{\beta}_B$	$I_{B,t-1}.\tilde{R}^e_{m,t}$	-0.164***	-0.280***	-0.0727***	0.0604***	0.100***	0.135***	0.113***	0.152***	0.175***
		-23.77	-48.94	-14.61	13.93	27.25	43.02	31.55	53.39	63.50
$\hat{\beta}_{B,U}$	$I_{B,t-1}.I_U.\tilde{R}^e_{m,t}$	0.369***	0.322***	0.0412***	-0.103***	-0.164***	-0.218***	-0.168***	-0.173***	-0.119***
		31.19	29.19	5.028	-16.02	-31.27	-46.06	-36.11	-49.34	-28.92
R^2_{adj}		0.0346	0.0298	0.0147	0.0102	0.00552	0.00471	0.00415	0.0173	0.0263
Observations		88,200	92,120	91,140	89,670	88,200	86,730	82,320	76,440	70,560
Optionality		**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**
Panel B: 6 months ranking period and K performance period										
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Coefficient	Variable	S (6,1)	S (6,3)	S (6,6)	S (6,9)	S (6,12)	S (6,15)	S (6,24)	S (6,36)	S (6,48)
$\hat{\alpha}_0$	1	0.0110***	0.00822***	0.00666***	0.00539***	0.00285***	0.00102***	0.000989***	0.00196***	0.00114***
		52.82	42.08	35.59	30.24	17.69	6.899	7.360	15.94	9.770
$\hat{\alpha}_B$	$I_{B,t-1}$	0.00386***	0.00352***	0.00556***	0.00578***	0.00879***	0.0118***	0.00622***	0.0101***	0.00635***
		8.598	8.046	14.46	16.33	26.24	42.37	28.47	62.38	28.90
$\hat{\beta}_0$	$\tilde{R}^e_{m,t}$	-0.283***	-0.124***	-0.140***	-0.130***	-0.110***	-0.102***	-0.0641***	-0.0812***	-0.0974***
		-55.78	-26.78	-30.47	-31.53	-30.89	-31.52	-20.83	-29.65	-38.73
$\hat{\beta}_B$	$I_{B,t-1}.\tilde{R}^e_{m,t}$	-0.00903	-0.00304	0.235***	0.283***	0.307***	0.279***	0.184***	0.259***	0.247***
		-1.140	-0.424	33.54	47.86	60.47	62.34	40.73	73.90	74.87
$\hat{\beta}_{B,U}$	$I_{B,t-1}.I_U.\tilde{R}^e_{m,t}$	-0.0332***	-0.127***	-0.388***	-0.371***	-0.422***	-0.402***	-0.267***	-0.276***	-0.186***
		-2.678	-11.13	-37.29	-41.65	-56.01	-61.95	-47.09	-74.51	-44.11
R^2_{adj}		0.0750	0.0209	0.0138	0.0131	0.0173	0.0194	0.00791	0.0235	0.0223
Observations		85,750	88,200	89,670	89,670	88,200	86,730	82,320	76,440	70,560
Optionality		**Yes/No**	**Yes/No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Panel C: 9 months ranking period and K performance period										
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Coefficient	Variable	S (9,1)	S (9,3)	S (9,6)	S (9,9)	S (9,12)	S (9,15)	S (9,24)	S (9,36)	S (9,48)
$\hat{\alpha}_0$	1	0.0109***	0.00711***	0.00530***	0.00370***	0.00201***	0.000885***	0.00151***	0.00189***	0.00106***
		51.24	34.69	26.00	19.89	11.90	5.767	10.55	14.23	8.337
$\hat{\alpha}_B$	$I_{B,t-1}$	0.00704***	0.0118***	0.0138***	0.0106***	0.00949***	0.00971***	0.00619***	0.0109***	0.00801***
		13.99	25.92	32.58	28.25	25.83	32.52	24.39	59.69	33.86
$\hat{\beta}_0$	$\tilde{R}^e_{m,t}$	-0.197***	-0.106***	-0.106***	-0.0819***	-0.0722***	-0.0564***	-0.0400***	-0.0832***	-0.0985***
		-38.73	-20.25	-19.76	-17.48	-18.15	-16.20	-11.84	-27.50	-35.51
$\hat{\beta}_B$	$I_{B,t-1}.\tilde{R}^e_{m,t}$	0.0720***	0.163***	0.297***	0.288***	0.242***	0.226***	0.181***	0.267***	0.268***
		6.982	21.32	42.43	46.41	41.58	41.00	38.38	68.74	71.74
$\hat{\beta}_{B,U}$	$I_{B,t-1}.I_U.\tilde{R}^e_{m,t}$	-0.314***	-0.565***	-0.622***	-0.553***	-0.456***	-0.391***	-0.311***	-0.298***	-0.240***
		-19.46	-47.43	-60.21	-61.69	-52.41	-49.10	-51.76	-70.03	-49.18
R^2_{adj}		0.0414	0.0244	0.0178	0.0155	0.0106	0.0100	0.00750	0.0208	0.0206
Observations		86,730	87,220	87,220	87,220	87,220	86,730	82,320	76,440	70,560
Optionality		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
		(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
Panel C: 12 months ranking period and K performance period										
Coefficient	Variable	S (12,1)	S (12,3)	S (12,6)	S (12,9)	S (12,12)	S (12,15)	S (12,24)	S (12,36)	S (12,48)
$\hat{\alpha}_0$	1	0.00881***	0.00592***	0.00361***	0.00238***	0.00148***	0.000961***	0.00193***	0.00165***	0.00140***
		41.99	27.76	17.87	12.75	8.636	5.833	12.24	11.42	10.24
$\hat{\alpha}_B$	$I_{B,t-1}$	0.0107***	0.0134***	0.0124***	0.00908***	0.00866***	0.00807***	0.00565***	0.0120***	0.0100***
		24.83	28.29	30.14	24.27	22.86	23.81	18.54	57.80	38.64
$\hat{\beta}_0$	$\tilde{R}^e_{m,t}$	-0.173***	-0.118***	-0.0730***	-0.0688***	-0.0507***	-0.0374***	-0.0262***	-0.0782***	-0.0921***
		-34.56	-21.93	-14.61	-15.49	-13.34	-10.19	-6.877	-23.87	-30.59

$\hat{\beta}_B$	$I_{B,t-1}.\tilde{R}^e_{m,t}$	0.196***	0.278***	0.261***	0.249***	0.202***	0.163***	0.154***	0.269***	0.285***
		25.60	36.59	37.47	38.08	29.85	23.88	26.34	57.85	65.99
$\hat{\beta}_{B,U}$	$I_{B,t-1}.I_U.\tilde{R}^e_{m,t}$	-0.507***	-0.715***	-0.605***	-0.492***	-0.414***	-0.339***	-0.302***	-0.286***	-0.267***
		-45.74	-64.34	-58.92	-52.49	-40.23	-33.32	-37.54	-51.84	-46.60
R^2_{adj}		0.0285	0.0240	0.0135	0.0103	0.00635	0.00342	0.00338	0.0190	0.0203
Observations		85,750	86,240	86,240	86,240	86,240	86,240	82,320	76,440	70,560
Optionality		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

This table presents the results of estimating 36 specifications of a monthly regression run over the chapter period. Coefficients and t-statistics are presented for each variable. The dependent variable is the return on different momentum strategies S (J, K). The independent variables are constant; an indicator for bear markets, $I_{B,t-1}$, which equals one if the cumulative past two-year return on the market is negative; the excess market return $\tilde{R}^e_{m,t}$; and a contemporaneous up-market indicator, $I_{U,t}$, which equals one if $\tilde{R}^e_{m,t} > 0$. Standard errors are robust. **Optionality** refers to momentum strategy exhibiting an option-like behaviour during the sample period proxied by YES. The symbols ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 3.9: Market stress and country index-based momentum returns regression results

Panel A: 3 months ranking period and K performance period									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coefficient	S (3,1)	S (3,3)	S (3,6)	S (3,9)	S (3,12)	S (3,15)	S (3,24)	S (3,36)	S (3,48)
$\hat{\gamma}_0$	0.0194***	0.0224***	0.0185***	0.0149***	0.00966***	0.00481***	-0.000565***	0.00295***	0.000593***
	49.60	60.97	59.14	51.62	35.26	19.58	-2.812	16.26	3.502
$\hat{\gamma}_B$	-0.00725***	-0.0235***	-0.0194***	-0.0202***	-0.0144***	-0.00638***	-0.00409***	-0.00400***	-0.0120***
	-10.08	-37.76	-39.37	-48.60	-34.77	-18.20	-15.31	-14.11	-29.98
$\hat{\gamma}_{\sigma^2_M}$	-6.343***	-7.956***	-7.596***	-5.776***	-3.748***	-1.906***	0.691***	-0.805***	0.0117
	-35.68	-50.45	-59.72	-48.24	-33.30	-19.24	8.628	-11.84	0.181
$\hat{\gamma}_{int}$	6.379***	9.515***	8.404***	7.102***	4.901***	2.542***	0.536***	2.024***	2.714***
	29.01	48.86	53.23	50.83	37.11	22.18	6.140	25.37	29.83
R^2_{adj}	0.014	0.031	0.037	0.037	0.019	0.005	0.004	0.008	0.013
Observations	88,200	92,120	91,140	89,670	88,200	86,730	82,320	76,440	70,560
Impact	**Negative**	**Negative**	**Negative**	**Negative**	**Negative**	**Negative**	**No Impact**	**Negative**	**No Impact**
Panel B: 6 months ranking period and K performance period									
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Coefficient	S (6,1)	S (6,3)	S (6,6)	S (6,9)	S (6,12)	S (6,15)	S (6,24)	S (6,36)	S (6,48)
$\hat{\gamma}_0$	0.0283***	0.0207***	0.0161***	0.0115***	0.00582***	0.000845***	-0.00142***	0.00187***	0.000171
	68.20	54.36	43.94	31.45	17.36	2.757	-5.152	7.383	0.724
$\hat{\gamma}_B$	0.00128*	-0.0108***	-0.0160***	-0.0122***	-0.00774***	0.00307***	-0.00375***	-0.00335***	-0.0170***
	1.731	-15.29	-27.09	-22.14	-14.17	6.447	-9.800	-8.362	-31.43
$\hat{\gamma}_{\sigma^2_M}$	-12.61***	-8.643***	-6.820***	-4.539***	-2.419***	-0.327***	1.301***	-0.291***	0.277***
	-62.94	-52.25	-43.02	-29.75	-17.52	-2.617	12.18	-3.037	3.089
$\hat{\gamma}_{int}$	9.458***	8.993***	7.837***	5.374***	3.209***	0.0212	0.0663	1.556***	3.164***
	39.16	42.80	40.89	29.71	19.21	0.143	0.570	14.11	25.94
R^2_{adj}	0.059	0.028	0.020	0.011	0.004	0.001	0.004	0.004	0.010
Observations	85,750	88,200	89,670	89,670	88,200	86,730	82,320	76,440	70,560
Impact	**No Impact**	**Negative**	**Negative**	**Negative**	**Negative**	**Negative**	**No Impact**	**Negative**	**No Impact**

Panel C: 9 months ranking period and K performance period									
	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Coefficient	S (9,1)	S (9,3)	S (9,6)	S (9,9)	S (9,12)	S (9,15)	S (9,24)	S (9,36)	S (9,48)
$\hat{\gamma}_{0}$	0.0237***	0.0173***	0.0124***	0.00721***	0.00246***	-0.00105***	-0.000830***	0.00151***	-0.000166
	57.14	42.93	30.43	18.80	6.980	-3.284	-2.884	5.564	-0.656
$\hat{\gamma}_{B}$	-0.00721***	-0.00600***	-0.00417***	-0.00730***	-0.00632***	-0.00117**	-0.00732***	-0.00442***	-0.0190***
	-9.839	-8.040	-6.212	-11.76	-10.12	-2.220	-16.61	-10.38	-33.07
$\hat{\gamma}_{\sigma_M^2}$	-9.217***	-7.073***	-5.118***	-2.649***	-0.604***	1.025***	1.361***	-0.103	0.445***
	-50.56	-39.73	-29.66	-16.49	-4.160	7.819	12.00	-0.983	4.606
$\hat{\gamma}_{int}$	8.412***	5.978***	4.038***	2.952***	1.756***	-0.188	0.588***	1.713***	3.441***
	37.95	26.79	19.35	15.33	9.702	-1.187	4.603	14.30	26.42
R^2_{adj}	0.027	0.017	0.010	0.003	0.001	0.001	0.006	0.004	0.010
Observations	86,730	87,220	87,220	87,220	87,220	86,730	82,320	76,440	70,560
Impact	**Negative**	**Negative**	**Negative**	**Negative**	**Negative**	**No Impact**	**No Impact**	**No Impact**	**No Impact**
Panel D: 12 months ranking period and K performance period									
	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
Coefficient	S (12,1)	S (12,3)	S (12,6)	S (12,9)	S (12,12)	S (12,15)	S (12,24)	S (12,36)	S (12,48)
$\hat{\gamma}_{0}$	0.0200***	0.0122***	0.00768***	0.00302***	-0.000447	-0.00236***	-0.000662**	0.000709**	0.000417
	47.33	28.46	18.48	7.816	-1.263	-6.950	-2.102	2.433	1.549
$\hat{\gamma}_{B}$	-0.00382***	-0.00351***	-0.00335***	-0.00792***	-0.00821***	-0.00262***	-0.0119***	-0.00656***	-0.0214***
	-5.289	-4.534	-4.864	-12.60	-12.70	-4.480	-23.06	-14.64	-33.60
$\hat{\gamma}_{\sigma_M^2}$	-8.073***	-4.597***	-2.987***	-0.717***	1.043***	2.013***	1.586***	0.283**	0.308***
	-42.94	-25.35	-17.42	-4.503	7.307	14.82	12.99	2.506	2.978
$\hat{\gamma}_{int}$	6.183***	3.087***	2.151***	1.887***	1.238***	-0.494***	1.523***	2.228***	4.197***
	27.28	13.60	10.45	9.993	6.940	-3.011	10.76	17.27	29.53
R^2_{adj}	0.022	0.008	0.004	0.002	0.004	0.004	0.010	0.008	0.012
Observations	85,750	86,240	86,240	86,240	86,240	86,240	82,320	76,440	70,560
Impact	**Negative**	**Negative**	**Negative**	**Negative**	**No Impact**	**No Impact**	**No Impact**	**No Impact**	**No Impact**

This table presents the estimated coefficients (t-statistics) for a set of regressions based on equation (6). $R_{wml,t} = \gamma_0 + \gamma_B . I_{B,t-1} + \gamma_{\sigma_m^2} . \hat{\sigma}^2_{M,t-1} + \gamma_{\sigma_m^2} . I_B . \hat{\sigma}^2_{M,t-1} + \varepsilon_{it}$ where $R_{wml,t}$ is the momentum return of different S (J, K), I_B is the bear market indicator and $\hat{\sigma}^2_{M,t-1}$ is the variance of the monthly returns of the market over the 24 months prior to time t. The symbols ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively. Standard errors are robust. **Impact (Negative)** refers to periods of high market stress, as indicated by bear markets ($\hat{\gamma}_B < 0$) and high volatility ($\hat{\gamma}_{\sigma_M^2} < 0$), where future momentum returns are low. **No Impact** refers to no market stress, where $\hat{\gamma}_{\sigma_M^2}$ is either positive or insignificant.

Table 3. 20: Asymmetry in the optionality

Coefficient	Momentum decile portfolio										
VARIABLES	1	2	3	4	5	6	7	8	9	10	WML
Panel A: Optionality in bear markets											
$\hat{\alpha}_B$	0.0158***	0.00568***	0.000259***	-0.00324***	0.000939***	0.00322***	-0.000969***	0.00295***	-0.00310***	-0.0169***	-0.0104***
	38.67	38.64	2.883	-76.05	9.683	118.8	-6.939	27.13	-17.49	-27.25	-27.50
$\hat{\beta}_0$	-0.396***	0.0585***	-0.0318***	0.0116***	-0.00745***	0.0115***	-0.0498***	-0.0204***	0.0407***	0.0254**	-0.161***
	-97.07	52.80	-37.25	12.37	-6.731	19.02	-17.97	-14.85	19.20	2.232	-31.64
$\hat{\beta}_B$	0.283***	0.0240***	0.0641***	-0.0128***	-0.0221***	0.121***	0.101***	0.0802***	-0.0960***	0.00988	-0.164***
	42.04	15.93	39.39	-13.46	-15.74	22.01	32.02	49.24	-33.95	0.855	-25.70
$\hat{\beta}_{B,U}$	**-0.405*** **	**-0.160*** **	**-0.0820*** **	**0.0433*** **	**-0.0461*** **	**-0.0461*** **	**-0.0635*** **	**-0.115*** **	**-0.0393*** **	**-0.190*** **	**0.369*** **
	-42.01	**-31.25**	**-32.51**	**52.51**	**-15.45**	**-15.46**	**-24.15**	**-34.65**	**-7.999**	**-34.60**	**33.73**
$\hat{\alpha}_0$	-0.0669***	-0.0319***	-0.0157***	-0.00654***	0.00296***	0.0126***	0.0231***	0.0359***	0.0557***	0.108***	0.0108***
	-304.2	-388.2	-506.9	-164.2	66.64	468.2	358.7	627.0	507.3	206.3	58.96
Observations	10,314	10,314	10,314	10,314	10,314	10,314	10,314	10,314	10,314	10,314	103,140
R-squared	0.535	0.135	0.143	0.187	0.194	0.103	0.125	0.100	0.167	0.085	0.040
Panel B: Optionality in bull markets											
$\hat{\alpha}_L$	-0.00218***	-0.00140***	0.000877***	0.00288***	-0.00155***	-0.00383***	0.00244***	0.00319***	-0.000522*	0.0566***	0.00221***
	-5.756	-7.656	11.51	45.62	-23.17	-113.4	11.27	27.15	-1.813	62.35	5.875
$\hat{\beta}_0$	0.361***	0.0580***	-0.0628***	0.0247***	-0.109***	-0.0897***	-0.0622***	0.0475***	-0.0968***	0.722***	-0.134***
	11.07	23.86	-37.17	25.36	-58.33	-30.17	-7.592	31.39	-13.82	81.96	-14.75
$\hat{\beta}_L$	0.657***	0.0561***	-0.0573***	0.0108***	-0.0684***	-0.0684***	-0.0785***	0.0359***	-0.0327***	0.736***	0.0620***
	20.07	18.10	-31.34	10.33	-35.47	-35.48	-9.562	20.38	-4.625	82.97	6.411
$\hat{\beta}_{L,U}$	**-0.867**	**0.00133**	**0.044**	**-0.0306*** **	**0.134*** **	**0.122*** **	**0.0286**	**-0.237*** **	**0.300*** **	**-1.922*** **	**0.0533**
	-0.237	**0.244**	**0.1384**	**-12.10**	**48.75**	**36.40**	**1.617**	**-50.76**	**23.90**	**-63.25**	**-0.310**
$\hat{\alpha}_0$	-0.716***	-0.0866***	0.0403***	-0.0197***	0.0715***	0.0158***	0.0988***	-1.01e-05	0.0846***	-0.651***	-0.0528***
	-21.87	-27.67	21.88	-18.84	36.86	18,880	12.04	-0.00572	11.94	-73.17	-5.437
Observations	10,314	10,314	10,314	10,314	10,314	10,314	10,314	10,314	10,314	10,314	103,140
R-squared	0.552	0.084	0.075	0.180	0.296	0.187	0.107	0.185	0.214	0.280	0.034

This table presents estimated coefficients (t-statistics) from regressions of the monthly excess returns of the momentum decile portfolios and the winner- minus-loser (WML) and reports results for optionality in bear and bull markets . The symbols ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 3.10: Country index-based momentum returns versus GFC crisis and funds' style regression results

Panel A: 3 months ranking period and K performance period									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variable	S (3,1)	S (3,3)	S (3,6)	S (3,9)	S (3,12)	S (3,15)	S (3,24)	S (3,36)	S (3,48)
Intercept	0.0101***	0.00873***	0.00655***	0.00466***	0.00386***	0.00257***	0.00114***	0.00213***	0.000963***
	61.97	60.09	52.21	42.48	38.27	27.82	13.81	26.78	11.94
Crisis GFC	-0.00866***	-0.00670***	-0.0150***	-0.0109***	-0.0167***	-0.0156***	-0.0127***	-0.00304***	-0.00493***
	-15.49	-14.72	-31.72	-28.65	-46.63	-59.33	-67.51	-15.36	-27.80
Market Factor	-0.220***	-0.105***	-0.107***	-0.0498***	-0.0452***	-0.0238***	-0.0159***	0.00267**	0.00104
	-61.50	-35.41	-44.68	-26.40	-28.01	-15.86	-11.82	2.013	0.801
SMB	0.298***	-0.0361***	-0.00471	0.0166***	-0.0185***	0.0172***	0.0844***	0.0923***	0.0551***
	33.82	-4.326	-0.649	2.910	-3.598	3.728	20.11	22.22	12.31
HML	0.318***	0.271***	0.0104*	-0.174***	-0.296***	-0.303***	-0.230***	-0.186***	-0.242***
	36.06	32.31	1.712	-34.16	-63.59	-67.53	-54.38	-43.18	-53.78
R^2_{adj}	0.0607	0.0264	0.0185	0.0124	0.0405	0.0468	0.0499	0.0208	0.0325
Observations	88,200	92,120	91,140	89,670	88,200	86,730	82,320	76,440	70,560
Panel B: 6 months ranking period and K performance period									
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Variable	S (6,1)	S (6,3)	S (6,6)	S (6,9)	S (6,12)	S (6,15)	S (6,24)	S (6,36)	S (6,48)
Intercept	0.0125***	0.00916***	0.00593***	0.00514***	0.00347***	0.00296***	0.00118***	0.00185***	0.000750***
	71.54	55.44	38.86	36.05	26.13	24.07	10.11	16.39	6.641
Crisis GFC	-0.0121***	-0.0131***	-0.0136***	-0.0190***	-0.0239***	-0.0252***	-0.0143***	-0.00415***	-0.00644***
	-22.18	-22.84	-23.90	-36.63	-53.71	-77.25	-66.65	-18.76	-28.01
Market Factor	-0.357***	-0.199***	-0.106***	-0.0700***	-0.0549***	-0.0609***	-0.0372***	-0.0119***	-0.0182***
	-107.9	-64.82	-37.33	-28.53	-25.04	-29.52	-20.21	-6.643	-10.66
SMB	0.248***	0.169***	0.104***	0.0782***	0.0389***	0.0170***	0.123***	0.121***	0.0595***
	25.86	19.28	13.19	11.52	5.938	2.800	21.52	20.61	9.399
HML	0.328***	0.166***	-0.139***	-0.320***	-0.423***	-0.423***	-0.303***	-0.241***	-0.279***
	42.67	18.24	-19.04	-50.08	-68.96	-65.20	-50.58	-42.05	-44.38
R^2_{adj}	0.0988	0.0351	0.0124	0.0279	0.0518	0.0654	0.0398	0.0168	0.0199
Observations	85,750	88,200	89,670	89,670	88,200	86,730	82,320	76,440	70,560
Panel C: 9 months ranking period and K performance period									
	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Variable	S (9,1)	S (9,3)	S (9,6)	S (9,9)	S (9,12)	S (9,15)	S (9,24)	S (9,36)	S (9,48)
Intercept	0.0114***	0.00814***	0.00718***	0.00505***	0.00414***	0.00294***	0.00147***	0.00195***	0.000863***
	63.42	47.49	43.41	32.87	28.49	21.82	11.70	15.84	7.073
Crisis GFC	-0.0131***	-0.0211***	-0.0280***	-0.0290***	-0.0325***	-0.0296***	-0.0141***	-0.00500***	-0.00824***
	-20.47	-32.62	-45.60	-55.87	-76.85	-90.98	-62.48	-21.17	-32.40
Market Factor	-0.273***	-0.190***	-0.119***	-0.0823***	-0.0728***	-0.0451***	-0.0214***	-0.0145***	-0.0233***
	-68.31	-52.39	-37.66	-29.10	-28.22	-18.60	-10.37	-7.311	-12.22
SMB	0.258***	0.182***	0.0611***	0.0750***	-0.0509***	-0.0289***	0.110***	0.109***	0.0633***
	26.07	19.26	7.036	9.647	-6.650	-4.068	16.99	16.95	9.297
HML	0.135***	0.0497***	-0.258***	-0.390***	-0.469***	-0.492***	-0.303***	-0.253***	-0.294***
	16.02	5.271	-32.31	-53.74	-67.70	-66.90	-46.69	-40.74	-44.64
R^2_{adj}	0.0525	0.0292	0.0309	0.0459	0.0692	0.0780	0.0320	0.0142	0.0199
Observations	86,730	87,220	87,220	87,220	87,220	86,730	82,320	76,440	70,560
Panel D: 12 months ranking period and K performance period									
	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
Variable	S (12,1)	S (12,3)	S (12,6)	S (12,9)	S (12,12)	S (12,15)	S (12,24)	S (12,36)	S (12,48)
Intercept	0.0106***	0.00821***	0.00639***	0.00442***	0.00375***	0.00289***	0.00150***	0.00181***	0.00113***
	60.76	46.46	37.60	27.84	24.74	19.72	10.86	13.49	8.615
Crisis GFC	-0.0311***	-0.0436***	-0.0406***	-0.0362***	-0.0351***	-0.0300***	-0.0136***	-0.00512***	-0.00779***
	-45.39	-64.44	-73.66	-80.06	-98.70	-101.6	-50.20	-20.29	-27.58
Market Factor	-0.251***	-0.213***	-0.135***	-0.0966***	-0.0759***	-0.0565***	-0.0225***	-0.0114***	-0.0166***
	-76.03	-64.44	-45.14	-35.81	-29.07	-21.41	-9.535	-5.336	-7.903

SMB	0.252***	0.223***	0.123***	0.103***	0.00577	0.0161**	0.177***	0.157***	0.104***
	26.74	23.18	13.62	12.70	0.714	2.038	23.59	22.08	14.25
HML	-0.0336***	-0.0742***	-0.354***	-0.446***	-0.544***	-0.548***	-0.378***	-0.317***	-0.356***
	-3.598	-7.464	-42.92	-59.19	-73.57	-67.14	-50.08	-44.54	-48.91
R^2_{adj}	0.0561	0.0647	0.0623	0.0677	0.0840	0.0770	0.0373	0.0221	0.0264
Observations	85,750	86,240	86,240	86,240	86,240	86,240	82,320	76,440	70,560

This table presents the estimated coefficients (t-statistics) for a set of regressions based on equation (7): $R_{wml,t} = \alpha_{0,i} + \beta_{0,i}\, CD_t + \beta_{1,i}\, R_{M,t} + \beta_{2,i}\, SMB_t + \varepsilon_{it} \beta_{3,i}\, HML_t + \varepsilon_{it}$.where $R_{wml,t}$ is the momentum return of different S (J, K), CD is a dummy variable that has a value of one during the 2007-2009 crisis period and a value of zero otherwise, $R_{M,t}$ is the excess market return on MSCI AC, SMB (MSCI Small Cap–MSCI Large Cap), and HML (MSCI Value–MSCI Growth). The symbols ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively. Standard errors are robust.

Table 3.11: Country index-based momentum returns versus funds' screening and characteristics regression results

Panel A: 3 months ranking period and K performance period									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variable	S (3,1)	S (3,3)	S (3,6)	S (3,9)	S (3,12)	S (3,15)	S (3,24)	S (3,36)	S (3,48)
Intercept	0.0102***	0.00868***	0.00468***	0.00439***	0.00143***	-0.000135	-0.00196***	0.00107***	-2.71E-05
	20.29	16.88	9.593	9.986	3.793	-0.494	-9.326	6.259	-0.129
Screening Intensity	0.0115**	0.0185***	0.0513***	0.0529***	0.0652***	0.0592***	0.0324***	0.0334***	0.0452***
	2.575	4.223	12.08	13.21	16.57	15.65	10.81	8.608	12.41
Age	-0.00393***	-0.00411***	-0.00272***	-0.00218***	-0.000539**	0.000389**	0.00183***	0.000776***	0.000970***
	-13.95	-14.3	-9.863	-8.682	-2.451	2.399	16.08	7.962	8.084
Size	-2.36E-06	2.78E-06	6.49e-06**	5.48e-06**	2.75E-06	-8.99E-07	-5.02e-06***	-3.54e-06***	-3.84e-06***
	-0.752	0.942	2.193	2.032	1.075	-0.439	-2.856	-2.811	-2.645
$Size^2$	5.22E-09	-8.56E-10	-6.38e-09*	-6.22e-09*	-4.19E-09	-9.41E-11	4.73e-09*	4.32e-09***	4.37e-09**
	1.309	-0.227	-1.766	-1.91	-1.244	-0.0328	1.955	2.748	2.34
Management fees	0.00174**	0.00122*	-0.000225	-0.000424	-0.000783	-0.000654	-0.000491	-3.26E-05	-9.53E-05
	2.563	1.729	-0.298	-0.832	-1.391	-1.186	-0.908	-0.158	-0.44
Other fees	-0.00194	-0.00221	-0.00154	-0.00122	-0.000615	-0.000317	0.000801	0.000125	7.61E-05
	-1.454	-1.599	-1.404	-1.259	-0.816	-0.587	1.447	0.343	0.177
R^2	0.0795	0.0639	0.083	0.132	0.126	0.0329	0.0273	0.012	0.0378
Observations	15,402	15,402	15,402	15,402	15,402	15,402	15,402	15,402	15,402
Panel B: 6 months ranking period and K performance period									
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Variable	S (6,1)	S (6,3)	S (6,6)	S (6,9)	S (6,12)	S (6,15)	S (6,24)	S (6,36)	S (6,48)
Intercept	0.00871***	0.00758***	0.00507***	0.00210***	-0.00176***	-0.00334***	-0.00311***	-0.00012	-0.00113***
	13.17	14.1	11.22	4.936	-4.578	-9.212	-9.989	-0.446	-3.564
Screening Intensity	0.0361***	0.0600***	0.0864***	0.0965***	0.0916***	0.0831***	0.0436***	0.0465***	0.0565***
	6.174	10.26	14.72	18.1	18.98	18.81	12.66	10.48	12.99
Age	-0.00444***	-0.00390***	-0.00222***	-0.000797***	0.00112***	0.00216***	0.00273***	0.00166***	0.00150***
	-13.37	-13.9	-8.717	-3.217	5.085	10.91	16.98	10.92	8.149
Size	1.39e-05***	7.92e-06**	8.42e-06***	4.95E-06	5.69E-07	-4.00E-06	-6.94e-06***	-4.07e-06**	-4.09e-06**
	2.86	2.304	2.701	1.6	0.181	-1.329	-2.931	-2.436	-2.239
$Size^2$	-1.15e-08*	-5.82E-09	-8.94e-09**	-6.62E-09	-2.37E-09	2.58E-09	6.77e-09**	4.87e-09**	4.44e-09*
	-1.786	-1.321	-2.382	-1.637	-0.531	0.592	2.115	2.342	1.924
Management fees	0.00163	0.00119	-0.000429	-0.000947	-0.00117	-0.00107	-0.000582	-8.17E-05	-0.000257
	0.954	0.957	-0.522	-1.276	-1.331	-1.128	-0.767	-0.231	-0.819
Other fees	-0.00197	-0.0016	-0.00125	-0.000758	-0.000123	0.000435	0.00125	0.000447	0.000258
	-1.085	-1.128	-1.194	-0.848	-0.147	0.506	1.47	0.749	0.424
R^2	0.0255	0.0236	0.138	0.161	0.0106	0.0109	0.0384	0.0284	0.0267
Observations	15,402	15,402	15,402	15,402	15,402	15,402	15,402	15,402	15,402
Panel C: 9 months ranking period and K performance period									

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Variable	S (9,1)	S (9,3)	S (9,6)	S (9,9)	S (9,12)	S (9,15)	S (9,24)	S (9,36)	S (9,48)
Intercept	0.00979***	0.00425***	0.00111**	-0.00161***	-0.00384***	-0.00479***	-0.00327***	0.000172	-0.00133***
	19.56	9.181	2.156	-3.294	-7.741	-9.585	-8.48	0.555	-3.662
Screening Intensity	0.0469***	0.0800***	0.107***	0.104***	0.106***	0.0956***	0.0556***	0.0638***	0.0702***
	8.554	14.09	17.31	18.44	20.45	19.35	13.64	12.07	13.71
Age	-0.00326***	-0.00194***	-0.000526*	0.00144***	0.00308***	0.00393***	0.00329***	0.00149***	0.00154***
	-11.94	-7.051	-1.735	5.15	11.55	15.54	16.77	8.399	7.305
Size	9.77e-06***	6.86e-06**	6.88e-06*	2.52E-06	-3.00E-06	-6.57E-06	-8.79e-06***	-5.76e-06***	-6.11e-06***
	2.73	2.142	1.801	0.643	-0.727	-1.524	-3.216	-3.001	-2.872
$Size^2$	-8.43e-09*	-7.62e-09*	-9.48e-09*	-5.31E-09	5.54E-10	5.11E-09	8.53e-09**	6.55e-09***	6.51e-09**
	-1.84	-1.925	-1.874	-0.961	0.0921	0.821	2.334	2.753	2.428
Management fees	0.00054	-0.00111	-0.00186**	-0.00188*	-0.00185	-0.00141	-0.000933	-0.000222	-0.000278
	0.449	-1.523	-2.127	-1.664	-1.401	-0.928	-1.051	-0.668	-0.734
Other fees	-0.00198	-0.0013	-0.00061	0.000189	0.000745	0.00138	0.00149	0.000281	0.000188
	-1.425	-1.262	-0.584	0.181	0.62	1.032	1.43	0.446	0.269
R^2	0.0514	0.162	0.103	6.21E-07	0.00111	0.0146	0.0249	0.0157	0.0301
Observations	15,402	15,402	15,402	15,402	15,402	15,402	15,402	15,402	15,402
Panel D: 12 months ranking period and K performance period									
	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
Variable	S (12,1)	S (12,3)	S (12,6)	S (12,9)	S (12,12)	S (12,15)	S (12,24)	S (12,36)	S (12,48)
Intercept	0.00404***	-0.00130**	-0.00234***	-0.00305***	-0.00394***	-0.00427***	-0.00230***	0.000776**	-0.000405
	7.266	-1.992	-3.656	-5.686	-7.523	-8.752	-5.437	2.139	-1.028
Screening Intensity	0.0991***	0.106***	0.100***	0.0942***	0.0896***	0.0775***	0.0458***	0.0617***	0.0719***
	14.74	15.47	15.63	17.1	16.51	14.87	9.039	9.702	11.67
Age	-0.00189***	0.000585	0.000845**	0.00178***	0.00303***	0.00346***	0.00311***	0.00134***	0.00125***
	-5.692	1.534	2.298	6.108	11.46	14.42	13.67	6.314	5.365
Size	9.13e-06**	3.17E-06	1.41E-06	-2.90E-06	-8.17e-06*	-1.02e-05**	-1.09e-05***	-7.46e-06***	-6.86e-06***
	2.388	0.651	0.287	-0.641	-1.662	-2.266	-3.534	-3.064	-2.832
$Size^2$	-1.00e-08**	-6.54E-09	-5.38E-09	-5.35E-10	6.03E-09	8.96E-09	1.11e-08***	8.53e-09***	7.45e-09**
	-2.055	-0.931	-0.747	-0.0786	0.824	1.371	2.766	2.814	2.446
Management fees	-0.00111	-0.00278***	-0.00299***	-0.00243**	-0.00184	-0.00142	-0.000718	-0.000106	-0.000233
	-1.205	-2.662	-2.87	-2.197	-1.403	-1.097	-0.914	-0.291	-0.537
Other fees	-0.00158	-0.000292	-0.00015	0.000303	0.000918	0.0014	0.00145	0.000174	-1.49E-05
	-1.298	-0.236	-0.119	0.266	0.738	1.108	1.376	0.243	-0.0204
R^2	0.175	0.0519	0.057	0.0388	0.0349	0.0731	0.0182	0.0153	0.0127
Observations	15,402	15,402	15,402	15,402	15,402	15,402	15,402	15,402	15,402

This table presents the estimated coefficients (t-statistics) for a set of regressions based on equation (8): $R_{wml,t} = \alpha_0 + \beta_0\, Screening\ intensity_t + \beta_1\, Fund\ Characteristics_t + \varepsilon_t$ where $R_{wml,t}$ is the momentum return of different S (J, K), Screening intensity is constructed as follows: (MSCI Islamic - MSCI AC); Age is measured from the inception date to the test date (in months); and Size is the fund's total assets under management (in USD million). Other fees are Shariah advisory and administaruive fees. The symbols ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively. Standard errors are double clustered.

Table 3.12: Crash risk of momentum strategies and investment styles regression results

	(1)	(2)	(3)
Variable	CRASH	COUNT	NCSKEW
Intercept	0.0167***	-0.967***	0.188***
	7.210	-209.1	4.920
Market Factor	-0.182***	-0.364***	-1.644***
	-4.698	-4.698	-7.628
SMB	0.273**	0.545**	1.476**
	2.351	2.351	2.407
HML	1.092***	2.185***	7.355***
	5.514	5.514	6.626
R^2	0.0855	0.0855	0.439
Observations	6,165	6,165	5,965
# of CMOM	36	36	36

This table presents the estimated coefficients (t-statistics) for a set of three regressions based on equation (9) $CR_{i,t} = \alpha_{0,i} + \beta_{0,i} R_{M,t} + \beta_{1,i} SMB_t + \varepsilon_{it} \beta_{2,i} HML_t + \varepsilon_{it}$ .We use three dependent variables CRASH, COUNT, and NCSKEW defined as follows: CRASH is an indicator variable that equals one for a momentum-year that experiences one or more crash months (as defined above) during the year period, and zero otherwise. Similarly, we construct a second crash risk measure (COUNT) based on the number of crashes and the number of jumps during a year. A crash (jump) occurs when the momentum-specific monthly return falls 3.09 standard deviations below (above) the annual mean. COUNT is defined as the number of crashes minus the number of jumps for the year. NCSKEW is the negative conditional return skewness measure. Specifically, NCSKEW for a given momentum in a year is calculated by taking the negative of the third moment of momentum-specific monthly returns for each sample year and dividing it by the standard deviation of momentum-specific monthly returns raised to the third power. Specifically, for each momentum j in year t, we compute NCSKEW as: $\text{NCSKEW}_{jt} = -[n(n-1)^{\frac{3}{2}} \sum w_{jt}^3] / [(n-1)(n-2)(\sum w_{jt}^2)^{3/2}$. The symbols ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively. Standard errors are clustered by crossid (momentum strategies). The panel used here is based on our 36 constructed momentum strategies.

3.9 Appendix

Table 3.14: Panel Regression Analysis

Models	Strategies	Constant	t-statistics	RM	t-statistics	SMB	t-statistics	HML	t-statistics	CMOM	t-statistics	Observations	R-squared
4(1)	J=3, K=1	0.00105***	13.37	0.427***	27.42	0.109***	7.348	-0.185***	-13.35	0.00995*	1.676	50,865	0.239
4(2)	J=3, K=3	0.000994***	12.94	0.425***	27.24	0.117***	7.667	-0.184***	-12.87	0.0203***	3.474	51,240	0.239
4(3)	J=3, K=6	0.000936***	12.79	0.426***	27.29	0.120***	7.799	-0.176***	-12.14	0.0530***	8.493	51,240	0.24
4(4)	J=3, K=9	0.000917***	12.23	0.425***	27.24	0.118***	7.687	-0.164***	-11.42	0.0768***	10.24	51,240	0.241
4(5)	J=3, K=12	0.00102***	14.17	0.423***	27.16	0.120***	7.792	-0.145***	-10.17	0.112***	11.46	51,240	0.243
4(6)	J=3, K=15	0.00114***	16.14	0.420***	27.33	0.116***	7.913	-0.140***	-10.85	0.144***	10.37	51,049	0.244
4(7)	J=3, K=24	0.00131***	20.01	0.420***	27.61	0.0881***	6.459	-0.140***	-11.18	0.199***	8.541	50,387	0.245
4(8)	J=3, K=36	0.000878***	9.27	0.419***	28.01	0.0796***	6.032	-0.139***	-11.27	0.241***	8.312	49,267	0.244
4(9)	J=3, K=48	0.00110***	16.07	0.418***	28.09	0.0754***	5.74	-0.119***	-9.559	0.310***	8.786	47,769	0.249
4(10)	J=6, K=1	0.00102***	12.79	0.430***	27.86	0.106***	7.711	-0.188***	-13.32	0.0172***	4.113	50,363	0.238
4(11)	J=6, K=3	0.000944***	11.99	0.429***	27.73	0.110***	7.689	-0.182***	-13.03	0.0403***	8.562	50,686	0.238
4(12)	J=6, K=6	0.000964***	12.82	0.426***	27.45	0.118***	7.899	-0.160***	-11.55	0.0603***	10.12	51,042	0.241
4(13)	J=6, K=9	0.00103***	14.37	0.425***	27.23	0.118***	7.711	-0.147***	-10.34	0.0777***	10.1	51,240	0.243
4(14)	J=6, K=12	0.00121***	18.16	0.422***	27.11	0.119***	7.742	-0.139***	-9.796	0.0943***	9.363	51,240	0.244
4(15)	J=6, K=15	0.00132***	19.85	0.422***	27.38	0.115***	7.874	-0.137***	-10.58	0.114***	8.725	51,049	0.244
4(16)	J=6, K=24	0.00132***	19.96	0.422***	27.65	0.0879***	6.439	-0.144***	-11.42	0.135***	6.923	50,387	0.243
4(17)	J=6, K=36	0.00107***	13.26	0.421***	28.02	0.0811***	6.107	-0.145***	-11.58	0.165***	6.985	49,267	0.243
4(18)	J=6, K=48	0.00122***	19.29	0.422***	28.11	0.0796***	6.029	-0.138***	-10.97	0.200***	7.463	47,769	0.246
4(19)	J=9, K=1	0.000920***	11.9	0.430***	27.9	0.106***	7.572	-0.184***	-12.97	0.0273***	6.912	50,387	0.238
4(20)	J=9, K=3	0.00100***	13.22	0.428***	27.79	0.109***	7.764	-0.168***	-12.14	0.0483***	9.879	50,450	0.239
4(21)	J=9, K=6	0.00109***	15.46	0.424***	27.37	0.112***	7.479	-0.148***	-10.77	0.0647***	10.17	50,644	0.242
4(22)	J=9, K=9	0.00119***	17.68	0.423***	27.26	0.109***	7.234	-0.145***	-10.54	0.0730***	9.343	50,854	0.242
4(23)	J=9, K=12	0.00125***	19.45	0.421***	27.06	0.118***	7.69	-0.139***	-9.842	0.0901***	8.893	51,079	0.244
4(24)	J=9, K=15	0.00133***	20.11	0.419***	27.28	0.113***	7.766	-0.136***	-10.54	0.106***	8.585	51,049	0.244
4(25)	J=9, K=24	0.00125***	18.69	0.422***	27.64	0.0874***	6.4	-0.148***	-11.72	0.126***	7.221	50,387	0.244
4(26)	J=9, K=36	0.00106***	13.1	0.421***	28.02	0.0838***	6.327	-0.144***	-11.6	0.162***	7.607	49,267	0.244
4(27)	J=9, K=48	0.00124***	19.7	0.423***	28.12	0.0797***	6.039	-0.138***	-11.09	0.191***	7.96	47,769	0.247
4(28)	J=12, K=1	0.000963***	12.57	0.429***	27.86	0.102***	7.399	-0.169***	-12.21	0.0534***	10.84	50,210	0.241

4(29)	J=12, K=3	0.00117***	16.37	0.425***	27.74	0.105***	7.559	-0.158***	-11.57	0.0540***	9.939	50,273	0.241
4(30)	J=12, K=6	0.00123***	18.24	0.422***	27.32	0.108***	7.288	-0.148***	-10.63	0.0576***	8.516	50,467	0.241
4(31)	J=12, K=9	0.00128***	19.59	0.422***	27.26	0.105***	7.063	-0.145***	-10.49	0.0725***	8.598	50,677	0.242
4(32)	J=12, K=12	0.00129***	20.35	0.420***	27.07	0.108***	7.205	-0.139***	-9.859	0.0859***	8.15	50,902	0.244
4(33)	J=12, K=15	0.00133***	20.25	0.420***	27.33	0.105***	7.312	-0.140***	-10.86	0.0932***	7.795	50,960	0.243
4(34)	J=12, K=24	0.00120***	17.7	0.422***	27.66	0.0817***	6.023	-0.148***	-11.83	0.104***	6.823	50,387	0.242
4(35)	J=12, K=36	0.00109***	13.66	0.421***	28.02	0.0773***	5.873	-0.140***	-11.29	0.143***	7.642	49,267	0.244
4(36)	J=12, K=48	0.00118***	18.29	0.422***	28.11	0.0728***	5.571	-0.133***	-10.66	0.170***	8.05	47,769	0.247

This table presents results for panel regressions of individual fund returns. We incorporate the country index-based momentum factor into Fama and French 3 factor models based on equation 4. We estimate equation 4 36 times by including each country index-based momentum strategy in a regression. Estimates are based on Newey and West (1987).

Table 3.15:Dominance Analysis

4F Model			
Adjusted R2 =	0.2490		
	Dominance	Standardized Domin Stat	Ranking
MKT	0.2100	0.8415	1
SMB	0.0140	0.0569	3
HML	0.0020	0.0079	4
CMOM	**0.0230**	**0.0937**	**2**
BB Model			
Adjusted R2 =	0.2513		
	Dominance Stat	Standardized Domin Stat	Ranking
MKT	0.1854	0.7378	1
MKT2	0.0132	0.0526	4
SMB	0.0202	0.0806	3
HML	0.0018	0.0071	5
CMOM	**0.0306**	**0.1219**	**2**

Table 3.16: Ramadan Effect

	1	2	3	4	5
Alphas	0.00166***	0.00286***	0.000927***	0.000970***	0.00163***
	7.508	11.9800	4.1320	9.687	11.4700
MKT	0.437***	0.414***	0.429***	0.421***	0.410***
	28.720	28.390	28.400	29.160	29.080
MKT2		-0.469***			-0.236***
		-8.406			-4.700
SMB			0.110***	0.0732***	0.0643***
			7.335	5.694	5.091
HTML			-0.187***	-0.126***	-0.113***
			-13.340	-10.31	-9.140
CMOM				0.306***	0.301***
				8.997	8.939
Ramadan Effect	-0.00014	-0.00004	-0.00008	0.00000	0.00003
	-0.333	-0.0962	-0.1830	0.00072	0.065
Observations	53,238	53,238	53,238	49,666	49,666
R-squared	0.299	0.293	0.303	0.254	0.255
Number of Funds	572	572	572	569	569

Table 3.13: Robustness test of country index-based momentum factor for Islamic mutual fund performance

	(1)	(2)	(3)	(4)	(5)	(6)
	CMOM= S (3,48)			CMOM= S (3,36)		
Alphas	0.00142***	0.00145***	0.00149***	0.00136***	0.00142***	0.00147***

t-value	21.93	26.23	24.57	17.27	21.98	21.07
MKT	0.235***	0.215***	0.173***	0.233***	0.214***	0.172***
t-value	12.79	14.25	10.79	12.77	14.27	10.84
SMB	0.0525***	0.0870***	0.0742***	0.0584***	0.0912***	0.0796***
t-value	3.947	7.01	5.612	4.315	7.264	5.9
HML	-0.125***	-0.108***	-0.104***	-0.125***	-0.108***	-0.101***
t-value	-9.612	-8.982	-7.89	-9.862	-9.079	-7.89
CMOM	**0.0992*** **	**0.0742*** **	**0.0481*** **	**0.0864*** **	**0.0647*** **	**0.0516*** **
t-value	3.541	4.29	2.674	3.596	4.009	3.054
MSCI (by country)	0.226***		0.0824***	0.228***		0.0828***
t-value	12.31		4.987	12.43		5.054
Islamic Factor		**0.235*** **	**0.202*** **		**0.236*** **	**0.202*** **
t-value		16.89	10.83		17.09	10.88
R-Squared	0.320	0.361	0.371	0.32	0.36	0.37
Hausman Test	FE	FE	FE	FE	FE	FE
Observations	39,189	42,508	35,841	39,952	43,272	36,541
Number of funds	393	490	393	393	490	393

This table presents panel regression estimates for our basic five factor model with additional factors. Specification 1 adds MSCI by country index; Specification 2 adds an Islamic factor; and Specification 3 adds both additional factors. In specifications 4 to 6, we substitute the country index momentum S (3,48) by the second-best strategy, being S (3,36). ***, ** and * denote significance at the 1%, 5%, and 10% level, respectively. SMB, HML, and CMOM correspond to the size, book-to-market, and the country index-based momentum risk factors. MKT stands for the market premium. The Hausman test is used to decide between random and fixed effects. Standards errors are clustered at two levels (investment regions and funds).

Chapter 4 : Board Characteristics of Shariah Compliant Firms and Corporate Social Responsibility

4.1 INTRODUCTION

Corporate social responsibility refers to the responsibility and commitment of firms towards the environment, consumers, employees, and communities. A firm's CSR activities are commonly viewed as an outcome of the firm's board decisions. Jamali et al. (2008) find that

the nature of a firm's corporate governance (CG) is what drives managers and executives to set specific goals and objectives in relation to CSR, and the board of directors plays an important role in addressing and promoting these CSR objectives. While the majority of the previous literature has provided empirical evidence on the association between CSR and board characteristics in conventional contexts (see, e.g., Webb, 2004; Dunn & Sainty, 2009; Huang, 2010; Rao & Tilt, 2016), much of the recent attention on CSR has shifted to non-conventional contexts, particularly in Islamic banks and Islamic financial institutions (see e.g., Haniffa and Hudaib, 2007; Farook et al., 2011; Bukair & Rahman, 2015). This shift is perhaps not surprising given that in recent years Islamic finance has emerged as one of the fastest-growing areas of ethical finance. For example, the size of assets managed by Shariah-compliant (SC) firms, which had a value of USD $1.4 trillion worldwide in 2014 (Standard & Poor, 2014) is expected to grow to US$3.8 trillion by the end of 2023 (Thomson Reuters, 2018). To the best of our knowledge, no study has yet provided a firm-level analysis on the association between board characteristics and the CSR score in the context of Shariah compliant firms (SCFs). In other words, as the Shariah screening criteria employed by screening providers only focuses on business scope and financial structure, there is no empirical work that determines precisely how Shariah principles can contribute to a firm's CSR score in the context of a firm's attributes such as board characteristics.

SCFs are firms that comply with the guidelines set by the principles of Shariah.[37] SCFs are thus firms that pass two primary screening levels, namely qualitative screening and quantitative screening. A more detailed explanation of screening criteria and steps is provided in the appendix (refer to Figure 4.1). Inferences about Shariah corporate governance structure do not provide sufficient information about how Shariah principles can contribute to a characteristically distinctive form of CSR. The main characteristic of SCFs is that they are required to operate in conformity with the rules and principles of Shariah law. SCFs are also required to provide CSR information to show their responsibility and accountability beyond their immediate society. The six components of CSR, namely environment, community, diversity, employee, product, and human rights applied to conventional firms are similar to those applied to SCFs since most of these attributes are consistent with the Shariah principles. Despite this similarity, there could be differences in the extent to which a component of CSR

[37] According to Kabbani (2016), Shariah is the Islamic law - the disciplines and principles that govern the behaviour of a Muslim individual towards himself or herself, family, neighbours, community, city, nation and the Muslim polity as a whole, the Ummah.

is applied. The potential differences in applying CSR in SCFs compared to non-SCFs take place mainly in the scope and the focus of each type of firm. SCFs address CSR in the light of Islamic values and beliefs derived from the primary and secondary sources of Shariah.[38] In contrast, non-SCFs apply CSR in business activities only as a commitment towards behaving ethically and contributing positively to society. Moreover, the focus of compliant firms is to balance material and spiritual business operations while the scope of non-SCFs is only material. Other differences are presented in Table 4.10 in the appendix to this chapter. CSR in SCFs is therefore seen to encompass a broader meaning of moral substance such as 'social good', 'good governance', 'environmental concern', and 'ethical individual and organisational behaviour'. However, we cannot determine precisely how Shariah principles can contribute to CSR in the context of a firm's characteristics such as management practices, leadership, and corporate governance. We believe that CSR of SCFs may be attributed to both their business scope outlined by the principles of Shariah as well as their board characteristics.

This chapter therefore examines the relationship between board characteristics and CSR in SCFs. We investigate various board characteristics of SCFs and their association with CSR scores.[39] These characteristics include board independence, executive tenure, multiple directorships (busyness), gender (female directors), and CEO power. We also extend our analysis to investigate the association between board co-option measures and CSR of SCFs given the recent finding by Coles et al. (2014) that the greater the number of co-opted directors on the board, the less effective the board is in mitigating agency conflicts because co-opted directors are conflicted, lack oversight over the CEO who appointed them, and provide less monitoring over the firms' activities. These findings suggest that CEOs of co-opted boards possess significant power regarding the implementation of CSR activities. Therefore, this chapter aims to explore the relationship between co-opted directors and the CSR score of SCFs given that directors in SCFs are required to deal justly with their stakeholders, including employees, clients, and all groups of stakeholders within the community in which they operate as outlined in the Shariah principles. The implication of this position for SCFs should be opposite to non-SCFs, proposing that co-opted directors are required to provide more monitoring over the firms' activities and be more accountable for their actions (or inactions) in

[38] Sources include: the holy Qur'an, Hadith (sayings and deeds of the holy Prophet Mohammed [PBUH]), Ijma (consensus), and Qiyas reasoning by analogy.
[39] Components of CSR score are community, diversity, human rights, employee, product, and environment scores.

their decisions. Hence, co-option may be favourable for boards in SC firms and as consequence may yield positive impact on the CSR score of SCFs.

Our chapter contributes to a growing body of research on Islamic finance in two ways. First, we make the first attempt to analyse firm-level CSR in the context of SCFs. This allows us to provide some insight into how board characteristics of SCFs impact their CSR score. Second, we examine whether among SCFs, those with co-opted directors are in favour of CSR. Using a firm-level analysis, this will provide evidence on how co-opted boards of directors might deliver a distinctive CSR score in SCFs.

In this chapter, we find strong evidence that board independence, women on the board, and CEO duality that is, where the CEO is also the Chair of the board have a significant and positive impact on CSR of SCFs. The size of the board and the age of directors have significantly positive impacts on CSR. In addition, we find that the effect of board characteristics on CSR of SCFs varies according to CSR type. Directors' independence, women on the board, CEO duality, and board size are positively associated with the environment, community, and diversity components of SC firms' CSR. Tenure and board size are negatively associated with the environment and product components, respectively. Moreover, we document a significant negative relationship between co-opted directors that is, the percentage of directors elected after the CEO assumes office and CSR score of these firms. Specifically, the more the board is co-opted, the lower the CSR score of the firm. This chapter contributes to the literature by providing a better understanding of the factors that drive the CSR score of SCFs.

This chapter is organized as follows. Section 4.2 discusses the related literature, and Section 4.3 presents hypotheses development. Section 4.4 discusses the data and methodology, Section 4.5 presents descriptive statistics and correlation matrix, and Section 4.6 reports the results. Section 4.7 discusses the key findings and Section 4.8 concludes the chapter.

4.2 LITERATURE REVIEW

Despite the increasing popularity of Islamic investments in terms of size and complexity, researchers have not yet addressed the issue of social responsibility in the context of SCFs. To develop our arguments and because there are no prior studies investigating the association between CSR of SCFs and board characteristics such as independence, tenure (experience), multiple directorships (busyness), gender (women directors), CEO duality, and co-opted

measures, we rely on studies that in general examine this association in the conventional literature.

4.2.1 Review of literature on CSR and Board characteristics

4.2.1.1 Independence

A number of studies have examined the association between board independence and CSR. Ibrahim and Angelidis (1995) use a survey questionnaire to examine the differences and similarities between inside and outside board members with regard to their attitudes toward CSR. They conclude that outside directors exhibit greater concern about the discretionary component of corporate responsibility, namely the voluntary obligations a firm assumes to make some desirable contribution to maintaining or improving the welfare of society. On the other hand, they found no significant differences between the two groups with respect to the legal and ethical dimensions of corporate social responsibility. Dunn and Sainty (2009) also find a positive relationship between board independence and corporate social performance. They suggest that independent directors provide greater monitoring on management and provide diverse inputs into strategic decision-making to promote a broader stakeholder orientation. Jo and Harjoto (2012) perform quantitative analysis on a large and extensive US sample (2,952 firms) from 1993 to 2004 in search of a link between corporate governance and CSR. To measure CSR, they follow Hillman and Keim (2001) and Baron et al. (2011) to calculate an index to aggregate the CSR strength of each firm. Among other variables, the results show that an independent board is positively related to CSR activities. They argue that the monitoring performed by independent directors can enhance the CSR activities of the firm. Khan et al. (2013) investigate the relationship between corporate governance and the extent of corporate social responsibility (CSR) disclosure in the annual reports of Bangladeshi companies listed with the Dhaka Stock Exchange (DSE) in Bangladesh from 2005 to 2009. They find that board independence has positive significant impacts on CSR disclosure. In explaining this connection, they argue that in the presence of greater board independence, companies tend to focus more on societal interests and organisational legitimacy and therefore disclose more CSR activities. Further, independent directors tend to exert pressure on companies to engage in CSR to ensure harmony between organisational actions and societal values. Post et al. (2011) evaluate the relationship between board of directors' composition and CSR focusing on the environmental aspects for 78 Fortune 1000 companies. They use two different measures of ECSR. One is based on ECSR disclosure as reported in firms' annual

reports, corporate environmental reports, corporate websites, and government websites. The second measure is collected from the KLD STATS database that provides annual ratings of the environmental, social, and governance actions of more than 3,000 publicly traded companies. The study finds that a greater percentage of outside board directors is associated with higher ECSR and more favourable KLD strengths scores. They argue that independent outside directors are more concerned with firm reputation and sustainability and may help the firm build environmental credibility by demanding environmental reports and by encouraging firm participation in government initiatives to improve environmental practices. Yet, there are contrasting views about the benefits of independent directors on boards with some studies finding that the proportion of independent directors on the board have negative or no impact on CSR and CSR reporting. Haniffa and Cooke (2005) find a negative relationship between the composition of non-executive directors and corporate social disclosure of Malaysian firms. They suggest that this is due to the lack of experience and knowledge of non-executive directors and their indifference towards societal concerns. Hafsi and Turgut (2013) randomly select a sample of 100 companies listed in the S&P500 Index to examine the relationship between board attributes and CSR obtained from the KLD database. They find an insignificant relationship between outside directors and CSR. They align this finding with agency theory injunctions and its purpose of controlling managers' discretion to minimize agency costs, which therefore leaves little space for social performance. Coffey and Wang (1998) examine the association between board diversity and managerial control as predictors of corporate social performance using a sample comprised of 98 Fortune 500 companies. Data regarding corporate philanthropic behaviour was taken from the report compiled by the Council on Economic Priorities (CEP). Their results show that outsiders are not strongly associated with philanthropic behaviour compared to insiders. In providing an interpretation, they assert that moral obligations could be the reason behind a social contribution and not the presence of independent or outside directors.

4.2.1.2 Tenure

Only several studies have investigated the association between directors' experience and CSR issues. The empirical evidence is also mixed and inconclusive. Melo (2012) uses panel data comprising a sample of 320 American listed companies from 2003 to 2007 to estimate a model of corporate reputation, measured by the Fortune index to examine the influence of board tenure on CSP provided by the KLD. They find a positive relationship between directors' tenure (proxied by the average length of time members of the board have been employed) and

CSR. They suggest that the longer managers work for the company, the more rooted the cultural values of the firm would be. Hafsi and Turgut (2013) argue that although long-tenured directors become familiar with company strategy and management practice, they also become bound and tied by the management. In presenting an explanation, the authors assert that longer tenured directors may become too close to managers and therefore seek to avoid any disputes in decision-making. Consequently, when dealing with social responsiveness and responsibility issues, long tenured directors will follow rather than lead. Rao and Tilt (2016) examine the relationship between corporate governance, in particular board diversity and corporate social responsibility (CSR) reporting, among the top 150 listed companies in Australia during the 2009-2011 period. CSR disclosure is measured by the number of words dedicated to CSR issues in each firm's annual report. Concerning directors' tenure, the results indicate that firms with boards that have a majority of long-tenured directors (over 10 years of tenure) tend to produce a lower level of CSR disclosure. They note that boards in Australia are getting older and as a consequence CSR is not given any importance. Krüger (2009) tests two hypotheses in this context. One is from a management friendliness perspective (providing support to management which may negatively influence long-term CSR decisions) and the other from an experience perspective (confronting the management/CEO which may lead to positive CSR outcomes). His findings support the second hypothesis. He argues that experienced directors believe that it is risky to neglect CSR issues. Consequently, they are more likely to support decisions that are consistent with long-term outcomes.

4.2.1.3 Gender

The number of female directors is another emerging board characteristic that is gaining attention in the CSR literature. Although limited, research suggests that female directors can play an important role in influencing the CSR of a firm. Recently, Rao and Tilt (2016) have found that the presence of female directors is associated with higher levels of CSR reporting. They argue that women and men differ in values when it comes to social responsibility and therefore having more female directors on Australian boards appears to have a positive effect on CSR disclosures. Similarly, Post et al. (2011) argue that having women on the board can add value in relation to CSR given they differ in their access to information about, and values regarding, environmental issues. Webb (2004) investigates the structure of the board of directors at socially responsible (SR) firms using a sample of 394 SR firms and comparing these to a matched sample of firms. He finds that SR firms have more outsiders and women directors, and less instances of CEO/Chairman duality than non-SR firms. He argues in line

with Carter et al. (2003) that diversity increases board effectiveness, and subsequently increases shareholder value. Krüger (2009) also finds a positive relationship between female directors and CSR of US firms.

4.2.1.4 Multiple directorships

This is another board characteristic that has recently attracted a reasonable level of scholarly interest. Mallin and Michelon (2011) investigate the association between board reputation (in terms of board composition, competence, diversity, leadership, structure, and links with the external environment) and the social performance of firms and corporate social performance using the Business Ethics 100 Best Corporate Citizens over the period 2005-2007. Their empirical evidence shows that multiple directorships have a negative effect on corporate social performance. In contrast, the proportion of independent and female directors is positively associated with corporate social performance. They argue that when non-executive directors are influential regarding the community aspect of CSR, the fact that they serve on many boards is detrimental to the legitimacy of the company, as they cannot adequately perform their service function. On the other hand, using a sample of 127 firms over a six-year period (2000 to 2005), Rupley et al. (2012) empirically test characteristics of governance and media in relation to voluntary environmental disclosure. They find that multiple directorships are positively associated with the quality of voluntary environmental disclosures. They argue that directors on multiple boards are exposed to different environmental reporting issues and recurrent discussions on social and environmental disclosure. Hence, this leads to higher quality of corporate social disclosure at other firms. Similarly, Haniffa and Cooke (2005) find a positive relationship between the level of CSR reporting and the number of directorships. They argue that this is due to the developed knowledge of handling situations to ensure harmony between firms' operations and societal concerns.

4.2.1.5 *CEO duality*

CEO duality has also been studied recently in the context of CSR. Jizi et al. (2014) examine the role of the board on the quality of CSR disclosure using a sample of large US commercial banks for the period 2009-2011. They find that CEO duality has a positive impact on CSR disclosure. They argue from an agency-theoretical viewpoint that this suggests that powerful CEOs may promote transparency about banks' CSR activities in order to become more successful and to increase their pay or tenure prospects, to appease personal moral concerns, or to reduce the supervision and control exerted by financial or goods markets, the board of

directors, or regulator. Another explanation why powerful CEOs might pursue a high degree of engagement with, and disclosure of, CSR might be related to the increased scrutiny they are exposed to. In contrast, Mallin and Michelon (2011) document a negative relationship between CEO duality and overall social performance. In explanation of their support regarding the separation of the roles of CEO and chairman, they rely on the agency theory hypothesis that CEO duality reduces the overall legitimacy of the company for its stakeholders.

4.2.1.6 *Co-opted directors*

Recently, the concept of a co-opted board has received momentum after the pioneer paper of Coles et al. (2014) that examines the effect of co-option on variables such as CEO turnover, executive pay, and pay-performance sensitivities. Additional studies investigate its impact on R&D investments (Chintrakarn et al., 2016) and dividends policy (Jiraporn & Lee, 2018a). Coles et al. (2014) use data on directors of S&P 500, S&P Midcap, and S&P Small Cap firms over the period 1996–2010. In proposing new measures of board composition that reflect the extent of the CEO's influence on directors, they find that when co-option increases, the sensitivity of CEO turnover to performance decreases, CEO pay increases, and investment increases. They argue that monitoring effectiveness of the board of directors decreases with co-option as contrary to non-co-opted independent directors who are found to provide more effective monitoring. The authors also argue that co-opted independent directors behave as they are not independent, and the CEO of a captured board tends to invest more in firm-specific human capital or in risky projects with long-term payoffs. Chintrakarn et al. (2016) explore the effect of co-opted directors on R&D investment using a sample of 13,039 firm-year observations from 1996 to 2010, encompassing 1553 unique firms. They find that board co-option leads to higher investments in R&D. They argue that board co-option represents a weakened governance mechanism that minimizes the probability of executive removal. As a result, managers are more confident that they will stay long enough to reap the benefits of long-term investments such as R&D. Jiraporn and Lee (2018a) investigate how co-opted directors affect dividend policy using a sample period from 1996 to 2014 that encompasses a total of 19,584 firm-year observations, representing 2,572 unique firms. They find a negative and significant relationship between co-opted boards and dividends, indicating that firms in which more directors are co-opted are significantly less likely to pay dividends. They argue that co-opted boards represent a weakened governance mechanism that allows managers to retain more free cash flow within the firm and therefore refrain from paying dividends.

4.3 HYPOTHESES DEVELOPMENT

Firms in our sample are not set to be compliant by nature. We perform a screening to identify if a firm is compliant with the Shariah screening employed. Normally, a Shariah compliant firm by nature has a so called Shariah Supervisory board (SSB) which consulate with board of directors on collective decision-making practices (Alnasser and Muhammed, 2012). For instance, The SSB is composed of Shariah scholars who have a wide knowledge of Islamic commercial law (Raman and Bukair, 2013). Theoretically, the role of board members in SCFs is outlined by the principles of Shariah in general. For example, independent directors of SCFs might be expected to monitor and ascertain that these companies are operating within the bounds of Shariah principles. Indeed, it could also be anticipated that independent directors must have an under-standing of the Islamic values such as helping the needy, accountability and transparency issues, thus, offering their independent opinion to key social decisions (Haj, 2012). Bhatti and Bhatti (2009) argued that in Shariah-compliant firms, managers also carry out their responsibilities according to Islamic values and principles.

In addition, our study is the first of its kind. Our aim is to identify board characteristics that might have an impact on CSR of firms that comply with Shariah principles. Therefore, the lack of prior empirical evidence on what board characteristics Shariah compliant firms have, limits our ability to formulate hypotheses in terms of Shariah compliant firms.
Thus, we formulated all hypotheses based on existing studies using conventional or socially responsible firms.

4.3.1 Board independence and CSR score of SCFs

The literature uses three terms to define board independence, namely independent director, outside director, and non-executive director; this chapter considers these terms to have the same meaning as board independence. A number of studies find a positive association between the presence of outside directors and CSR score or CSR reporting. Ibrahim and Angelidis (1995) argue that outside directors exhibit greater responsiveness towards society's needs and are more concerned about the discretionary aspects of CSR in the firm. Jo and Harjoto (2012) argue that independent directors possess internal and external monitoring abilities that enhance the firm's CSR engagement. Barako and Brown (2008) find a positive relationship between non-executive directors and CSR reporting. Dunn and Sainty (2009) find a positive relationship between independent directors and corporate social performance. In the same context, both studies argue that independent directors provide greater oversight on management. Therefore,

improvements in the quality of the board, in terms of its independence, tend to have a positive impact on the firm's CSR. Contrarily, Haniffa and Cooke (2005) find a negative relationship between independent directors and corporate social disclosures. The authors relate their finding to the lack of experience and knowledge of independent directors and also, in some situations, to indifference towards societal concerns. Furthermore, several studies have recently provided evidence that board independence does not have any effect on CSR reporting. For instance, Rao and Tilt (2016) find that the percentage of non-executive/independent directors on the board is not significantly associated with CSR reporting. They argue that the presence of independent directors may not matter in making decisions with regard to stakeholders or CSR and hence is unlikely to influence CSR disclosure. We explore the association between the percentage of independent directors on the board of SCFs and CSR score. Therefore, it is expected that:

H1a: There is a positive relationship between the percentage of independent directors on the board and the CSR score of SCFs.

H1b: There is a negative relationship between the percentage of independent directors on the board and the CSR score of SCFs.

4.3.2 Board tenure and CSR score of SCFs

Board tenure is defined as the length of experience that a director has on firms' boards in total. Results on the association between directors' tenure and CSR of conventional firms are mixed. Rao and Tilt (2016) and Handajani et al. (2014) find a negative association between board tenure and CSR reporting. They argue that when board members spend a long time with the management, it is possible that this might affect their monitoring and control over executives. Thus, they tend to produce lower amounts of CSR disclosure. Moreover, Hafsi and Turgut (2013) find no effect of tenure on CSR performance, arguing that a longer relationship between board members and management may lead to the development of a friendly environment in which directors avoid controversial discussions when dealing with social responsiveness and responsibility issues. Krüger (2009), however, documents a positive effect of tenure on CSR ratings, arguing that longer tenured directors are likely to possess more knowledge and experience about the company and are more likely to have high commitment towards the company; hence, they are more likely to support CSR decisions. Based on the above findings

and to explore the relationship between tenure and CSR score of SCFs, our second hypothesis is as follows:

H2a: There is a positive association between the length of directors' experience in total and the CSR score of SCFs.

H2b: There is a negative association between the length of directors' experience in total and the CSR score of SCFs

4.3.3 Multiple directorships and CSR score of SCFs

In relation to the impact of multiple directorships on CSR, limited studies have been performed. Haniffa and Cooke (2005) find a positive relationship between the level of CSR reporting and the number of directorships. They argue that this is due to the developed knowledge of handling situations to ensure harmony between firms' operations and societal concerns. Supporting the positive impact of multiple directorships on CSR, both Rupley et al. (2012) and Elsakit and Worthington (2014) argue that directors on multiple boards are exposed to different environmental reporting issues and recurrent discussions on social and environmental disclosure. Hence, this leads to higher quality of corporate social disclosure at other firms. Similar results are found in Rao and Tilt (2016), arguing that directors with experience, knowledge, and information gained by sitting on multiple boards may be better able to make decisions which benefit stakeholders and can potentially influence CSR disclosure. In line with the above reasoning and in order to examine the association between the number of multiple directorships on a SCF's board and the CSR score, we propose the following third hypothesis:

H3: There is a positive association between the number of multiple directorships on a board and the CSR score of SCFs.

4.3.4 Gender and CSR score of SCFs

Hillman et al. (2002) argue that female directors support community activism more than male directors. Indeed, the presence of female directors on boards may promote and address CSR issues and thus increase strength ratings for CSR (Bear et al., 2010), provide higher levels of charitable giving (Wang & Coffey, 1992) and higher levels of environmental CSR (Post et al., 2011). The presence of female directors on the board also enhances decision-making (Daily & Dalton, 2003), enabling more effective monitoring of management (Hillman & Dalziel, 2003),

providing effective communication among board members through participation (Eagly & Carli, 2003), and encouraging more open discussions (Bear et al., 2010). In line with the above studies, Rao and Tilt (2016) document evidence that the presence of women directors is associated with higher levels of CSR reporting, suggesting that women and men differ in values when it comes to social responsibility. We explore the relationship between women on the boards of SCFs and CSR score. Thus, we propose the following fourth hypothesis:

H4: There is a positive relationship between the number of female directors on a board and the CSR score of SCFs.

4.3.5 CEO duality and CSR score of SCFs

Some of the literature clearly tends to adopt the view that the position of chair and CEO should be separated. Gul and Leung (2004) argue that combining the CEO position and a chairman position will reduce the board's independence, which tends to adversely affect directors' monitoring management and lead to lower corporate disclosure (including CSR). Managers and directors tend not to oppose the decisions of powerful CEOs in order to retain their positions (Dey, 2008). It is also argued that CEOs who also act as chairs tend to hide important information from directors and non-executives (Haniffa & Cooke, 2005), and are less likely to care about public accountability and legitimacy (Muttakin et al., 2018). On the other hand, Jizi et al. (2014) find that CEO duality has a positive impact on CSR disclosure. They argue from an agency-theoretical viewpoint that this suggests that powerful CEOs may promote transparency about CSR activities in order to become more successful and to increase their pay or tenure prospects, to appease personal moral concerns, or to reduce the supervision and control exerted by financial or goods markets, the board of directors, or regulator. Therefore, it is assumed that when the same person undertakes both the roles of a CEO and a chairman, it will have an impact on CSR. Accordingly, our fifth hypothesis is as follows:

H5a: There is a negative relationship between CEO duality and the CSR score of SCFs.

H5b: There is a positive relationship between CEO duality and the CSR score of SCFs.

4.3.6 Co-option and CSR score of SCFs

In a recent pioneer study, Coles et al. (2014) show that co-opted directors (directors appointed after the CEO assumes office) impose less board monitoring. Chang et al. (2017) assert that an

excessive level of closeness between the CEO and directors may impair a board's ability to oversee an executive's self-serving decisions. Moreover, because CEOs tend to appoint directors who share similar views (Hwang & Kim, 2009) and co-opted directors tend to be loyal to the CEO who appoints them (Coles et al., 2014), the probability that the CEO will remain in the position for an extended period of time on a co-opted board will increase (Jiraporn & Lee, 2018a). In light of the above, co-opted directors' decision-making and control on management are more likely to be influenced by their CEO's directions and opinions. We hypothesize that this effect will reduce the CSR score of a firm. We argue that co-opted directors are less willing to exert any opinion or to push towards more CSR engagement of the firm. The evidence on the positive relationship between co-option and CEO pay and investment in tangible assets (Coles et al., 2014) and R&D investments (Chintrakarn et al., 2016) also tends to support our hypothesis. In a context where CEOs who have co-opted the board possess high remuneration, have control over resources, and invest in ways they otherwise would not (in the absence of effective board monitoring), their interest in investing in CSR activities is likely to be minimal. Based on the above arguments, it is expected that when the percentage of directors appointed after the CEO assumes office compared to the total number of directors on the board increases, the CSR score of a firm will decrease. Accordingly, our sixth hypothesis is as follows:

H6: There is a negative relationship between the percentage of co-opted directors and CSR score of SCFs.

We also used multiple co-option measures and test the following sub-hypotheses:

H6.1: There is a negative relationship between the percentage of independent co-opted directors and the CSR score of SCFs.

H6.2: There is a negative relationship between the percentage of tenure weighted dependent co-opted directors and the CSR score of SCFs.

H6.3: There is a negative relationship between the percentage of tenure weighted independent co-opted directors and the CSR score of SCFs.

H6.4: There is a positive relationship between the percentage of co-opted directors who are appointed before the CEO assumes office and the CSR score of SCFs.

4.4 DATA AND METHODOLOGY

4.4.1 Data

Our sample is an unbalanced panel of 1620 US firms during the period 2001–2016. We apply the screening criteria employed by the Dow Jones Market index (DJMI) screening method (refer to Figure 4.1 in the appendix). The resultant universe therefore acquires 1480 SCFs in the qualitative stage. Finally, 1379 fully SC firms comprise the final sample after employing stage 2 of the screening. The availability of data on corporate social responsibility score of firms in the US makes it relevant to conduct the analysis. DJMI screening is commonly used Shariah screening method in many studies see (Akhtar and Jahromi, 2017); (Girard and Hassan, 2005);(Bousalam and Hamzaoui, 2016), amongst others.

Data for the CSR score in this chapter is obtained from MSCI ESG KLD Stats. As an independent firm that provides research and consulting services to firms that are interested in corporate social responsibility, MSCI ESG KLD Stats are designed to provide in-depth research, ratings, and analysis of environmental, social, and governance-related business practices to companies worldwide. MSCI ESG KLD Stats provides numerical values for the number of strengths and concerns of the firm for the following categories: community, diversity, human rights, employees, product, and environment.

Data for board characteristic variables and some other board characteristics used as controls in this chapter is obtained from MSCI GMI Rating which offers access to annual corporate governance datasets starting from 2001. This chapter examines five important characteristics of the board of directors: board independence, tenure, multiple directorships, gender, and CEO duality.

The data on board co-option are from Risk Metrics.[40] We define and calculate the percentage of co-opted directors in the same way as provided by Coles et al. (2014). Company financials are obtained from Thomson Reuters Worldscope accessible through the WRDS Platform.

[40] We thank Lalitha Naveen for sharing the data on co-opted directors.

4.4.2 Empirical methodology

In order to investigate the association between board characteristics and SCFs' CSR score, we conduct a regression analysis summarised by the equation below:

$$\text{CSR Score}_{i,t} = \alpha + \sum_{k} \gamma_k \text{Board characteristics}_{i,t} + \sum_{l} \delta_l \text{Control variables}_{i,t} + \varepsilon_{i,t} \quad (4.1)$$

where i extends from firm 1 to firm 1379 and t takes the value of the relevant sample year from 2001 to 2016. The γ_k parameters capture the potential impacts of various board characteristics on SCFs' CSR. The δ_l parameters capture the potential impacts of various control variables on SCFs' CSR. In a sub-analysis, we also examine the association between each component of CSR and board characteristics. Thus, we replace the overall score of CSR in equation 1 with separate CSR components in separate specifications. Components of CSR are environment, community, diversity, employees, product, and human rights. In a subsequent analysis, we examine the association between board co-option and CSR score of SCFs as per our hypothesis H6 and its related sub-hypotheses. In doing so, we use five various measures of co-option[41] in separate specifications by performing a regression analysis using the following equation:

$$\text{CSR Score}_{i,t} = \alpha + \beta\ \text{Co-option}_{i,t} + \sum_{k} \gamma_k \text{Board characteristics}_{i,t} + \sum_{l} \delta_l \text{Control variables}_{i,t} + \varepsilon_{i,t} \quad (4.2)$$

The β parameter captures the potential impact of each of the co-option measures on SCFs' CSR. Details regarding the dependent, independent, and control variables are presented in the following sub-sections and in Table 4.1.

[Insert Table 4.1 here]

4.4.3 Measuring CSR score

To construct this score, we follow the approach in the recent literature (see e.g., El Ghoul et al., 2011; Kim et al., 2012; McGuire et al., 2012; Jha and Cox, 2015).We first subtract the

[41] Refer to Table 4.1.

number of strengths from the number of concerns in each category. We then add up the score in each of these categories to construct a composite index. The highest CSR score is 18 and the lowest is -9.

4.4.4 Board characteristic measures

Following the previous literature (see Section 4.2), we measure the following board characteristics: board independence, tenure, multiple directorships, gender, and CEO duality.

Percentage of independent directors: The percentage of independent directors is measured as the proportion of independent/non-executive/outside directors on the board to the total number of directors on the board.

Tenure: Tenure is defined as the number of years each board member has served as a director for their current firm.

Multiple directorships: Multiple directorships are measured as the percentage of directors serving on more than one board to the total number of directors on the board.

Percentage of female directors: The percentage of female directors is measured as the percentage of female directors on the board to the total number of directors on the board.

*CEO duality***:** CEO duality in this chapter refers to the situation where the CEO is also the chair of the board.

4.4.5 Co-option measures

We follow Coles et al. (2014) in defining board co-option. The degree of board co-option is the proportion of directors elected after the CEO assumes office:

Co-option = No. of Co-opted Directors/Board Size. (1)

This variable therefore ranges from 0 to 1, with a higher value indicating more co-option. Like Coles et al. (2014), we employ some alternate measures of co-option:

TW Co-option, which is the sum of the tenure of co-opted directors divided by the total tenure of all directors. (2)

Co-opted Independence, which is the number of co-opted independent directors/Board Size (3)

Non-Co-Opted Independence, which is number of independent directors who were already on the board before the CEO assumed office/Board Size (4)

The assumption behind these alternate measures is that co-opted directors who are independent, have longer tenure, and are appointed before the CEO assumed office have more influence on board decisions and are more concerned about corporate social responsibility. These measures can also vary from 0 to 1, with a higher value representing more co-option.

4.4.6 Control variables

Control variables were selected based on prior work (see e.g., Haniffa & Cooke, 2005; Cheng et al., 2008; Bear et al., 2010; Muttakin et al., 2018). We control for board size, director outside related, director problem, director failed, board meetings, director age, firm size, firm age, firm leverage, and firm profitability.

4.5 DESCRIPTIVE STATITISCS AND CORRELATION MATRIX

4.5.1 Descriptive Statistics

Table 4.2 presents the summary statistics for the SCFs in our sample regarding corporate social responsibility overall score, individual CSR component scores, board characteristics, and firm characteristic measures.

[insert Table 4.2 here]

Panel A of Table 4.2 provides descriptive statistics for the CSR score and its individual components. The average CSR score of our sample SCFs is 0.038 with a standard deviation of 2.428 and a min and a max of -9 and 18, respectively. Panel A also show that SCFs have, on average, a positive high score for CSR environment (0.139) followed by community (0.084), diversity (0.059), and employees (0.021). However, the average of SCFs' CSR score for humans rights and product is negative, at -0.038 and -0.145, respectively. The CSR components for SCFs also differ in their standard deviation, min, and max values. All the components of CSR score have 12884 observations except for the environment CSR score, which has only 7458 observatiosns. Panel B of Table 4.2 provides descriptive statistics of the board characteristic variables. Board independence has an average of 0.841, indicating that 84 percent of directors on the boards of SCFs are independent. Panel B also shows that, on average, 14

percent of directors on the boards of SCFs have a tenure of more than 15 years. 11.5 percent of directors are female, which indicates that the majority of directors in the sample are male. Moreover, CEO-chair duality is observed in almost 60 percent of firms, and only 1.7 percent of directors serve on 4 or more boards. The co-option variable in the sample has an average of 0.40. This indicates that, on average, SCFs have 40 percent of their directors appointed after the CEO assumes office. Only 24 percent of these co-opted directors are independent and 27 percent of them have over 15 years of experience. The average of non-co-opted independent directors is 0.59, indicating that 59 per cent of directors on SCFs were appointed before the CEO assumes office. The board of directors of SCFs in our sample has, on average, 9 directors, a small percentage of outside directors with a significant relationship with the firm, and 3 percent of directors that have been involved in problems such as bankrupty. Furthermore, SCFs' board of directors maintain regular meetings, with an average of almost 8 meetings per year, and almost none of the directors failed to attend these meetings. Panel C presents summary statistics for SCFs' characteristics in the sample. The average total assets are approximately US$20b. The mean value of SCFs' age, ROA, and leverage is 3.5 years, 0.02, and 0.20, respectively.

4.5.2 Correlation matrix

[insert Table 4.3 here]

The majority of correlations are below 0.4. The cut-off point regarding the multicollinearity problem is a debatable issue among authors; for instance, some note that multicollinearity becomes a concern if the correlation between independent variables exceeds 0.8 (see e.g., Farrar and Glauber, 1967; Gujarati, 2003; Studenmund, 2006). However, multicollinearity could be a concern with co-option variables. For instance, the correlation between these variables lies between 0.77 to 0.93. Table 4.3 also shows the variance inflation factors (VIF) for the variables used in the main model. VIF measures the degree of multi-collinearity of the independent variable with the other independent variables. Most commonly the rule of 10 associated with VIF is regarded by many practitioners as a sign of severe or serious multi-collinearity. If the VIF value is higher than 10, then multicollinearity is thought to be problematic (see e.g., Neter et al., 1996; Gujarati & Porter, 2003; Ho, 2006; Hair et al., 2006). Indeed, except for co-option variables, all values are well below 10, which indicates that multicollinearity is only a concern with co-option variables. We address this issue by using each of the co-option variables in a separate specification when running equation 2.

It is worth noting that we find a negative correlation between CSR score and all co-option variables, which indicates that firms with more co-opted directors tend to undertake less CSR. In contrast, the correlation between directors appointed before the CEO assumes office and CSR is positive, suggesting that firms with more non-co-opted independent directors tend to pay more attention to CSR. Thus, co-option seems to have a negative impact on the CSR score of SCFs.

4.6 EMPIRICAL RESULTS

In this chapter, we aim to examine empirically the impact of various board characteristics on CSR of SCFs. In our analysis, it is possible that both board characteristics and CSR are influenced by unobservable firm characteristics, thus creating a spurious relationship. Therefore, we employ a fixed effects estimation model that controls for time-invariant unobservable firm characteristics. In other words, the fixed effects model controls for unobserved heterogeneity that could be correlated with CSR. Hausman and Taylor (1981) state that the fixed effects model represents a common, unbiased method for controlling for omitted variables in a panel data set. We use robust standard errors clustered by firm for all our firm-level analyses. The residuals of a given year may be correlated across different firms (cross-sectional dependence). Using robust standard errors clustered by firm alleviates the potential cross-sectional dependence issues (Petersen, 2009). Clustered standard errors correct for heteroscedasticity and serial correlation. To control for possible variable across industries and time, we also include industry (defined by two-digit SIC codes) and year dummies.

4.6.1 Board characteristics regression results

In this section, we regress CSR score on the five widely used board characteristic variables in the literature (namely board independence, director tenure, female directors, CEO duality, and multiple directorships). The results are reported in columns (1) and (2) in Table 4.4.

[Insert Table 4.4 here]

4.6.1.1 *Board independence*

The results from Table 4.4 show that board independence in models 1 and 2 has a positive and statistically significant relationship with the CSR score of SCFs at the 1% level. This finding cannot reject the positive association predicted in H1a. The results indicate that the higher the number of independent directors on the board of SCFs, the higher the CSR score of these firms.

A number of studies that examine the relationship between board independence and the CSR of conventional firms have documented similar positive relationship. Possibly, these studies have samples that include both non-SCFs and SCFs. Thus, the explanation provided in these studies may be applied in our context. The results therefore support the conclusion of Ibrahim and Angelidis (1995) that outside directors exhibit greater responsiveness towards society's needs and are more concerned about the discretionary aspects of a firm's CSR activities. Independent directors possess internal and external monitoring abilities which enhance the firm's CSR engagement (Jo & Harjoto, 2012) and play a proactive role in improving the quality of the board, which tends to enhance the corporate social performance of the firm (Dunn & Sainty, 2009). Overall, the positive effect suggests that the presence of independent directors on SCFs might facilitate a greater level of firm engagement in CSR activities, which may subsequently improve overall SCF CSR score.

4.6.1.2 *Board tenure*

With regard to board tenure and CSR score, results in models 1 and 2 show statistically insignificant relationship between directors' tenure and SCFs' CSR score, thereby providing evidence in favour of the null of hypotheses 2a and 2b. This indicates that longer tenured directors on the boards of SCFs tend to have no impact on the CSR score of SCFs. In a conventional context, Hafsi and Turgut (2013) find an insignificant relationship between tenure and CSR performance. They conclude that more experienced or tenured board members may be too close to managers and tend to shy away from introducing controversy in the decision-making process. Such a situation may lead board members to follow rather than lead when it comes to dealing with social responsiveness and responsibility issues. Overall, our results imply that directors' longer experience has a limited impact on the CSR score of SCFs. A possible explanation is that over time long tenured directors may tend to be more concerned about managing the SCF in terms of achieving strategic objectives other than those related to CSR activities.

4.6.1.3 *Board multiple directorships*

The coefficient estimates in models 1 and 2 on directors with multiple directorships (Director Busyness) on the board of SCFs are statistically insignificant, indicating no association with CSR score of these firms**.** The results provide evidence in favour of the null of hypothesis 3. Our results do not coincide with results obtained in the conventional literature concluding that board multiple directorships are positively associated with CSR reporting (see e.g., Haniffa &

Cooke, 2005; Rupley et al., 2012; Elsakit & Worthington 2014; Rao & Tilt, 2016). Our results imply that directors who serve on multiple boards have limited impact on the CSR score of SCFs.

4.6.1.4 *Gender*

The results in models 1 and 2 in Table 4.4 show a positive and statistically significant association between female directors and the CSR score of SCFs at the 1% level of significance. This finding rejects the null of H4. Furthermore, the effect of female directors on SCFs' CSR score appears to be not only statistically significant, but also economically large. An increase in the proportion of female directors on the board of SCFs (by one female director) is associated with an increase in CSR score by 4.8. This association suggests that female directors pay more attention to CSR aspects in a SC firm. Studies on the impact of female directors on the CSR of conventional firms provide similar evidence that the presence of female directors is positively associated with CSR. Bear et al. (2010) conclude that the presence of female directors on boards may promote and address CSR issues and thus increase strength ratings for CSR. Wang and Coffey (1992) and Post et al. (2011) conclude that female directors provide higher levels of charitable giving and higher levels of environmental CSR, respectively. Female directors might play an important role in board meetings to discuss and exchange ideas on how to monitor and address CSR issues, which could subsequently enhance SCFs' CSR score.

4.6.1.5 *CEO duality*

Table 4.4 also shows a positive and statistically significant relationship between CEO duality and CSR of SCFs at the 1% level of significance, thereby rejecting our null H5b. This indicates that powerful CEOs who also hold the chair position on the board of SCFs are more concerned about addressing CSR issues, which subsequently tends to have a positive impact on the CSR score of these firms. A possible explanation is that the role duality allows the CEO to better manage the SC firm in achieving its objectives and importantly enhancing its social responsibility aspects. In a conventional context, Jizi et al. (2014) find a similar association between CEO duality and CSR disclosure. The authors conclude that powerful CEOs may promote transparency about CSR activities in order to become more successful, increase their pay or tenure prospects, appease personal moral concerns, and reduce the supervision and control exerted by the board of directors.

4.6.1.6 *Control variables*

In relation to control variables, the results show that six of the ten control variables are statistically significant. The result for board size is consistent with the notion that larger sized boards are likely to influence CSR score, with a positive and significant relationship between board size and CSR at the 1% level. Studies on the relationship between board size and the CSR of conventional firms document a statistically positive association between these two variables (Handajani et al., 2014; Jizi et al., 2014). They conclude that more board members can provide a greater amount of experience, knowledge, skills, and diverse values, which may be helpful in making complex decisions like those around CSR**.** Model 2 of Table 4.4 shows a significantly negative relationship between directors outside related and CSR of SC firms at the 1% level. This may suggest that over time, an increase in the percentage of independent directors on a given board who had or have had a significant relationship with the company will have a negative impact on the CSR of these firms. This indicates that over time directors outside related may develop a friendly relationship with the management and feel reluctant to question them about issues related to CSR. The coefficient estimates on director age are positive and significant. This finding may suggest that older directors are more concerned and have the incentive, energy, and necessary knowledge to actively monitor and advise top management on issues related to CSR of SCFs. Concerning firms' characteristics, results indicate a significant and positive (negative) relationship between firms' size and leverage (profitability) and CSR score of SCFs. These findings suggest that larger and highly leveraged SCFs are significantly related to a greater level of CSR score. On the other hand, the results indicate that SCFs with better financial performance seem to be less interested in investing in social activities. One explanation for these findings could be that highly leveraged firms may be investing in social activities to maintain a high reputational status. In contrast, highly profitable firms may choose to focus on other investments given that it is hard to recoup any benefits from investing in social activities in the short run.

Overall, the results in Table 4.4 provide strong support for our proposition that CSR score of SCFs is attributable to board characteristics and not only to the business scope outlined by the principles of Shariah. SCFs in our sample are compliant by screening and not by nature. Thus, our results suggest that board characteristics play an important role in affecting the CSR of SCFs.

4.6.2 CSR Components and Board Characteristics of SCFs

In order to get a better idea of the components of CSR that are mostly driven by board characteristics, we examine the relationship between board characteristics and each component of CSR of SCFs. The results are reported in columns 1–12 of Table 4.5.

[Insert Table 4.5 here]

These results show that the positive and significant effect of board independence and CEO duality on CSR of SCFs (as documented in Table 4.4 in Section 4.6.1) is more pronounced in the environment (model 2), community (models 3 and 4), and diversity (models 5 and 6) components of CSR score. However, this is not the case with employees (models 7 and 8), product (models 9 and 10), and human rights (models 11 and 12) components. This suggests that having more independent directors or CEO-chair duality can increase the environmental, societal, and diversity aspects of SCFs. In a conventional context, Ibrahim and Angelidis (1995) conclude that independent directors tend to be more sensitive to society's needs and Jizi et al. (2014) conclude that powerful CEOs who also hold a chairman position promote transparency about CSR activities. Columns 1 and 2 of Table 4.5 also show a negative and significant relationship between CSR (environment) and tenure, indicating that experienced directors who have more than 15 years of experience are less concerned about the environment aspects of SCFs. The results in specifications 1-8 of Table 4.5 also show that an increase in the percentage of female directors is positively associated with the environment, community, and diversity components of SCFs' CSR score. In a conventional context, Krüger (2009) indicates that companies with a higher fraction of female directors tend to be more generous towards communities and pay more attention to the welfare of a firm's natural stakeholders (e.g. communities, employees or the environment). With regards to control variables, Table 4.5 shows that board size has a positive impact on CSR components such as environment, community, diversity, and employees, and a negative impact on product CSR. In contrast, directors outside related is positively linked to CSR (product) but negatively linked to other CSR components. Overall, the environment, community, and diversity components of CSR are mostly addressed by SCFs' independent directors, female directors, and CEOs who also hold a chair position.

4.6.3 CSR and co-option

In this section, we extend our analysis to investigate the impact of co-option on CSR of SCFs. For this, we use five measures of co-option[42] in separate specifications. Table 4.6 presents the results of regressing the hypothesized variables on SCFs' CSR score.

[Insert Table 4.6 here]

In models 1 and 2, the coefficient estimates on the co-option measure are significantly negative at the 5% level. We observe similar relationships between the other three co-option measures in models 3 to 8, confirming the negative impact of co-option on CSR of SC firms. The economic impact varies from -0.3 to -0.6 depending on the co-option measure used. These strong negative relationships reject the null of hypothesis H6 (and sub-hypotheses H6.1, H6.2, and H6.3) that a large number of co-opted directors on the board, regardless of being independent or longer tenured, represent efficient governance and have no effects on CSR of SCFs. This finding suggests that having more co-opted directors on the board of SCFs tends to have an adverse effect on their CSR score. Contrarily, the coefficient on the non-co-option measure in models 9 and 10 is positive and significant at the 1% and 5% levels, respectively. We can reject the sub-hypothesis H6.4 that an increase in non-co-opted independent directors who are appointed before the CEO assumes office is able to increase the CSR score of SCFs. This may imply that non-co-opted independent directors in SCFs are more likely to increase the efficacy of supervision of top management resulting in a higher CSR score of these firms. The conventional literature also argues against co-option. For instance, Coles et al. (2014) conclude that co-option reduces the monitoring effectiveness of the board of directors. Chang et al. (2017) assert that an excessive closeness between the CEO and directors may impair a board's ability to oversee an executive's (potentially self-serving) decisions. Combining the empirical evidence from conventional studies and our results, the negative association between co-option and CSR of SCFs can be explained by the less stringent oversight that co-opted directors impose on close management in relation to control over resources and their investment policy, which subsequently have an adverse impact on the CSR score of SCFs.

Similar to our results in the previous section, the effect of some board characteristics on CSR of SCFs also appear to be statistically significant and economically large. Board independence, female directors, and CEO duality have the most positive economic significance. An increase

[42] Refer to Table 4.1.

in the proportion of independent directors, female directors, and CEO-chair duality by one percent is associated with an increase in CSR score of SCFs by almost 2.5, 8, and 0.3, respectively. The economic magnitude of the effect of tenure of directors is negative but insignificant. In addition, as the size of the board and directors' age rise by one unit, CSR increases by 0.3 and 0.008, respectively. Leverage and size have a positive impact on SCFs' CSR, whereas a firm's profitability is negatively associated with CSR. The adjusted R^2 reported in Table 4.6 shows that approximately 35% to 38% of the variations in the CSR of firms in our sample is explained when we include our co-opted board variables.

4.6.4 Addressing Endogeneity

The endogeneity problem is widely acknowledged in empirical finance and in corporate governance literature (see e.g., Roberts and Whited, 2012; Wintoki et al., 2012). Gippel et al. (2015) note that "endogeneity has always been present and recognized as a problem that undermines causal inference." Simultaneity and unobservable heterogeneity are two potential sources of endogeneity identified by most empirical corporate finance researchers.

In our context, simultaneity can arise in the board characteristics/CSR relation. As an example, firms choose their board characteristics in any period with a view towards achieving a particular level of CSR in that period. Then while CSR may be affected by board characteristics, the reverse will also be true. Firms with a particular level of CSR may invest more in personnel training and development to increase their awareness of CSR, which in turn may affect board characteristics. In this case, board characteristics and CSR are simultaneously determined and fixed-effects estimates of Eq. (2) will be biased. Another problem is unobservable heterogeneity across firms, which could be very large in our case given differences in firms' industries, business operations, and corporate governance. This leads to unobservable factors that affect both CSR and the explanatory variables.

Finally, one source of endogeneity that may also affect our fixed effect model may arise from the possibility that current values of governance variables are a function of past firm CSR score. For instance, Raheja (2005) shows that board structure depends on past firm performance through the effect of performance on firm characteristics. Building on this finding, we argue that if SCFs' board structure may be determined by firms' characteristics such as business scope and compliance with Shariah law, and these characteristics are related to past CSR score of these firms, then board structure is related to past CSR through the effect of CSR on firm

characteristics. Ignoring these sources of endogeneity can have serious consequences for inference if one is only relying on panel data and fixed-effects estimates for inference. Traditional fixed-effects estimation can potentially ameliorate the bias arising from simultaneity and unobservable heterogeneity and from assuming that current observations of the explanatory variables (e.g., board characteristics) are completely independent of past values of the dependent variable (CSR score), an assumption that may not be realistic. According to Wintoki et al. (2012), ignoring the dynamic relation between current board structure and past performance (as do traditional fixed-effects estimators) will yield inconsistent estimates. Thus, the dynamic nature of the relation between corporate governance and CSR score actually sets up a powerful methodology for identifying the causal effect of governance on CSR score.

We address these three problems by first performing Durbin and Wu-Hausman tests to test for the presence of endogeneity and then employing the system GMM method.

4.6.4.1 *Durbin and Wu- Hausman tests*

We use two-stage least squares regression and test for the presence of endogeneity using the Durbin (1954) and Wu-Hausman tests (Wu, 1974; Hausman, 1978). We apply these tests to equation (2) to test for endogeneity between CSR score and board characteristics. In the presence of co-option, the relationship between the CEO and directors employed (not employed) by the CEO affect board independence and will probably affect performance of duties related to CSR. The null hypothesis of the Durbin and Wu–Hausman tests is that the variables are exogenous. Table 4.7 presents the results. Both Durbin Chi2 (specification (1): 4.118, p =0.042) (specification (2): 4.223, p= 0.040) and Wu-Hausman F test (specification (1): 4.099, p=0.043) (specification (2): 4.204, p=0.040) are both statistically significant at the 5% level. Therefore, both tests reject the null hypothesis of no endogeneity.

[Insert Table 4.7 here]

4.6.4.2 *System GMM*

This method was developed by Arellano and Bover (1995) and Blundell and Bond (1998) to improve the efficiency of first difference GMM developed by Arellano and Bond (1991). System GMM consists of two equations of level and difference, and each equation adopts Instrumental Variables (IV) to remove the correlation between explanatory variables and residuals. The benefits of using the GMM approach are related to its prominent advantages in

dealing with heteroscedasticity, autocorrelation, heterogeneity, and endogenous and predetermined explanatory variables. Thus, it potentially improves on traditional fixed-effects estimates through two ways. First, it allows current governance to be influenced by previous realizations of, or shocks to, a firm's past CSR score. Second, the success of the GMM estimator in producing unbiased, consistent, and efficient results is highly dependent on the adoption of the appropriate instruments. A key insight of the system GMM method is that if the underlying economic process itself is dynamic - in our case, if current board characteristics are related to past CSR score - then it may be possible to use some combination of variables from the firm's history as valid instruments for current governance to account for simultaneity. Thus, an important aspect of the methodology is that it relies on a set of "internal" instruments contained within the panel itself: past values of governance and CSR can be used as instruments for current realizations of governance. This eliminates the need for external instruments.

The following GMM specification is used in the empirical analysis of this chapter. We empirically examine to what extent the CSR score of SCFs are influenced by board characteristics including co-option.

$$\mathrm{CSRSCORE_{it}} = \alpha\, \mathrm{CSRSCORE_{i,t-1}} + \gamma \sum_{j=1}^{j} X_{it}^{j} + \delta \sum_{m=1}^{m} X_{it}^{m} + \varepsilon_{it} \quad (3)$$

Where:

$CSRSCORE_{i,t-1}$ is the CSR score of the firm in year t-1

X_{it}^{j}: Board characteristics that include independence, tenure, female directors, CEO duality, director busyness, board size, director outside related, director failed, director problem, director age, and board meetings.

X_{it}^{m}: Control variables that include the firm's size, age, leverage, and ROA.

ε_{it} : is an error term.

We also account for both industry and time effects. We assume that all the regressors except dummy variables are endogenous.[43]

[Insert Table 4.8 here]

Table 4.8 reports the estimated results for eq. (3). In terms of standard econometric tests, the Hansen's over identifying Chi squared test of whether the instruments are uncorrelated with the error confirms that there is no over identification, so we cannot reject the hypothesis that our instruments are valid and the insignificant AR (2) underlines that the null of second-order serial correlation cannot be rejected.

Results in Table 4.8 show a positive and significant relationship between CSR score and its 1-year lag at the 1% level. This relationship is robust in all specifications, indicating persistence in the dependent variable. We also find no statistically significant relationship between CSR score and SCFs' main board characteristics (independence, tenure, female directors, and director busyness) including the co-option measure in specifications (1) and (2) and non-co-option measure in specifications (3) and (4). These results are different to fixed effects estimates in the previous section. This suggests that the causal relations uncovered by the fixed-effects panel models are the result of a bias in the parameter estimates produced by dynamic endogeneity, unobservable heterogeneity, and/or simultaneity. The system GMM results illustrate that several causal relationships between board characteristics and CSR score of SCFs reported in cross-sectional panel regression disappear when addressing endogeneity. Therefore, it is much better to model the CSR-board characteristics relationship at the firm level.

The coefficients of CEO duality in all specifications in Table 4.8 are positive and significant at the 5% level, indicating that combining the CEO and chairman positions can have a positive impact on the CSR score of SCFs. Furthermore, the coefficient estimates of other board characteristics such as director outside related in all specifications and director age in specifications (2) and (4) are positive and significant, suggesting that an increase in the number

[43] We use xtabond2 in Stata. The large number of endogenous variables means that we have many instruments and could inadvertently overfit our endogenous variables. To reduce this possibility, we use the "collapse" option in xtabond2, which is explained further in Roodman (2009).

of directors who have outside relationships and older directors would have a positive contribution to the CSR score of SCFs.

Considering the limitations of the system GMM method, Gippel et al. (2015) detail a state-of-the-art solution—utilising a natural experiment as a way of mitigating endogeneity and building stronger theory. They note that if the naturally occurring event is convincingly exogenous, and the study well implemented, then researchers have a way to isolate causal links, build new theory, and clarify (confirm/disconfirm) existing theory by mitigating the issue of endogeneity. Natural experiments remain the "gold standard" for consistently identifying the effect of an explanatory variable on a dependent variable. For instance, to get around the endogeneity issue, Heider and Ljungqvist (2015) conduct a natural experiment by using many exogenous shocks (changes in state taxes). Nguyen and Nielsen (2010) use the sudden death of independent directors as an exogenous event impacting firm value. We select the legislated corporate governance changes in the US, namely the NYSE listing requirements that was enacted in 2003, as a relevant natural experiment that can justifiably be seen as an exogenous source of variation in the explanatory variables of interest (detailed in the following subsection).

4.6.4.3 Natural Experiment: NYSE listing requirements

In 2003[44], the NYSE new listing rules came into effect, requiring all listed firms to adjust their board composition by having independent directors as a majority representation on their board in order to increase its oversight. According to these new rules, firms were required to adopt these changes during their first annual meeting after January 15, 2004, but no later than October 31, 2004. Firms with classified boards were given until the second annual meeting but not past December 31, 2005, to comply with the requirements.

Results in prior sections indicate that an increase in the percentage of independent directors is positively associated with CSR score. Thus, those firms that were compliant with the new rules prior to the introduction of NYSE were unaffected by the new listing requirements. However, those firms that were non-compliant prior to the introduction of NYSE were required to increase board independence after the implementation of the new listing requirements. As a

[44] Securities and Exchange Commission press release 34–48745, November 4, 2003.

consequence, noncompliant firms were required to add new independent directors to the board (Linck et al., 2009). This resulted in an exogenous increase in co-option.

Firms that did not have a majority of independent directors in the pre-NYSE period (i.e., noncompliant firms) were forced to appoint new independent directors to their boards, thereby causing an exogenous increase in independent directors for such firms. These new independent directors are, however, co-opted because they are appointed after the CEO assumes office. Accordingly, it is more accurate to argue that these noncompliant firms experience an exogenous increase in co-opted independent directors. Relatedly, Coles et al. (2014) argue and find evidence suggesting that co-opted independent directors, though independent of the firm in the conventional and legal sense, behave as though they are not independent in the function of monitoring management. That is, co-opted independent directors act as if they are co-opted directors. Therefore, it is reasonable to argue that NYSE and the listing requirements are a quasi-natural experiment that captures an exogenous increase in co-opted independent directors in particular, and in co-opted directors in general.

This change can be viewed as an exogenous shock to the firm's internal governance. We follow the recent existing literature that uses this exogenous shock as a natural experiment to examine the relationships between board independence and various internal governance mechanisms, including director characteristics, CEO compensation, CEO power, and corporate risk-taking (see e.g., Chhaochharia & Grinstein, 2009; Guthrie et al., 2012; Jiraporn and Lee, 2018b). We employ this exogenous shock to examine the causal effect of board characteristics of SCFs on CSR score in the US. Our chapter is the first to do so.

We follow Coles et al. (2014) and conduct a modified difference-in-differences (DiD) analysis. Coles et al. (2014) argue that using a typical difference-in-differences approach is problematic, since other regulations and political pressures arising from SOX were likely to have affected monitoring through various channels. To assess the impact of co-option, we follow Coles et al. (2014) and estimate the modified regression, which includes Co-option and the interaction of Co-option with two dummy variables:

$$\text{CSRSCORE} = \alpha + \beta_1\, Co\text{-}option + \beta_2\, Post\text{–NYSE}\times Co\text{-}option + \beta_3\, Noncompliant \times Co\text{–}option + \beta_4\, Post\text{-NYSE} \times Noncompliant \times Co\text{-}option + \beta_5\, Post\text{-}\ \text{NYSE} + \beta_6 Noncompliant + \beta_7 C + \varepsilon. \quad (4.4)$$

In Equation (4.4), Post-NYSE is an indicator variable equal to one if the year is 2005 or later, and zero otherwise. Noncompliant is an indicator variable equal to one if the firm was not in compliance with the NYSE regulations prior to 2005, and zero otherwise. We define compliance when a firm has more than 50% of independent directors on the board.

The 'clean' estimate is given by the sum of the three coefficients: Co-option, Co-option × Noncompliant, and Co-option × Post-SOX × Noncompliant (i.e. linear combinations of the three parameters $\beta 1 + \beta 3 + \beta 4$)[45]. The 'clean' estimate can be interpreted as capturing the change in CSR score as a consequence of the exogenous increase in co-option, forced on non-compliant firms through a mandated increase in board independence. We include the same set of control variables (C) including board characteristics as in the regressions reported in the baseline results. In all regressions, we include firm and year fixed effects and report t-statistics with robust standard errors clustered at the industry level. Our hypothesis is that the passage of NYSE results in more co-opted directors becoming less aggressive in terms of addressing corporate social responsibility.

[Insert Table 4.9 here]

We report results in Table 4.9. The results in estimation 1 in Table 4.9 shows that the 'clean' estimate is negative and significant at the 5% level when Co-option is used, suggesting that an exogenous increase in co-opted boards has a negative effect on CSR score of SCFs. The results in estimation 2 of Table 4.9 shows that the 'clean' estimate is positive and significant at the 5% level when non-co-opted independent directors is used, suggesting that an exogenous increase in non-co-opted boards has a positive effect on CSR score of SCFs. Overall, these endogeneity tests suggest that the negative association between co-option and CSR score of SCFs is causal.

4.7 DISCUSSION

Numerous studies have provided evidence on the association between religiosity and firm CSR (see e.g., Longenecker et al., 2004; Brammer et al., 2007; Chatjuthamard-Kitsabunnarat et al., 2014; Wu et al., 2016; Harjoto & Rossi, 2019). Other studies have considered social norms and values (i.e., religion) as determinants of corporate behaviour and CSR (see e.g., La Porta et al., 2008; Liang & Renneboog, 2017). Importantly, the intensity of CSR, defined as how and

[45] For a detailed discussion of the 'clean' estimate approach see Coles et al. (2014)

why it changes and its consequences, is found to vary across different culture and institutional settings (Matten & Moon, 2008). The culture and the institutional setting of SCFs differ from conventional firms because SCFs abide by Islamic principles that have an influence on how these firms conduct business. The majority of studies focus on the link between board characteristics and CSR of firms in Western and non-Western contexts; however, the literature lacks evidence on whether the CSR score of SCFs is influenced by board characteristics of these firms. Focusing on board independence, tenure, CEO duality, gender, multiple directorships, and co-option, we explore how these key board characteristics affect CSR of SCFs.

First, we find that board independence has a positive impact on the CSR score of SCFs. This suggests that independent directors on the boards of SCFs may play a significant monitoring role regarding operating activities of these firms, including CSR activities. In this way they offer an independent opinion, contributing to positive decisions which encourage the preservation of rights of the environment and community. At the same time, they also provide sufficient information to the firm's diverse stakeholders. In other words, independent directors appear to possess considerable moral integrity and are technically qualified to incorporate Islamic values in their business activities to fulfil their accountability to society. Second, a positive relationship is also found between CEO duality and the CSR score of SCFs. This finding suggests that duality gives the CEO of a SC firm (who is required to serve society and address its needs according to Shariah principles) the power to better manage the firm and achieve its objectives, including those related to CSR. Female directors are found to play a vital role in increasing the CSR score of SCFs. This may indicate that the presence of female directors on the boards of SCFs enables more effective monitoring, especially that related to promoting and addressing issues of CSR. Interestingly, our results document a negative impact of co-opted directors on the CSR of SCFs. This finding tends to contradict with the principles outlined by Shariah law which stress the truthfulness, trust, sincerity, brotherhood, science, knowledge, and sense of justice shared by board members in a SCF. These ethical principles hinder a board member from close relationships that might affect their decision, judgement, or ability to act in the best interests of the firm and its shareholders. In other words, a director of a SCF who strictly follows the principles of Shariah is required to perform his/her duties and thus exhibit concern about CSR regardless of being appointed before or after the CEO assumes office in the same firm.

This chapter contributes to the existing literature by exploiting the board characteristics of SCFs as determinants of CSR and its components. We offer practical implications by investigating the competing views on the role of the board of directors in relation to CSR, doing so in a non-conventional context. Our results provide valuable insights to managers and stakeholders on what board characteristics play a key role in deriving a high CSR score.

4.8 CONCLUSION

In the context of the ongoing growth of Islamic finance worldwide, this chapter investigates the role of the board of directors in SCFs. We screen US firms using the DJMI Shariah screening methodology. We then examine a comprehensive set of board characteristics (independence, tenure, gender, and busyness) and analyse the impact of board characteristics on SCFs' corporate social responsibility (CSR) score and its components. We also extend our analysis to chapter the association between boards co-optedness and SCFs' CSR score.

We find strong evidence that board independence, the presence of female directors on the board, and CEO duality have a significantly positive impact on CSR of SC firms. We also find evidence that the size of the board and the age of directors have significantly positive impacts on CSR. The results suggest that in SCFs, larger boards with independent, older, and more female directors tend to be more efficient in promoting CSR score. Further, in studying the relationship between CSR components and board characteristics, we find that the effect of board characteristics on CSR varies according to CSR type. Directors' independence, the presence of female directors on the board, CEO duality, and board size are positively associated with the environment, community, and diversity components of SCF's CSR. In contrast, tenure and board size are negatively associated with the environment and product components, respectively. Moreover, we find that the greater the number of co-opted directors on the board, the lower the CSR score of these firms.

We also address endogeneity by using a system GMM to estimate the effect of board characteristics on SCFs' CSR score. We find that board characteristics are, in part, determined by past CSR score, and after accounting for this, we find no causal relationships between several board characteristics and CSR score. We then employ a natural experiment using NYSE listing rules as an Exogenous Regulatory Shock to overcome the limitations of the system GMM method. We find that the requirement for a majority of independent directors is important to address the CSR aspects of SCFs.

The findings of this chapter have important policy implications. In particular, the findings suggest that certain board characteristics play an important role in maintaining high CSR score of SCFs. Although the boards of SCFs in our sample do not include Shariah scholars, and thus it is hard to draw any conclusions on how it may eventually affect the functioning of the board, the evidence that this chapter provides helps shed light on the effect of the board of directors' characteristics on corporate social responsibility score of Shariah compliant firms.

Table 4.1: Variable definitions

Variable	Measurement
Dependent variables	
CSR	The total number of strengths minus the total number of concerns from all the aspects of CSR in a given year t for firm i;
CSR COM	The total number of strengths minus the total number of concerns within the community aspects of CSR in a given year t for firm i;
CSR DIV	The total number of strengths minus the total number of concerns within the workforce diversity aspects of CSR in a given year t for firm i;
CSR EMP	The total number of strengths minus the total number of concerns within the employee relation aspects of CSR in a given year t for firm i;
CSR ENV	The total number of strengths minus the total number of concerns within the environment aspects of CSR in a given year t for firm i;
CSR HUM	The total number of strengths minus the total number of concerns within the human rights aspects of CSR in a given year t for firm i;
CSR PRO	The total number of strengths minus the total number of concerns within the product quality aspects of CSR in a given year t for firm i;
Independent variables	
Independence	Percentage of directors who are independent
Tenure	Percentage of directors who have more than 15 years' experience
Female Director	Percentage of directors who are female
CEO Duality	Dummy variable equal 1 if CEO is also chairman of the board and 0 otherwise
Directors busyness	Percentage of directors who serve on 4 or more other boards
Co-opted directors	The percentage of co-opted directors who joined the board after the CEO assumed office calculated as per Coles et al. (2014) for firm i in year t;
Co-opted independent directors	The percentage of co-opted independent directors who joined the board after the CEO assumed office calculated as per Coles et al. (2014) for firm i in year t;
Non-co-opted independent director	The percentage of non-co-opted directors who joined the board before the CEO assumed office calculated as per Coles et al. (2014) for firm i in year t;
TW Co-opted dependent director	Sum of tenure of co-opted directors divided by the sum of (Tenure-Weighted Co-option) tenure of dependent directors calculated as per Coles et al. (2014) for firm i in year t
TW Co-opted independent director	Sum of tenure of co-opted directors divided by the sum of (Tenure-Weighted Co-option) tenure of independent directors calculated as per Coles et al. (2014) for firm i in year t
Control Variables	
Board size	The number of directors on the board

Directors Outside Related	Percentage of independent directors on a given board who had or have had a significant relationship with the company
Directors Problem	Percentage of directors who have personally involved in problems such as bankruptcies, fraud, major litigation, etc
Directors Failed	Percentage of directors who have failed to meet the board's minimum attendance standards
Board Meetings	Number of board meetings
Director Age	Age of a given director
Firm Size	Natural log of total assets
Firm age	Natural log of the number of years company has been in the business
Firm ROA	Net income/total assets
Firm leverage	Total debt/total assets

This table summarises the primary variables used in the analysis.

Table 4.2: Summary statistics

variable	N	Mean	SD	Min	Median	Max
Panel A: Corporate social responsibility scores						
CSR score	12884	0.038	2.428	-9.000	0.000	18.000
CSR score environment	7458	0.139	0.812	-4.000	0.000	5.000
CSR score community	12884	0.084	0.504	-2.000	0.000	4.000
CSR score human rights	12884	-0.038	0.260	-2.000	0.000	2.000
CSR score employee	12884	0.021	1.045	-4.000	0.000	8.000
CSR score diversity	12884	0.059	1.321	-3.000	0.000	7.000
CSR score product	12884	-0.145	0.606	-4.000	0.000	2.000
Panel B: Boards Characteristics						
Independent variables						
Independence	6885	0.841	0.084	0.250	0.875	1.000
Tenure	10888	0.147	0.173	0.000	0.100	1.000
Women Director	10888	0.115	0.103	0.000	0.111	0.667
CEO Duality	10646	0.603	0.489	0.000	1.000	1.000
Directors busyness	10888	0.017	0.046	0.000	0.000	0.375
Co-option	9363	0.405	0.353	0.000	0.364	1.000
Independent Co-option	9363	0.239	0.231	0.000	0.214	0.750
TW dependent Co-option	9363	0.272	0.331	0.000	0.131	1.000
TW independent Co-option	9363	0.163	0.195	0.000	0.076	0.700
Non-Co-option	4782	0.589	0.251	0.048	0.627	0.917
Control Variables						
Board size	13782	9.060	2.214	3.000	9.000	30.000
Directors Outside Related	10888	0.115	0.145	0.000	0.091	0.889
Directors Problem	10888	0.030	0.075	0.000	0.000	0.909
Directors Failed	10888	0.009	0.036	0.000	0.000	0.556
Board Meetings	12685	7.941	3.778	1.000	7.000	49.000
Director Age	13869	62.191	9.585	31.000	63.000	95.000
Panel C: Firm characteristics						
Firm Size	13335	20.716	2.160	4.942	20.721	28.494
Firm age	10974	3.494	0.902	0.000	3.497	5.357
Firm ROA	13871	0.026	0.148	-0.601	0.053	0.249
Firm leverage	13871	0.193	0.190	0.000	0.161	0.770

This table presents the summary statistics for sample CSR scores, board characteristics, and firm characteristics variables.

Table 4.3: Correlation Matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]
[1] CSR score	1.000																				
[2] Independence	0.197	1.000																			
[3] Tenure	-0.066	-0.271	1.000																		
[4] Female Director	0.393	0.213	-0.139	1.000																	
[5] CEO Duality	0.079	-0.047	0.143	0.011	1.000																
[6] Directors busyness	0.057	0.041	-0.068	0.011	-0.007	1.000															
[7] Co-option	-0.007	-0.006	-0.064	0.073	0.005	0.029	1.000														
[8] Independent Co-option	-0.022	0.011	-0.072	0.068	-0.014	0.027	**0.881**	1.000													
[9] TW Co-option	-0.016	-0.008	-0.077	0.064	0.005	0.037	**0.932**	**0.770**	1.000												
[10] TW independent Co-option	-0.015	0.032	-0.094	0.069	0.004	0.046	**0.863**	**0.866**	**0.845**	1.000											
[11] Non-Co-option	0.087	0.317	-0.021	0.010	-0.004	-0.014	**-0.837**	**-0.944**	**-0.733**	**-0.811**	1.000										
[12] Board size	0.386	0.264	-0.031	0.323	0.088	0.045	0.047	0.052	0.011	0.057	0.040	1.000									
[13] Directors Outside Related	-0.028	0.084	0.148	-0.077	0.017	0.001	-0.036	-0.039	-0.042	-0.051	0.063	0.039	1.000								
[14] Directors Problem	0.043	0.015	-0.022	0.014	0.027	0.055	0.003	0.019	-0.004	0.027	-0.014	0.042	0.007	1.000							
[15] Directors Failed	-0.017	-0.051	0.011	-0.043	-0.062	0.011	0.000	-0.002	-0.002	-0.014	-0.014	-0.018	0.032	-0.032	1.000						
[16] Board Meetings	0.007	0.090	-0.160	0.026	-0.148	0.043	0.031	0.042	0.030	0.046	-0.011	-0.017	-0.012	0.042	-0.015	1.000					
[17] Director Age	0.043	0.015	0.132	-0.007	0.016	-0.016	-0.023	-0.052	-0.030	-0.021	0.054	0.078	0.009	-0.005	0.013	-0.057	1.000				
[18] Firm Size	0.302	0.111	0.019	0.145	0.109	0.073	0.026	0.009	-0.013	-0.001	0.028	0.323	0.008	0.054	-0.045	-0.021	0.030	1.000			
[19] Firm age	0.157	0.103	0.196	0.164	0.089	-0.055	-0.065	-0.063	-0.098	-0.056	0.095	0.245	-0.016	0.049	-0.082	-0.092	0.134	0.175	1.000		
[20] Firm ROA	0.075	-0.041	0.109	0.001	0.109	-0.028	-0.049	-0.051	-0.058	-0.040	0.035	0.041	-0.030	0.021	-0.060	-0.144	0.021	0.375	0.114	1.000	
[21] Firm leverage	0.074	0.102	-0.044	0.105	0.019	0.067	-0.002	-0.021	-0.022	-0.009	0.054	0.181	0.077	0.054	-0.008	0.052	0.025	0.295	0.094	-0.018	1.000
VIF	1.380	5.617	1.260	1.300	1.070	1.030	15.930	47.750	10.500	6.000	51.767	1.410	1.070	1.020	1.020	1.070	1.050	1.510	1.200	1.250	1.150

This table presents the correlation matrix and variance inflation factors (VIFs) for the variables used in this chapter.

Table 4.4: Regression results: board characteristics and overall CSR score of SC firms

	Dependent variable: Overall CSR score	
	(1)	(2)
Independence	**1.861*** **	**2.418*** **
	3.994	**5.296**
Tenure	**-0.236**	**-0.0345**
	-1.240	**-0.184**
Female Director	**4.818*** **	**4.874*** **
	11.94	**12.31**
CEO Duality	**0.238*** **	**0.200*** **
	3.489	**3.037**
Directors busyness	**0.706**	**0.767**
	0.784	**0.891**
Board size	0.241***	0.235***
	11.43	11.65
Directors Outside Related	0.213	-1.153***
	0.982	-4.981
Directors Failed	0.301	0.519
	0.301	0.542
Director Age	0.00411**	0.00387**
	2.098	1.972
Directors Problem	0.0491	0.0687
	0.129	0.186
Board Meetings	0.00266	0.00111
	0.334	0.144
Firm Age	0.0563	0.0746*
	1.259	1.750
Leverage	0.0104***	0.00914***
	7.197	6.607
ROA	-0.0487***	-0.0551***
	-3.939	-4.551
Firm Size	0.262***	0.273***
	9.744	10.50
Constant	-10.11***	-10.98***
	-15.78	-17.53
Industry group	YES	YES
Time Effect	NO	YES
Observations	5,352	5,352
R-squared	0.240	0.294

The table presents regressions of CSR. All variables are defined in Table 4.1. T-statistics, given in below coefficients, are based on standard errors corrected for heteroscedasticity and firm-level clustering. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4.5: Regression results: board characteristics and CSR component scores of SC firms

	Dependent variables: CSR Components											
	Environment		Community		Diversity		Employee		Product		Human Rights	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Independence	**0.154**	**0.346****	**0.186****	**0.299*****	**1.257*****	**1.350*****	**0.000699**	**0.218**	**0.0363**	**-0.00907**	**0.00370**	**0.00720**
	0.934	**2.167**	**2.246**	**3.663**	**6.179**	**6.679**	**0.00317**	**1.081**	**0.346**	**-0.0873**	**0.118**	**0.224**
Tenure	**-0.251*****	**-0.163****	**-0.0408**	**-0.00165**	**0.0148**	**0.0464**	**-0.0488**	**0.0366**	**0.0256**	**0.00824**	**0.0159**	**0.0172**
	-3.712	**-2.475**	**-1.244**	**-0.0513**	**0.167**	**0.534**	**-0.561**	**0.454**	**0.681**	**0.220**	**1.040**	**1.141**
Female Director	**0.222***	**0.520*****	**0.158****	**0.269*****	**3.409*****	**3.258*****	**0.845*****	**0.718*****	**0.0451**	**-0.0359**	**0.0272**	**0.0261**
	1.778	**4.337**	**2.416**	**4.156**	**18.64**	**17.46**	**4.799**	**4.382**	**0.677**	**-0.536**	**0.823**	**0.792**
CEO Duality	**0.0639****	**0.0503****	**0.0388*****	**0.0338*****	**0.142*****	**0.137*****	**0.0258**	**0.00722**	**-0.0111**	**-0.0138**	**-0.00746**	**-0.00800**
	2.505	**2.084**	**3.114**	**2.806**	**4.591**	**4.520**	**0.809**	**0.249**	**-0.743**	**-0.925**	**-1.270**	**-1.371**
Directors busyness	**-0.285**	**-0.226**	**-0.0798**	**-0.00283**	**0.0845**	**0.202**	**0.420**	**0.238**	**0.239**	**0.201**	**0.249*****	**0.245*****
	-0.959	**-0.801**	**-0.473**	**-0.0172**	**0.214**	**0.517**	**0.946**	**0.605**	**1.490**	**1.266**	**3.264**	**3.258**
Board size	0.0639***	0.0522***	0.0436***	0.0392***	0.118***	0.120***	0.0422***	0.0457***	-0.0251***	-0.0219***	-0.00219	-0.00212
	8.091	7.072	10.41	9.816	12.46	12.82	4.196	5.020	-5.032	-4.498	-1.088	-1.067
Directors Outside Related	-0.129*	-0.198**	-0.105***	-0.241***	-0.188**	-0.652***	0.592***	-0.158	0.107**	0.122**	0.0206	0.0105
	-1.663	-2.401	-2.913	-6.162	-2.272	-7.061	5.044	-1.313	2.425	2.402	1.040	0.482
Directors Failed	-0.000101	-0.0875	-0.131	-0.0935	0.320	0.478	-0.303	-0.276	0.193	0.197	0.0504	0.0504
	-0.000264	-0.237	-0.799	-0.581	0.738	1.121	-0.639	-0.651	1.340	1.349	0.579	0.578
Director Age	0.000222	0.000112	0.000360	0.000229	0.00124	0.00156	0.00141	0.00109	0.000376	0.000551	0.000209	0.000210
	0.324	0.167	1.065	0.688	1.221	1.517	1.626	1.357	0.896	1.312	1.346	1.317
Directors Problem	0.156	0.132	0.132*	0.102	0.0220	0.0277	-0.0521	0.0239	-0.192*	-0.164	-0.0427	-0.0410
	1.118	0.981	1.890	1.469	0.137	0.179	-0.275	0.140	-1.881	-1.610	-1.385	-1.331
Board Meetings	-0.00239	-0.00403	-0.000149	-0.000647	0.00820*	0.00817**	0.00178	0.00166	-0.00493**	-0.00488**	0.000720	0.000707
	-0.764	-1.347	-0.109	-0.482	1.951	1.966	0.465	0.461	-2.519	-2.534	0.951	0.933
Firm Age	0.0203	0.0391**	0.00675	0.0150*	0.0568***	0.0556***	-0.0238	-0.0252	-0.0145	-0.0188**	0.00584	0.00585
	1.072	2.139	0.762	1.724	2.810	2.747	-1.085	-1.284	-1.528	-2.009	1.291	1.285
Leverage	0.00229	-0.00120	-0.000664**	-0.000687***	-0.000197	-0.000884	0.00762***	0.00680***	0.00211***	0.00210***	0.00155***	0.00154***
	0.798	-0.434	-2.545	-2.998	-0.312	-1.406	13.05	12.84	6.163	6.279	8.542	8.458
ROA	0.0386	-0.0644	-0.00536	-0.00653**	-0.00402	-0.00652	-0.0133**	-0.0171***	0.000343	0.00243	-0.00125	-0.00121

	0.493	-0.854	-1.523	-2.479	-0.523	-0.867	-2.227	-2.681	0.133	0.826	-1.082	-1.047
Firm Size	0.0641***	0.0840***	0.0224***	0.0289***	0.106***	0.104***	0.0637***	0.0609***	-0.000587	-0.00504	0.00186	0.00181
	6.123	8.241	4.115	5.460	9.587	9.246	5.324	5.618	-0.110	-0.944	0.741	0.713
Constant	-1.904***	-2.210***	-0.979***	-1.106***	-5.420***	-5.505***	-1.664***	-2.051***	0.220*	0.170	-0.0615	-0.0737
	-7.895	-9.438	-7.890	-9.093	-19.58	-19.62	-5.991	-8.018	1.702	1.320	-1.125	-1.313
Industry group	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time Effect	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Observations	4,526	4,526	5,352	5,352	5,352	5,352	5,352	5,352	5,352	5,352	5,352	5,352
R-squared	0.159	0.245	0.133	0.185	0.306	0.322	0.0610	0.220	0.0593	0.0847	0.0410	0.0423

The table presents regressions of CSR components. All variables are defined in Table 4.1. T-statistics, given in below coefficients, are based on standard errors corrected for heteroscedasticity and firm-level clustering. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4.6: Effect of co-option on CSR score of SC firms

	Dependent variable: Overall CSR score									
	Co-option measures used									
	Co-option	Co-option	Independent Co-option	Independent Co-option	TW Co-option	TW Co-option	TW independent Co-option	TW independent Co-option	Non - Co-option	Non-Co-option
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Co-option measure	**-0.298****	**-0.252****	**-0.512*****	**-0.460****	**-0.316****	**-0.228***	**-0.630*****	**-0.613*****	**0.517*****	**0.463****
	-2.373	**-2.064**	**-2.671**	**-2.464**	**-2.536**	**-1.868**	**-2.924**	**-2.912**	**2.704**	**2.490**
Independence	2.636***	2.814***	2.641***	2.814***	2.623***	2.808***	2.630***	2.802***	2.142***	2.367***
	4.322	4.702	4.329	4.702	4.302	4.694	4.315	4.686	3.394	3.808
Tenure	-0.235	-0.148	-0.227	-0.143	-0.242	-0.150	-0.235	-0.151	-0.227	-0.142
	-0.897	-0.572	-0.868	-0.553	-0.925	-0.581	-0.898	-0.585	-0.868	-0.552
Female Director	7.657***	7.332***	7.664***	7.340***	7.661***	7.329***	7.675***	7.354***	7.661***	7.337***
	14.53	14.01	14.54	14.01	14.53	14.00	14.54	14.03	14.53	14.01
CEO Duality	0.266***	0.225**	0.267***	0.226***	0.269***	0.227***	0.270***	0.229***	0.267***	0.227***
	2.963	2.568	2.975	2.579	2.996	2.593	3.008	2.612	2.981	2.585
Directors busyness	1.847	1.730	1.843	1.728	1.849	1.721	1.889	1.779	1.846	1.730

	1.476	1.411	1.473	1.409	1.477	1.403	1.510	1.452	1.475	1.411
Board size	0.300***	0.309***	0.301***	0.310***	0.300***	0.309***	0.302***	0.311***	0.301***	0.310***
	11.49	12.13	11.54	12.18	11.50	12.12	11.56	12.20	11.54	12.17
Directors Outside Related	-0.315	-1.286***	-0.317	-1.286***	-0.319	-1.287***	-0.325	-1.299***	-0.316	-1.285***
	-1.193	-4.521	-1.199	-4.516	-1.210	-4.526	-1.231	-4.562	-1.196	-4.512
Directors Failed	1.018	1.414	1.024	1.418	1.011	1.407	0.993	1.392	1.022	1.416
	0.746	1.070	0.751	1.073	0.741	1.065	0.728	1.053	0.750	1.071
Director Age	0.00652**	0.00469	0.00634**	0.00453	0.00656**	0.00474	0.00663**	0.00478*	0.00634**	0.00453
	2.223	1.618	2.163	1.564	2.237	1.637	2.262	1.650	2.161	1.563
Directors Problem	-0.0361	0.0934	-0.00707	0.118	-0.0352	0.0984	-0.00519	0.120	-0.00587	0.119
	-0.0733	0.196	-0.0143	0.248	-0.0716	0.207	-0.0105	0.252	-0.0119	0.251
Board Meetings	0.00363	0.00147	0.00374	0.00162	0.00355	0.00133	0.00436	0.00228	0.00376	0.00164
	0.346	0.143	0.357	0.158	0.339	0.129	0.417	0.222	0.359	0.160
Firm Age	0.0894	0.0734	0.0901	0.0735	0.0888	0.0739	0.0903	0.0732	0.0901	0.0735
	1.559	1.327	1.575	1.334	1.550	1.337	1.579	1.329	1.575	1.333
Leverage	0.00979***	0.00867***	0.00979***	0.00867***	0.00983***	0.00871***	0.00986***	0.00873***	0.00979***	0.00867***
	5.882	5.409	5.887	5.411	5.906	5.426	5.949	5.467	5.885	5.410
ROA	-0.0812***	-0.0813***	-0.0809***	-0.0809***	-0.0818***	-0.0821***	-0.0796***	-0.0794***	-0.0809***	-0.0809***
	-4.696	-5.305	-4.707	-5.304	-4.732	-5.360	-4.655	-5.222	-4.707	-5.304
Firm Size	0.347***	0.335***	0.345***	0.333***	0.347***	0.334***	0.345***	0.333***	0.345***	0.333***
	9.944	9.762	9.903	9.724	9.925	9.741	9.898	9.721	9.903	9.724
Constant	-13.31***	-13.51***	-13.28***	-13.48***	-13.32***	-13.54***	-13.32***	-13.50***	-13.29***	-13.49***
	-16.23	-16.77	-16.22	-16.73	-16.20	-16.74	-16.27	-16.78	-16.24	-16.75
Industry group	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time Effect	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Observations	3,659	3,659	3,659	3,659	3,659	3,659	3,659	3,659	3,659	3,659
R-squared	0.356	0.384	0.357	0.384	0.356	0.384	0.357	0.385	0.357	0.384

The table presents regressions of co-option varibles on CSR. All variables are defined in Table 4.1. T-statistics, given in below coefficients, are based on standard errors corrected for heteroscedasticity and firm-level clustering. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4.7: Durbin and Wu-Hausman tests

	Co-option	Non-Co-option
	(1)	(2)
Co-option measure	-6.387	1.845***
	-1.634	3.441
Tenure	-0.807**	-0.262
	-1.969	-1.005
Female Director	9.339***	8.105***
	9.727	18.670
Directors busyness	3.041**	2.217**
	2.021	2.084
Board size	0.368***	0.318***
	8.843	14.530
Directors Outside Related	-1.495***	-1.290***
	-3.185	-4.224
Directors Failed	1.085	1.343
	0.627	1.016
Director Age	0.002	0.002
	0.602	0.563
Directors Problem	0.783	0.847*
	1.229	1.737
Board Meetings	0.014	0.004
	0.840	0.319
Firm Age	-0.138	0.014
	-0.975	0.269
Leverage	0.0113*	0.0134***
	1.921	3.114
ROA	-0.002	-0.022
	-0.035	-0.470

Firm Size	0.274***	0.257***
	9.286	11.870
Constant	-6.107***	-9.809***
	-3.118	-18.020
Industry Effect	YES	YES
Time Effect	YES	YES
Durbin Chi2	**4.118**	**4.223**
P Value	**0.042**	**0.040**
Wu-Hausman	**4.099**	**4.204**
P Value	**0.043**	**0.040**
Observations	3,659	3,659

This table presents 2SLS empirical results used to test for the presence of endogeneity using the Durbin and Wu-Hausman tests. We use two co-option measures: co-option (the percentage of co-opted independent directors who joined the board after the CEO assumed office) and non-co-option (the percentage of non-co-opted directors who joined the board before the CEO assumed office). Other variables are defined in Table 4.1. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4.8: System GMM results

	Co-option		Non-Co-option	
	(1)	(2)	(3)	(4)
Lag (CSRSCORE)	0.488***	0.554***	0.524***	0.559***
	3.479	4.912	3.473	4.815
Co-option measure	-2.052	0.205	1.751	0.0889
	-1.251	0.178	0.634	0.0416
Independence	-1.742	4.258	-6.305	2.524
	-0.214	0.754	-0.738	0.370
Tenure	-3.183	-0.823	-3.707	-1.165
	-1.417	-0.641	-1.517	-0.749
Female Director	9.252	-1.099	7.273	-3.411
	0.755	-0.148	0.525	-0.341
CEO Duality	0.629**	0.455**	0.619**	0.492**
	2.177	2.552	2.026	2.323
Directors busyness	16.22*	5.169	14.87	7.214
	1.784	0.688	1.484	0.769
Board size	-0.0825	-0.0225	-0.171	0.0552
	-0.182	-0.058	-0.369	0.12
Directors Outside Related	1.359*	4.925**	1.526**	4.952*
	1.924	2.122	2.13	1.707
Directors Failed	-7.226	0.998	-5.634	-1.555
	-0.61	0.138	-0.414	-0.178
Director Age	0.149***	-0.0159	0.174***	-0.00947
	3.625	-0.429	3.82	-0.224
Directors Problem	-37.57	-16.87	-35.93	-25.01
	-1.585	-1.092	-1.333	-1.275
Board Meetings	0.182	0.0496	0.231	0.0566

	1.149	0.589	1.368	0.536
Firm Age	-0.207	0.305	-0.0843	0.201
	-0.307	0.771	-0.112	0.39
Leverage	2.115	2.517	2.048	3.05
	0.603	1.091	0.536	1.202
ROA	0.171	-0.0293	0.138	-0.05
	0.438	-0.136	0.33	-0.2
Firm Size	0.231	0.122	0.29	0.14
	0.898	0.599	1.094	0.607
Constant	-12.58*	-5.52	-13.80*	-4.248
	-1.792	-1.062	-1.837	-0.727
Industry group	YES	YES	YES	YES
Time Effect	NO	YES	NO	YES
AR (2)	**0.325**	**0.560**	**0.319**	**0.556**
p value of AR (2) statistic	0.745	0.575	0.834	0.578
Hansen J statistic	**28.5**	**26.91**	**19.90**	**21.08**
p value of Hansen statistic	0.197	0.523	0.338	0.576
Number of instruments	42	52	37	47
Number of groups	1,102	1,102	1,102	1,102
Observations	3,587	3,587	3,587	3,587

This table reports results from our system GMM estimation of model (3). There are two diagnostic tests, namely the Hansen J test of over identifying restrictions and Arellano-Bond test for AR (2). We use two co-option measures: co-option (the percentage of co-opted independent directors who joined the board after the CEO assumed office) and non-co-option (the percentage of non-co-opted directors who joined the board before the CEO assumed office). Other variables are defined in Table 4.1. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4.9 Co-option and CSR score: Evidence from a Natural Experiment

	Co-opted	No-co-opted
	CSR score	
	1	2
Clean estimate: β1+ β3+ β4	**-3.796****	**2.287****
	(-2.52)	**(1.99)**
All Controls	YES	YES
Time fixed effect	YES	YES
Industry effect	YES	YES
Adjusted R2	0.386	0.385
Observations	3,659	3,659

This table reports the modified difference-in-difference analysis of co-option on CSR score around the passage and mandated changes and listing requirements of NYSE Act of 2005. We use the clean "estimate" approach as per Coles et al. (2014) to allow for the possibility that NYSE have a direct effect on CSR score. It provides the "clean" estimate results for the period from 2000 to 2015. Detailed variable definitions are provided in Table 4.1. All regressions control for industry- and year-fixed effects. t-statistics are reported in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

4.9 APPENDIX

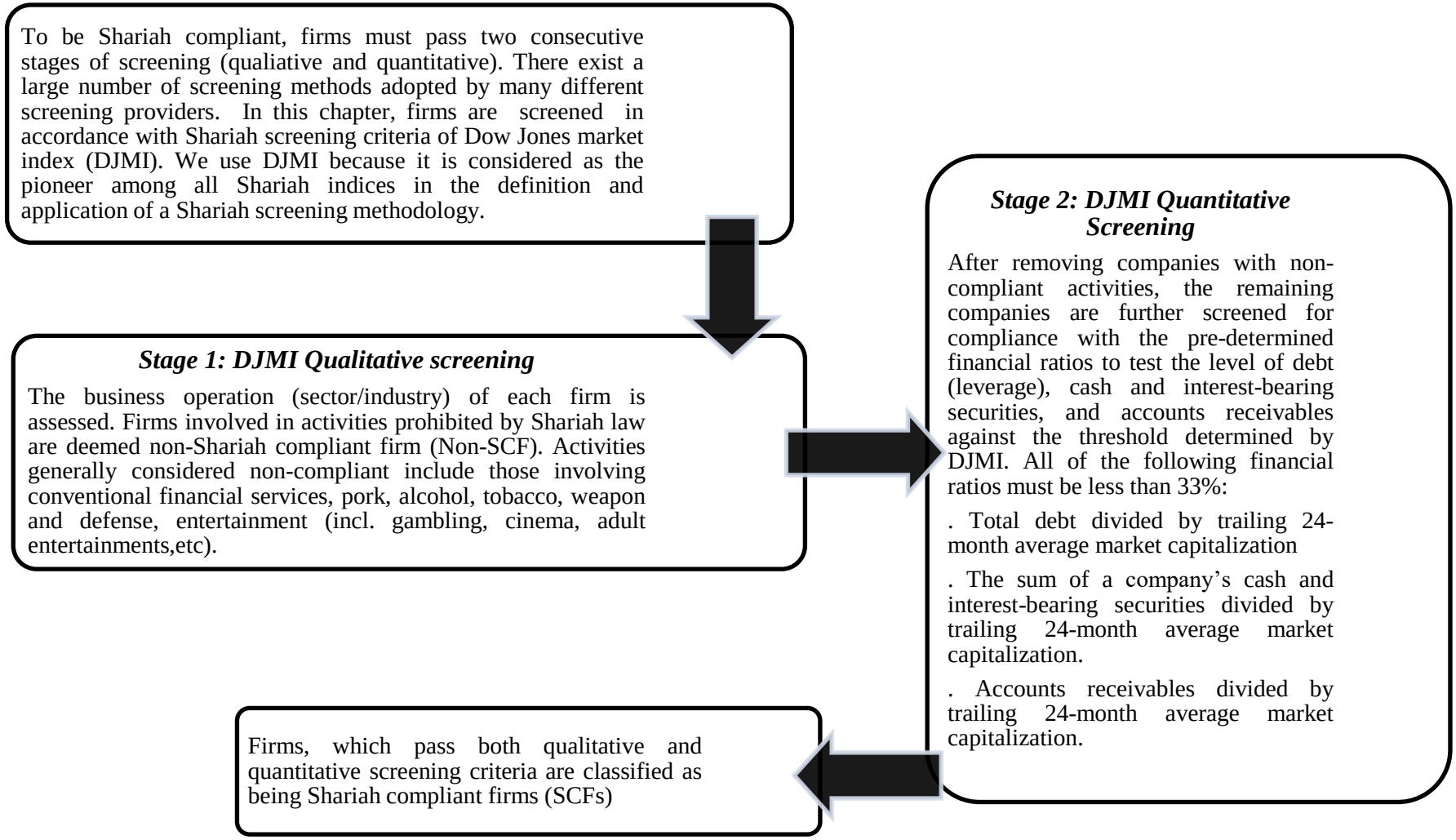

Figure 4.1: DJMI screening criteria and steps (DJMI, 2013)

Table 4.10: Similarities and differences of CSR in SCFs and non-SCFs

	CRITERIA	SCFs	NON-SCFs
Similarities	Objectives	Both types of firms have ethical, social and financial objectives. Addressing CSR in business activities is a part of their ethical and social objectives.	
	Employing CSR components	Both types of firms consider the six components of CSR in their business activities. CSR components include environment, community, diversity, employee, product and human rights.	
	Shareholder advocacy	Shareholders in both types of firms are encouraged to formally express any negative opinion regarding certain practices specially those related to CSR.	
Differences	Scope	SCFs address CSR in the light of Islamic values and beliefs derived from the primary and the secondary sources of Shariah.	Non-SCFs firms see CSR as a continuous commitment by business to behave ethically and contribute positively to the society at large.
	Focus	SCFs operate in different philosophical grounds such as halal (lawful) and haram (unlawful). The spiritual aspects of their business activities overcome other aspects. Thus, CSR in SCFs is seen to have broader meaning. The focus of SCFs is to protect the benefit of individual and community as well as to facilitate the improvement and perfection of human lives in this world.	Non-SCFs can invest in any type of business as long as it meets the criteria set by these firms. These firms are therefore material but not spiritual.
	Source of guidance	The source of guidance for SCFs is Shariah, however, due to the multiple Islamic schools, different interpretations are used. Shariah is a system of ethics and values which emphasise on SCFs to contribute their wealth to society and treat their employees, consumers, supplies and others in best manners.	There is no universal source of guidance for non-SCFs in relation to CSR and ESG (Environmental, Social and Governance) principles. The perception of CSR in these firms depends on the strategic business plans discussed on each firm's management.
	Supervisory Committee	Shariah Supervisory board (SSB) play a key role in monitoring the compliance status of SCFs and their business activities	Some non-SCFs have an ethical committee, acting as an advisory body only. These committees can only provide an opinion but cannot enforce it.
	CSR obligation	The concept of social responsibility under the Shariah framework stems from the tawhidic (faith) approach, which consists of three relationships, which are to God, to the human and to the environment (Muwazir et al., 2006). Dusuki (2008) asserts that the Islamic concept of CSR stems from the principles of vicegerency and brotherhood. According to the principle of vicegerency, God appoints man to act as His representative on earth by being His guardian and upholding the principle of stewardship towards His possession whereas the principle of ukhuwwah (brotherhood) insists on the importance of social justice.	CSR becomes recently an obligation for firms to show their accountability to society as whole.
	Purification Process	Yes. Purification is the process of eliminating or cleaning the portfolio of income or gain resulting from interest or other impermissible revenue sources. Impermissible portfolio income is donated to charities and non-profit organisations	No

Chapter 5 : CONCLUSION

This chapter provides an overall summary of the thesis and its key contributions (Section 5.1), in addition to outlining avenues for future research (Section 5.2).

5.1 Summary and Key Contributions

This thesis comprises three essays in ethical finance (Chapters 2 – 4), summarised as follows.

Chapter 2 examines the impact of multiple Shariah screening methods on the performance of stocks listed on the ASX 200. This chapter focuses on the relationship between financial ratios employed in the quantitative stage of the screening and performance of Shariah compliant stocks. Using 12 different screening methods, the empirical results show that the contribution of screening to the performance of stocks varies with the screening method used, which suggests that the screening criteria employed plays a vital role in deriving positive, negative, or insignificant contribution to performance. The results also show that the restriction of financial leverage affects performance negatively for compliant stocks, whereas the restriction towards investing in firms with liquid assets tends to have a positive impact on the performance of compliant stocks. The inability of compliant stocks to invest in non-permissible activities also affects performance negatively.

Chapter 3 investigates the impact of country index-based momentum on the performance of Islamic mutual funds (IMFs). This essay also examines whether the returns of country index-based momentum strategies crash, have exposure to the GFC and fund investment styles, and are associated with screening intensity and fund characteristics. Moreover, it provides new evidence on the relationship between fund investment styles and the crash risk of country index-based momentum strategies. Results show that index-based country momentum investment strategies improve the performance of Islamic mutual funds. Moreover, higher momentum exposure to crashes is mainly driven by shorter holding period strategies. Investments with exposure to small and value stocks are positively associated with momentum crash risk.

Chapter 4 examines the association between board characteristics of Shariah compliant firms (SCFs) and their corporate social responsibility (CSR) score. This essay also investigates whether co-opted directors affect the CSR of SCFs. This chapter finds strong evidence that board independence, female directors on the board, and CEO duality are positively associated with CSR score. We also find evidence that the size of the board and the age of directors have a significantly positive impact on SC firms' CSR. Board characteristics are associated with a number of individual CSR components. Directors' independence, female directors on the board, CEO duality, and board size are positively associated with the environment, community, and diversity components of SCFs' CSR. In contrast, tenure and board size are negatively associated with the environment and product components, respectively. Furthermore, the results show that the greater the number of co-opted directors on the board, the lower the CSR score of these firms.

5.2 Future research

This thesis has revealed a number of points to be addressed by future research. With respect to Shariah screening methods, a worthwhile extension would be to examine the impact of Shariah screening on the liquidation and fraud risks of Shariah compliant firms. In addition, it is also important to perform a simulation in order to evaluate the best combination of thresholds applied to financial ratios in the quantitative screening and investigate the value added by these combinations to performance. This may serve to standardise a unique screening method. Further, future studies on the performance of IMFs should consider factors other than country index-based momentum strategies in their analysis. Such factors may include higher moments (skewness and kurtosis). Another direction for future research that is important to investors in Shariah compliant firms lies in investigating in more detail the link between board characteristics, particularly co-option and several corporate outcomes other than CSR, such as CEO turnover, executive pay, R&D investments, and pay-performance sensitivities.

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