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## Revealing the Secrets of Working Capital: A Comparison Between Sharia-Compliant and Conventional Firms

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### Abstract

This research compares the performance of sharia-compliant (SC) and non-shariah-compliant (non-SC) firms by examining the impact of working capital on the return on assets, the return on equity, and the net profit margin. The dataset, based on the Dow Jones Islamic Market Index (DJIMI) standards, is divided by the leverage ratio and includes PSX-500 firms listed in the Pakistan Stock Exchange from 1996 to 2020. Our findings reveal that working capital has a significant and positive effect on all firm proxies, among which non-SC firms outperform SC firms because of their access to funds for business operations. SC firms face restrictions in obtaining funds from conventional banks. Our study has many implications. As liquidity

injection is crucial for growth, policy makers should focus on developing novel credit instruments that are SC to address financing needs and boost business operations.

**Keywords:**

financial crisis, firm performance, sharia compliant, working capital management

**JEL classifications:** G14, G31, G41

## 1. Introduction

Effective working capital management (WCM) comprises the policies, changes, and management of the level of a company's short-term assets and liabilities (Chalmers et al., 2020). The liquidity shortage that followed the US financial crisis in 2008 refocused the attention of investment analysts on the immediate financial well-being of their companies. According to this definition, it is important to control the levels of each component of working capital in order to maximize its use, because any surplus is wasted and contributes nothing to the company's bottom line. Hence, it makes sense for business leaders to seek to optimize their companies' worth by maintaining a healthy amount of working capital. WCM is an efficient method used to bridge the gap between a company's short-term assets and obligations (Chalmers et al., 2020; Kayani, 2021; Song et al., 2020).

Cash on hand, inventory, accounts receivable, and accounts payable are the four main categories of working capital. They all contribute to a company's financial health or lack thereof, and their proper management and control can help prevent or at least mitigate financial difficulties (Mazzarol & Reboud, 2020; Johan et al., 2024). Therefore, managers must spend a significant amount of time and effort to attain the ideal level of working capital that balances risk and efficiency. Inadequate WCM can lead to financial vulnerabilities, thereby increasing the likelihood of bankruptcy, so, businesses should maintain the optimal amount of WCM by

keeping the trade-off between profitability and liquidity in mind. According to Lefebvre (2022), in the United States (US) and the United Kingdom (UK) inadequate WCM is the primary factor that contributes to the failure of small businesses. When businesses experience financial difficulties or are on the verge of bankruptcy, WCM quickly becomes the center of attention for both financial and legal institutions. In addition, financial institutions analyze the amount of a company's working capital in order to decide whether to extend new business loans to the company, and legal experts review the working capital data of a company in order to determine whether the company is bankrupt. Both evaluations are performed to ascertain whether the company will receive additional business loans (Mazzarol & Reboud, 2020).

Over the past two decades, many socially responsible investment options (SRIs) have emerged. SRIs and Islamic indexes have various common characteristics but also have some key distinctions (Widyawati, 2020). SRIs usually avoid dealing with industries such as gambling, beverages, cigarettes, and the military. Companies listed in Islamic indexes also adhere to screening requirements based on sharia, or Islamic law, and are forbidden to engage in the trade of pork (Yan et al., 2019).

A KPMG study on WCM states: "Enterprises throughout the globe are now concentrating more on cash holdings and WCM to deal up with the liquidity constraint during the 2008 financial crisis" (Baker et al. 2017). The global financial crisis (GFC) and its aftermath bolstered the need for effective WCM because it can release cash from multiple working capital accounts, hence, increasing free cash flow. As a result, looking at a company's WCM tactics before, during, and after the GFC would be an interesting topic of study. Screening data to distinguish sharia-compliant (SC) from non-sharia-compliant (non-SC) firms is difficult, so, in this paper, we use a screening method that has been employed in various prior papers (Hassan et al., 2023; Iqbal et al., 2020, 2022). The data suggest that Islamic financial

institutions were much more stable and were affected much less by the crisis than their traditional counterparts (Wetzel & Hofmann, 2019).

The WCM policies and procedures of SC institutions differ considerably from those of their traditional counterparts because they must adhere to sharia (Akbar et al., 2021). However, the majority of the literature has addressed the WCM procedures by traditional corporations. Therefore, the goal of this paper is to address this gap in the literature, and it makes three contributions to the literature. First, it is a comprehensive and extensive study in the context of Pakistan, examining the relationship between WC and firm profitability at the SC and non-SC firms for the period 1996-2020. Second, it is the first study to investigate the influence of WCM rules on the profitability of SC and non-SC firms. Third, through empirical observation of three periods—before the GFC (2002–2007), during the GFC (2007–2008), and after the GFC (2008–2013)—we study the effect of the GFC on the WC practices of Pakistani SC and non-SC firms, in comparison to their traditional counterparts. We select this event because it had a significantly negative impact on firm liquidity. Finally, we investigate the data using a regression model based on the generalized method of moments (GMM), to ensure that our findings are consistent and are not influenced by any endogeneity in the data.

Our empirical findings reveal a significantly positive relationship between WC and all the dependent variables (proxies for firm performance). The comparison between SC and non-SC firms shows that non-SC firms use their WC more efficiently, and financial firms perform better than nonfinancial firms, mostly because of the difficulty in screening the data on SC firms. With respect to the GFC, the positive relationship between WC and firm performance weakens during the crisis but is stronger for non-SC firms because of injections of liquidity. The system-GMM results indicate that our main findings are robust.

Following this introduction, the paper is organized as follows. Section 2 reviews the literature, Section 3 describes the data sample and the variables, Section 4 lays out the research

methodology, Section 5 summarizes the results and performs a robustness check. The paper concludes in Section 6 with a discussion of policy implications.

## **2. Literature review**

### *2.1 Theoretical background*

Two important perspectives are used to study WC in the WCM literature: the operational cycle idea (Richards & Laughlin, 1980) and the static view. The many characteristics of WC can be divided into three categories: position measurement, activity measurement, and leverage measurement (Smith & Begemann, 1997).

The static view, also known as position measurement, focus on the current asset and liability section of the balance sheet. It interprets current cash flow (WC) as either the current assets net of current liabilities or as the current ratio. The concept of the operational cycle or activity measurement encompasses a cash conversion cycle (Richards & Laughlin, 1980), weighted cash conversion cycle (Gentry et al., 1990), net trade cycle (Shin & Soenen, 1998), or modified cash conversion cycle (Talonpoika et al., 2014)—which show the effectiveness of management of the operational part of WC. According to Smith and Begemann (1997), leverage measurement of WC addresses the financing component of WC in the form of long-term financing, rather than short-term financing.

The goal of a company's WC planning is optimizing the volume and length of WC investment, which typically translates into reducing investment volume and accelerating the recovery process (Nuhiu & Dermaku, 2017). Richards and Laughlin (1980) proposed the concept of an operating cycle to gauge the effectiveness of WCM. A cash conversion cycle (CCC) is defined as the net period of time between the acquisition of resources and the receipt of cash. It is calculated by deducting the payable deferral period from the total from the conversion periods of inventory and receivables. CCC is a metric commonly used to assess the effectiveness of WCM (Enqvist et al., 2014).

The primary emphasis of CCC is the length of time that cash is related to the operating cycle, as a proxy for evaluating the effectiveness of WCM; the amount of money involved at various stages of the operating cycle is not taken into consideration. Gentry et al. (1990) articulated the concept of weighted CCC (WCCC) to highlight the true resource commitment of the entire WC process. But the utilization of WCCC has become extremely challenging because of the complexity of obtaining different operating and financial data from businesses.

Shin and Soenen (1998) propose the concept of a net trade cycle (NTC), based on the concept of the number of days' worth of sales a firm needs in order to finance its working capital. Like CCC, NTC is based on the additive concept of accounts receivable days (RECD), accounts payable days (PAYD), and inventory days (INVD). However, unlike CCC, NTC uses sales as a common denominator.

Some studies (Baños-Caballero et al., 2014; Altaf & Ahmad 2019) have identified an inverted U-shaped relationship between WCM and business profitability. Baños-Caballero et al. (2014) find an inverted U-shaped relationship between WCM and business profitability for nonfinancial firms in the UK, suggesting that an ideal level of working capital investment exists for balancing costs and earnings and optimizing corporate value. In addition, using a sample of 437 nonfinancial firms in India from 2007 to 2016, Altaf and Ahmad (2019) find an inverse U-shaped relation between WCM and the return on assets (ROA).

## *2.2 Empirical background*

As one of the most significant subfields of corporate finance, WC is a crucial part of every company's financial decisions. Studying the Indian telecommunication sector, Saluja and Kumar (2012) find a trade-off between liquidity and profitability, hypothesizing that strategies designed to increase a company's liquidity might not be the best way to boost profits. Rather, a firm's profit margin will suffer if its resources are dedicated only to ensuring liquidity. With effective WC, businesses can respond swiftly to changes in fundamentals such as interest rates

and the price of raw materials, giving them an advantage over their competition (Nicholas, 2018). Numerous empirical studies have shown a correlation between WCM procedures and productivity gains for businesses (e.g., Haleem et al., 2012; De Felice et al., 2013; Petrillo et al., 2019). According to prior research, an organization's WCM policy plays a significant role in the WC-Performance relation (Digalwar et al., 2015; Wang et al., 2020). Businesses might adopt either a bold or a cautious WC approach; therefore, their risk and return dynamics might be significantly impacted by the WC approach that it chooses (Rode et al., 2021). Companies with a conservative WC strategy prefer a larger outlay of funds in their working capital accounts because they believe that it will increase sales volume and, thereby, raise profits (Panda et al., 2021).

Kerr (2020) shows that when firms have more inventory on hand, they are less likely to deplete their stock and more likely to reduce their supply costs and have more stable prices. Additionally, a rise in receivables might raise overall sales because it enables firms to give consumers additional time to complete payments for the goods and services that they purchase (Devi et al., 2020). However, significant investment in working capital balances lead to significant foreign financing, which might significantly increase the likelihood that a company would declare insolvency. Also, businesses that implement proactive WC strategies seek to tie up a smaller percentage of their available money in working capital accounts. These companies tend to reduce their investment in inventory and receivables; as a result, they tend to rely more heavily on short-term assets. Businesses can boost their revenue by shortening the amount of time that they keep their goods on hand. This strategy might significantly save the costs of warehousing, insurance, and theft (Lefebvre, 2022).

Reducing the amount of time needed to collect receivables is one further way in which an aggressive WC strategy can help a company maintain profitability. This policy helps a company hold a higher amount of available net cash. This net cash can be used to satisfy the



firm's requirement for daily liquidity and for financing long-term investment projects, which will decrease the need for costly external financing. Boisjoly et al. (2020) find that 94 percent of the companies they studied do not incorporate their working capital components in the way that the theory suggests. Hence, the WC procedures of different companies vary considerably.

Extant research on WC at Pakistani enterprises concentrates on the revenue aspects, but does not explore investor sentiment regarding WC regulations (Haider & Siddiqui, 2020). Additionally, several empirical papers have produced contrasting findings. Seth et al. (2020) find a positive correlation between working capital and financial gains in the textile industry. Iqbal et al. (2022) note that the profit margin rises with increases in the duration of the CCC at textile firms in Pakistan. Fernández-López et al. (2020) show that WC has a substantial impact on revenue growth by manufacturers. Wahab and Khan (2021) indicate that an aggressive working capital strategy has a negative impact on business efficiency. Lee and Wang (2021) similarly find a negative association between cash flow and growth in financial revenue. Akbar et al. (2021) indicate that the textile industry and Islamic market indexing enterprises in Pakistan both have an inverse U-shaped relation between WC and firm profitability. In a related study, Hassan et al. (2023) investigate the relationship between WCM and firm performance in Scandinavian markets from 2007 to 2020. Using 5,331 yearly observations from a Bloomberg database, their analysis employs multiple regressions with unbalanced panel data, revealing an inverse u-shaped relationship between WCM and firm performance. They test the robustness of the results using alternative measures of firm performance, excluding the 2008 global financial crisis period, and performing a group analysis of all countries. Panigrahi et al. (2022) research the connection between WC and business success and obtain conflicting findings, which they attribute in part to different points in a company's life cycle. They show that the correlation between WC and performance changes at different stages of a company's development. Contradictory results on the association between WCM and company success

are also obtained in global research. Nema and Lyroudi (2020) and Hossain (2020), studying Greece and Malaysia, respectively, find an inverse correlation between the length of time that a company is in a CCC and its profitability. Tobin's Q (TQ) is a measure of the profitability of a firm relative to its counterparts. Similarly, Vijayakumaran (2019) find an inverse U-shaped relation between the net trade cycle (NTC) and TQ. The lack of a statistically meaningful relationship between CCC and TQ in Jordan suggests that traders and shareholders there do not take into consideration the productivity of a firm's current assets when making investment decisions (Ahmad et al., 2022). Moussa (2018) examines the relation between WC and firm performance in four African countries and finds that the relation was strongly negative in all of them. According to Akbar et al. (2021), NTC has a detrimental impact on profits at Chinese textile businesses. Azganin et al. (2021) study the effect of WC on the profits of Malaysian enterprises based on whether they are sharia compliant. They show that SC firms have implemented superior Accounts Receivable (AR) monitoring systems and more efficient asset turnover mechanisms. As a result, they have a better return on equity (ROE) than their more conventional counterparts (Vu et al., 2019).

Several authors have examined the effect of the relationship between the GFC and WC. Akgün and Karataş (2020) investigate the impact of the GFC on the working capital of Turkish firms operating in the manufacturing sector. Creditor payment ratios are found to be significantly influenced by the GFC, and their data reveal a decline in the ratio from 15.18 in the pre-crisis era to only 5.04 during the crisis. They interpret this as showing that companies with stable operational capabilities during recessions eventually bounce back more quickly. But no prior studies have determined whether companies traded on Islamic exchanges take a different approach to WC, especially in times of economic upheaval. The goal of this study is to fill that gap in the literature.

### **3. Methodology**

#### **3.1 Sample and methodology**

##### *3.1.1 Sample design*

Our sample consists of SC and non-SC firms in the Islamic Republic of Pakistan, which is foremost among the countries that implement Islamic financing. The sample is divided into subsamples of SC and non-SC firms, based on the Dow Jones Islamic Market Index (DJIMI). All of the non-SC firms operating in the same Industry Classification Benchmark (ICB) Subsector (Level 4), are qualified as our data sample based on the DJIMI (see Section 2.1). To eliminate concern about overestimation due to outliers, we winsorize the data at the 1 percent and 99 percent levels (Iqbal et al., 2020; Kijkasiwat et al., 2022).

The goal of this paper is to identify similarities and differences in the performance of SC and non-SC firms. To do so, we need to compile detailed histories of these firms. Therefore, we employ DJIMI criteria (see Section 2.1) on SC firms from 1996 to 2020 and confirm that they have been SC for at least three years. In the previous literature, different screening criteria are used to identify SC firms, including the MSCI Islamic index, S&P sharia indexes, the FTSE Islamic index, and DJ Islamic indexes (see Ashraf, 2016; Reza & Ashraf, 2019). Following Ashraf (2016), we select non-SC firms using the selection criteria by DJ Islamic indexes: we employ a consistent approach by controlling for the leverage ratio in the sample for each year with a threshold of 33 percent and ensuring that these firms were non-SC for at least three years in a row (Raza, 2021). We exclude firms that do not satisfy this criterion. All firm-specific and macro-specific data are obtained from DataStream and the World Bank World Development Indicators (WDI) respectively.

##### *3.1.2 Variable measurement and model specifications*

Following Hassan et al. (2023) and Iqbal et al. (2020, 2022), we use three firm performance proxies as dependent variables: the return on assets (*ROA*) as net income (loss) over total assets, the return on equity (*ROE*) as net income (loss) over total equity, and the net profit margin (*NP*) net income (loss) over sales. We use working capital, proxied as current assets minus current liabilities over total assets, as an independent variable. Following Iqbal et al. (2020), we include control variables such as capital expenditure (*CAPEX*), proxied as total capital expenditures over total assets. This demonstrates that larger firms usually achieve higher performance than small firms because they have various capabilities, such as effective operations and the ability to implement economies of scale and scope (Hasan, 2022). For this reason, we should find a positive relationship between firm size and firm performance. Therefore, we use firm size (*Size*) as a control variable, measured as the natural logarithm of total assets as well as cash flow from operations (*CFO*), measured using operating cashflow over total assets. Hasan et al. (2022) document that leverage is a main variable for firm performance because higher debt can create agency problems and lead to underinvestment, hence, we measure leverage (*LEV*) as total debt over total assets. Research and development expenses (*R&D*) is measured as research and development expenses over total sales. We also use sales growth (*GROWTH*) as a control variable because prior papers have found that sales growth can increase market power, which in turn can lead to higher firm performance (Hasan et al., 2022), so we measure sales growth as the annual change in net sales and cashflow volatility (*CFO*) as the standard deviation of operating cash flows divided by average sales during the period.

Next, we describe the baseline regression model that we estimate, as follows:

$$y_{it} = \alpha + \beta x_{i,t-1} + \mu_i + \mu_t + \varepsilon_{it} \quad (1)$$

where  $y_{it}$  is the firm performance of firm  $i$  in year  $t$ .  $x_{i,t-1}$  is a vector for a one-year lag in firm-specific factors.  $\alpha$  is a constant,  $\mu_i$  is an individual error term,  $\mu_t$  is a time-specific factor, and

$\varepsilon_{it}$  is a classical error term. Following previous literature (Hassan et al., 2023; Iqbal et al., 2020, 2022), we construct our regression models, as follows:

$$ROA_{it} = \alpha + \beta_1 WC_{i,t-1} + \beta_2 CAPEX_{i,t-1} + \beta_3 SIZE_{i,t-1} + \beta_4 CFO_{i,t-1} + \beta_5 Lev_{i,t-1} + \beta_6 R\&D_{i,t-1} + \beta_7 GROWTH_{i,t-1} + \beta_8 CFVol_{i,t-1} + \mu_i + \mu_t + \varepsilon_{it} \quad (2)$$

$$ROE_{it} = \alpha + \beta_1 WC_{i,t-1} + \beta_2 CAPEX_{i,t-1} + \beta_3 SIZE_{i,t-1} + \beta_4 CFO_{i,t-1} + \beta_5 Lev_{i,t-1} + \beta_6 R\&D_{i,t-1} + \beta_7 GROWTH_{i,t-1} + \beta_8 CFVol_{i,t-1} + \mu_i + \mu_t + \varepsilon_{it} \quad (3)$$

$$NP_{it} = \alpha + \beta_1 WC_{i,t-1} + \beta_2 CAPEX_{i,t-1} + \beta_3 SIZE_{i,t-1} + \beta_4 CFO_{i,t-1} + \beta_5 Lev_{i,t-1} + \beta_6 R\&D_{i,t-1} + \beta_7 GROWTH_{i,t-1} + \beta_8 CFVol_{i,t-1} + \mu_i + \mu_t + \varepsilon_{it} \quad (4)$$

Models 2, 3, and 4 are static in nature. We use fixed effect (FE) estimation for our study relationship (Iqbal et al., 2020; Yildirim et al., 2018).

## 4. Results and discussions

### 4.1 Descriptive statistics

Table 1 gives descriptive statistics of listed Pakistani firms for all variables (dependent, independent, and control variables). The means of all the dependent variables (0.029, 0.080, and -0.019) are similar. Working capital has a mean of 0.168, which indicates that, on average, all firms in the sample have positive working capital. This also shows that, on average, firms hold more current assets than current liabilities. It demonstrates the healthy financial position of firms and their ability to repay their short-term obligations promptly.

**[Insert Table 1]**

#### 4.2 Correlation matrix

Table 2 gives a pairwise correlation matrix of all the variables (dependent, independent, and control variables) used in the baseline models. The results suggest correlation of less than 80 percent among all the key variables, indicating the absence of multicollinearity. Brooks (2014) state that coefficient correlation of more than 80 percent implies serious concerns about multicollinearity.

**[Insert Table 2]**

#### 4.3 Baseline results

This section discusses our empirical results. Table 3 reports the baseline results, showing that WC has a significantly positive relationship with all the dependent variables (proxies for firm performance). We employ an FE regression and report the results in Columns (1), (2), and (3): Column (1) reports the results with the dependent variable *ROA*, Column (2) with *ROE*, and Column (3) with *NP*. All the models include time-fixed effects.

**[Insert Table 3]**

#### 4.4 Sharia-compliant (SC) and non-sharia-compliant (non-SC) firms:

In this section, we test our main hypothesis and divide our data into two groups: SC and non-SC based on the DJIMI. Firms with leverage of less than 30 percent are considered to use SC benchmarks and non-SC if they do not (Yildirim et al., 2018). We employ all three firm proxies as dependent variables to regress on the independent variable with both subsamples of firms (SC and non-SC) in order to compare them. Table 4 reports that WC has a significantly positive relationship with *ROA*, *ROE*, and *NP*. The coefficient of *WC* is higher at non-SC firms than SC

firms, which indicates that non-SC firms use their *WC* more efficiently than SC firms. These findings are consistent with those by Huq et al. (2022) and Yildirim et al. (2018).

**[Insert Table 4]**

#### *4.5 Financial and nonfinancial firms under SC and non-SC*

For further comparative analysis, we divide the data into two further categories: financial and nonfinancial firms. Hernaus et al. (2012) find that financial firms are efficient at using a business process management approach. Table 5 reports the results for all firms: SC and non-SC financial and nonfinancial firms. Columns (1) to (9) reports the results for nonfinancial firms and Columns (10) to (18) for financial firms. Consistent with our previous findings, all the coefficients of *WC* are significant and positively related to all firm proxies. The coefficients of *WC* (including SC and non-SC firms) are higher for financial firms than nonfinancial firms, which shows that financial firms are better at business process management.

**[Insert Table 5]**

#### *4.6 Working capital, sharia compliance, and financial crisis*

Table 6 reports the results on working capital and firm performance during the global financial crisis (GFC) in 2007-2009. Using quarterly data on Japanese firms, Tsuruta (2019) shows that working capital adjustment is weaker during the GFC, but in the longer run, the GFC did not affect the relationship between working capital and firm performance. To test this argument, we divide the SC and non-SC firm data into three periods: the period before the financial crisis (1996-2006) in Panel A, the period during crisis (2007-2009) in Panel B, and the period after the crisis (2010-2020) in Panel C. We regress all the firm performance proxies on *WC* and find

a significantly positive relationship. The positive and significant coefficient of all the proxies is weaker during the crisis than in the periods before and after the crisis, showing a decline in the efficiency of working capital. These findings are persistent at SC and non-SC firms, however, non-SC firms perform very well during the crisis because of injections of liquidity.

**[Insert Table 6]**

#### *4.7 Endogeneity test: working capital and firm performance of SC and non-SC firms*

Firm performance, based on working capital, is not an exogenous process; rather, it is endogenous in industrial settings (Hasan et al., 2022, 2023; Iqbal et al., 2020; Wintoki et al., 2012). Firm performance in the previous fiscal year may have an impact on current firm performance; hence, studies on firm performance always face a potential issue with endogeneity. In unreported results, we report our findings on autocorrelation and heteroskedasticity (these results are available from the author on request). To eliminate concerns about endogeneity, following Iqbal et al. (2020), we employ an advanced panel data estimation technique, system GMM and give the results in Table 7. Once again, WC is significant and positively related to all the firm proxies, which confirms that our main findings are robust to endogeneity due to reverse causality and omitted variable bias.

**[Insert Table 7]**

## **5. Conclusion and discussion**

The goal of this study is to evaluate the association between a firm's working capital and the factors that determine its overall financial performance, specifically considering SC and non-SC factors. In addition, because SC firms are subject to limitations due to compliance with sharia, this study compares the effects of working capital on firm performance between SC and



non-SC firms. We use an FE estimator in our static regression model, which includes the ratios of ROA, ROE, and net profit margins as dependent variables.

We find that the relationship between working capital and firm performance is stronger at non-SC firms. We run various regression models with different subsamples of our data and obtain consistent results. The main reason that non-SC firms achieve higher performance is that they do not face restrictions in obtaining loans on financial markets. This source of liquidity helps non-SC firms to expedite their business operations, which results in higher firm performance.

Our findings offer useful insights for corporate decision-makers, such as by showing the differences between SC and non-SC with respect to the relationship between working capital and firm performance. This study could help top-level firm executives make better financial decisions that will ultimately benefit their business operations. Islamic law forbids interest-bearing debt, however, it is often a cost-effective way to obtain the necessary capital (financing shortfall). Debt financing is popular way to fund high-return, low-risk projects because it limits the impact of financing on the value of a company's equity. Non-SC firms tend to have leverage of more than 30 percent, which increases the risk of bankruptcy. However, SC firms tend to have lower performance than non-SC firms due of their shortage of funding.

Our findings lead to some implications for policy makers, chiefly the need to develop alternative financing instruments that comply with sharia, foster financial innovation, and address the demand for liquidity by SC firms so as to increase firm performance. Policy makers should encourage ethical financing practices and prudent risk management by non-SC firms to ensure financial stability. Additionally, enhancing investor awareness about the differences between SC and non-SC firms can lead to more informed investment decisions and efficient

capital allocation. Overall, these implications can help policy makers create a balanced, inclusive financial system that promotes economic growth and stability.

Finally, our findings offer several implications for investors, which can help them make more informed decisions about investment. Investors can assess the efficiency of a firm's WCM to evaluate its financial performance and growth potential. Diversifying investment portfolios by including both SC and non-SC firms can mitigate risks and capitalize on opportunities. Risk assessment should encompass the higher bankruptcy risk of non-SC firms. Ethical investors in an Islamic context who wish choose investments that align their personal values would benefit by understanding the financial performance of SC firms. Lastly, the need to address liquidity demands for SC firms offers opportunities for investment in alternative financing instruments, such as sukuk and Islamic financial products. Overall, these findings enhance investor understanding of WCM and firm performance and thereby better portfolio management.

Future research explore the specific constraints and opportunities faced by SC and non-SC firms in managing their working capital. It would be worthwhile to examine the role of alternative financing instruments, such as sukuk and Islamic financial products, in improving the performance of SC firms. Investigating the relationship between financial stability, risk management, and firm performance in the context of SC and non-SC firms would also be interesting. We use DJIMI criteria to screen data in this paper, but future studies could consider other screening criteria (MSCI Islamic index series, S&P sharia indexes, FTSE Islamic index) to see whether they would yield different results. Furthermore, exploring whether corporate governance practices at SC and non-SC firms affect their ability to manage working capital efficiently could provide additional insights. Finally, cross-country and cross-industry comparisons could enhance the generalizability of our findings and identify the best WCM practices in different contexts.

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Table 1. Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>ROA</i>	8,150	0.029	0.094	-0.470	0.276
<i>ROE</i>	8,150	0.080	0.296	-1.282	1.101
<i>NP</i>	8,150	-0.019	0.705	-7.302	1.079
<i>WC</i>	8,150	0.168	0.120	0.003	0.507
<i>CAPEX</i>	8,150	0.039	0.062	0.000	0.362
<i>Size</i>	8,150	7.826	2.597	0.000	13.49
<i>CFO</i>	8,150	0.042	0.104	-0.376	0.359
<i>Lev</i>	8,150	0.290	0.287	0.000	1.770
<i>R&amp;D</i>	8,150	0.000	0.002	0.000	0.036
<i>GROWTH</i>	8,150	0.143	0.938	-1.000	11.29
<i>CFVol</i>	8,150	0.122	0.291	0.000	2.752

*Note:* This table shows the mean, standard deviation, minimum, maximum and the number of observations of working capital and all dependent variables for all firms in the sample, for the full period 1996-2020. The sample firms are determined according to the Dow Jones sharia screening methodologies, with a debt-to-equity ratio of 33% (threshold). Firms with leverage ratio below the sharia threshold are considered sharia compliant (SC), otherwise, non-sharia compliant (non-SC). All variables are winsorized at the 1% and 99% level.

Table 2. Pairwise correlations matrix

Variables	ROA	ROE	NP	WC	CAP EX	Size	CFO	Lev	R& D	GROW TH	CFV ol	Une mp	GD P
ROA	1.00												
	0												
ROE	0.41	1.00											
	5*	0											
NP	0.42	0.14	1.00										
	4*	6*	0										
WC	0.21	0.09	0.07	1.00									
	5*	3*	9*	0									
CAPE X	0.16	0.10	0.07	0.00	1.000								
	8*	8*	6*	9*									
Size	0.15	0.10	0.06	-	0.180	1.00							
	7*	2*	4*	0.07	*	0							
				1*									
CFO	0.29	0.16	0.10	-	0.230	0.19	1.00						
	4*	8*	0*	0.03	*	6*	0						
				1*									
Lev	-	-	-	-	0.096	0.19	-	1.00					
	0.35	0.01	0.17	0.25	*	4*	0.07	0					
	0*	1*	1*	0*			5*						
R&D	0.08	0.04	0.02	0.08	0.082	0.11	0.09	-	1.00				
	3*	6*	0*	8*	*	6*	7*	0.04	0				
								3*					
GROW TH	0.06	0.03	0.04	0.06	0.074	-	-	-	0.00	1.000			
	0*	0*	5*	2*	*	0.02	0.03	0.02	5				
						7*	3*	8*					
CFVol	-	-	-	0.04	-	-	-	0.00	-	-	1.00		
	0.16	0.03	0.04	5*	0.104	0.40	0.13	5	0.05	0.013	0		
	2*	6*	5*	*	1*	3*			2*	*			
	-	0.01	-	-	-	0.05	0.00	0.02	0.00	-	0.00	1.00	
Unemp	0.01	4*	0.01	0.02	0.010	9*	5	9*	7*	0.012	2	0	
	9*		1*	2*	*					*			
GDP	0.03	0.02	0.01	0.04	0.063	-	-	-	0.01	0.045	-	0.22	1.0
	6*	4*	7*	2*	*	0.05	0.02	0.01	7*	*	0.01	3*	00
						5*	5*	5*			0*		

Notes: This table shows both the mean and the coefficient correlations between the variables for the pooled SC and non-SC firms. Variable definitions are already presented in methodology section.

Table 3. Baseline regression: Working capital and firm performance

Variables	(1) <i>ROA</i>	(2) <i>ROE</i>	(3) <i>NP</i>
<i>WC</i>	0.000** (0.000)	0.001** (0.000)	0.003* (0.001)
<i>CAPEX</i>	-0.035* (0.019)	0.008 (0.048)	0.116 (0.192)
<i>Size</i>	-0.001* (0.001)	0.001 (0.002)	-0.001 (0.008)
<i>CFO</i>	0.075*** (0.012)	0.380*** (0.047)	-0.157 (0.105)
<i>Lev</i>	0.003 (0.006)	-0.006 (0.025)	-0.123 (0.109)
<i>R&amp;D</i>	-1.250* (0.667)	-1.083 (1.734)	-14.742 (17.110)
<i>Growth</i>	0.002* (0.001)	0.007** (0.003)	0.004 (0.024)
<i>CFVol</i>	0.020*** (0.005)	0.003 (0.020)	0.049 (0.079)
<i>Unemp</i>	0.002*** (0.001)	0.001 (0.002)	0.012* (0.006)
<i>GDP</i>	-0.005*** (0.001)	0.004* (0.002)	-0.023*** (0.008)
Constant	0.056*** (0.006)	0.021 (0.020)	0.034 (0.082)
Observations	5,982	7,258	5,013
R-squared	0.025	0.019	0.007
No. of firms	474	479	474
Firm and year effects	Yes	Yes	Yes

Note: This table reports the fixed effect results for all sample countries. Robust standard errors are in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 4. Working capital and firm performance: sharia compliant (SC) and non-sharia compliant (non-SC) firms

Variables	SC firms			non-SC firms		
	(1) <i>ROA</i>	(2) <i>ROE</i>	(3) <i>NP</i>	(4) <i>ROA</i>	(5) <i>ROE</i>	(6) <i>NP</i>
<i>WC</i>	0.001** (0.000)	0.009** (0.004)	0.019* (0.010)	0.006** (0.002)	0.006* (0.004)	0.058** (0.023)
<i>CAPEX</i>	1.497*** (0.187)	1.044 (1.024)	- (4.950)	-0.012 (0.257)	0.604 (0.942)	0.856 (1.581)
<i>Size</i>	0.000 (0.004)	-0.018 (0.024)	0.066 (0.059)	-0.109 (0.212)	0.154 (0.128)	1.215 (1.172)
<i>CFO</i>	0.532*** (0.172)	0.810*** (0.291)	-0.065 (0.925)	-0.128 (0.149)	0.192 (0.273)	1.007 (1.504)
<i>Lev</i>	0.261* (0.158)	-0.126 (0.647)	-0.247 (1.854)	-0.077 (0.122)	0.167 (0.110)	-0.919 (1.049)
<i>R&amp;D</i>	-0.781 (0.590)	110.642 (100.315)	-348.615 (706.543)	2.572 (2.576)	3.991 (12.406)	85.316** (40.652)
<i>Growth</i>	0.003 (0.003)	0.001 (0.010)	0.252* (0.143)	0.008 (0.005)	-0.012 (0.017)	0.184 (0.137)
<i>CFVol</i>	-0.022** (0.011)	-0.053 (0.149)	-0.188 (0.155)	-0.031 (0.188)	0.134 (0.169)	2.938 (1.901)
<i>Unemp</i>	-0.001 (0.002)	0.009 (0.014)	-0.084 (0.059)	0.005 (0.011)	-0.017 (0.017)	0.219** (0.106)
<i>GDP</i>	0.006** (0.003)	0.028* (0.015)	0.042 (0.053)	-0.014 (0.010)	0.029* (0.017)	-0.134 (0.094)
Constant	0.032*** (0.012)	0.077 (0.067)	0.551* (0.285)	0.664 (1.158)	0.886 (0.757)	7.632 (7.331)
Observations	244	165	138	156	156	156
R-squared	0.192	0.370	0.091	0.162	0.185	0.277
No. of firms	125	91	125	53	53	53
Firm and year effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the fixed effect results of all sample countries. Sample is divided into two subsamples: sharia compliant (SC) and non-sharia-compliant (non-SC) firms for the period 1996 to 2020. Columns (1) to (3) show the results for SC firms, and Columns (4) to (6) for non-SC firms. All the firm performance proxies are regressed on working capital. Robust standard errors are in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 5. Financial and nonfinancial firms divided into SC and Non-SC firms: Working capital and firm performance

Variables	Nonfinancial Firms									Financial Firms								
	All Firms			SC Firms			Non-SC Firms			All Firms			SC Firms			Non-SC Firms		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	<i>ROA</i>	<i>ROE</i>	<i>NP</i>	<i>ROA</i>	<i>ROE</i>	<i>NP</i>	<i>ROA</i>	<i>ROE</i>	<i>NP</i>	<i>ROA</i>	<i>ROE</i>	<i>NP</i>	<i>ROA</i>	<i>ROE</i>	<i>NP</i>	<i>ROA</i>	<i>ROE</i>	<i>NP</i>
<i>WC</i>	0.000*** (0.000)	0.00 (0.00)	0.0 (0.01)	0.00 (0.00)	0.00 (0.01)	0.0 (0.00)	0.00 (0.00)	0.0 (0.01)	0.0 (0.00)	0.002* (0.001)	0.00 (0.04)	0.01 (0.00)	0.0 (0.02)	0.0 (0.05)	0.03 (0.09)	0.00 (0.06)	0.0 (0.15)	0.0 (0.10)
	1* *	03* *	0* *	1* *	1* *	02 *	1* *	02* *	07 *	6* *	1* *	03* *	08* *	2** *	9* *	30* *	24* *	
<i>CAPEX</i>	0.143*** (0.016)	0.14 (0.06)	0.1 (0.07)	0.01 (0.04)	- (0.12)	0.0 (0.17)	- (0.36)	- (0.79)	- (0.14)	-0.001 (0.047)	- (0.15)	0.10 (0.31)	0.0 (0.08)	0.2 (0.24)	0.15 (0.64)	- (0.05)	- (0.39)	0.7 (0.93)
	8** *	22 *	0 *	0.24 *	0.02 *	0.11 *	0.1 *	0.2 *	0.2 *	8 *	8 *	24 *	34 *	0 *	0.04 *	0.2 *	0.5 *	
<i>Size</i>	0.005*** (0.000)	0.00 (0.02)	- (0.10)	- (0.01)	- (0.03)	- (0.02)	- (0.05)	- (0.11)	0.0 (0.02)	-0.001 (0.001)	0.00 (0.04)	0.00 (0.01)	- (0.01)	0.0 (0.05)	0.02 (0.02)	- (0.06)	- (0.47)	0.1 (0.64)
	8** *	0.0 *	0.0 *	0.00 *	0.0 *	0.0 *	0.00 *	0.0 *	0.0 *	1 *	5 *	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *	
<i>CFO</i>	0.235*** (0.009)	0.60 (0.35)	- (0.04)	0.03 (0.20)	0.08 (0.60)	0.0 (0.13)	0.04 (0.22)	0.1 (0.80)	0.1 (0.19)	0.073*** (0.037)	0.01 (0.21)	- (0.19)	0.1 (0.87)	0.2 (0.46)	- (0.15)	- (0.52)	- (0.74)	0.3 (0.51)
	3** *	0.0 *	0.0 *	0.03 *	0.08 *	0.0 *	0.04 *	0.1 *	0.1 *	3 *	0.05 *	0.1 *	0.2 *	- *	0.91 *	0.04 *	0.1 *	
<i>Lev</i>	-0.113*** (0.004)	-0.01 (0.15)	- (0.27)	0.02 (0.29)	0.11 (0.90)	- (0.37)	0.04 (0.29)	- (0.59)	0.1 (0.29)	0.006 (0.012)	0.00 (0.36)	- (0.16)	- (0.03)	- (0.06)	- (0.40)	- (0.33)	0.3 (0.69)	- (0.39)
	8** *	0.0 *	0.0 *	0.02 *	0.11 *	- *	0.04 *	- *	0.1 *	6 *	0.27 *	- *	- *	- *	- *	0.02 *	0.3 *	
<i>R&amp;D</i>	-0.134 (0.468)	0.25 (1.59)	2.5 (5.14)	1.57 (1.60)	2.22 (2.39)	1.0 (2.58)	- (1.66)	- (3.49)	- (6.57)	-15.359 (12.165)	- (25.135)	21.2 (4.16)	5.2 (2.18)	3.7 (4.29)	- (30.333)	- (2.037)	- (86.886)	12. (6.47)
	6 *	14 *	5 *	8 *	11 *	3.31 *	4.1 *	2.9 *	2.9 *	15 *	50** *	92* *	38 *	32.9 *	6.78 *	67. *	085 *	
<i>Growt h</i>	0.008*** (0.001)	0.01 (0.03)	0.0 (0.25)	0.00 (0.01)	0.00 (0.03)	- (0.04)	- (0.02)	0.0 (0.06)	0.0 (0.04)	-0.003 (0.006)	0.01 (0.20)	0.05 (0.03)	0.0 (0.05)	- (0.02)	0.29 (0.82)	- (0.12)	0.0 (0.59)	
	2** *	0.0 *	0.0 *	0.00 *	0.00 *	- *	- *	0.0 *	0.0 *	2 *	5 *	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *	
<i>CFVol</i>	0.006 (0.004)	0.00 (0.15)	0.0 (0.52)	0.00 (0.10)	- (0.29)	- (0.07)	0.05 (0.42)	- (0.35)	0.0 (0.81)	0.015 (0.010)	0.03 (0.30)	- (0.14)	0.0 (0.23)	0.0 (0.42)	0.09 (0.46)	0.00 (0.35)	- (0.59)	
	6 *	0.0 *	0.0 *	0.00 *	- *	0.05 *	- *	0.0 *	0.0 *	2 *	0.26 *	0.0 *	0.0 *	0.0 *	0.09 *	0.0 *	0.1 *	
<i>Unemp</i>	-0.000 (0.000)	-0.00 (0.02)	0.0 (0.05)	- (0.01)	0.00 (0.03)	- (0.01)	0.00 (0.02)	- (0.04)	0.0 (0.01)	0.005*** (0.001)	0.02 (0.04)	0.02 (0.01)	0.0 (0.01)	0.0 (0.04)	0.02 (0.13)	- (0.02)	0.0 (0.10)	
	1 *	0.0 *	0.0 *	0.00 *	0.0 *	- *	0.0 *	- *	0.0 *	5 *	5** *	02* *	11* *	3* *	0.00 *	0.0 *	0.0 *	
<i>GDP</i>	0.002*** (0.001)	0.00 (0.02)	- (0.09)	- (0.01)	- (0.04)	- (0.01)	- (0.02)	- (0.04)	- (0.01)	0.009*** (0.002)	0.00 (0.05)	5 (0.01)	0.0 (0.01)	0.0 (0.03)	- (0.11)	0.00 (0.03)	- (0.13)	
	6** *	0.0 *	0.0 *	0.00 *	0.0 *	0.0 *	0.0 *	0.0 *	0.0 *	9** *	5 *	0.0 *	0.0 *	0.03 *	0.03 *	4 *	0.0 *	
Const	0.011** (0.002)	0.04 (0.02)	0.0 (0.09)	0.07 (0.01)	0.18 (0.04)	0.1 (0.01)	0.02 (0.02)	0.2 (0.04)	0.3 (0.01)	0.025 (0.002)	- (0.05)	0.11 (0.01)	0.0 (0.01)	0.1 (0.03)	0.32 (0.11)	0.19 (0.03)	0.2 (0.13)	
	1 *	0.0 *	0.0 *	0.07 *	0.18 *	0.1 *	0.02 *	0.2 *	0.3 *	2 *	- *	0.11 *	0.0 *	0.1 *	0.32 *	0.19 *	0.2 *	

ant	3**	27	7**	7**	35	9	17*	85		0.05	0	15	07	7	4**	21	47*	
	(0.005)	(0.018)	(0.096)	(0.010)	(0.030)	(0.015)	(0.046)	(0.007)	(0.019)	(0.058)	(0.01)	(0.026)	(0.072)	(0.210)	(0.088)	(0.437)	(0.424)	
Observations	6,210	6,210	3,826	2,420	1,994	849	1,931	2,404	1,628	1,424	1,556	1,939	1,230	1,230	889	306	410	497
R-squared	0.046	0.053	0.005	0.016	0.010	0.024	0.002	0.011	0.012	0.048	0.028	0.020	0.038	0.035	0.032	0.042	0.066	0.036
Number of firms	474	479	474	355	355	35	310	310	310	309	124	124	115	121	115	110	105	102
Firm and year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the fixed effect results for all sample countries. The sample is divided into two subsamples such as financial firms and nonfinancial firms that are sharia compliant (SC) and non-sharia compliant (non-SC) firms for the period 1996 to 2020. Columns (1) to (9) show the results for nonfinancial firms, and Columns (10) to (18) for financial firms. In Columns (1) to (3), all the firm performance proxies are regressed on working capital for nonfinancial firms; Columns (4) to (6) for SC firms, and Columns (7) to (9) for non-SC firms. The results for financial firms are similarly reported. Robust standard errors are in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 6. Working capital and firm performance in the global financial crisis, 2007-2009

## Panel A. Pre-crisis period

Variables	Nonfinancial Firms									Financial Firms								
	All Firms			SC Firms			Non-SC Firms			All Firms			SC Firms			Non-SC Firms		
	(1) ROA	(2) ROE	(3) NP	(4) ROA	(5) ROE	(6) NP	(7) ROA	(8) ROE	(9) NP	(10) ROA	(11) ROE	(12) NP	(13) ROA	(14) ROE	(15) NP	(16) ROA	(17) ROE	(18) NP
WC	0.001 *** (0.000)	0.002 *** (0.000)	0.005 *** (0.001)	0.001 *** (0.000)	0.001 *** (0.000)	0.004 *** (0.001)	0.001 *** (0.000)	0.004 *** (0.000)	0.007 *** (0.001)	0.00 3* (0.02)	0.00 3 (0.03)	0.00 1 (0.02)	0.00 2* (0.01)	0.00 6** (0.03)	0.00 3** (0.01)	0.00 8** (0.04)	0.00 7** (0.03)	0.02 2** (0.10)
Firm control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,860	1,416	1,320	1,030	1,030	834	609	633	577	437	237	453	284	274	284	186	67	106
R-squared	0.253	0.018	0.029	0.214	0.091	0.165	0.211	0.027	0.125	0.11	0.06	0.01	0.12	0.09	0.08	0.65	0.36	0.27
No. of firms	284	254	268	225	225	216	176	180	174	96	96	96	77	75	77	54	31	42
Firm and year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

## Panel B. Period during the crisis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	ROA	ROE	NP	ROA	ROE	NP	ROA	ROE	NP	ROA	ROE	NP	ROA	ROE	NP	ROA	ROE	NP
WC	0.00 1** (0.000)	0.00 4** (0.002)	0.00 3** (0.001)	0.00 1* (0.001)	0.00 4* (0.002)	0.00 2* (0.001)	0.00 1** (0.000)	0.00 6** (0.002)	0.01 1 (0.009)	0.024 *** (0.002)	0.058 *** (0.017)	0.189 *** (0.013)	0.022 *** (0.006)	0.03 4** (0.017)	0.098 *** (0.022)	0.022 *** (0.008)	0.479 *** (0.130)	0.00 0* (0.000)
Firm control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	710	735	770	427	379	396	315	296	315	278	250	265	176	176	176	102	36	40
R-squared	0.08	0.05	0.09	0.21	0.04	0.02	0.03	0.19	0.02	0.333	0.154	0.108	0.334	0.28	0.132	0.532	0.428	0.66
No. of firms	270	281	294	199	182	186	158	151	158	100	92	98	72	72	72	47	19	22
Firm and year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

## Panel C. Post-crisis period

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	ROA	ROE	NP	ROA	ROE	NP	ROA	ROE	NP	ROA	ROE	NP	ROA	ROE	NP	ROA	ROE	NP
WC	0.000 ** (0.000)	0.003 ** (0.001)	0.000 ** (0.000)	0.00 1* (0.000)	0.00 2* (0.001)	0.00 1* (0.000)	0.00 3* (0.002)	0.02 7* (0.016)	0.00 2* (0.001)	0.00 6* (0.004)	0.091 ** (0.011)	0.00 2* (0.001)	0.023 *** (0.007)	0.031 ** (0.012)	0.009 ** (0.005)	0.03 9* (0.021)	0.02 7* (0.016)	0.00 ** (0.000)
Firm control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,303	770	1,908	1,908	1,658	1,250	1,250	416	864	985	183	690	143	690	195	195	416	3,303
R-squared	0.089	0.090	0.074	0.05	0.08	0.06	0.02	0.05	0.03	0.01	0.041	0.05	0.068	0.039	0.099	0.04	0.05	0.098
No. of firm	355	294	312	312	301	253	253	174	109	110	85	102	72	102	45	45	174	355
Firm and year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the fixed effect results for all sample countries. The sample is divided into two subsamples such as financial firms and nonfinancial firms that are sharia compliant (SC) and non-sharia compliant (non-SC) firms. The results for the period before the financial crisis are in Panel A, those during the crisis in Panel B, and those after the crisis in Panel C. Columns (1) to (9) show the results for nonfinancial firms and Column (10) to (18) for financial firms. In Columns (1) to (3), all the firm performance proxies are regressed on working capital for nonfinancial firms; Columns (4) to (6) for SC firms, and Columns (7) to (9) for non-SC firms. The results



for financial firms are similarly reported. Robust standard errors are in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

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Table 7. Endogeneity test: Working capital and firm performance

Variables	SC Firms			Non-SC Firms		
	(1) <i>ROA</i>	(2) <i>ROE</i>	(3) <i>NP</i>	(4) <i>ROA</i>	(5) <i>ROE</i>	(6) <i>NP</i>
<i>ROA</i> <sub><i>t-1</i></sub>	0.273*** (0.088)			0.291*** (0.084)		
<i>ROE</i> <sub><i>t-1</i></sub>		0.117* (0.070)			0.115* (0.068)	
<i>NP</i> <sub><i>t-1</i></sub>			0.229** (0.104)			0.397*** (0.000)
<i>WC</i>	0.001** (0.001)	0.002* (0.001)	0.005* (0.003)	0.001** (0.001)	0.004* (0.002)	0.012*** (0.000)
<i>CAPEX</i>	-0.008 (0.077)	0.095 (0.203)	0.115 (0.685)	0.049 (0.057)	-0.033 (0.103)	0.928*** (0.005)
<i>Size</i>	0.003 (0.002)	0.006 (0.005)	-0.017 (0.011)	0.005** (0.002)	0.004 (0.008)	0.014*** (0.000)
<i>CFO</i>	0.187*** (0.040)	0.280*** (0.104)	0.503 (0.372)	0.142*** (0.044)	0.287*** (0.086)	0.504*** (0.002)
<i>Lev</i>	0.062** (0.029)	0.029 (0.085)	0.211 (0.215)	0.062** (0.026)	0.108** (0.052)	-0.264*** (0.002)
<i>R&amp;D</i>	-0.756 (0.515)	-1.662 (1.497)	-1.326 (7.213)	-1.866 (3.060)	-6.436 (4.003)	22.018*** (0.471)
<i>Growth</i>	-0.001 (0.009)	-0.015 (0.018)	-0.023 (0.067)	-0.004 (0.008)	0.009* (0.005)	-0.025*** (0.000)
<i>CFVol</i>	0.001 (0.022)	0.029 (0.069)	0.107 (0.099)	-0.045 (0.040)	-0.072 (0.048)	0.000 (0.001)
Constant	-0.035* (0.021)	-0.058 (0.044)	0.006 (0.077)	-0.097*** (0.023)	-0.091 (0.078)	-0.286*** (0.002)
Observations	4,357	4,357	3,967	2,901	2,901	2,901
Number of firms	458	458	457	408	408	408
No. of instruments	307	301	307	318	318	318
AR2 <i>p</i> -value	0.760	0.635	0.441	0.387	0.625	0.603
Hansen-J	946	916	664	975	802	573
Difference in Hansen-J	157	164	202	180	176	162
<i>F</i> -stat <i>p</i> -value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table reports the system-GMM results for all sample countries. The sample is divided into subsamples for sharia-compliant (SC) and non-sharia-compliant (non-SC) firms for the period 1996 to 2020. Columns (1) to (3) show the results for SC firms and Columns (4) to (6) for non-SC firms. All the firm performance proxies are regressed on working capital. Robust standard errors are in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

### Data Statement:

This research utilized a dataset based on the Dow Jones Islamic Market Index (DJIMI) standards, focusing on firms listed on the Pakistan Stock Exchange (PSX-500) from 1996 to 2020. The dataset includes both Shariah-compliant (SC) and non-Shariah-compliant (non-SC) firms, segregated by their leverage ratio to ensure accurate classification according to DJIMI's criteria. Firm-specific and macro-specific data were meticulously collected from

Datastream and the World Development Indicators, respectively. For the analysis, we employed the Fixed Effect (FE) estimator, incorporating variables such as return on assets (ROA), return on equity (ROE), and net profit margin (NP) as dependent variables to understand the impact of working capital on firm performance. Control variables included capital expenditure (CAPEX), firm size (Size), cash flow from operations (CFO), leverage (LEV), research and development expenses (R&D), sales growth (GROWTH), and cash flow volatility (CFVol), among others. The data is publicly accessible.

### Highlights

- Non-Shariah-compliant firms outperform Shariah-compliant ones in working capital use.
- Urges non-SC firms to adopt ethical financing and prudent risk management to avoid bankruptcy risks.
- 2007-09 financial crisis differently affected firm performance based on working capital management.
- Highlights how unrestricted access to debt financing boosts non-SC firms' operations and performance.
- Provides investors with a framework for evaluating firm performance through working capital management, advocating for a diversified portfolio of SC and non-SC firms.