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Corporate Cash Holdings and Speed of Adjustment: Impact of *Shariah* Compliance

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Abstract

This study examines the impact of *Shariah* compliance and firm-specific factors on corporate cash holdings, as well as the speed of adjustment towards the target cash holdings in both *Shariah*-compliant and non-*Shariah*-compliant firms. The data of non-financial firms listed on the Pakistan Stock Exchange (PSX) for the period 2015-2020 was collected. Panel data methodology was used for analysis. The findings showed that *Shariah*-compliant firms hold more cash than non-*Shariah*-compliant firms. The adjustment speed toward the target cash holdings was also found to be faster in *Shariah*-compliant firms. While, financial leverage and cash flows showed a negatively significant effect on corporate cash holdings. On the other hand, working capital, dividends, and profitability were found to exert a significant positive effect on cash holdings. It was further revealed that trade-off and pecking order theories play a central role in explaining cash holding determinants.

***Keywords*:** cash flow, cash holding, dividends, financial leverage, Islamic finance, *Shariah* compliance, profitability, speed of adjustment

Introduction

Corporate cash holdings have been widely investigated in the corporate sector due to the importance of liquidity policy in firms. A firm cannot survive without cash because cash remains the lifeline of firms. So, every firm holds an adequate amount of cash as reserve. There are different perspectives regarding the cash ratio needed to manage business operations smoothly. For example, AlNajjar and Belghitar (2011) postulated that firms must hold an average of 9% cash or liquid asset. Due to asymmetrical information, Alnori and Alqahtani (2019) found that the cash in hand decreases the cost of financing more than external funds, which are more costly. Some other reasons for corporate cash holding decisions are described by various influential theories, such as the trade-off theory

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(Myers, 1977), pecking order theory (Myers & Majluf, 1984), and free cash flow (Jensen, 1986). At the same time, laws and principles for cash holding in conventional firms differ from those in *Shariah*-compliant firms. As Islamic finance grows, firms continue to move towards the Islamic financial system. Several studies focused on firm-specific factors as corporate cash holding determinants. Still, there is little research available regarding the determinants of corporate cash holdings in *Shariah*-compliant and non-*Shariah*-compliant firms.

The body of research available on Islamic corporate finance is growing and scholars are interested in investigating the major corporate finance decisions made by *Shariah*-compliant firms. Cash holdings and their adjustment speed are among the significant decisions made by *Shariah*-compliant firms. This study argues that cash holding decisions of *Shariah*-compliant firms are comparatively different than those of non-*Shariah*-compliant firms because of the restrictions imposed on the former. Corporate cash holdings is a vast topic and significant research on it has been conducted in most developed countries; however, little evidence is available for emerging economies. As an emerging economy, Pakistan is a suitable case to examine the role of cash holdings in *Shariah*-compliant firms. Hence, this study contributes to the literature by examining the differences in cash holding decisions between *Shariah*-compliant and non-*Shariah*-compliant firms. It also provides insight into the speed of adjustment between these firms. It also investigates whether the implementation of *Shariah* principles bring any significant change in cash holdings, an area of research which previous researchers have neglected.

Research Questions

In light of the above discussion, this research attempts to find the answers to the following questions:

1. Does *Shariah* compliance alter cash holdings and adjustment speed?
2. What is the effect of firm-specific factors the cash holding decisions of *Shariah*-compliant?
3. Which theory better depicts the cash holding determinants in *Shariah*-compliant firms?

Literature Review

Corporate Cash Holdings: Theoretical Background

Corporate cash holdings, an important element required for the durability of advanced institutions, remains uninvestigated in the context of *Shariah*-compliant firms. Research on corporate cash holdings is based on theories developed originally for finance, such as trade-off theory, pecking order theory, and free cash flow theory. According to the trade-off theory, "firms must have set a cash level that maintains a balance between marginal cost and cash holding benefit" (Alnori & Alqahtani, 2019). Cash holdings reduce the firm's stress when they are in financial crisis. They also reduce transaction cost and create investment opportunities for the firms. The firm's main purpose behind the transaction motive is to hold cash for day-to-day operations, pay for goods and services, and capitalize the net working capital (Brisker et al., 2013). Another motive is the precautionary motive because firms require liquid assets to capitalize on their assertions and investments when other types of funds are unavailable and extra costly (Opler et al., 1999). In speculative motive, firms retain and hold more cash to benefit from investment, acquisition, and contract purchases (Brisker et al., 2013).

In the existence of asymmetrical information, "the financing hierarchy of the firms is firstly they used their retained earnings then debt and equity to finance their investments" (Bigelli & Sánchez-Vidal, 2012). More specifically, Myers and Majluf (1984) stated that a firm's source of funding follows a hierarchy of internal funds (retained earnings), further external debt, risky debt, and equity (Al-Najjar & Belghitar, 2011). The theory proposed by Jensen (1986) suggests that "firms having fewer investment opportunities, managers use the reserves to improve their discretionary power instead of issuing the dividend to their shareholders." Firms escalate their non-mandatory power by building up the value of the assets under dominance, rather than focusing on investment decisions (Bugshan et al., 2021).

Shariah Compliance Screening

Rules and regulations in the *Shariah* enforce various constraints on firms involved in maintaining a compliance reputation. According to Islamic law, a firm's primary business activity should be *halal*. In contrast, businesses in *haram* products and services include gambling, pork,

pornography, interest-based financial services, and alcohol (Alnori & Alqahtani, 2019). However, *Shariah* Board (SB) and several scholars accept that over the last twelve months, the total amount of demand for the gross value of market capitalization should be less than 33% (Bin Mahfouz & Ahmed, 2014). The same is true with interest-bearing investment and cash, that is, the total amount of assets should be less than 30% of the firm's gross value of market capitalization over the last twelve months. In Islam, trade is allowed since Almighty Allah has permitted trade and forbidden interest (Quran, 2:227). In *Shariah*-compliant firms, *mudaraba* or *musharaka* are the respective financing partnership contracts (Al-Khazali et al., 2016). *Musharakah* is a permissible joint venture and partnership contract, while *mudarabah* is a profit and loss sharing agreement in which one party is *rab-al-maal* that provides capital. The second party is *mudarib* who provides labour, managerial skills, and expertise. Debt-based financing includes *tawarruq* (monetization) and *murabaha* (sale by mentioning cost plus profit margin).

Shariah Compliance and Corporate Cash Holdings

Naz et al. (2017) studied the decisions of the top managers of both *Shariah* and non-*Shariah*-compliant Pakistani and UK firms during the period 2001-2014 . The results highlighted the various financial decisions, such as working capital, dividend, and capital structure in these two types of firms. Iftikhar (2017) investigated the correlation between cash holdings and firm performance of the listed firms. The study found a significant positive relationship between corporate cash holdings and ROE. Recently, Alnori and Alqahtani (2019) reached similar findings. In Pakistan, Aslam et al. (2021) investigated the impact of corporate governance on *Shariah* and non-*Shariah*-compliant firms, covering the years 2006-2015. The results predicted that corporate governance matters for both *Shariah*-compliant firms and conventional bank performance. Furthermore, the cash holding level was found to be higher in *Shariah*-compliant firms than non-*Shariah*-compliant firms. According to Ashraf et al. (2022), cash value is significantly greater for *Shariah*-compliant firms than non-*Sharia*-compliant firms. The higher cash value is also the antecedent of a robust governance mechanism and improves the performance of these firms. Chen and Yu (2023) also arrived at similar results.

H_1: *Shariah*-compliant firms hold more cash than non-*Shariah*-compliant firms.

Speed of Adjustment of Cash Holdings

Different researchers have different viewpoints regarding the adjustment speed of cash holdings. Opler et al. (1999) studied the adjustment speed of cash holdings in US firms for the period 1971-1994. The static trade-off theory and the time series analysis support their findings. Dittmar and Duchin (2011) also reported the same conclusion. Rehman and Hussain (2018) investigated the adjustment speed of cash holdings using a sample of 200 non-financial firms listed on PSX from 2006 to 2016. They proved that firms holding cash below the optimal level have a lower speed of adjustment than those holding cash above the optimal level. However, evidence regarding the speed of adjustment in the case of *Shariah*-compliant firms is still limited.

H_2: There is greater adjustment speed of *Shariah*-compliant firms toward their optimal cash holdings.

Effects of Firm-Specific Factors

These factors include financial leverage, profitability, net working capital, growth opportunity, capital expenditure, cash flow volatility, and dividend payment. The effects of all these factors were reviewed under the two leading theories in the corporate finance literature, namely the trade-off theory and the pecking order theory.

Leverage

According to the transaction cost motive, vastly leveraged firms confront high costs at the time of investment in financial resources, triggering them to hold low cash (Chang et al., 2017;Ferreira & Vilela, 2004; Kim et al., 1998). As indicated by Ahmed, (2009) andAl-Najjar & Belghitar, (2011), costs related to bankruptcy are crucial in a growing market. Moreover, moderately leveraged firms are less monitored than highly leveraged firms, which shows managerial discreetness. Hence, after reviewing the available empirical evidence, the trade-off theory, and the pecking order theory, the following hypothesis is assumed.

H_3: Leverage has a negative effect on cash holdings for both *Shariah*-compliant and non-*Shariah*-compliant firms.

Profitability

Dittmar et al. (2003) noted that under the pecking order theory, which propagates the hierarchal order of financing, cash is for investment activities and financing. Hence, highly profitable firms can pay debt obligations, stockpile cash, and dividend payments. Contrarily, firms with low profitability hold less cash and issue debt to finance their projects (Al-Najjar & Belghitar, 2011; Demerjian et al., 2013; Dittmar et al., 2003; Ferreira & Vilela, 2004). So, with the above-mentioned empirical evidence, the following hypothesis is assumed.

H_4: Profitability has a negative impact on cash holdings for both *Shariah*-compliant and non-*Shariah*-compliant firms.

Net Working Capital

Liquidity is one of the most essential variables in trade-off theory. The conversion of a liquid asset into cash costs very low, as compared to its conversion to other less liquid assets. The trade-off theory (Ahmed, 2009; Al-Najjar, 2013; Al-Najjar & Belghitar, 2011; Almeida et al., 2004; Guizani, 2017; Morais et al., 2018; Ozkan & Ozkan, 2004) postulates that there is a significant positive relationship between cash holdings and liquidity. Hence, the following hypothesis is assumed.

H_5: Asset liquidity positively affects cash holdings for both *Shariah*-compliant and non-*Shariah*-compliant firms.

Cash Flow Volatility

Cash flows enormously affect the must-have to hold more significant cash reserves (Al-Najjar, 2013; Dittmar & Duchin, 2011). According to the trade-off theory, the highly uncertain firms tend to hold a considerable amount of cash than other firms. So, cash flows affect the firm's cash holdings. Moreover, a positive relationship exists between cash flow uncertainty and cash holdings. Some prior studies (Demir & Ersan, 2017; Jebran et al., 2019; Kariuki et al., 2015) highlighted that there is a progressive relationship between risk-return and firms' cash holdings. Ferreira and Vilela (2004) found negative impact of cash flow volatility on corporate cash holdings. In light of the above results, the following hypothesis is assumed:

H_6: Cash flow volatility positively affects cash holdings for both *Shariah*-compliant and non-*Shariah*-compliant firms.

Dividend Payments

As the trade-off theory predicts, there is a negative association between dividend payments and cash holdings, as the firms paying the dividends can trade off the expense by lowering dividend payments. There is a high chance that the firms paying dividends to their shareholders raise the finance at a low cost when they need to, by reducing the dividend payment (Ahmed, 2009; Al-Najjar & Belghitar, 2011). However, Ozkan and Ozkan (2004) postulated that external equity financing is costlier than internal financing and decreases dividend payments. On the basis of the trade-off theory, the following hypothesis is assumed:

H_7: Dividend payments have a negative effect on corporate cash holdings for both *Shariah*-compliant and non-*Shariah*-compliant firms.

Research Methodology

The current study used the screening methodology developed by PSX and Meezan Bank Limited to classify the *Shariah*-compliant and non-*Shariah*-compliant firms[1]. Financial institutes, utilities, and insurance companies were excluded from the sample as these firms have different accounting rules and capital structures. Firms with negative values in sales, equity, and total assets were also dropped. Further, firms with missing values were also excluded from the sample (Alnori & Alqahtani, 2019; Anwer et al., 2021; Bates et al., 2018; Brisker et al., 2013; Chen & Lin, 2018). Accordingly, a total of 277 non-financial firms were used as sample in this study. All the continuous variables were winsorized by 1% and 99% to deal with the outliers (Chen et al., 2014). Table 1 shows that the number of observations of every industry for *Shariah*-compliant and non-*Shariah*-compliant is also mentioned.

Table 1

Distribution of Shariah-compliant and non-Shariah-compliant firms across Ten Industries during 2015-2020

Industry No.	Industry Name	*Shariah*	Non-*Shariah*	All
1	Textile	89	72	161
2	Cement	76	63	139
3	Mineral Products	26	15	41

[1] https://www.psx.com.pk/psx/themes/psx/documents/AllShrIslamic_Idx_Brochure.pdf

Industry No.	Industry Name	*Shariah*	Non-*Shariah*	All
4	Fuel and Energy	71	61	132
5	Manufacturing	99	56	155
6	Chemicals	77	67	144
7	Food	299	119	418
8	Sugar	112	78	190
9	Electrical Machinery	78	47	125
10	Motor Vehicles	98	59	157
	Total	1025	637	1662

The measurement values of all dependent and independent variables with the corresponding theory are mentioned in Table 2.

Table 2

All Measurements of Dependent and Independent Variables

Variable	Measurement	References
Cash holding (CAN)	Ratio of cash and equivalent to total net asset	(Bugshan et al., 2021; Choi, Baik, & Farber, 2019)
Cash holding (CTA)	Ratio of cash and equivalent to total asset	(Choi et al., 2019; P. Demerjian, Lewis-Western, & McVay, 2020)
Shariah	Dummy variable if the firm complies with *Shariah* status is equal to 1 and 0 otherwise	(Bugshan et al., 2021; Ferreira & Vilela, 2004)
Financial leverage (LEV)	$\frac{Total\ Debt}{Total\ Asset}$	(Al-Najjar & Belghitar, 2011; Ali, 2011; Alnori & Alqahtani, 2019; Ullah & Kamal, 2018)
Profitability (PROF)	$\frac{Net\ Income}{Average\ Total\ Equity}$	(Al-Hadi, Eulaiwi, Al-Yahyaee, Duong, & Taylor, 2020; Ullah & Kamal, 2018)
Net Working capital (NWC)	$\frac{Current\ Asset - Curren\ Liability}{Net\ Total\ Asset}$	(Shabbir, Hashmi, & Chaudhary, 2016; Yildirim, Masih, & Bacha, 2018)

Variable	Measurement	References
Cash flow volatility (CFV)	Standard deviation of firm cash flows divided by total asset	(Al-Najjar & Belghitar, 2011; Shabbir et al., 2016)
Dividend payment (DIV)	$\frac{Dividend}{Earnings}$	(Anwer et al., 2021; Brisker et al., 2013)

Estimation

Univariate and multivariate techniques were applied to examine the differences with regard to corporate cash holdings between *Shariah*-compliant and non-*Shariah*-compliant firms. The significance of the mean difference between *Shariah*-compliant and non-*Shariah*-compliant firms was determined via *t*-test. Panel data was used to investigate the effects of *Shariah*-compliance on cash holdings via random-effects and fixed-effects models. To select the appropriate model, Hausman (1983) statistics test which helps to choose between the random-effects and fixed-effects models was implemented. Following are the equations of the static cash holdings regression model:

$$CashNet_{it}=\beta0+\beta1Shariah_{it}+\beta2LEV_{it}+\beta3PROF_{it}+\beta4NWC_{it}+\beta5CFV_{it}+\beta6DIV_{it}+YEAR+IND+£_{it} \quad (1)$$

$$CashTA_{it}=\beta0+\beta1Shariah_{it}+\beta2LEV_{it}+\beta3PROF_{it}+\beta4NWC_{it}+\beta5CFV_{it}+\beta6DIV_{it}+YEAR+IND+£_{it} \quad (2)$$

Adjustment speed estimation is shown in the regression equations 3 and 4 (Alnori & Alqahtani, 2019; Park et al., 2016). Here are the equations of the speed of adjustment regression:

$$CashNet_{it} = \beta0 + \beta1Cash_{it-1} + \beta2Shariah_{it} + \beta3Cash_{it-1}*\beta1Shariah_{it} + \beta4LEV_{it} + \beta5PROF_{it} + \beta6NWC_{it} + \beta10CFV_{it} + \beta11DIV_{it} + YEAR + IND + £_{it} \quad (3)$$

$$CashTAit = \beta0 + \beta1Cash_{it-1} + \beta2Shariah_{it} + \beta3Cash_{it-1}*\beta1Shariah_{it} + \beta4LEV_{it} + \beta5PROF_{it} + \beta6NWC_{it} + \beta10CFV_{it} + \beta11DIV_{it} + YEAR + IND + £_{it} \quad (4)$$

Results and Discussion

Table 3 presents the descriptive statistics of all the variables used in this study. Cash holdings were measured using two alternative proxies, namely ‘cash to net assets’ and ‘cash to total assets’. The mean is the first statistical

effect of the investigated variable. The average cash value to net assets (CAN) is 11.6% with a standard deviation of 18.5%. While, the mean of cash to total asset (CTA) is 0.087 and the standard deviation is 0.107. Companies show the leverage (LEV) mean and standard deviation of 0.074 and 0.092. The average net working capital (NWC) is 0.102 and the standard deviation is 0.351. The dividend (DIV) mean is 0.183 and the standard deviation is 0.296. The average profitability (PROF) is 0.043 and the standard deviation is 0.086. The last variable is cash flow (CFV), with a mean of 0.095 and a standard deviation of 0.088. The highest and lowest values in the data of the variables are in the maximum and minimum columns.

Table 3
Descriptive Statistics-Overall

Variable	Obs	Mean	Std. Dev.	Min	Max
CAN	1662	0.116	0.185	0.001	1.100
CTA	1662	0.087	0.107	0.001	0.524
LEV	1662	0.074	0.092	0.000	0.392
NWC	1662	0.102	0.351	-1.786	1.041
DIV	1662	0.183	0.296	-0.113	2.047
PROF	1662	0.043	0.086	-0.202	0.331
CFV	1662	0.095	0.088	-0.164	0.375

Table 4 shows the difference in mean concerning *Shariah* and non-*Shariah* compliant firms. The primary motive of this test was to determine whether the *Shariah*-compliant firms hold more cash than the non-*Shariah*-compliant firms. As shown in the table, the mean of cash to net assets and cash to total assets in *Shariah*-compliant firms is higher than in non-*Shariah*-compliant firms. Further, *t*-test shows that the mean value of the *Shariah*-compliant firms is significantly higher than that of non-*Shariah*-compliant firms. Moreover, the leverage level is lower in *Shariah*-compliant firms than non-*Shariah*-compliant firms. This is the same as the findings of Alnori and Alqahtani (2019) for Saudi Arabian market. They found that the leverage level in *Shariah*-compliant firms is lower than non-*Shariah*-compliant firms in the country. It can also be observed that the net working capital and profitability are higher in *Shariah*-compliant firms than in their conventional peers. Likewise, it is evident that *Shariah*-compliant firms depend more on internal cash flows. These findings are aligned with the study of Akguc and Al Rahahleh (2018). Furthermore, the table depicts

that the dividend payout ratio in *Shariah*-compliant firms is less than in non-*Shariah* compliant firms. Moreover, the value of the last variable, that is, cash flow volatility, is also higher in *Shariah*-compliant firms than in non-*Shariah*-compliant firms.

Table 4
Difference of Mean between Shariah and Non-Shariah Firms

Variables	Non-*Shariah* Mean = 637	*Shariah* Mean = 1025	Mean Diff
CAN	0.101	0.126	-0.025***
CTA	0.076	0.094	-0.017***
LEV	0.095	0.062	0.033***
NWC	0.026	0.149	-0.123***
DIV	0.139	0.210	-0.071***
PROF	0.023	0.055	-0.033***
CFV	0.084	0.103	-0.019***

The pairwise correlations of matrices of all the independent and dependent variables used in regression analysis are shown in Table 6. Table 4 suggests no multicollinearity because the correlation between all the independent variables is less than (0.55). The leverage (LEV) negatively correlates with the cash holding proxies (CAN and CTA) at a 0.01 level of significance. In contrast, the correlation between other independent variables, net working capital (NWC), dividend (DIV), profitability (PRO), and cash flows (CFV) with cash holding proxies, are positive and significant.

Table 5
Pairwise Correlation

Variables	CTA	CAN	LEV	NWC	DIV	PROF	CFV
CTA	1						
CAN	0.976	1					
LEV	-0.229	-0.221	1				
NWC	0.527	0.520	-0.155	1			
DIV	0.336	0.325	-0.133	0.312	1		
PROF	0.392	0.361	-0.131	0.446	0.404	1	
CFV	0.292	0.270	0.003	0.364	0.357	0.943	1

Table 6 shows the static model evaluation of the *Shariah*-compliant and non-*Shariah*-compliant firms. Cash to Total Asset (CTA) is an independent variable. The results of *t*-test show that the unobserved individual firms' effect is not insignificant statistically. Hence, the null hypothesis is rejected. It is implicit that OLS regression for estimating the cash holding relationship and establishing financial determinants is unsuitable, expressing heteroskedasticity. While, the results of Hausman test recommend the rejection of null hypothesis due to the deficit of correlation between the unobserved individual firms' effect and the regressors. This shows that the random-effects model is the most suitable method for relationship modelling between financial determinants and cash holdings. Table 7 depicts the panel regression effect of *Shariah* status on cash holdings (cash to net assets).

The proxy to cash holdings, that is, cash to net asset is summarized below in Tables 7 and 8. *Shariah* is the primary variable in regression, the dummy variable that correlates the results between the two groups of cash holdings. The coefficient sign of the variable *Shariah* is negative and statistically significant at a significance level of $p < 0.01$. It implies that the *Shariah*-compliant firms hold more cash than the non-*Shariah*-compliant firms.

The results in Table 6 report that *Shariah*-compliance shapes firms' cash holding decisions and explains the optimal cash holding difference among the two types of firms. Notably, the cash holding level in *Shariah*-compliant firms is more than that of the non-*Shariah*-compliant firms. The high level of cash holdings in *Shariah*-compliant firms verifies the hypothesis that religious restrictions on these firms prohibit them to rely on external financing and inflict significant transaction costs. Past research on other countries also revealed the same results (Alnori & Alqahtani, 2019; Bugshan et al., 2021; Choi et al., 2019; Dittmar et al., 2003; Ferreira & Vilela, 2004; Guizani, 2017).

Furthermore, the table shows that leverage has a statistically negative association with cash holdings to net asset at a significance level of 1%. It indicates that firms with access to external financing hold less cash than those with a limited access to external financing. This finding is in line with the pecking order theory. Furthermore, the difference in leverage and cash holding level between *Shariah* and non-*Shariah*-compliant firms is associated with the transaction cost of the trade-off theory. The third

hypothesis is that leverage negatively affects both types of firms. This finding is compatible with the past studies on cash holdings (Al-Najjar, 2013; Anand et al., 2018; Chen & Lin, 2018; Choi et al., 2019; Dittmar et al., 2003; Opler et al., 1999). The net working capital is positively associated with cash holdings to net asset at β 0.210, indicating that firms have incurred excess current liabilities. The cash conversion cycle is longer and this variable is connected with the pecking order theory. The fifth hypothesis is accepted due to the positive association with cash in both *Shariah*-compliant and non-*Shariah*-compliant firms. Prior studies depicted the same results (Opler et al., 1999; Wang & Kabiraj, 2016).

The dividend positively affects cash holding with significant (1%) and β 0.085 between shariah-compliant and non-shariah-compliant firms. It implies that both types of firms pay dividends to maximize their shareholders' wealth. So, the seventh hypothesis is rejected due to the positive relationship between dividends and cash holdings. Moreover, the current findings are the same as the findings of previous researches (Al-Najjar, 2013). Furthermore, for *Shariah*-compliant firms, profitability has a positive but insignificant effect with β 0.985, although an insignificant relationship also exists for non-*Shariah*-compliant firms. According to the pecking order theory, the positive association of profitability with *Shariah*-compliant firms reveals that these firms mainly rely on internal funds rather than external financing because of *Shariah* restrictions (Ahmed, 2009; Alnori & Alqahtani, 2019). The results are consistent with the results of prior researches (Al-Najjar, 2013; Dittmar et al., 2003; Errico & Sundararajan, 2002; Ferreira & Vilela, 2004). Furthermore, the results also indicate an insignificant relationship of profitability with non-*Shariah* compliant firms. These results are the same as the results of Guizani (2017). Finally, the negative relationship of cash flow with cash holdings to net assets is significant at 1% level. Firms with limited or no access to external financing hold more cash for precautionary reasons when faced with uncertainty in cash flows (Demerjian et al., 2020).

Table 6

Regression: Effect of Shariah Status on Cash Holdings (Cash to Net Assets)

Variable	Pool OLS		Year Fixed Effect	
CTN	Coef	*t*-value	Coef	*t*-value
Shariah Status	0.031	3.91***	0.032	3.970***

Variable	Pool OLS		Year Fixed Effect	
CTN	Coef	*t*-value	Coef	*t*-value
LEV	-0.189	-5.06***	-0.191	-5.070***
NWC	0.210	8.78***	0.208	8.730***
DIV	0.085	3.83***	0.086	3.790***
PROF	0.985	6.05***	1.026	6.130***
CF	-0.737	-5.51***	-0.763	-5.510***
Constant	0.141	13.51***	0.143	9.970***
R^2	0.339			0.342
F-test	52.785***			29.057***
Akaike crit. (AIC)	-1566.064			-1563.650
Bayesian crit. (BIC)	-1528.153			-1498.661

Note. *** p<.01, ** p<.05, * p<.1*

Table 7

Panel Regression: Effect of Shariah Status on Cash Holdings (Cash to Net Assets)

Variable	Fixed Effect		Random Effect	
CTN	Coef	*t*-value	Coef	*t*-value
Shariah Status	0.032	4.040***	0.031	3.960***
LEV	-0.191	-4.320***	-0.189	-4.290***
NWC	0.208	17.090***	0.210	17.270***
DIV	0.086	6.160***	0.085	6.150***
PROF	1.026	6.740***	0.985	6.530***
CFV	-0.763	-5.350***	-0.737	-5.210***
Constant	0.142	13.670***	0.141	13.590***
R^2				
within	0.3402			0.3401
between	0.3005			0.3075
overall	0.3390			0.3390
F-test / Wald chi2	141.773***			848.89***
Hausman (1978) specification test	7.873			

Note. *** p<.01, ** p<.05, * p<.1*

Cash holdings in terms of the proxy cash to total assets is summarized below in tables 4.6 and 4.7. *Shariah* is the primary variable in regression. This dummy variable correlates the results between the two groups of cash holdings (*Shariah*-compliant and non-*Shariah*-compliant firms). In cash holding proxy cash to total assets, the effect of *Shariah* compliance on cash holdings is negative with a coefficient of -0.017 and significant at 1% level. It confirms that the *Shariah*-compliant firms hold more cash than the non-*Shariah*-compliant firms. So, the first hypothesis is accepted because, in Pakistan, *Shariah* restrictions are high and limit the access to external financing. Hence, *Shariah*-compliant firms have to reserve more cash due to *Shariah* restrictions (Dittmar & Mahrt-Smith, 2007; Ferreira & Vilela, 2004).

Leverage is negatively associated with both the *Shariah*-compliant and non-*Shariah*-compliant firms. The cash holding level is low due to higher leverage in both groups. Following the pecking order theory between cash holdings to total asset and the higher leverage level, there is a simultaneous existence (Dittmar et al., 2003; Ferreira & Vilela, 2004). The trade-off theory shows negative relationship of cash holdings to total asset and leverage between the group's align and transaction cost motive. Some previous studies (Al-Najjar, 2013; Al-Najjar & Belghitar, 2011; Alnori & Alqahtani, 2019; Choi et al., 2019; Guizani, 2017; Opler et al., 1999) were related to leverage. There is a positive relationship between cash holdings and working capital with a coefficient (0.118) at 1% significance level for both *Shariah*-compliant and non-*Shariah*-compliant firms. The findings reveal that liquidity is one of the essential variables in the notion of trade-off theory. The cost of conversion of a liquid asset into cash as compared to conversion to other less liquid assets. Therefore, the *Shariah*-compliant firms keep more liquid assets that can be converted into cash as compared to other firms. So, the hypothesis that both groups maintain a significant net working capital is accepted. These results align with the findings of prior researches (such asChoi et al., 2019; Dittmar & Duchin, 2011).

Dividends also have a positive relationship with cash holdings with a coefficient of 0.049 and remain significant at 1% level. It signifies that both types of firms pay dividends to their shareholders. Thus hypothesis 7 is rejected because both groups pay dividends according to the prior researches (Guizani, 2017; Haron & Ibrahim, 2012; Opler et al., 1999). Profitability is positively associated with corporate cash holdings to total

asset with a coefficient (0.689), which is significant for *Shariah*-compliant and insignificant for non-*Shariah*-compliant firms. According to the pecking order theory, cash is used for investment and financing activities. So, the profitability hypothesis is rejected due to the positive relationship of cash holdings with profitability (Al-Najjar & Belghitar, 2011; Alnori & Alqahtani, 2019; Dittmar & Mahrt-Smith, 2007; Ferreira & Vilela, 2004). There is a negative and significant relationship between cash flows and cash holdings with the coefficient (-0.505). When firms face cash flow uncertainty, they use their cash for preventive purposes. So, the hypothesis of a positive relationship with cash holdings is rejected. This finding is aligned with Ferreira and Vilela (2004) and Haron and Ibrahim (2012).

Table 8

Regression: Effect of Shariah Status on Cash Holdings (Cash to Total Assets)

Variable	Pool OLS		Year Fixed Effect	
CTA	Coef	t-value	Coef	t-value
ShariahStatus	0.017	3.700***	0.017	3.780***
LEV	-0.105	-4.550***	-0.106	-4.580***
NWC	0.118	9.720***	0.117	9.680***
DIV	0.049	4.500***	0.049	4.450***
PROF	0.689	7.660***	0.715	7.740***
CFV	-0.505	-6.580***	-0.522	-6.590***
Constant	0.103	16.960***	0.105	12.740***
R^2	0.361			0.362
F-test	76.266***			156.226***
Akaike crit. (AIC)	-3444.768			-3454.018
Bayesian crit. (BIC)	-3406.857			-3416.108

Note. **** p<.01, ** p<.05, * p<.1*

Table 9

Panel Regression: Effect of Shariah Status on Cash Holdings (Cash to Total Assets)

Variable	Fixed Effect		Random Effect	
CTA	Coef	*t*-value	Coef	*t*-value
Shariah Status	0.017	3.830***	0.017	3.740***

Variable	Fixed Effect		Random Effect	
CTA	Coef	*t*-value	Coef	*t*-value
LEV	-0.106	-4.220***	-0.105	-4.180***
NWC	0.117	16.840***	0.118	17.030***
DIV	0.049	6.180***	0.049	6.170***
PROF	0.715	8.270***	0.689	8.050***
CFV	-0.522	-6.440***	-0.505	-6.290***
Constant	0.104	17.550***	0.103	17.460***
R^2				
within	0.3623		0.3622	
between	0.2983		0.3048	
overall	0.3608		0.3608	
F-test / Wald chi2	156.23***		934.21***	
Hausman (1978) specification test	11.007			

Note. **** p<.01, ** p<.05, * p<.1*

Speed of Adjustment and Corporate Cash Holdings

The results regarding the difference in cash holdings adjustment speed between the *Shariah*-compliant and non-*Shariah*-compliant firms are depicted in Tables 10 and 11. The trade-off theory assumed that cash holding target is confirmed by the significantly lagged cash holding evaluation (lag cashNet and lag cashTA). This finding is consistent with the previous researches (Dittmar & Duchin, 2011; Gao et al., 2013; Haron & Ibrahim, 2012; Jiang & Lie, 2016). Hence, the results illustrate that both types of firms, that is, *Shariah*-compliant and non-*Shariah*-compliant firms, hold an optimal level of cash. The lag cash holding proxies coefficient (lag cashNet and lag cashTA) are 0.788 and 0.771, which show that the *Shariah*-compliant and non-*Shariah*-compliant firms have the adjustment speeds of 19% and 20%, respectively. So, among the current and optimal cash holding firms, nearly one-fifth of the gap is fulfilled within one year.

The focal point is on the interrelated variables (lagCash*Shariah status). This interaction permits us to correlate the difference between *Shariah*-compliant and non-*Shariah*-compliant firms. Hence, there is a significant negative relationship at 1% and 5% levels with coefficient values (-0.083 and -0.064) between the interrelated variables that lag cash holdings and dummy *Shariah* throughout the model, as shown in tables 9 and 10. The results show that the adjustment speed of cash holdings in *Shariah*-

compliant firms is significantly faster than that in non-*Shariah*-compliant firms. The results also reveal that the level of market imperfection among both groups, that is, *Shariah*-compliant and non-*Shariah*-compliant, varies due to the restrictions enforced on the *Shariah*-compliant firms. Due to the faster adjustment speed of cash holdings in *Shariah*-compliant firms, these firms stay away from any external source of finance.

Alnori and Alqahtani (2019) suggested that *Shariah*-compliant firms have fewer external financing sources and face higher financial constraints than non-*Shariah* compliant firms. Prior findings showed slower cash adjustment speed for *Shariah*-compliant firms, such as the findings of Ozkan and Ozkan (2004) and Venkiteshwaran (2011).

Table 10

Regression Speed of Adjustment: Effect of Shariah Status on Cash Holdings (Cash to Net assets)

Variable	Pool OLS		Year Fixed Effect	
CTN	Coef	*t*-value	Coef	*t*-value
Lag_CTN	0.785	31.350***	0.788	31.700***
Lag_CTN *ShariahStatus	0.079	2.890***	0.083	3.030***
LEV	-0.076	-2.360**	-0.080	-2.480**
NWC	0.065	6.930***	0.063	6.660***
DIV	0.014	1.310	0.013	1.230
PROF	0.181	1.600*	0.223	1.970**
CFV	-0.036	-0.340	-0.059	-0.560
Constant	0.024	3.540***	0.031	3.600***
R^2	0.704		0.709	
F-test	467.429***		303.673***	
Akaike crit. (AIC)	-2411.606		-2426.690	
Bayesian crit. (BIC)	-2369.738		-2363.889	

Note. **** p<.01, ** p<.05, * p<.1*

Table 11

Regression Speed of Adjustment: Effect of Shariah Status on Cash Holdings (Cash to Total Assets)

Variable	Pool OLS		Year Fixed Effect	
CTA	Coef	*t*-value	Coef	*t*-value
Lag_CTA	0.767	32.660***	0.771	33.080***

Variable	Pool OLS		Year Fixed Effect	
CTA	Coef	*t*-value	Coef	*t*-value
Lag_CTA *ShariahStatus	0.061	2.430**	0.064	2.590***
LEV	-0.044	-2.360**	-0.046	-2.510**
NWC	0.036	6.780***	0.035	6.500***
DIV	0.009	1.510	0.009	1.430
PROF	0.139	2.160**	0.164	2.540**
CFV	-0.044	-0.730	-0.057	-0.950
Constant	0.020	5.010***	0.024	4.890***
R^2	0.712			0.717
F-test	485.946***			316.919***
Akaike crit. (AIC)	-3979.203			-3998.365
Bayesian crit. (BIC)	-3937.335			-3935.563

Note. *** $p<.01$, ** $p<.05$, * $p<.1$

Conclusion

This research investigated the impact of corporate cash holdings on *Shariah*-compliant and non-*Shariah*-compliant firms, as well as the adjustment speed towards the target cash holdings in the non-financial firms listed on PSX. The association among the *Shariah*-compliant firms and corporate cash holdings and their determinants was examined empirically using annual data for the period 2015-2020. Moreover, the speed of adjustment regarding the optimal cash holding level was also investigated. The study established that trade-off and pecking order theories significantly explain cash holding determinants. Particularly, in *Shariah*-compliant firms, cash holdings are greater than non-*Shariah*-compliant firms. Furthermore, the adjustment speed towards the optimal level of target cash holdings is faster in *Shariah*-compliant firms than in non-*Shariah*-compliant firms.

It was determined that are limited external financing channels accessible to *Shariah*-compliant firms and the cost of external funds is much higher for Islamic firms than other firms. Hence, for the fulfilment of their financial needs and to avoid the risk of bankruptcy, *Shariah*-compliant firms hold a more significant level of cash than non-*Shariah*-compliant firms and rely more on their internal funds. Also, the transaction cost motive prompts *Shariah*-compliant firms to hold a greater level of cash than conventional firms.

Implications

This research is mainly useful for investors, policymakers, and researchers. To increase the external financing accessible to *Shariah*-compliant firms, the regulators and policymakers should further increase the market for Islamic bonds *(Sukuk).* The availability of funds to *Shariah*-compliant firms is deficient due to the financial restrictions these firms face, so the managers need to originate optimal liquidity as well as net working capital management policies and maximize the firm's value. These steps are especially needed in view of the fact that the bankruptcy risk in *Shariah*-compliant firms is higher than that of non-*Shariah*-compliant firms.

Further research should investigate firm performance and corporate liquidity of both *Shariah*-compliant and non-*Shariah*-compliant firms. Future researchers should take into account more determinants of corporate cash holdings, such as, firm size, firm growth, and capital expenditure. Due to the shortage of time, these determinants were not included in the current study and the impact of these determinants on both types of firms in terms of cash holding decisions needs to be investigated. The sample size was also very small and other researchers can take into account more sectors and companies for the purpose of analysis.

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