

The impact of cash holding, and exchange rate volatility on the firm's financial performance of all manufacturing sector in Pakistan

Sarfraz Hussain

Azman Hashim International Business School,
Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia
Govt. Imamia College Sahiwal, Pakistan
mianfraz1@gmail.com

Asan Ali Golam Hassan

Azman Hashim International Business School,
Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia
asanali@utm.my

Allah Bakhsh

Assistant Professor, Department of Commerce,
Bahauddin Zakariya University, Multan.
abkhan@bzu.edu.pk

Dr. Muhammad Abdullah

Assistant Professor,
Department of Economics, University of Sahiwal, Pakistan
mabdullah@uosahiwal.edu.pk

Abstract

Exchange rate movement is a mostly debatable issue amongst economists and strategic financial planners in the economies as a vital phenomenon, of every economy in the developing the world. This study sets out to examine the impact of cash conversion cycle, Size, Age, and exchange rate movement on firms' financial decisions. The estimation used techniques of static panel data analysis in this study; pooled OLS, random effects, and fixed effects. Interaction techniques are applied to check the impact of the exchange rate by multiplying this variable with the main variables of cash conversion cycle, that is receivable in days and payables in days. The results depict there is a significant negative relationship between return on assets and exchanger rate during the period of review while the beta of cash conversion cycle has negative value; age and size are positive and significant at 1% level with return on assets. Therefore, it is recommended that organizations that have some measure to agreement in foreign currencies can adopt some advanced hedging technique to occupy the exchange rate movements risk to improve firm's performance.

Keywords: exchange rate, cash conversion cycle, size, age, cash holding

Introduction

In many studies, it was admitted that macro-economic factors do not continually reproduce the same crucial value. These inequalities are vital for companies to implications of their strategies which were most important among the main players of the economic life. The key factor of this macro-economics is known as exchanger rate, which deviates very frequently, which helps to measure the value of the currency of the country. This imbalance measured by checking the nonconformities in comparative purchasing power parity. The exchange rate measured the same power to buy commodities and services from different economies among the nations.

Governments and academicians both agree that the firms tended to have open positions in demand for improvement from current and expected local currency devalue or overvalued. This paper is to identify the reasons for cash holding, firm age, and size, affect, as well the effects of high exposure of external currency on manufacturing sector's financial performance. The primary purpose is to identify exchange rate exposure, as well as to find out firm size and age effect, and reasons of cash holding position in a high

exchange rate volatility situation, how it affects the financial performance to different industries. There are mostly three main key exchange rate planings, the floating exchange rate regime, fixed exchange rate regime, and managed the exchange rate regime; all were applied in Pakistani economies.

Currently, government trying both regime that were floating regime and managed regime exchange rate applied and rotate according to the economic situation. The floating exchange rate regime is risky for emerging economies like Pakistani where so many other factors also affect the economic situation of the country where the stock exchange effect viciously, for example, terrorism, political instabilities, and so many macro factors. The current research objectives to addition in existing knowledge by exploring the risk connected with short term foreign exchange situations strategies and long-run foreign exchange rate positions of the firms towards, when high volatility of exchange rate exists and cannot control at the government level. This research is organized as a literature review in the upcoming section and after its methodology used by the study, and analysis and interpretation of the results and main findings conclusions of the study.

Dufey and Srinivasulu (1983) explains following forms of exchange rate risks for industries functioning in international trade, which are a transactional exposure, transformational exposure, and economic exposure. Transactional exposure defined as “the probability of loss and gain because of exchange rate fluctuations’ effect on expected cash flows.” Alternatively, we can explain, the transactional risk mostly caused by movements amongs exchange rates from the transactional date and the agreement date about futures payments in shapes of any foreign currency. The transformational risk some time called accounting risk is a risk instigate by the change of foreign money to another currency. The economic risk a risk which has changed in concerned foreign exchange rates which effect on the economic worth of business (Prakash and Gopal, 2019).

Literature reviews

Many scholars have studied the association among cash holding, firm age and size of the firms and firm’s performance (Bigelli and Sánchez-Vidal, 2012; Kipesha, 2013; Ronald Anderson and Malika Hamadi, 2016; Ben Said Hatem 2017; Guizani, 2017; Amahalu and Ezechukwu Bwatrice, 2017; Raja Muddessar Iftikhar, 2018; Vu et al., 2019). The cash conversion cycle (CCC) is used now as the quantity of cash holding during the research period (Richards and Laughlin, 1980). Guragai, Hutchison, and Farris (2019) explaining that the CCC used as a tool to calculate the liquidity and how it has influenced the performance of a company. Le (2019) recommended that the value of a firm in market affected by the CCC. Widyastuti, Oetomo, and Riduwan (2017) originate a optimistic and significant association in CCC and firm performance. Abdullah and Siddiqui (2019) proposed, during growth in the financial side, liquidity rises to some level by WCM, but there is no visible variation seen through the financial strike. Anser and Malik, (2013) show that the rise in CCC upsurges the lowest liquidness necessities of the companies and likewise a reduction in CCC cuts the lowest liquidity necessities of the companies. Anser, and Malik (2013) specified that the optimum level of liquidness situation is attained at diminished the level of liquidity, so the placement of existing funds in working capital in design to achieve the best level of liquidity which is compulsory. The research added a pattern that is associated with the CCC, which is compulsory to manage the liquidity level. In case of uncertainty, the CCC rises the minimum level, which required for liquidity to gets it manageable levels; and when the CCC declines from the lowest level which needed for liquidity, it moves downcast to lower levels. Ebben and Johnson (2011) investigate significant impact of CCC on financial performance of the firm and where it has influenced the liquidity position of the corporations.

Large size firms those having large amount of account receivables can raise sales by permitting its customers to pay in delay time (Deloof, 2003). A traditional policy might also expand the profitability of firms as it decreases the info asymmetry among buyers and sellers by cumulative the business deal on credit (Abad, and Jaggi, 2003). The conservative approach is allowing extra trade credit which supports to rise productivity as it can serve as a product diversity strategy (Mättö, and Niskanen, 2019). An increase in trade credit; may support supplier/customer longer connection (Wilner, 2000). Carnovale, Rogers, and Yenyurt (2019) explore that if there is a high level of CCC, it will boost the firm’s profitability. The correlation in CCC and profitability was found positive and important by investigators together with (Chowdhury, Alam,

Sultana, and Hamid, 2018) it seconds the conservative approach of working capital management. In an aggressive approach, a firm can adopt it where WCM techniques useless investment in both accounts receivable and the inventory (Afrifa and Tingbani, 2018) minimizing the inventory period adopting the aggressive strategy that will key factor to improved firm’s profitability because holding costs of inventory can be decreased, which may include warehouse cost of storage, spoilage, insurance of inventories, loos by theft, etc. (Turgut, Taube, and Minner, 2018).

Alibabae and Khanmohammadi (2016) studied three industries and found that the oil products industry has a confident and noteworthy relationship of ER with ROA while the automotive product industry and part found that ER has an adverse and significant relationship with ROA whereas pharmaceutical industry has a positive and significant relationship between ER and ROA. Widyastuti, Oetomo and Riduwan (2017) investigate that ER and firm financial performance have a adverse and significant association. Koech (2018) observes the listed firms in nairobi stock exchange (NSE) with a topic “the effect of capital structure on profitability” all firms selected of the financial sector suggests that firms that funded their trade activities by debts and equity all supporting the theory “pecking order.” The firms in Kenya have an adjustment of affected capital structure-directing to complex costs and low profits opposing (Ting et al., 2017) results that financial leverage performs a vital role in exploiting its shareholder’s capital. Explicitly, the research by Njenga and Jagongo (2019) about financial leverage determine the firm value where the manufacturing firms have rigid capital structure and are offered a scope of adjustment.

Concerning with firm size, experiential research on corporate finance have usually used the size of the firm as a significant and an essential firm characteristic. This feature is value seeing that business rules or taxation strategies often patron amongst small, big, and average, firms, which act of the firm’s performance (Garicano et al. 2016). Moreover, practical found, capital structure and firm size have a positive association, as that larger firms might have complex leverage in exterior funding (Kurshev and Strebulaev 2015). In context of firm size and its performance, research has needed to equate the corporate social performance among big and small firms. Let's say, Pett and wolf (2003) distinguished that when the globalizations of U.S. small level firms, the bigger firms did show their competitive designs reliable according to their size in connection with the resources, as challengers to the small firms. In the interim, researchers have established the positive association of corporate financial performance and social performance in companies with a big size (Schreck and Raithel 2015). The sustainable performance, the minor and the middle level originalities, especially from chain of the food supply, found more vulnerable to extra environmental, societal, and economic burdens than bigger companies. The positive association in the size of a firm and its performance (Doğ an, 2013).

The firm’s size affects its performance in several ways. The main benefits of big firm are its varied competences, the capability to adventure economies of scale where the solemnization of measures and its scope. These features, by the creation of the operation of processing more effective, allows larger firms to produce higher performance compared to small firms (Majumdar, 1997). Another fact recommends that size is interrelated with market power (Berk, 1995), and laterally by low market power incompetence is developed, which leads to comparatively inferior performance (Kioko, 2013). Consequently, it is ambiguous between the relationship in firm size and its performance.

In the context of age impact on firms performance, one class of research recommends that elder firms have extra experienced, due to it these firms availing more learning, are not disposed to responsibilities of newness Coad, Segarra, and Teruel (2013), and can, consequently, enjoy the higher performance. Another class of investigator, yet, recommends that senior compnies are subject getting advantage, and can avail administrative benefits that is the basic motivations of age; therefore, they are unsure to make fast changes to changing the situations and it is a risk factor to newer firms, and extra alarming, to novice firms (Majumdar, 2004). Yet again, the theory is ambiguous on issue of age of the firms.

Table 1 Literature review

| Authors | Methods | Findings |
|---------|---------|----------|
|---------|---------|----------|

| | | |
|--------------------------|---|--|
| (Dhasmana, 2015) | Results base on Panel-VAR analysis. | The observed analysis confirms the real exchange rate instability has a important impact on Indian firms' financial performance. Nonetheless, the impact differs across dissimilar firms and manufacturing firms according to their different characteristics. Moreover, currency depreciation or appreciation disturb firms' routine differently. |
| Kipsha (2013) | The panel regression analysis on data about 30 microfinance organizations covering five years. | It is found firm size has positive relationship with firms financial performance, the age usually indicates firms' experience, after empirical analysis it was found a encouraging effect on firms financial performance, and the profitability of microfinance institutions. |
| Vu et al., (2019). | In this study, it uses two different techniques of data analysis where it uses static panel the ordinary-least-square (OLS) and time series quantile regression methods | Firm's age has negative, and firm size is positive correlated with firm performance |
| Dalci et al., (2019). | Static and dynamic panel analysis techniques used to analyze the 285 firms with 2,280 observations. The sample period is eight years because the investigator took the period about those firms that adopting International Financial Reporting Standards (IFRS). | There is negative impact of CCC on ROA; the medium sized firms are not as efficient as the small firms. When the firm size get bigger, the CCC becomes large. Therefore the ROA get increased instead of decreased. |
| Ebenezer et al., (2019). | The balanced panel data was applied for these sixteen commercial banks period of study is 2009-2015 making up 112 observations. | The short period debts and long period debts these variables have a damaging impact on firm performance. |
| Hao and Song (2016). | This study uses a hierarchical regression approach | It is found that the firm's size and age have a constructive association with firm financial performance |

3 Research Methodology

To comprehend and test “the impact of cash holding, and exchange rate volatility on firm’s financial performance” from the empirical evidence, we castoff panel data in the method of earlier studies (Kim, Kim and Woods, 2011; Hatem, 2017; Guragai et al., 2019). The data of the study covered 4899 observations on 302 non-financial industrial companies listed on the Karachi Stock Exchange from 1999 to 2015. The data used about the variables in this study were established from the state bank of Pakistan (SBP) database. SBP is one of Pakistan’s principal providers of financial data and did analysis using different tools to evaluate economic indicators of Pakistan. We used Excel, EViews, and STATA software is for analysis of the panel data. Following the method used by Guizani, (2017), this study had three regression models to run, the

simple pooled ordinary least squares model and with 1st interaction effects and 2nd interaction effects, the simple random-effects model and with 1st interaction effects and 2nd interaction effects, the simple fixed effects model and with 1st interaction effects and 2nd interaction effects. The study extra examined the most suitable model of the three using the redundant fixed effects test and the Hausman test (some time named chow test). The redundant fixed effects test helps to compare the POLS model with random effects, whereas the Hausman test helps us to compare the fixed effects model and random effects. The equations narrated under displays the model used in the research to assessment:

$$ROA_{it} = \beta_0 + \beta_1(CCC)_{it} + \beta_2(FL)_{it} + \beta_3(Age)_{it} + \beta_4(Size)_{it} + \beta_5(ER)_{it} + \varepsilon_{it}$$

Eq. 1

$$ROA_{it} = \beta_0 + \beta_1(CCC)_{it} + \beta_2(FL)_{it} + \beta_3(Age)_{it} + \beta_4(Size)_{it} + \beta_5(ER)_{it} + \beta_7(RD * ER)_{it} + \varepsilon_{it}$$

Eq. 2

$$ROA_{it} = \beta_0 + \beta_1(CCC)_{it} + \beta_2(FL)_{it} + \beta_3(Age)_{it} + \beta_4(Size)_{it} + \beta_5(ER)_{it} + \beta_7(PD * ER)_{it} + \varepsilon_{it}$$

Eq. 3

$$ROE_{it} = \beta_0 + \beta_1(CCC)_{it} + \beta_2(FL)_{it} + \beta_3(Age)_{it} + \beta_4(Size)_{it} + \beta_5(ER)_{it} + \varepsilon_{it}$$

Eq. 4

$$ROE_{it} = \beta_0 + \beta_1(CCC)_{it} + \beta_2(FL)_{it} + \beta_3(Age)_{it} + \beta_4(Size)_{it} + \beta_5(ER)_{it} + \beta_7(RD * ER)_{it} + \varepsilon_{it}$$

Eq. 5

$$ROE_{it} = \beta_0 + \beta_1(CCC)_{it} + \beta_2(FL)_{it} + \beta_3(Age)_{it} + \beta_4(Size)_{it} + \beta_5(ER)_{it} + \beta_7(PD * ER)_{it} + \varepsilon_{it}$$

Eq. 6

The variables of the study defined in table-I, return on assets (ROA) (and return on equity (ROE) is a measure of a corporation's profitability, and i is number of firms ranging from 1- 302, and t is time period ranging from 1999-2015, β_0 is the intercept of equation, β_i is Coefficients of independent variables, ε_{it} is $\lambda_i + \mu_{it}$ the error term, and λ_i is constant across individuals μ_{it} is composite error term normally distributed error $\mu_{it} \sim N(0, \sigma^2\mu)$. Where ROA is taking a amount of a firm's profit, and CCC, FL, Age, and ER are independent variables, and the (RD*ER) and (PD*ER) used as interaction effects of the exchange rate with the firm financial performance. This is presumed that ER has a negative association with the corporation's ROA and ROE. If number of days reduces in CCC, it will improve cash holding and corporate profitability.

Table 2 Description of the variables

| Variables | Abbreviation | Definition | Calculations | Reference |
|-----------------------|--------------|--|--|-----------------------------|
| Return on Assets | ROA | "A measure of the amount of profit earned per dollar of investment; equal to net income divided by Total Assets of the firm." | = Net Income/Total Assets | Horne and Wachowicz (2009) |
| Return of Equity | ROE | "A measure of the amount of profit earned per dollar of investment; equal to net income divided by equity." | =Net Income/ Share Holder Equity | Horne and Wachowicz (2009) |
| Cash Conversion Cycle | CCC | "The length of time from the actual outlay of cash for purchases until the collection of receivables resulting from the sale of goods or services; also called the cash conversion cycle." | = Inventory Turnover Ratio + Receivable Days - Payables Days | Horne and Wachowicz (2009) |
| Financial leverage | FL | Ratios that show the extent to which the firm is financed by debt | = Total debt/ Shareholders' equity | Horne and Wachowicz (2009) |
| Age of the Firm's | Age | From the date of establishment, it starts | = Current Year- Year of incorporation | Toraganli and Yazgan (2016) |

| | | | | |
|--------------------------------------|-------|---|--|---|
| Log of Total Assets (Size) | Size | Log of total Assets valium of the business | = Natural log of Total Assets | Jakpar, et al., (2017) |
| Exchange rate Movement | ER | “The exchange rate (ER) indicates the number of units of individual currency that relations for exchange with another unit of currency.” | Current Exchange with US dollar eve year = Pak Rupee/US \$ | Sercu et al., (1995) |
| Real exchange rate | REER | The real exchange rate means how many goods and services in the local country can be exchanged for goods and services in any foreign country. | | Nyen Wong, and Cheong Tang, (2008). |
| 1 st interaction variable | RD*ER | The product of two independent variables or multiplication, the term (RD*ER) is called an interaction term. The impact of X on Y is independent of the value of z but the world more complicated than that? Specifically, does the impact of x depend on the value of Z holds? If “yes” then there is an interaction effect. The product term should be included such as explained in the following column of the same rows | RD*ER $Y = a + bx + (bx_1 * bx_2) + e$ | Jaccard, Wan, and Jaccard (1996). Chin et al., (2003). |
| 2 nd interaction variable | PD*ER | Product of two independent variables or multiplication, the term (PD*ER) is called interaction term | PD*ER $Y = a + bx + (bx_1 * bx_2) + e$ | Jaccard, Wan, and Jaccard (1996). Chin et al., (2003). |

3.1 Choice of the appropriate model

In present study we used the redundant fixed effects test which help to select among the POLS models and the random-effects models (Table 6 and 7). To prove the hypotheses described below.

H₀: The POLS model is best as compare to the random-effects model.

H₁: The POLS model is best as compare to the random-effects model.

Tables 6 and 7 show the outcomes of the redundant test was noteworthy (p-value 0.000). This means the result that it is rejected, the POLS model is better than the random-effects model, and it helps us to choose

the random effects model is suitable for current study. The Hausman test helps to makes comparison in random effects and fixed effects. The hypothesis developed to check the test.

H₀: The random effects model is best as compare to the fixed effects model.

H₁: The random effects model is best as compare to the fixed effects model.

Tables 6 and 7 show the Hausman test were weighty (p-value 0.000). This outcome rejects the random effects model is best as compare to the fixed effects model, and ultimately, it helps us to select the fixed effects model is appropriate for the study on hand.

3.2 Descriptive statistics

Descriptive statistics showed in Table 4 specify that companies in the selected sample hold CCC means values 4.430 levels means that the firm converts its inventories into cash at least 4.43 times in a year. We consider CCC as the liquidity position of the firms. It is found an average of 3.01 and 4.78 of ROA, ROE and their standard deviation is 1.25 and 4.81 respectively. There is the alternative dependent variable used in the study to check the firm's performance. Remarkably, the CCC (cash holdings) is observed for the firms between 1999 and 2015. The numbers also show that the firms selected in the sample have leverage ratios that means it is 3.60, and the standard deviation is 2.28, telling that the corporations do not more trust in debt funding. The age and size have a mean value of 3.24 and 9.69, and the standard deviation is 0.72 and 4.02. Plotting the cash conversion trend, the study experiential that the firms improved their cash assets meaningfully better to better to cover the financial leverage of the company. ER has a mean value of 4.26, and a standard deviation of 0.24 means there is too much variation during the selected period.

Table 3 Descriptive Statistics

| | Mean | Median | Std. Dev. | Skewness | Kurtosis | Observations |
|------|-------|--------|-----------|----------|----------|--------------|
| ROA | 3.023 | 2.839 | 1.239 | 0.875 | 4.412 | 5133 |
| ROE | 4.781 | 2.693 | 4.183 | 0.991 | 2.997 | 4898 |
| CCC | 4.428 | 4.464 | 1.395 | 0.786 | 7.957 | 4899 |
| FL | 3.675 | 4.429 | 2.246 | -0.252 | 1.907 | 5134 |
| AGE | 3.237 | 3.258 | 0.727 | -1.115 | 6.106 | 5134 |
| SIZE | 9.706 | 7.961 | 4.042 | 0.590 | 1.932 | 5134 |
| ER | 4.257 | 4.126 | 0.238 | 0.337 | 1.624 | 5134 |

3.3 Correlation matrix

Tables 4 and 5 showing the correlation among the coefficients. The variable is considered in the study. Return on equity and return on assets is destructively associated with CCC, which means it has similar effect on the firm's profitability. Where CCC, ER, and Size have a contrary correlation with ROA and ROE. While FL and Age have a positive relationship with ROA and ROE. All variable is significant, except Age is insignificant in correlation with ROA and significant about ROE at 5 %.

Table 4 Correlation Analysis

| Probability | ROA | CCC | FL | AGE | SIZE |
|-------------|-----------|-----------|-----------|----------|----------|
| CCC | -0.045*** | 1.000 | | | |
| FL | 0.161*** | 0.014 | 1.000 | | |
| AGE | 0.030** | -0.008 | -0.180*** | 1.000 | |
| SIZE | -0.081*** | -0.074*** | -0.712*** | 0.220*** | 1.000 |
| ER | -0.060*** | -0.072*** | -0.721*** | 0.294*** | 0.845*** |

Note: The definition available in Table-2 P value, 10%, 5%, 1%, declared by *, **, *** respectively.

Table 5 Correlation Analysis

| Probability | ROE | CCC | FL | AGE | SIZE |
|-------------|-----|-----|----|-----|------|
|-------------|-----|-----|----|-----|------|

| | | | | | |
|------|-----------|-----------|-----------|---------|----------|
| CCC | -0.068** | 1 | | | |
| FL | 0.340*** | 0.014 | 1 | | |
| AGE | 0.004 | -0.009 | -0.180*** | 1 | |
| SIZE | -0.330*** | -0.074*** | -0.712*** | 0.22*** | 1 |
| ER | -0.241*** | -0.073*** | -0.721*** | 0.29*** | 0.845*** |

Note: The definition available in Table-2 P-value, 10%, 5%, 1%, declared by *, **, ***

respectively.

3.4 Interpretation of results of Regression Analysis

It is founded after the selection of fixed effects model is appropriate. The tables 6 and 7, results shows that the FE model is the best fit model among all applied model, because it gives significant value of F statistics at 1% level, where F statistic is 6.14, 6.21, 6.31 respectively in case of ROA and 9.47, 17.98, 9.46 respectively when ROE is dependent variable. The R2 values are 29%, 29%, 30% respectively when ROA is dependent variable all first three research models and 38%, 53% and 38% in case when dependent variable is ROE in all research models from 4-6 which all has higher values than others all rejected models, it is signifying that the percentage previously mentioned such change in the dependent variable tacit with the five variables. Outcomes also confirm that the coefficient of liquid asset is replaced by CCC which has a negative value. The outcome of the study is also reliable where it explains that the trade-off theory, that argues that CCC alternates to reduce the dependence on cash holdings, as it can rapidly be converted into cash when it is needed. Further researchers also found the same effect (Ebben and Johnson, 2011; Afrifa and Tingbani, 2018; Le, 2019).

This research also finds a positive coefficient for FL of the businesses, which are noteworthy at the 1% level significance. The trade off theory concept makes it clear where capital asset improves shameful to a firm those can be deals in upcoming time as collateral securities to gain credit from a private supplier or financial institutions. Improving the lending capacity eliminates the motivations of holding cash, ensuing in companies taking a small number of cash holdings. The pecking order theory in cares new relationship, with the discussion, that FL consumes cash reserves to pay the creditor, as firms desire with internal funds earlier, which helps to increase the debt later. The result is supported by experiential suggestion (Afrifa and Tingbani, 2018; Chang, et al., 2017; Abdullah, and Siddiqui, 2019).

Tables 6 and 7 also show that the Age of firms was observed to take a positive association with ROA and ROE, is highly significant at 1% level of significance. This result is in line with (Majumdar, 1997; Loderer et al., 2011; Majumdar, 2004; Toraganli and Yazgan 2016; Ilaboya, and Ohiokha, 2016; Pervan et al., 2017; and Vu et al., 2019). Matured firms have a constructive association by firm financial performance; normally, it is true because they have more sources and more market repute to perform. The research also originates a positive affiliation, and highly significant coefficients of a firm's size at the 1% level, the firm's financial performance, when the case is ROA is the dependent variable. Though maximum studies to another place initiate similar variables found significant, (see the studies in Kioko, 2013; Doğan, Mesut 2013; Kurshev, and Strebulaev, 2015; Schreck, and Raitel, 2018; Ilaboya, and Ohiokha, 2016; Dalci et al., 2019) but in case of ROE it has negative coefficients in all the 4-6 models(Majumdar, 1997; Vu et al., 2019).

The ER coefficients have a negative and significant relation with firms' performance in research model from 1-3, (Hanagaki and Hori, 2015; Widyastuti et al., 2017) and positive relationship found between ER and ROE in 4-6 models of research (Runo, 2013; Alibabae and Khanmohammadi, 2016; Williams, 2018). Other interaction variables consisting of RDER and PDER were originate significant in explaining the interaction effects of the exchange rate with receivable days and payable days of the manufacturing companies (Lee, 2017). It is found that rises movements in exchange rate reasons increased changes in imports of the industry results in dipping the earning, total assets value (size) of firms. High movements of the exchange rate reasons increasing movements of forex expenditure were the case foreign currency borrowings. Consequently, this raises the net worth and total assets. If firms have a higher internal growth

rate, movements in exchange rates have a minor effect and import. Accordingly, reducing the financial performance and increase in capital expenditures. Positive fluctuations of the exchange rate reasons increase forex spending, and it needs foreign currency loan a result, decrease in firm performance, and increase capital expenditures (Nagahisarchoghaei et al., 2018).

Whereas the investigation applied six different regression models, after the accomplishment of the redundant fixed effect test and Hausman test, it is found that the fixed effects model is the most suitable. The outcomes of the fixed effects model exhibited that the impact of cash holding (CCC), and exchange rate volatility has negative effect on firm's financial performance in model 1-3, while FL, Age, Size have positive impact but in case research model 4-6 CCC and Size have negative coefficients while FL, Age, and ER have positive relation with firms performance.

Finally, this study originate that exchange rate instability demotivates Pakistani companies to hold extra cash as a protection in the high volatility days. This variable was not comprised in the previous researches conducted by different authors, and other research works that applied panel data investigation, as the degree of ER volatility is not usually used in the previous literature. Interaction techniques give a new version in this topic where it gives the direction; we can check the coefficients have changed after using interaction mean it has a mediating role in the model (Lee, 2017). **Table 6 regression analysis ROA**

| VARIABLES | Model 01 | | | A model with the firm st interaction | | | A model with second interaction | | |
|-----------|---------------------------|-------------------------|-------------------------|---|---------------------------|----------------------------|---------------------------------|---------------------------|---------------------------|
| | Pooled OLS | RE | FE | Pooled OLS | RE | FE | Pooled OLS | RE | FE |
| CCC | -0.030* ** (-2.799) | -0.023* (-1.750) | -0.018 (-1.346) | -0.054* ** (-4.882) | -0.044* ** (-3.287) | -0.0347* ** (-2.464) | -0.0510* ** (-4.6726) | -0.039* ** (-3.014) | -0.035** * (-2.507) |
| FL | 0.159* ** (16.363) | 0.099* ** (7.998) | 0.093** * (7.015) | 0.155* ** (15.769) | 0.096* ** (7.816) | 0.094** * (6.859) | 0.1284* ** (12.358) | 0.077* ** (6.093) | 0.074** * (5.486) |
| AGE | 0.122* ** (6.614) | 0.166* ** (3.829) | 0.354** * (4.690) | 0.106* ** (5.738) | 0.133* ** (3.106) | 0.279** * (3.625) | 0.1257* ** (6.8012) | 0.169* ** (3.926) | 0.335** * (4.454) |
| SIZE | 0.0130* ** (1.939) | 0.012 (1.213) | 0.020* (1.787) | 0.019* ** (2.754) | 0.022* * (2.235) | 0.029** * (2.632) | 0.0112* (1.6702) | 0.017* (1.743) | 0.029** * (2.513) |
| ER | 0.443* ** (3.711) | 0.030 (0.200) | -0.285* (-1.685) | 0.256* ** (2.073) | -0.196 (-1.247) | -0.448** * (-2.596) | 0.3733* ** (3.1291) | -0.077 (-0.507) | -0.397** * (-2.347) |
| (RD*ER) | | | | 0.015* ** (6.872) | 0.015* ** (5.649) | 0.013** * (4.517) | | | |
| (PD*ER) | | | | | | | 0.0196* ** | 0.017* ** | 0.017** * |

| | | | | | | | | | |
|--------------------------------|-----------------------------|-----------------------------|-------------------------|-----------------------|-----------------------------|-------------------------|------------------------|-----------------------------|-------------------------|
| | | | | | | | (9.6911) | (6.801) | (6.477) |
| Constant | 0.068* ** (0.144) | 1.976* ** (3.418) | 2.640** * (4.399) | 0.792* (1.620) | 2.852* ** (4.771) | 3.395** * (5.460) | 0.2464 (0.5205) | 2.247* ** (3.895) | 2.963** * (4.948) |
| Diagnostic tests | | | | | | | | | |
| R-squared | 0.07 | 0.03 | 0.29 | 0.07 | 0.03 | 0.29 | 0.08 | 0.031 | 0.30 |
| F-State | 74.55* ** | 24.41* ** | 6.14*** | 69.42* ** | 24.16* ** | 6.21*** | 78.32** * | 26.51* ** | 6.31*** |
| Redundan t Fixed Effects | | | 1501.66 *** | | | 1474.47 *** | | | 1492.41 *** |
| Hausman test | | 28.85* ** | | | 40.50* ** | | | 29.18* ** | |
| Observati ons | 4898 | 4898 | 4898 | 4898 | 4898 | 4898 | 4898 | 4898 | 4898 |
| Number of Firms | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 |

Note: The definition available in Table-2 t statistics shown in parentheses, 10%, 5%, 1%, declared by *, **, *** respectively.

Table 7 Regression analysis ROE

| VARIABLES | Model 01 | | | A model with the fir st interaction | | | A model with second interaction | | |
|-----------|--------------------------------|--------------------------------|--------------------------------|--|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|
| | Pooled OLS | RE | FE | Pooled OLS | RE | FE | Pooled OLS | RE | FE |
| CCC | - 0.243** * (-6.134) | - 0.243** * (-6.969) | - 0.174** * (-4.056) | - 0.7031* ** (-18.5865) | - 0.703* ** (-21.683) | - 0.551** * (-14.277) | - 0.287* ** (-7.077) | - 0.288** * (-8.026) | - 0.199** * (-4.364) |
| FL | 0.484** * (13.148) | 0.484** * (14.939) | 0.253** * (6.102) | 0.4213* ** (12.742 5) | 0.421* ** (14.865) | 0.204** * (5.6373) | 0.428* ** (11.064) | 0.428** * (12.547) | 0.234** * (5.518) |
| AGE | 0.362** * (4.565) | 0.362** * (5.187) | 4.947** * (20.912) | 0.2074* ** (2.9162) | 0.207* ** (3.402) | 3.229** * (15.275) | 0.387* ** (4.887) | 0.387** * (5.542) | 4.928** * (20.823) |
| SIZE | - 0.358** * (-13.507) | - 0.358** * (-15.346) | - 1.086** * (-31.289) | - 0.2099* ** (-8.6967) | - 0.210* ** (-10.146) | - 0.859** * (-27.809) | - 0.357* ** (-13.499) | - 0.357** * (-15.309) | - 1.078** * (-30.869) |
| ER | 3.762** | 3.762** | 8.285** | -0.2851 | -0.285 | 4.535** | 3.593* | 3.592** | 8.1723* |

| | | | | | | | | | |
|----------|----------|----------|----------|----------|---------|---------|---------|----------|----------|
| | * | * | * | (- | (- | * | ** | * | * |
| | (8.086) | (9.187) | (15.622) | 0.6584) | 0.768) | (9.582) | (7.714) | (8.748) | (15.335) |
| (RD*ER) | | | | 0.2593* | 0.259* | 0.284** | | | |
| | | | | ** | ** | * | | | |
| | | | | (34.672 | (40.450 | (37.929 | | | |
| | | | | 8) |) | 8) | | | |
| (PD*ER) | | | | | | | 0.038* | 0.037** | 0.017** |
| | | | | | | | ** | * | (2.057) |
| | | | | | | | (4.768) | (5.407) | |
| Constant | - | - | - | 5.4298* | 5.430* | - | - | - | - |
| | 9.638** | 9.638** | 36.123* | ** | ** | 18.781* | 9.217* | 9.217** | 35.799* |
| | * | * | ** | (3.1615) | (3.688) | ** | ** | * | ** |
| | (-5.198) | (-5.905) | (- | | | (- | (- | (-5.643) | (- |
| | | | 19.194) | | | 11.017) | 4.979) | | 18.963) |

Diagnostic tests

| | | | | | | | | | |
|-------------------------------|---------|---------|---------|---------|--------|---------|--------|---------|---------|
| R-squared | 0.15 | 0.15 | 0.38 | 0.32 | 0.32 | 0.53 | 0.16 | 0.16 | 0.38 |
| F-State | 181.77* | 181.77* | 9.47*** | 389.03* | 389.03 | 17.98** | 155.94 | 155.94* | 9.46*** |
| | ** | ** | | ** | *** | * | *** | ** | |
| Redundant Fixed Effects | | | 1562.02 | | | 1820.96 | | | 1543.82 |
| | | | *** | | | *** | | | *** |
| Hausman test | | 1504.48 | | | 1781.2 | | | 1480.78 | |
| | | *** | | | 2*** | | | *** | |
| Observatio ns | 4899 | 4899 | 4899 | 4899 | 4899 | 4899 | 4899 | 4899 | 4899 |
| Number of Firms | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 | 302 |

Note: The definition available in Table-2 t statistics shown in parentheses, 10%, 5%, 1%, declared by *, **, *** respectively.

Conclusion

The purpose of cash holding and concerned decisions in any organization is a very complex situation when ER movements are in high volatility situation, and it has the worst impact on short term funds and the other hand on day to day required for business operation. This study highlights a different view about cash holding in context with exchange rate movements, firm size, age, and FL impact on firm financial decisions. The sample is consisting of all manufacturing from Pakistan 302 firm was selected, and data range from 1999-2015 collected from State Bank of Pakistan. The result from static panel data multivariate regression analysis result shows that CCC and ER have a positive association with ROA and CCC and Size has an adverse effect on ROE. FL has Age and has a constructive impact on ROA and ROE. The interaction effect shows there is a very high impact on firm performance as we use this variable the beta value of the CCC and ER itself.

Limitations. Present study emphasizes a sample of Pakistani manufacturing firms, such as the results that can be widespread to the whole of the firms registered on the KSE. Similarly, this research excepted the services sector as well as the financial sector. Whereas this uses an unbalanced panel, excluding the firms with missing observations, increase the survivorship partiality biased.

Recommendations. Future researchers can include other sectors to makes the comparison of the manufacturing sector and financial sector. The present study consists on manufacturing sector only to

understand the motorists of cash holdings in different businesses. It can also be verified the role of corporate governance for example the organization's at local as well as at international level, composition, and independence of trade, on cash holdings about another macro factors like monetary (interest rate regime) and fiscal policies (tax rate regime) should be explored.

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