Determinants of Money Demand by Business Sector for Extending Monetary Policy Applications in Pakistan

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ABSTRACT:

The complex interplay between monetary policy, cash holdings, and their motives holds crucial importance for the economic stability, investment decisions, and financial resilience of a developing country like Pakistan. The nation is enduring a difficult period where it has a weak domestic currency, a burden of foreign debt and adverse exchange rates. Under this situation, corporate cash-holding decisions are highly influenced by monetary policy, making it crucial to explore the determinants of money demand by the business sector to extend monetary policy implications in Pakistan. In order to understand the wider effects of Pakistan's monetary policy, it is crucial to look into the elements that influence the demand for money inside the business sector. Therefore, the current study explores the determinants of money demand by the business sector for extending monetary policy applications in Pakistan and the non-linear association between cash holdings and their motives in order to assess if the priorities of business change with the change in the incidence of cash holding motives. The study used the panel quantile regression for 315 firms listed in the KSE index. The model is merited on its ability to address non-normal variables while handling the panel data sets. The results indicate that all the indicators of demand for cash by firms have a non-linear effect. Transaction and speculative motives have an inverted U-shaped effect, while precaution motives have U shaped effect.

KEYWORDS: Cash Holdings, Monetary Policy, Motives of Cash Holdings, Pakistan

Introduction

Cash holdings refer to cash on hand in a business, including short-term investments Gill & Shah (2012). Cash holding decisions are one of the vital factors that affect business financing choices, dividend payments and monetary risk controls (Amess et al., 2015). It also provides instant cash availability for daily operations, innovative business prospects, grasps quick market opportunities, business expansions, and research and development initiatives (Chen et al., 2018). Likewise, cash holdings safeguard against any financial and monetary uncertainties and risks due to economic fluctuations (Trinh et al., 2022). Therefore, cash holdings enable businesses to transact magnificently with all the market and economic uncertainties and fluctuations, effective debt management, and prudent investment decisions, eventually enhancing their sustainability and long-term performance.

Moreover, Myers and Majluf (1984), the presenters of the pecking order theory, suggest that the company's finance-related decisions are directly related to its investment decisions. The amount of cash held by a business also decreases their investment adoptions as the pecking order theory suggests that firms choose less risky financing resources first. Companies will, therefore, prioritize using internal finance sources when making investment decisions. However, the company may see a reduction in cash on hand if the amount of planned investment exceeds the amount of internal funding available to it (Saleem et al., 2021).

In contrast, trade-off theory suggests that companies should decide whether to keep a specific amount of cash on hand or invest it in projects that could be profitable for them (Tayem, 2017). If a firm chooses to hold cash for reserve while also missing lucrative investment possibilities, the firm suffers the marginal cost. If the corporation holds the most cash possible, it can trade this marginal cost for the marginal benefits it will receive, maximizing the value gained from the transaction (Opler et al., 1999). Likewise, while discussing the agency theory, Jensen (1986) explores that management has the authority to determine how the company will handle and use its cash. Due to excessive financial inflows, there may be disagreements among owners and management. By ensuring that money is available to pay dividends, management must be able to enhance the welfare of shareholders. In light of this choice, management must allocate resources for the organization in the form of liquid assets, specifically cash holdings.

Besides, a strong monetary policy framework is essential for reducing economic vulnerabilities in developing economies (Daoui, 2023). The same case is true for Pakistan, where the country is poor, indebted, has weak domestic currency and adverse foreign exchange rates. In this situation, it is highly significant to highlight the link between monetary policy as well as corporate cash holdings since the interaction between them directly influences the transmission mechanism through which changes in monetary policy impact real economic activities (Xing-quan & Wan-li, 2016; Yang et al., 2017). Similarly, understanding the motives behind cash holdings is crucial for central banks and policymakers to accurately gauge the responsiveness of individuals and businesses to monetary policy adjustments (Trinh et al., 2022). Further, the linkage between monetary policy and cash holdings is closely tied to the stability of the domestic currency and the confidence of economic mediators in its value. The presence of foreign currency holdings as an alternative store of value can complicate the effects of domestic policy actions. An all-inclusive response for interplay among monetary policy, cash holdings, and cash holding motives is indispensable for formulating effective policy strategies, promoting financial stability, and fostering sustainable economic progress in less developed economies.

Thus, the primary aim of the current study is to identify the determinants of money demand by the business sector for extending monetary policy applications in Pakistan. This study further explores the non-linear association between cash holdings and their motives in order to assess if the priorities of business change with the change in the incidence of cash holding motives. The remaining sections of this study are structured as follows: the second section discusses numerous reasons for cash holdings, which enables the formulation of the various hypotheses. The third section includes research methodology. Results and discussions are presented in the fourth section. The fifth and last section includes the conclusion and policy implications.

Motives of Cash Holdings

Companies and industries hold cash for various reasons, each with its unique set of circumstances, financial objectives, and risk tolerance. The specific reasons for cash holdings vary based on the size of the business, the dynamics of its industry, the state of the market, its stage of development, and its capital structure (Amess et al., 2015; Chen et al., 2018). Like, a tiny company might place a higher priority on transaction motivation, paying particular attention to having enough money to pay for operating costs and retain liquidity throughout the early phases of firm development. On the other hand, a large, well-established company can emphasize the strategic purpose and use cash reserves to finance R&D, market expansion, or mergers and acquisitions.

It is also crucial to note that external factors like interest rates, inflation, and access to credit markets can affect a company's reasons for retaining cash (El Ghoul et al., 2023; Lin et al., 2019; Ndou & Mokoena, 2019; Trinh et al., 2022). For instance, in an economy with low interest rates, businesses might be more likely to store capital for extended periods of time because alternative investments might yield less money. Hence, there are many different reasons for holding cash, and they all depend on the particular circumstances, financial objectives, and risk tolerance of any corporation. Companies can choose the right amount of cash reserves and link their goals with their overall financial management plan by first analyzing their unique needs and objectives.

If we comprehend the reasons for maintaining cash, we can more effectively investigate the factors influencing cash holdings (Keynes, 1937; Ye, 2018). Theoretically, there are several motives to keep cash on hand, including transactional, precautionary, and speculative (Brigham, 2008; Keynes, 1937; Trinh et al., 2022). Overall, these studies emphasize how crucial it is to comprehend why businesses and industries store cash because doing so can shed light on their risk management and financial decision-making processes and how it will influence the effectiveness of the monetary policy.

Transactional motives include the company's day-to-day cash requirement for regular business transactions and activities (Brigham, 2008). Meanwhile, precautionary motives suggest keeping cash on hand as a safety precaution in case of accidents or unforeseen events (Brigham, 2008; Trinh et al., 2022). Speculative motives accumulate cash to ensure operational safety in emergencies as well as to grasp potential investments (Trinh et al., 2022). Moreover, the reasons behind cash holdings may change over time. A company's motivations may change as it gets older and more stable, as it looks for growth prospects or makes investments in innovation to remain competitive, from a precautionary focus to a more strategic or speculative motive.

Transaction Motives

Money acts as a medium of exchange and is interchangeable with other commodities. Baumol (1952) advocates that cash reserves can be employed as an intermediary for the business to operate as a trading medium. Companies often use the money to pay for equipment, raw materials, or wages as part of their everyday production and operation processes (Ozkan & Ozkan, 2004; Rukh et al., 2017; Wirianata & De Mayo, 2023). Net working capital replaces the need for cash holding for the firm (Astuti et al., 2019; Ozkan & Ozkan, 2004; Tayem, 2017; Wirianata & De Mayo, 2023). As the ability to turn net working capital into cash is quick and inexpensive, firms usually hold modest cash and high net working capital.

Likewise, a short cash conversion cycle gives a company a chance to get funds more quickly and build up a sizable cash reserve, whereas an extended cash conversion cycle reduces the volume of cash held. As most of the previous studies show a negative association between the transaction motives of a company with its level of cash holdings (Astuti et al., 2019; Mesfin, 2016; Ndou & Mokoena, 2019; Rukh et al., 2017; Tayem, 2017; Wirianata & De Mayo, 2023), the following hypothesis can be constructed:

H1: Transaction motives negatively affect corporate cash holdings.

Precautionary Motives

The corporation keeps cash on hand to cover daily operating expenses for trade and guard against unpredictable risks and unforeseen events (Keynes, 1937). Companies want to retain extra cash on hand as a preventive measure to better manage the risks associated with uncertainty (Bates et al., 2009). Precautionary measures can be achieved by maintaining assets' tangibility, sustaining free cash flows, upholding growth opportunities and new investments, continuing dividend payouts, and keeping an effective debt-to-asset ratio.

Jensen (1986) suggests that the firm holds free cash flows in order to ease capital expenditure decisions. Capital expenditure levels are usually high for manufacturing concerns, and they have to pay frequently for such expenses; therefore, firms have less cash on hand (Guizani, 2017). Likewise, Gu and Sun (2009) reveal a positive

association between a company's cash holdings and cash flow risk when the organization is facing financing restrictions. One of the precautionary motives is to have more tangible assets in the company's asset portfolio. Companies that currently pay dividends do not need to maintain large quantities of capital because they can obtain money cheaply by cutting back on their dividend payments (Guizani, 2017). In contrast, enterprises with limited internal financing capabilities can avoid these costs by issuing shares or lowering dividend payments (Chen et al., 2018).

Firms with greater inconsistency in cash flows are more likely to run out of it because uncertainty might result in the firm spending more than anticipated (Tayem, 2017). According to Bates et al. (2009), businesses with higher cashflow risk keep more cash reserves on hand. Moreover, Ozkan and Ozkan (2004) conclude that there is a positive association between cash holding and the market to-book value of shares. Meanwhile, Rukh et al. (2017) and Tayem (2017) explore a positive relationship between cash holdings and growth opportunities. Based on the studies of (Guo et al., 2023; Jensen, 1986; Morris, 1983; Ozkan & Ozkan, 2004; Rukh et al., 2017; Tayem, 2017) the following hypothesis is developed:

H2: *Precautionary motives positively affect corporate cash holdings.*

Speculative Motives

Cash has a highly powerful characteristic compared to other assets called liquidity, which can help the corporation take advantage of favourable investment possibilities (Trinh et al., 2022). Therefore, some businesses keep cash on hand in order to take advantage of future investment possibilities, a strategy called speculative motivation, as explained by Keynes (1937). The firms tend to have a direct association between cash holdings and economic uncertainty since it is very difficult for them to raise external capital because of an increased cost of finance (Trinh et al., 2022). Likewise, the US (Duong et al., 2020) and Australian firms show a direct and significant link between cash holdings and economic policy uncertainties (Heeney et al., 2023). Bayyurt & Nizaeva (2016) and Yu et al. (2015) find that interest rates are positively associated with cash holdings. Similarly, Economic policy uncertainty positively and significantly affects cash holdings (Trinh et al., 2022). Therefore, the following hypothesis is constructed:

H3: *Speculative motives positively affect corporate cash holdings.*

Size of the Firm

Giant companies have fewer cash holdings because they get the advantage of economy of scale (Miller & Orr, 1966). Moreover, these companies have easy access to capital markets to raise money and experience fewer funding difficulties. In contrast, small firms' access to the capital market is restricted, and therefore, they have to keep more cash on hand (Han & Qiu, 2007; Ozkan & Ozkan, 2004). Empirical evidence also shows an inverse link between the size of the firms and their cash holdings (Drobetz & Grüninger, 2007; Rukh et al., 2017; Tayem, 2017). Therefore, the following hypothesis is constructed for the current study:

H4: *The size of the firm negatively affects the firm's cash holdings.*

Previous studies overlooked the modeling of cash holding of firms from the perspective of commercial money demand. This model implies that it will define how the central banks can improve the effectiveness of monetary policy. This model will help policymakers assess how changes in the monetary base or credit provisions can influence the cash holding patterns by firms and, eventually, business outcomes.

Research Methodology
Variables and Data Sources

The data is taken from the financial statement analysis report issued by the State Bank of Pakistan (2021) for the current study. According to this report, a total of 369 manufacturing companies were listed on the Pakistan Stock

Exchange during the period 2016 to 2021. 355 companies are available, of which 315 are selected as samples because of data availability, and the rest whose data sets are insufficient are discarded. The selected companies represent different sectors like textile, sugar, automobile, cement, fuel and energy, etc. As discussed earlier, studying the association between cash holding motives and cash holdings in the context of a developing country like Pakistan is crucial since it provides insights into economic stability, capital structure optimization, monetary policy implications, investment promotion, risk management, and attractiveness to foreign investors. Understanding these dynamics will help decision-makers promote sustainable economic growth, lower debt levels, and enhance the nation's overall financial stability.

Table 1 describes the variables which are used in the study. Here, the Cash holding ratio (CASH) is the dependent variable representing the firm's money demand. This study has proposed that the working capital ratio (WCR), cash conversion cycle (CCC), and operating cash in hand (OCH) are indicators of transaction motive (TRA) demand for money. While cash conversion ratio (CCR), cashflow volatility (CFV), cash ratio (CR), free cash flows (FCF), growth opportunities (GO), leverage (LEV), investment (INV), market to book ratio (MTB), tangibility (TAN) and dividend payout ratio (DPR) as indicators of precautionary motive (PRE). Lastly, long-term investments (LTI), exchange rate (ER), and interest rate (IR) are indicators of speculative motive (SPEC). The size of the firm is used as a control variable.

Table 1

Summary of Variables

Variable	Proxy	References
Dependent Variable		
Cash Holding Ratio	Cash and Cash Equivalent/ Total Assets	(Lin et al., 2019; Tayem, 2017; Wirianata & De Mayo, 2023)
Independent Variable - Transaction Motives		
Working capital Ratio	(Current assets − Current Liabilities) / Current Assets	(Wirianata & De Mayo, 2023)
Cash Conversion Cycle	Day in inventory + Collection days − Payable days	(Wirianata & De Mayo, 2023)
Operating cash on hand	Operating Cashflows	(Lin et al., 2019)
Independent Variable - Precautionary Motives		
Cash coverage ratio	(EBIT + Non-cash expenses) /Interest Expense	
Cashflow Volatility	(SD of Profit before tax + Depreciation) / Total assets over a period of 5 years	(Tayem, 2017)
Cash Ratio	Cash / Current liabilities	
Free cashflows	Net Income + depreciation − Changes in working capital − Capital Expenditure	(Jensen, 1986)
Growth Opportunities	Yearly sales growth rates	(Tayem, 2017)
Leverage	Total debt / total assets	(Lin et al., 2019; Tayem, 2017)
Investment	Capital Expenditure / Total assets	(Gao et al., 2017; Lin et al., 2019; Tayem, 2017; Wirianata & De Mayo, 2023)
Market to Book Ratio	Market value of shares / Book value of Shares	(Gao et al., 2017; Lin et al., 2019)
Tangibility	Property, plant, and equipment / Total assets	(Bayyurt & Nizaeva, 2016; Gao et al., 2017)
Dividend Payout Ratio	Dividends per share / Earnings per share	(Gao et al., 2017; *Lin et al., 2019;* Tayem, 2017)

Independent Variable - Speculative Motives		
Long term Investments	Long term Investments to total assets	(Bayyurt & Nizaeva, 2016)
Exchange rate	Rupees per dollar exchange rate at the end of the year.	(Akbar, 2023)
Interest rate	Government T bill rate per annum	(Bayyurt & Nizaeva, 2016; Ndou & Mokoena, 2019)
Control Variable		
Size	Natural Logarithm of total assets	(Lin et al., 2019; Tayem, 2017)

Methods and Estimation Equation

This study has computed indices of transactional, precautionary, and speculative motive factors using Principal Axis Factoring (PAF). Equation 1 is the parameterized form this study estimates to assess the determinants of money demand by the firms. The quadratic forms are deployed in the study, allowing the model to have variable effects whose value is determined by the incidence of that variable. A quadratic function is used when the said variable can have both positive and negative effects justified by competing theories (Haans et al., 2016).

$$CASH_{it} = \alpha_0 + \alpha_1 TRA_{it} + \alpha_2 TRA_{it}^2 + \alpha_3 PRE_{it} + \alpha_4 PRE_{it}^2 + \alpha_5 SPEC_{it} + \alpha_6 SPEC_{it}^2 + \alpha_7 SIZE_{it} + \varepsilon_{it} - (1)$$

Using these indicators, the quadratic function is estimated using Panel Quantile Regression. This model can be used even when the data is not normal (having skewness or kurtosis), and since it is a panel data model, it can also absorb the unobserved heterogeneity and make the model robust to cross-sectional heteroskedasticity. The added advantage of this model is that it can estimate the marginal effects at different percentile levels of the dependent variable (Hameed et al., 2023; Huang et al., 2023)

Results and Discussions

Table 2 provides the test statistics to confirm the sufficiency of the data to form indices. In the 3 cases, the KMO value is above 0.5, and the Bartlett test is significant, showing that the data is sufficiently spherical to be used for index making. Table 3 shows that there are 3, 9 and 3 items for TRA, PRE and SPEC index, respectively. The selected items are able to explain 44.879%, 16.05% and 43.12% of the variation in TRA, PRE and SPEC index, respectively. Further, table 4 provides the correlations of selected items with the indices. Here, the majority of the items have a high correlation with the index.

Table 2

Data sample Sufficiency

	KMO	Bartlett (Prob).
TRA	0.500	1271 (0.00)
PRE	0.689	1147 (0.00)
SPEC	0.502	1144 (0.00)

Table 3

Constructed Index Characteristics

	TRA		PRE		SPEC	
Component	Total	% of Variance	Total	% of Variance	Total	% of Variance
1	1.674	55.807	2.131	23.672	1.652	55.075
2	1.000	33.331	1.093	12.147	0.995	33.174
3	0.352	10.865	1.018	11.312	0.353	11.751
			0.999	11.095		

	TRA		PRE		SPEC	
Component	Total	% of Variance	Total	% of Variance	Total	% of Variance
			0.917	10.190		
			0.874	9.708		
			0.783	8.703		
			0.693	7.697		
			0.493	5.475		
Extraction sums of squares loadings (Eigenvalues)						
Component	Total	% of Variance	Total	% of Variance	Total	% of Variance
1	1.346	44.879	1.445	16.054	1.296	43.12

Table 4

Index − Component Correlations

Indicator no.	TRA	PRE	SPEC
1	0.820	0.192	0.803
2	-0.007	0.756	0.806
3	0.821	0.485	0.049
4		0.295	
5		0.037	
6		-0.501	
7		0.302	
8		-0.410	
9		0.047	

Table 5 shows the descriptive statistics of the variable used in the study. Here we can see that other than size, all variables have mean values smaller than standard deviation, making them over-dispersed while the size is under-dispersed. Further, the skewness and kurtosis values are not nearing 0 and 3, respectively. This denotes that the data is not normally distributed. In order to address this, Panel Quantile Regression is used, which uses the median as the central tendency, which is robust to outliers and skewness.

Table 5

Descriptive Statistics

Stats.	CASH	Size	TRA	PRE	SPEC
Sample	1969	1969	1969	1969	1969
Mean	3.970	15.454	0.000	0.000	0.000
Std. Dev.	7.889	1.906	0.868	0.842	0.886
Skewness	4.683	-0.325	8.904	0.234	-0.381
Kurtosis	35.341	3.799	138.93	7.534	1.603

Table 6 provides the estimates using panel quantile regression. The results are generated using 1969 observations from 315 firms listed in KSE. While observing the control variables, size has a negative coefficient whereby an increase in size leads to a decrease in cash holding by 3.9% on the median. This negative association between size and cash holding is because large firms have easy access to the capital market and thus hold less cash (Han & Qiu, 2007; Ozkan & Ozkan, 2004; Tayem, 2017).

For the case of transaction motive, the TRA (transaction motive) coefficient is negative, and its squared is negative too. It shows that an increase in transaction motive indicators tends to decrease cash holding by firms at

an increasing rate. The pattern of effects in Figure 3 shows the inverted U-shaped effect. This is because the index data is centred to zero, so when the data is negative, its effect becomes positive by multiplying it with the negative coefficient (-0.632). Hence it is concluded that at a low level of the transaction motive index, its increase leads to an increase in demand for cash, but at a higher level (beyond the turning point), its increase leads to a decrease in demand for cash. This is because corporations with lower cash holdings face higher transaction costs when they need to raise external funds since they have to pay higher interest rates on loans and issue more securities to raise the same amount of funds as firms with higher cash holdings (Ozkan & Ozkan, 2004; Rukh et al., 2017) . Nguyen et al. (2021) highlight that when transaction costs are high, it becomes more expensive to engage in various financial activities such as buying and selling securities, making transfers, or converting assets. As a result, entities may hold larger cash reserves to avoid frequent transactions and the associated costs.

For the case of precautionary motive, the PRE coefficient and its squared are positive, which shows that an increase in precautionary motive leads to an increase in cash holding at an increasing rate. Figure 4 depicts this pattern whereby higher precaution indicators increase the precautionary demand for cash by the firm at an increasing rate. This result is the same as the previous studies of (Guo et al. 2023; Ozkan & Ozkan, 2004; Tayem, 2017) where they mention that due to uncertain economic conditions and frequent business fluctuations, firms choose to hold more cash to protect themselves against unforeseen financial challenges. Cash provides a liquid and easily accessible asset that can be used to cover immediate expenses if income or revenue streams are disrupted.

For the case of speculative motive, the coefficient of SPEC is positive while SPEC squared is negative, showing that speculative motive has an inverted U-shaped effect on cash holding. This denotes that with the increase in the speculative motive, there will be a proportional increase in demand for cash by 0.018%, but for every unit increase in the speculative motive, there will be a fall in demand for cash by 0.024% because of increase in the opportunity cost of holding cash. According to Trinh et al. (2022) and Duong et al. (2020), companies hold larger cash reserves in anticipation of future investment opportunities in order to take advantage of favourable market conditions or undervalued assets when they become available. However, they might view cash as an asset with a lower potential for returns compared to other investment options. Holding excess cash could be seen as a missed opportunity to allocate resources to investments that could yield greater benefits.

Table 6

Panel Quantile Regression

Regression Estimates (Dep. Var. CASH)		
Variables	Coefficients	Prob.
Size	-0.040	0.000
TRA	-0.632	0.000
TRA^2	-0.022	0.000
PRE	1.813	0.000
PRE^2	0.650	0.000
SPEC	0.018	0.000
$SPEC^2$	-0.024	0.000
Regression Statistics		
Sample = 1696	Firms = 315	

Conclusion

The triangle of monetary policy, cash holdings and its motives have major implications for the financial stability, investment options, and economic sustainability of a developing country like Pakistan. Currently, the economic condition of the country is unstable, with weak local currency, the burden of foreign debt, and unfavourable

exchange rates. The monetary policy has a significant impact on how businesses decide to allocate their cash reserves in this situation. In order to understand the wider effects of Pakistan's monetary policy, it is crucial to look into the elements that influence the demand for money inside the business sector. Therefore, this study explores the determinants of money demand by the business sector for extending monetary policy applications in Pakistan. This study also explores the non-linear relationship between cash holdings and their motives in order to assess if the priorities of business change with the change in the incidence of cash holding motives. Panel quantile regression is used to achieve the study objectives for 315 firms listed in the KSE index. The results showed that all of the indicators of demand for cash by firms have a non-linear effect. Transaction and speculative motives have an inverted U-shaped effect, while precaution motives have U shaped effect. This study is instrumental in assessing what determines the cash holding by firms. The monetary policy instruments can intervene in the proposed indicators in the study to achieve macroeconomic goals, and the estimate of money demand is crucial in achieving the monetary policy targets with certainty.

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