Monetary Policy, Cash Flow and Corporate Investment: Evidence from Pakistan

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Abstract

The current research aims to study the combined effect of micro-economic factor internal cash flow (CF) and macro-economic factor monetary policy on investment behavior of non-financial firms listed on Pakistan Stock Exchange over the period of 2010-2020. Dynamic panel model is used in the study for empirical testing of the hypotheses. One-step and two step system with Quintile regression GMM estimation techniques were applied for empirically testing of hypothesis. Data were collected from secondary sources through company's annual published and audited financial statements and from company's website of 265 non-financial firms Pakistan. The results identify cash flow has an inverse relationship with investment of firms in one step system GMM i.e. simple regression. However, cash flow tends to increase the level of investment in all other regression models. The contractionary monetary policy would likely to decrease the investment. Cash flow decreases the investment of firms in lower quintile of firms as compared to high quintiles. Monetary policy decrease the investment in lower quintiles but this relationship tends to be positive when firm move towards high quintiles of firm investment. The magnitude of cash flow and monetary policy varies in all quintiles of firm investment. Overall, the results are inconclusive across all the level. This study suggested that financial managers should manage internal cash flows to increase cash reserves in order to meet capital expenditures and project's needs of non-financial firms in Pakistan.

Key words: Cash flow, monetary policy, corporate investment, dynamic panel model

Introduction

The macro level policy is imperatively designed by the monetary policy through managing the currency circulation. It contributes to flourish the economic activity that helps the firms to boost their investments. The central bank implements the monetary policy arrangement in order to accomplish various economic objectives i.e., to control inflation and to stabilize economic growth. However, due to liquidity restrictions, rising global interest rates and inflationary expectations, interest rates are expected to increase. Monetary policies would greatly affect the corporate lending and corporate investment (Kashyap et al., 1993; Morck et al., 2013). The corporate investment sensitivity with a shift in monetary policy rests on the business financial dimensions and its reliance on internally generated funds. The narrow monetary policy has a bad effect on investment decisions but the money reserves can save the firm from external borrowing difficulties (Gertler & Gilchrist, 1994). The investments are

not backed by the external borrowings all the times because the investment deficiency might put the firm under bankruptcy. The fund provision to new and additional investment in a firm is made through various internal and external alternatives. The verdicts about making capital expenditures are not only decisions which generate earnings and profits but comprise all those choices which leads to lower costs, increase profits and savings (Jangili & Kumar, 2010).

Every business's economic and financial success directly and indirectly relies upon effective management of cash flows (Liman & Mohammed, 2018). To be just profitable for a firm is not enough to consider it as financially stable and successful. A firm performance depends upon its cash flows management evaluated by using various financial measures. Firms are able to fulfill the desires of business operating, financing and investing activities by holding enough cash funds. Likewise, a firm might lead to facing adverse consequences if it lacks suitable and effective funds management policies. That's why; it is the main responsibility of managers of every firm to effectively cope with cash flows in order to avail investment opportunities desired performance. The cash flows dictate the investment decision of firms (Atrill & Mclaney, 2011; David et al., 2018).

The instable monetary policy transmission mechanism adversely affects the corporate financial structure and investment behavior. There are many prior researches done regarding the monetary policies like (Brandt & li 2003; Devereux & Schiantarelli, 1990; kadapakkam et al., 1998; Kaplan & Zingales, 1997). Specifically, the tightened monetary policy decrease investments and at this time cash flows plays a very important role for investment decisions. This study aims to identify the combined effect of cash flow and monetary policy on investment behavior of non-financial firms in Pakistan. This study contributes as follows in many key ways to established literature as limited studies are available in the context of developing country like Pakistan. Firstly, it provides the more understanding and new evidence about the macroscopic and microscopic determinants, such as monetary policies and internal cash flows and their relationship with corporate investment. Secondly, a dynamic panel model with one-step and two step system and Quintile regression GMM estimation techniques is used in the study for empirical testing of the hypotheses.

Literature Review

Monetary Policy and Investment

Monetary policy is a significant tool related to investment assessments of enterprises. (Awais, Kashif, & Raza, 2020; Yaqub, Awais, Aslam, Mohsin, & Rehman, 2022). The loose monetary policy eliminates financing problems of private sector by making loans more easily available to them (Jing et al., 2012). This entitles the firm to take the advantage of better and more investment opportunities in beneficial projects for the improvement in profits and performance. Young et al. (2017) find that in china due to contractionary monetary policy from 2003-2013 decreases the corporate investment. Zhang et al. (2020) explores U.S monetary policy and investment in R&D by Chinese companies from 2015 to 2018. This study shows that Chinese companies are having a significant positive influence on R&D expenditures from Federal Reservation. The monetary approach through utilizing the macroeconomic information inferred the interest rates which has identified the major private sector investments (Tobias & Chiluwe, 2012). This examination likewise denotes to enormous studies (Bernanke & Gertler, 1995; Kahn, 2010; Majumder, 2007; Mishkin, 2009). The tight monitory policy improves the firm's ability in availing the loans for investments. It only possible with proper monitoring the onwards debt policy in times of expansionary monetary policies (Xuan, 2012). In this way, they can be able to moderately respond the monetary policy shocks. Hence, monetary policy notably explains the firm's investment behavior (Liu et al., 2013).

The demand and supply sides of economic policy (monetary policy) studied by Zhang et al. (2012) has suggested MP causes a lot of variations in investment decisions. It also affects the firm ability to make investments in capital projects, shares and bonds of other firms. Moreover, they are of view, by adopting various credit sources, monetary policy affects corporate investment in companies with various level of financing limitations. Takashi and Toshikaka (2004) investigated effects of monetary policy by valuing firm investment functions; the paper discloses there is only one way that is interest rate channel through which that monetary policy worked. But due to the deficiency especially in bank balance sheet conditions, its effect through the credit sources is non-existent which strictly hindered investments by smaller equity issuing firms than by larger debt-issuing firms.

The increase of money supply economy and available internal cash flows boost the borrowing capacity of firm and investment activities (Linh et al., 2019). The monetary policy has a greater and sometimes lesser significance for investment decisions (Valentine & Anca, 2017). However, relative risk in all types of investments and quantitative loose monetary policy have led to increase in financial investments (Chengsi & Ning, 2020). The change in cost of capital is backed by interest rates which economically and statistically affects the investments (Benoit et al., 2002). The investment behavior of firm is deeply dependent on central bank's monetary policy and bank's loan policy (Chaiporn et al., 2017).

Ndikumana (2008) analyzed significant positive effects of the interest rate reduction on private investment in expansionary MP. However, ancillary impacts on the private investment become significant by promoting domestic investment. Change in the interest rates does affect the present value of expected cash flows and time value of investment decisions (Emmons & Schmid, 2004). They claimed that low interest rates would result in a high present value of investment cash flows, thereby encouraging investment. Otherwise, investment may be discouraged because while making investment decisions it lowers the capital's opportunity cost. In a nutshell, because interest rates can influence investment practices in both directions, the impact of monetary policy on capital investment appears to be ambiguous. A Chinese research conducted by Fu and Liu (2015) examined impact of monetary policy in perspective of money supply and credit channels concluded companies tend to adjust investment cash flows faster during the duration of tight monetary policy. Corporate investment, on the other hand, tends to adjust faster as the money supply and credit expand. Markedly, this trend becomes significant during period of tighter or contractionary monetary policy.

H1: Monetary policy is a significant factor of investments of firms.

Cash Flows and Investment

The investments embrace the capital expenditures which are backed by sufficient cash flows availability. The more cash flows availability heightens the firm's investment activities (Bates et al., 2009; Oler & Picconi, 2014). The firm's cash holding or cash flows pushes them to more investments (Dittmar et al., 2003; Hoberg et al., 2014; Huang et al. 2013; Opler et al., 1999). The high amount of cash balance causes an increase in capital expenditures (Harford, 1999; Harford et al., 2008; Ferreira & Vilela, 2004; Mikkelson & Partch, 2003). Kim et al. (2011) conducted research by using panel data and examine that restaurant companies hold more cash for greater investment opportunities. It has been concluded large restaurant firms in USA possess less cash in hand because these firms hold more liquid assets, incur high capital expenditures and distribute more dividends. In this way, both preventive and transactional drives are very significant in determining reasons of holding cash level by firms.

Sher (2014) examined that cash and cash equivalents at non-financial corporations worldwide have increased over the past twenty years. The non-financial firms hold more cash at the expense of investment activities which hinders the change. It has been suggested that the large amount of cash reserves is associated with an increasing uncertainty of firms. The investment cash flow sensitivity is low in companies that has less financing restrictions (Johnson et al., 2018). This sensitivity in investment cash flows is negatively associated with large shareholders' cash flow rights (Wei & Zhang, 2008). The shareholders claim as cash dividends reduce the investments. However, the investment cash flow sensitivity is higher in cash constraint firms (Riaz et al., 2016). The sensitivity of investment due to cash flow variation is greater in financially restricted firms (Carpenter et al., 1994). The capital investments are susceptible to external cash flows in financially constraint firms. They prefer to save large portion of cash flow for making future investment (Almeida et al., 2004). Hyde (2007) also concluded the same results of significant effect of cash flows on shareholders' investment decisions. Cleary (2006) discovered that in firms with a strong financial position, investment decisions are more sensitive to cash flow.

The financially restricted firms rely on cash inflows (Fazzari et al., 1988). Hence, managers under information asymmetry prefers the internal financing for investments (Donaldson, 1961). The firm could reduce its financial difficulties by holding large amount of reserves in the form of cash flow in organization (Cantor, 1990). So that investment practices continue without any hurdle. Devereux and Schiantarelli (1992) while investigating the relationship between cash flows and investment decisions concluded the significant positive impact of cash flow upon investment activities by large-sized and newly established firm because small level firms face problems of

cash shortages. The cash flows help the forms to take more and better investment decisions (Joseph, 2002). The cash flow has a greater influence on investments made by highly leveraged firms than by low leveraged firms (Whited, 1980). Overall, cash flow put the firms towards more investments (Bond & Reenen, 2007; Cleary, 1999; Fazzari & Petersen, 1988; Fazzari, & Petersen, 1993; Hoshi et al., 1991; Hubbard & Whited, 1980; Junlu, Zeguang & Qunyong, 2009; Kaplan & Zingales, 1997; Mizen & Vermeulen, 2004; Sun & Nobuyoshi, 2009; Vermeulen, 2002).

H2: Cash flows significantly explain the firm's investments.

Theoretical Framework

Theoretically, it is explored that firm follows the hierarchical pattern of financing for their investment needs. They maintain the sufficient cash flows for their future needs. It does not occupy the cost of capital and investment can easily be met through cash flows maintained by the firm. So, pecking order theory supports the relationship between cash flows and investment of firms. Pecking order theory drives the asymmetric information and it causes higher return on risky investments (Myers & Majluf, 1984). Outside sources are accompanied with high rate of return and corporations often prefer the use of available cash flows for making investment decisions.

Moreover, the crowding out theory refers to a phenomenon in which increased government spending responds to a reduction in private sector investment. It is attributed to the rise in interest rates coupled with the development of the public sector. The belief that crowding out occurs and represents a major economic issue is crucial to 'free market' intellectuals. The unsustainable growth in the public sector would eventually lead to an inefficient use of resources. As far as effect of monetary policy was concerned to Friedman's (1978) principle of crowd-out principle, this hypothesis suggests that unstable and ambiguous macroscopic strategies such as rising inflation or rising interest rates may have negative effects on investment. The position of interest rates goes to the core of the transmission method between increased government spending and rising corporate sector investment.

Q theory is another theory for investment decisions which is presented by (Tobin, 1969). As per this theory, an increase in Q index greater than one, corporate investment would promote. In this case return on investment is greater than cost of purchasing assets for company. Furthermore, capital expenditures made by companies rejected when Q index value is below 1 based on the fact that cost of purchasing properties is more than anticipated gains from the project. Both aggregate demand and aggregate supply decides the investment. This approach states investor multiplier describes relation between a rise in investment and a rise in magnitude. In another sense, it means how quantity is influenced by an increase in investment. The investment acts as a fundamental component of cumulative demand. Investment increases quantity from the perspective of aggregate production, which raises the amounts of money, and encourages investment.

Methodology

To examine the empirical combined impact of monetary policy and internal cash flows on corporate investment, a quantitative research design, deductive research approach with positivism research paradigm was used. The sample data was collected for the study population of 265 non-financial firms over the 10 years period i.e. 2010-2020. For data analysis, secondary data was collected from audited and published financial statements and company's websites of non-financial firms in Pakistan.

Data Estimation Method

This study followed the empirical hypothesis testing using the dynamic panel model. The purpose of adopting the dynamic panel model is to be observed that there is an endogeneity problem in empirical model as supported by (Bond & Meghir, 1994; Dickinson & Jia, 2007; Yang et al., 2017). In the econometric model, leverage is the endogenous variables that lead toward the omitted variable bias and estimation through OLS put the biased estimates. Moreover, the inclusion of accounting based variables in one model leads to potential endogeneity. One and two step system GMM panel estimation was used to mitigate the endogeneity problems, which leads to appropriate and less biased estimates (Amidu & Wolfe, 2013). Moreover, the results would be better in GMM despite of the arise of autocorrelation and heteroscedasticity problems (Baum et al., 2003). This technique often confirms the use of instrumental variables to correct endogeneity, which results in skewed and contradictory

performance. By following the Roodman (2009) the command xtabond2 is used for one step and two-step system GMM. Antoniou et al. (2006) mentioned it is a superior estimate. Generally, two systems GMM is more accurate than the one step.

Econometric Model

Most the firm specific investments are dependent upon monetary policy mechanism. Like higher interest rates in monetary policy adversely affects the investment decisions of firms. Moreover, cash flows determine the liquidity position of the firm and are very helpful for investment decisions. Firms can utilize the cash flows for their investment opportunities with low cost of capital. The sufficiently availability of cash flows is an integral part of financial health of a firm and they can easily meet their financial obligations. In this way, investment decisions can be easily undertaken. The study provides the important insights about the relationship between monetary policy, cash flows and investment decisions of listed non-financial firms in Pakistan. Cash flows are endogenously determined due to precautionary and transaction cost motives. Furthermore, monetary policy is also highly dependent upon other macro-economic factors that create the potential endogeneity. Therefore, to remove the potential endogeneity and simultaneity bias in the model, the study developed the dynamic panel model. The model elaborates how cash flows and monetary policy are related with investments of firms. The dynamic panel model for hypothesis testing was developed due to endogeneity and heteroscedasticity problems. Bond and Meghir (1994) has referred this model.

$$INVST_{it} = \beta_1 INVST_{it-1} + \beta_2 CF_{it} + \beta_3 MP_{it} + \beta_4 ROA_{it} + \beta_5 FS_{it} + \beta_6 LEV_{it} + \beta_7 Risk_{it} + \beta_8 MTB_{it} + \beta_9 T_{it} + \varepsilon_{it}$$

Where $Invst_{it}$ is measured as net end of year fixed assets minus net value of fixed assets at the beginning of the year, CF_{it} is the cash flow calculated as earning after tax+ fixed assets depreciation+ corporate income tax – dividend payment, MP_{it} is the monetary policy calculated as the value of M2 supply money, ROA_{it} is the return on assets, calculated as net profit to total assets, $Size_{it}$ is measured as natural logarithm of total assets, LEV_{it} is the leverage ratio, measured by total debt to total assets, $Risk_{it}$ is the standard deviation of firms net income, MTB_{it} is market value to book value of equity ratio measured as market value to book value and T_{it} is the tangible assets, calculated as fixed assets to total assets.

Table 3.1: Variables Measurement

Variables	Proxies	Measurement	Evidences
Dependent Variable Corporate Investment	Corporate Investment rate	Net Fixed Assets at the end to Net Fixed Assets at the beginning	Duchin et al. (2010), Linh and Hong (2019), Azzoni et al. (2006), Ullah (2017), kaddapakam et al. (1998).
Independent Variables • Monetary Policy (MP) • Cash Flow	• The value of M2 supply money • Earning after tax plus fixed assets depreciation plus corporate income tax minus dividend payment	• Value of M2 supply money • Earnings after-tax + Fixed Asset Dep + corporate income tax – Dividend Payment	• Li and Liu (2017), Linh & Hong (2019). • Kadapakkam et al. (1998), Linh & Hong (2019).

Control Variables • Leverage	• Debts ratio	• Total Debts/Total Assets	• Kaplan & Zingles, (1997), Opler & Titman, (1994), Aivazian et al. (2005) Saquido (2003), Rahman (2020).
• **Size**	• Natural Logarithm of firm size	• LN (TA)	• Jangili & Kumar (2010), Cheng, (2018); Linh & Hong, (2019), Rahman (2020).
			• Yang et al. (2017), Rahman (2020).
• Return on Assets (ROA)	• Net profit to total assets	• NP after-tax/Total Assets	• Yang et al. (2017), Saquido, (2003), Linh & Hong (2019),
• MTB	• Market value to book vale	• Market value of equity/Book value of equity	
• Tangible Assets	• Gross fixed assets to total assets	• Gross Fixed Assets/Total Assets	• Yang et al. (2017), Saquido (2003), Shah & Hijazi (2004).
			• Chou, yang & Lin, (2011). Habib, Hasan & Sun, (2020).
• Risk	• Standard Deviation of Net Income	• $\sqrt{\sum}(NIi–NI\ avg)^2/n-1$	

Results and Discussions

The study followed the scientific methods of estimation in empirical analysis. More specifically, the techniques used in the testing and construction of hypothesis. The mathematical tools are aligned together with theory have addressed the methodological problems in the explanation and justification of induction. Hence, the empirical analysis likes descriptive statistics, correlation analysis and Generalized Methods of Moments (GMM) are presented in a rational manner.

Descriptive Statistics and correlation analysis

Descriptive statistics indicate the distribution of data and numeric information of all variables used in this study. Table 4.1 given below presents the descriptive statistics while table 4.2 represent the correlation analysis among the variables. The average value of corporate investment of non-financial firms in Pakistan is 0.284 while its dispersion measured by standard deviation is 0.085. The mean value of cash flows and monetary policy are 0.050 and 0.093 respectively, while they deviate from their mean value by 0.239 and 0.021 respectively. All the variables in the study are only partially correlated with each other and are not highly correlated with each other; there is no multicollinearity problem in the model. It shows the rough picture and it is premature to draw the conclusion based on correlation analysis.

Table 4.1: Descriptive Statistics

Variables	Mean	Std. Dev.	P25	P50	P75	Skewness	Kurtosis
INV	0.284	0.085	0.250	0.307	0.336	-1.178	4.827
F	0.050	0.239	-0.021	0.029	0.107	23.754	939.442
MP	0.093	0.021	0.067	0.098	0.113	-0.101	1.470
ROA	0.060	0.126	0	0.039	0.120	0.669	6.812
SIZE	7.898	1.243	6.893	7.881	8.932	-0.112	2.451
LEV	0.455	0.160	0.319	0.476	0.581	-0.248	2.068
RISK	0.348	0.305	0.062	0.256	0.584	0.603	2.039
MTB	2.356	2.106	0.909	1.513	3.112	1.481	4.457
TANG	0.481	0.142	0.361	0.451	0.592	0.498	2.181

Note: The descriptive statistics table represent the mean, standard deviation, percentile 25, percentile 50, percentile 75, skewness and kurtosis of variables firm size, investment, risk, return on assets (ROA). cash flows (CF), monetary policy (MP), leverage, tangible assets, and market to book ratio (MTB).

Table 4.2: Correlation Analysis

Variables	INV	CF	MP	ROA	SIZE	LEV	RISK	MTB	TANG
INV	1.000								
CF	0.0025	1.000							
MP	0.0011	-0.0148	1.000						
ROA	-0.0014	-0.0189	-0.0030	1.000					
SIZE	-0.0316	-0.0199	-0.0170	-0.1171	1.000				
LEV	-0.0611	0.0009	0.0043	-0.0961	0.0838	1.000			
RISK	-0.0627	-0.0021	-0.0055	0.0346	-0.0196	0.1036	1.000		
MTB	0.0310	0.0233	0.0154	0.0009	0.0300	0.0452	0.0326	1.000	
TANG	-0.0048	-0.0603	0.0215	0.0402	-0.1083	-0.0609	0.0417	-0.0936	1.000

Note: This table shows the correlation / direction between the variables of study. The correlation is among the variables leverage, risk, investment, market to book ratio (MTB), cash flows (CF), firm size, monetary policy (MP), return on assets (ROA). and tangible assets.

Cash Flow and Investment

This section shows the relationship between independent variable cash flows and dependent variable corporate investment of non-financial sector in Pakistan. Table 4.3 represents the results in connection to the cash flow and investment behavior of firms. The lagged dependent variable is significant and it is the confirmation of dynamic panel model, proving the strong justification for GMM technique. This shows that firm investment is based on last year's investment. With respect to one-step system GMM, the coefficient of cash flow without control variables shows a significant negative relationship with corporate investment consistent with the findings of (Bates et al., 2009; Hoberg et al., 2014; Oler & Picconi, 2014; Sher, 2014; Wei & Zhang, 2008). The coefficient of cash flows is significant and positive in both one-step (with control variables) and two step GMM (With and without control variables) consistent with the findings of (Almeida et al., 2004; Harford, 1999; Harford et al., 2008; Hoshi et al., 1991; Huang et al., 2013; Joseph, 2002; Mikkelson & Partch, 2003; Kim et al., 2011;). The huge holding of cash flow enlarges the cash reserves which helps the future managerial investment decisions. Moreover, financially constraint firms depend more on internal cash flows in order to fulfill their capital investment needs in the period of financial distress. In addition to it, by supporting the pecking order theory, managers prefer internal funds more as compare to external funds due to asymmetry information in the capital market. They also claimed that the corporate investment is very sensitive towards cash flow, and this effect is found stronger in highly leveraged firms with more debt capital. It is concluded that cash flows has a significant positive relationship with investment decisions of firms in Pakistan. Firms maintaining the higher level of cash flows prefer to go for more investment by utilizing available resources for investments which is supported by pecking order theory. Contrarily, firms with better cash flows can easily meet their financial obligations and prefers the debt financing to support the investments. This particular is in support of trade off theory.

Table 4.3: Estimation results between Cash Flow and Investment

Investment is dependent variable in all the columns				
Variables	**One-Step GMM**		**Two-Step GMM**	
$Perf_{(t-1)}$	-0.8745***	-0.4827**	-0.8437***	-0.0981**
	(0.1711)	(0.2313)	(0.1163)	(0.0475)
CF	-0.7192***	0.9911***	0.6082**	0.4277***
	(0.2592)	(0.0376)	(0.2806)	(0.1263)
ROA		-0.0411		-0.0605***
		(0.0517)		(0.0245)
SIZE		0.0061**		0.0000
		(0.0032)		(0.0019)
LEV		0.0689		-0.0149
		(0.0485)		(0.0147)
RISK		-0.0540**		-0.0253*
		(0.0271)		(0.0136)
MTB		0.0026**		0.0004
		(0.0013)		(0.0012)
TANG		-0.0160		-0.0146
		(0.0214)		(0.0178)
AR (1)	0.028	0.000	0.004	0.000
AR (2)	0.209	0.258	0.605	0.407
Sargan	0.461	0.562	-	-
Hansen	-	-	0.841	0.739
Instruments	41	101	52	166
No. of Groups	265	265	265	265

Note: One step and two step system GMM results in dynamic panel model are reported in above table. The significance of AR (1) while insignificance of AR (2) and Sargen/Hansen test proves that model is correctly specified and is not over identified, hence no specification issues.

Monetary Policy and Investment

This section shows the relationship between independent variable monetary policy and dependent variable corporate investment of non-financial sector in Pakistan. One step and two step system GMM panel estimators are applied for empirical testing. Table 4.4 represents the results in connection to the monetary policy and investment behavior of firms. The lagged dependent variable is a noteworthy feature of dynamic panel model and its significance confirms the dynamic panel model and is a strong justification for GMM technique. This shows that firm investment is based on last year's investment. With respect to one-step system two-step system GMM, overall the coefficient of monetary policy with and without control variables shows a significant and negative relationship with corporate investment decisions of firms in Pakistan which results are in accordance with the study of (Lenoco, 2016; Masuda, 2015; Sagi et al., 2020; Young et al., 2017). They argued that contractionary monetary policy is greater for small size firms due to significant rise in the liquidity constraint, resultantly reduction in corporate investment. Controlling inflation with contractionary monetary policy comes at a high cost in terms of reduced investment and, as a result, slower economic growth. This situation put the firms under pressure towards more investments. Moreover, as investments are backed by financing decisions and higher interest rates due to contractionary monetary policy would results in lower level of investments. On the contrary to these results, some researchers are in support of significant and positive impact of monetary policy on the corporate investment (Alawneh et al., 2015; Benoit et al., 2002; Chengsi & Ning, 2020; Jing et al., 2012; Jing et al., 2018; Linh et al., 2019; Li & Liu 2017; Morck et al., 2013; Tobias & Chiluwe, 2012; Zhang et al., 2019). They are of the view that an increase in the expansionary monetary policy leads to an increase in the level investment of non-financial firms in Pakistan because when money supply increases then interest rates fall which ultimately boost the domestic investment. Moreover, low interest rates would make the present value of investment cash flows to rise, thus encouraging investment activities.

Table 4.4: Estimation results between Monetary Policy and Investment

Investment is dependent variables in all the columns				
Variables	**One-Step GMM**		**Two-Step GMM**	
Perf$_{(t-1)}$	0.1201**	-0.4604***	-0.2309**	0.0336***
	(0.0599)	(0.1274)	(0.1038)	(0.0136)
MP	-0.4515***	-0.1746**	0.6497***	-0.5094***
	(0.1884)	(0.0822)	(0.1674)	(0.0860)
ROA		-0.0556**		0.0996***
		(0.0280)		(0.0363)
SIZE		-0.0023		-0.0021
		(0.0034)		(0.0019)
LEV		-0.0107		0.0299
		(0.0392)		(0.0241)
RISK		-0.0513***		-0.0451***
		(0.0214)		(0.0162)
MTB		0.0019		0.0028***
		(0.0021)		(0.0009)
TANG		-0.0603**		0.0270*
		(0.0318)		(0.0148)
AR (1)	0.000	0.000	0.003	0.000
AR (2)	0.451	0.185	0.160	0.716
Sargan	0.754	0.897	-	-
Hansen	-	-	0.677	0.548
Instruments	84	166	66	134
No. of Groups	265	265	265	265

Note: One step and two step system GMM results in dynamic panel model are reported in above table. The significance of AR (1) while insignificance of AR (2) and Sargen/Hansen test proves that model is correctly specified and is not over identified, hence no specification issues.

Quintile Regression

This section shows the quintile regression results to identify the relationship between cash flow (CF) and monetary policy (MP) with the corporate investment decisions of the non-financial firms in Pakistan. Low quintiles identify the firms with lower investment while high quintiles identify the firms with higher level of investment. Table 4.5 represents the results in connection to the relationship in those low and high quintiles. The results identify that both CF and MP have a significant negative relationship in lower quintile of firm investment than in upper quintiles, consistent with the findings of (Bates et al., 2009; Dittmar et al., 2003; Hoberg et al., 2014; Lenoco, 2016; Masuda, 2015; Oler & Picconi, 2014; Sagi et al., 2020; Sher, 2014; Young et al., 2017). They claim that the investment cash flow sensitivity is inversely associated with the cash flow rights of the largest shareholders. Both CF and MP have a significant and positive relationship in medium and upper quintiles of firm investment support the findings of (Cantor, 1990; Devereux & Schiantarelli, 1992; Ferreira & Vilela, 2004; Harford et al., 2008; Huang et al., 2013; Johnson et al., 2018). The high cash reserves are the results of huge holdings of cash flows that put the managers in a position to more future investment decisions. However, the magnitude of relationship varies with respect to quintiles. Both cash flows and monetary policy have lower explanatory power in describing the investment of firms in low quintiles than in upper quintiles.

Table 4.5: Quintile Regression Results

Variables	**Investment is the dependent variable in all the columns**				
	1	**2**	**3**	**4**	**5**
Constant	0.2378***	0.2749***	0.3002***	0.3150***	0.3441***
	(0.0217)	(0.0826)	(0.0578)	(0.0396)	(0.0506)
CF	-0.0706***	0.1234**	0.1692***	-0.2551***	0.3730***
	(0.0262)	(0.0291)	(0.0291)	(0.1026)	(0.0822)
MP	-0.1052***	0.1972***	0.2749***	0.3892***	0.4110***
	(0.0373)	(0.0829)	(0.0512)	(0.1408)	(0.1521)
Controls	No	No	No	No	No

Note: this table shows the quintile regression of the model in 5 quintiles of cash flow and monetary policy. Column 2 to 6 shows the low quintile to high quintile of both cash flows (CF) and monetary policy (MP). Figures in parentheses shows the standard errors,''***'' and ''**'' show the significance level at 1% and 5% respectively.

Conclusion

The study aims to examine the role and effect of macroeconomic factor like monetary policy and micro economic factor cash flow on investment decisions of non-financial firms in Pakistan over the period of 2010-2020. The secondary data is collected from annual published financial reports of commercial banks. The dynamic panel model was developed due to endogeneity issues. One-step and two step system GMM panel estimators along with Quintile regression were applied for empirically testing of hypothesis and to control the potential endogeneity. The study concluded that both cash flow and monetary policy are significant factors that influence the level of corporate investment. The results identify cash flow has an inverse relationship with investment of firms in one step system GMM i.e. simple regression. However, cash flow tends to increase the level of investment in all other regression models. The study determined expansionary monetary policy causes increase in investment practices by firms. However, this is not always the case when monetary policy is ideal, because as inflation rises, so does the real value of the currency. The contractionary monetary policy would likely to decrease the investment. Moreover, Cash flow decreases the investment of firms in lower quintile of firms as compared to high quintiles. Monetary policy decrease the investment in lower quintiles but this relationship tends to be positive when firm move towards high quintiles of firm investment. However, the magnitude of relationship varies with respect to quintiles. Cash flow and monetary policy have lower effect in describing investment of firms in low quintiles than in upper quintiles of investment. Overall, the results are inconclusive across all the level. This study suggested that financial managers should manage internal cash flows to increase cash reserves in order to meet capital expenditures and project's needs of non-financial firms in Pakistan. Furthermore, in view of current results, political establishments should obligate themselves to maintain political stability and undertake better economic policies to eliminate insecurity in Pakistan. It was suggested that in the future, more researches could be initiated by increasing sample size for longer time period; by including different industries in financial and non-financial sector for better comparison between them and various other factors like sale growth, dividend payout ratio etc. would also affect the investment decision at firm level. Nonetheless, it can also be extended to include small and medium enterprises of Pakistan into sample.

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