Finance Decisions and Cash Flow Sensitivity : An Empirical Study of the Indian Industry

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Abstract

To be effective in cash management, there is a necessity to quantify the influence of various finance functions on the cash accounts of the firms. This paper empirically measured the effects of finance functions on the cash account. The results revealed that the effect of cash flow on dividend decisions was statistically significant, while the effect of cash on capital budgeting and capital structure decisions was of limited relevance. Subsequent analysis unfolded that capital budgeting and capital structure decisions are inherently related; indeed, big size investments are linked with the mobilization of funds. While financing the investments, firms prioritized borrowing, and comparatively lower priority was given to mobilizing new equity capital. This observation confirmed the application of the pecking order hypothesis in the financing practice of Indian firms.

Keywords : finance decisions, cash management, sensitivity of cash flow, cash balance

JEL Classification Code : G30, G31, G35

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How much cash should be kept in hand so that neither the problems of shortage nor the burden of excess cash can impose costs on a firm's operations? This is a common question faced by every finance manager and treasurer of a corporate house. In an effort to provide the solution to this management problem, Baumol (1952) and Tobin (1956) presented the cash management models. These models are characteristically economic in nature, which have focused on the minimization of the sum of carrying costs and transaction costs, without questioning the finance functions the managers have to execute in the immediate future.

In fact, how much cash the managers need depends on the functions and operations the management plans to execute. It suggests that the knowledge about the true relationship of cash account with different finance functions is of great help. Empirical research dedicated to exploring the exact measure of cash sensitivity of the finance functions seems to be quite relevant. The finance executives can subsequently use the information in their corporate financial planning and cash management. This paper is an effort in this direction.

Literature Review

Cash can be counted as a strategic resource because it enables quick adoption of corporate strategy (Kim & Bettis, 2014). Lyandres and Palazzo (2016) observed that strategic considerations substantially influenced the cash policies of innovative firms. However, holding of excessive cash by the management stands as an index of the managerial agency problem; hence, cash held by the management is subjected to heavy discounting (Kalcheva & Lins, 2007).

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Some scholars (Bond & Soderbom, 2013; Lewellen & Lewellen, 2016; Vogt, 1997) examined the sensitivity of cash flow to capital expenditure. Given the uncertainty of the capital market, the scholars observed that managements exhibited the bias to depend on internal cash savings to meet the capital expenditure needs. This managerial behavior reflects the pecking order hypothesis (Myers & Majluf, 1984). The scholars pointed out that firms exposed to financing constraints relied more on accumulated cash savings than firms less exposed to constraints in terms of mobilizing capital from external sources.

Park and Jang (2013); Danjuma et al. (2015); Keefe and Yaghoubi (2016); and Harris and Roark (2019) examined the relationship between cash flow and capital structure. They noticed that a considerable extent of the variability of cash could be attributed to leverage, that is, the weightage of debt in capital structure. The scholars observed that the use of debt aggravated the cash flow risk of the firms. Danjuma et al. (2015) strongly recommended that the chief financial officers should exercise caution while choosing the amount of debt in formulating their capital structures.

Singh and Bhar (2015) recommended that firms should adopt a decision support system for better cash management of microfinance institutions. Kumar et al. (2018) observed that cash flow forecasting and cash management practices contributed to improved business performance; hence, the scholars recommended that the firms should adopt better cash flow forecasting practices. Maiti and Hemachandra (2018) examined the benefits of the real-time gross settlement system in the cash management of banks.

A dividend decision is conventionally presumed to have a strong relationship with the cash position of a firm. In fact, a shortage of liquid cash sometimes compels many firms to announce stock dividends or pay no dividends at all. Empirical works, in this context, revealed contradictory findings. Al-Najjar and Belghitar (2011) observed that neither dividend payments affected cash holdings significantly, nor did cash holdings affect dividend policy. On the other hand, Garrett and Priestley (2012) noted that cash flow information had a direct connection to dividend growth.

Research Gap

How much cash the managers need depends on the functions and operations the management plans to execute. It means that the focus of cash management should be on the sensitivity of cash to various finance functions. Indeed, some functions require a bulk quantum of cash, while others require a limited amount of cash. In other words, understanding the relationship of various finance functions with cash flow should be treated as the beginning of cash management. If the sensitivity of cash to various finance functions is known, the management of cash can be undertaken with a practical approach.

The review of literature points to the fact that each study is devoted to examining the relationship of cash with a single finance function, say, capital expenditure, while all other finance functions are presumed to remain constant. This is indeed a naïve assumption. This paper points to the necessity of studying the whole instead of a part. In the light of the systems approach to management, it is necessary to see how the various types of finance functions simultaneously influence the cash account of a firm. This paper is dedicated to studying the effect of the simultaneous effect of the various finance functions on the cash account of a firm. The study's findings can be considered useful in financial planning and cash management in the corporate sector.

Objectives of the Study

The objectives of the study have been enumerated as below:

✤ To examine the percentage of total assets Indian firms keep in hand as liquid cash.

✤ To examine the effect of cash balance on the firm's finance functions such as capital budgeting, capital structure, dividend payment, etc.

✤ To identify variables influencing a finance function, where cash fails to stand as an explanatory variable.

✤ To examine the interrelationship between capital budgeting and capital structure decisions.

Research Methodology

This is an empirical research based on secondary data downloaded from CMIE Outlook. The data is the aggregate data of enlisted Indian companies maintained by the CMIE database. The variables and the research design have been discussed in the following paragraphs.

Data, Variables, and Model Fitting

The study begins with identifying the finance functions as independent variables. For example, time-series data on dividend payments reflect firms' dividend decisions. In cases where the data were not available corresponding to a financial decision, a proxy variable has been used. For example, data pertaining to the issue of debenture and equity shares is treated as a proxy variable of capital structure decisions. Similarly, a percentage increase in fixed assets is counted as a proxy of capital budgeting or capital expenditure decision. As current assets consist of cash, finding the relationship of cash with current assets is practically inconsistent. Hence, the percentage change in current liability is treated as a proxy of working capital decision. The list of the variables includes :

(i) *Equity* : New equity capital

(ii) *PAT* : Profit after tax

(iii) *DIV* : Dividend payout

(iv) *CAPEXP* : Capital expenditure

(v) *BORROW* : Borrowing

(vi) *CL* : Current liability

The year-to-year change in cash is counted as dependent variable C_t, while the other variables standing for different finance functions such as capital structure decision, dividend payment, capital expenditure, and current liability are the explanatory variables. The relationship can be looked at as a multivariate relation as noted below:

$$C_t = \beta_0 + \beta_1\, Equity + \beta_2\, PAT + \beta_3\, DIV + \beta_4\, CAPEXP + \beta_5\, BORROW + \beta_6\, CL + e_t \qquad (1)$$

β_i is the sensitivity of the related variable *i*. It reflects a priori assumption that cash position is affected by the variables noted above; e_t is the random term with the stochastic property.

The period for this study is 30 years, from 1990–91 to 2019–20. Data is the summary data of non-finance private sector firms of India, downloaded from the database of Corporate Sector window of CMIE Outlook. All data entries are in terms of percentage change over the previous year (Y-to-Y change in percentage terms). As the data measures the changes over the previous year (i.e., 1st difference), expressed in percentage terms, the data satisfy the characteristics of stationarity of time-series data.

Software and Statistical Analysis

Pearson's coefficient of correlation has been used as the initial step to trace the existence of the interrelationship between cash account with each of the finance functions. Subsequently, multiple regression analysis has been used for quantifying the effect of simultaneous variations of all the finance functions on the cash accounts of the firms. For statistical analysis of the data set, IBM SPSS Version 21 has been used.

Data Analysis and Results

Data analysis has been performed in five different trials to elicit findings of different nature. The results of the analysis and interpretation have been arranged in the following paragraphs.

Cash Balance of Indian Companies : The Trend

Table 1 shows the entries in respect of aggregate investment in cash against total investments in current and non-current assets by public limited companies. In general, the size of cash is found to be 3.3%, 3.2%, and 3.4% of total assets in the financial years 2016–17, 2017–18, and 2018–19, respectively. It means that the companies tried their best to keep investments in idle cash limited to approximately 3.3% of the total investments in assets.

Finance Functions and Sensitivity of Cash Balance

It is normally believed that all the finance functions have a definite interrelationship with cash flow and cash balance. However, the magnitude of a finance function's influence on cash may vary from case to case. To identify the finance functions that substantially affected a company's average cash balance, bivariate correlations of cash with the six other variables noted above have been computed. The results are presented in a summarized form in Table 2.

Table 1. *Combined Balance Sheet of the Select 16,045 Public Limited Companies*

			(₹ **Crore**)
Assets	**2016–17**	**2017–18**	**2018–19**
Non-current assets	5,184,666	5,590,231	5,999,543
Current assets	2,727,407	2,981,160	3,335,602
Total assets	7,912,075	8,571,391	9,335,146
Cash and cash equivalents	265,893	274,701	317,528
Cash as % of total assets	3.3%	3.2%	3.4%

Source : Corporate Sector Statistics, Database of Indian Economy, Reserve Bank of India (n.d.).

Table 2. *Correlation of Cash with Finance Functions*

		DIVIDEND	*CL*	*PAT*	*EQUITY*	*BORROW*	*Capital Exp*
Cash	Correlation	**.331***	**.426***	.070	–.039	.240	.214
	Sig. (1-tailed)	**.040**	**.011**	.360	.420	.104	.132
	N	30	30	30	30	30	30

Decisions regarding dividend payment are taken by the firms after assessing the firm's cash position. While the dividend is usually paid in cash, it is sure to leave an implication on a company's cash balance. Hence, it is understandable that dividend payments inherently affect the cash position of a firm. Empirical results, as shown in Table 2, support the truth. The coefficient of correlation between dividend payment and cash is found to be significant at the 5% level.

The coefficient of correlation of cash balance with current liability is statistically significant. It reflects the existence of an interrelationship between cash and current liability. Finally, the coefficients of correlation of cash balance with capital structure, capital expenditure, and PAT (profits after tax) appear to be statistically insignificant. It is to be noted that this analysis is based on summarized data of all Indian non-financial private sector companies. Hence, the results can be counted to be authentic and verifiable.

The coefficient of correlation between cash flow and capital expenditure is only 0.214, which undoubtedly fails to establish the statistical significance of the relationship. This observation contradicts the findings of Vogt (1997) and Lewellen and Lewellen (2016). They noted that firms depended more on internal cash savings to finance capital expenditures; whereas, the empirical results of this study, based on CMIE data, show that Indian firms do not substantially depend on internal cash savings for financing capital expenditures. This is understandable that firms should not continue to sit on idle cash savings and incur carrying costs for holding excessive cash in hand! Contrary to this, it is better to park the cash in marketable securities or sign a contract with a commercial bank for an instant cash loan when the firms really need it for making additional capital expenditures.

Harris and Roark (2019) noticed that a considerable extent of the variability of cash could be attributed to leverage, that is, the weightage of debt in capital structure. However, the result of this study contradicts their findings. The coefficient of correlation between cash balance and additional equity issues is only – 0.039, which is statistically insignificant. On the other hand, the coefficient of correlation of cash balance with borrowing is 0.24. Borrowing is supposed to induce firms to increase cash savings to build liquidity; hence, the coefficient of correlation between cash balance and borrowing should be positive. The correlation coefficient obtained from the data is positive but not statistically significant. Hence, the study fails to provide evidence to draw a clear conclusion regarding the interrelationship between cash and leverage.

How Do Firms Finance Capital Expenditure?

While it is found that the degree of correlation between cash and capital expenditure is statistically insignificant, it seems appropriate to explore how the firms meet the needs of capital expenditure. While doing so, two more variables are incorporated into the analysis; these are borrowings and capital issues. Both the variables are in terms of year-to-year change, expressed in percentage terms. The results of correlation analysis of capital expenditure with three variables: cash, borrowing, and addition of equity capital have been shown in Table 3.

Table 3. *Relationship of Capital Expenditure with Cash, Borrowing, and Equity Capital*

		Cash	Borrowing	Equity-Capital	Reserve
Capital Expenditure	Pearson Correlation	.214	.728**	.436**	0.722
	Significance. (1-tailed)	.132	.000	.000	.000
	N	30	30	30	30

Note. **. Correlation is significant at the 0.01 level (1-tailed).

Table 3 shows that capital expenditure has a very weak correlation with cash. It does not support the hypothesis that capital expenditures are made from accumulated cash savings. The coefficient of correlation between cash and PAT (profit after tax) is very close to zero (0.07) (see Table 2). This additional observation indicates that in the contemporary Indian industry, the scope of generating cash savings from a firm's operating profits is limited. Hence, in general, it cannot be accepted that firms use cash savings to finance capital expenditures.

Column 4 of Table 3 shows that capital expenditure has a strong correlation with borrowing and the issue of equity capital. It means that in the contemporary industrial scenario in India, firms extensively depend on external financing to finance capital expenditures. As the coefficient of correlation of capital expenditure with borrowing is higher than the coefficient of correlation with equity capital, it reflects that borrowing (leverage) is the preferred option for financing new investments and expansions.

Finance Functions and Cash Balance: Multivariate Analysis

In the previous paragraph, the coefficients of bivariate correlations were computed, where a pair of variables were presumed to interact with each other, ignoring the influence of multiple other variables. In this paragraph, we permit the simultaneous change in each variable and quantify the relative influence of each finance decision on the cash account of a firm. Multiple regression analysis makes it feasible to incorporate all the identified variables in a single equation. This analysis is useful to measure the relative influence of an explanatory variable while all other variables are changing simultaneously. Given the list of finance decisions and variables defined earlier in the study, the regression analysis gives the coefficient table. This is further to note that the model's goodness of fit is 32.6% (Table 4). Secondly, the Durbin – Watson statistic is close to 2, which means autocorrelation is almost non-existing.

Table 6 reflects the relationship of the finance functions with the cash balance of the firms. Variance inflation factor (VIF) corresponding to none of the slope coefficients is more than five; it means multicollinearity is not a significant problem in this case. This is to be noted that the variable *CAPITAL* means equity capital.

Only the relationship of dividend payment with cash is statistically significant at 6%, which is close to the conventional 5% level of significance. The influence of capital structure, PAT, and current liability on cash, being

Table 4. *Model Summary* [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin–Watson
1	.571[a]	.326	.180	15.27741	2.117

[a.] Predictors: (Constant), *CAPEXP, CL, PAT, CAPITAL, DIVIDEND, BORROW.*

[b.] Dependent Variable: *Cash.*

Table 5. *ANOVA* [a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2603.737	6	433.956	1.780	.150[b]
	Residual	5362.135	22	243.733		
	Total	7965.872	28			

[a.] Dependent Variable: *Cash.*

[b.] Predictors: (Constant), *CAPEXP, PAT, DIVIDEND, CL, Capital, BORROW.*

Table 6. *Finance Decisions and Cash Position - The Relationship*

	Coefficients [a]							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics		
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	7.602	10.906		.697	.493		
CAPEXP	−.091	.578	−.046	−.158	.876	.355	2.819
DIVIDEND	.412	.209	.467	1.973	.061	.547	1.830
BORROW	.572	.891	.240	.642	.528	.219	4.558
CL	.685	.702	.257	.976	.340	.442	2.264
PAT	.006	.033	.033	.172	.865	.836	1.196
CAPITAL	−1.350	.917	−.327	−1.473	.155	.619	1.614

[a.] Dependent Variable: *Cash.*

statistically insignificant, can be ignored. It has already been established that capital expenditure has a very negligible relation with the cash balance of the firms. Even after this information, if capital expenditure is incorporated into the multiple regression analysis, the model's goodness of fit appears to be as low as 32.6%. The ANOVA table (Table 5) indicates that the model formulated appears statistically rejected (significance level 15%, instead of 5%). It reflects that industrial reality does not always support the hypothetical relation. Especially in the case of the Indian experience, the direct relationship of some of the finance functions with cash appears to be too weak to be established.

Capital Expenditure and Capital Structure

This paragraph is devoted to examining how firms finance capital expenditures. The utilization of reserves, borrowing, the new issue of equity capital, and accumulated cash savings are the alternative means for financing capital expenditures. So, we define capital expenditure as the dependent variable and borrowings, equity issue, and cash savings as the explanatory variables. PAT is a source of accumulated cash savings, and e_t is the random term.

$$CAPEXP_t = b_0 + b_1\ EQUITY + b_2\ PAT + b_3\ CASH + b_5\ BORROW + b_6\ RESERVE + e_t \qquad (2)$$

The results of empirical analysis have been presented in Tables 7 – 9. The goodness of fit (*R*-square) of the model is 76.7% (Table 7). Secondly, the result of the ANOVA table (Table 8) indicates that the postulated model stands valid in the light of data and empirical analysis. Table 9 shows that reserves and borrowing are significant sources of financing capital expenditures. The variance inflation factor (VIF) corresponding to each of the slope

Table 7. *Model Summary* [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin–Watson
1	.876 [a]	.767	.716	4.56613	1.697

[a.] Predictors: (Constant), *PAT, Cash, Capital, BORROW, Reserve* ; b. Dependent Variable: *CAPEXP.*

Table 8. ANOVA [a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1575.570	5	315.114	15.144	.000 [b]
	Residual	479.540	23	20.850		
	Total	2055.110	28			

[a.] Dependent Variable: *CAPEXP.*

[b.] Predictors: (Constant), *PAT, CASH, CAPITAL, BORROW, RESERVE.*

Table 9. Coefficients [a]

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	1.964	2.921		.672	.508		
BORROW	.481	.156	.397	3.077	.005	.609	1.642
CASH	−.111	.064	−.218	−1.726	.098	.635	1.574
RESERVE	.454	.109	.630	4.149	.000	.440	2.270
CAPITAL	.181	.238	.086	.759	.455	.784	1.275
PAT	−.012	.010	−.137	−1.203	.241	.786	1.273

[a.] Dependent Variable: *CAPEXP.*

coefficients is close to unity; it means multicollinearity is almost insignificant. Cash and PAT are identified as insignificant means of financing capital expenditures.

The coefficient of borrowing is the highest among all. It indicates that, in the study period, from 1990–91 to 2019–20, Indian firms depended more on borrowing. Contrary to this, new equity capital is not significant at the conventional 5% level; it means new equity is not a major source of financing investments.

Table 9 draws attention to two things. Firstly, the coefficient of borrowing is more than the coefficient of equity; secondly, the significance level of borrowing (1% level) is much better than the significance level of equity issue (45%). These findings establish that the firms prioritize borrowing more than the new issue of equity capital for financing capital expenditure. This order of financing conforms to the pecking order. However, establishing the priority of reserves over borrowing is not possible from the results of the analysis. For this, we can take support from the findings of Anand (2002). Compiling the responses of CFOs of top 500 companies in India, the scholar arrived at the result that 89% of the CFOs considered retained earnings to be the most favored source of finance.

Theoretical and Managerial Implications

The paper indicates that cash requirement or sensitivity of cash is a multivariate function, which the previous scholars did not count in their analysis. Scholars, prior to this work, used to ascribe total variations in cash balance to a single finance function, that is, the effect of dividend payout on cash. Hence, their findings provided only incorrect results. This study provides a practical approach to measuring the consequences of financial decisions on cash. Using the output of Table 6, a linear relationship of cash with finance functions can be stated as below :

$$CASH = 7.6 - 0.09CAPEX + 0.41DIV + 0.57BORROW + 0.68CL + 0.001PAT - \mathbf{1.35}\,CAPITAL \qquad (3)$$

The management of a company can obtain a similar equation from the time-series data of their company. It is already stated that the relationship is obtained from the year-to-year percentage change of the variables; hence, if the management can forecast the percentage changes in the explanatory variables, the final cash position can be estimated from the equation. Conversely, how much borrowing is desirable can also be estimated to keep cash at a target level. It indicates that the study's findings can be put to important managerial uses.

Conclusion

The conventional belief that all finance functions have close relation with the firm's cash flow has been verified in this paper. This belief has been examined in the light of summarized data of non-financial domestic private sector firms in India for 30 years. The result does not provide evidence that all financial decisions have an equally significant relationship with cash. Only the dividend decision has verifiable relation with the firm's cash position; whereas, other finance functions such as capital budgeting and capital structure decisions have only limited relation with the firm's cash balance. Subsequent analysis of capital expenditure unfolds that capital budgeting and capital structure decisions are inherently related to each other. While big investments are undertaken, utilizing the retained earnings and borrowing appears equally important. The results reflect that firms give greater priority to borrowing and lower priority to the addition of new equity capital. While findings of this study are combined with the findings of Anand (2002), it confirms that the pecking order hypothesis is applied in the financing practice of Indian firms.

Limitations of the Study and Scope for Further Research

The findings of the study, obtained from 30 years' time-series data of Indian corporate houses, can be counted as appropriate for drawing a generalized inference. However, the study is not free from limitations. More advanced analytical tools like structural equation modeling could be used to obtain better findings from the data. Secondly, instead of using corporate summary data, panel data could be used. Given that management practices vary from one industry to another, the study's findings may appear inapplicable to a particular industry or company. It suggests that for each industry, similar studies can be undertaken. All these outline the scope for further research.

Author's Contribution

Prof. Dipen Roy conceived the idea and developed qualitative and quantitative design to undertake this empirical study. He extracted research papers with high repute, filtered these based on keywords, and generated concepts and codes relevant to the study design. Prof. Dipen Roy, verified the analytical methods, downloaded data from the CMIE Outlook database, and conducted the data analysis using SPSS 21.0.

Conflict of Interest

The author certifies that he has no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

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