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Financial determinants of cash holding levels: An analysis of Indian agricultural enterprises

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Abstract: A significant number of studies have been conducted on the determinants of cash holding levels for different corporates. However, no such study has been witnessed so far on the agricultural enterprises. In this study, we examine the determinants of the cash-holding levels for the Indian agrarian enterprises during 1995–2016 period. With the help of weighted least-squares (WLS) regression analysis, we find evidence that the Indian agro-enterprises with greater lucrative opportunities tend to hold less cash. On the other side, we found that large agro-enterprises tend to hold some other mode of liquid assets rather than cash. The firms with higher capital expenditure and distributing profits as a dividend were shown to hold more cash. In our analysis, we find supportive evidence of the static trade-off theory of cash holding. In general, transaction motives and precautionary motives also play an important role in explaining the determinants of cash holding levels for Indian agrarian enterprises.

Keywords: agricultural cash holding; cash-holding levels; cash management

In the finance literature, cash holding is receiving increasing attention as a significant amount of cash can be seen in the company's balance sheets. For many enterprises the benefits of holding such cash are several. Firstly, for transaction motives, there is a need to hold cash for maintaining the daily operating expenses. Such kind of cash also helps the firm to undertake any new investment opportunities without raising any external liability. Secondly, for precautionary motives, cash is required to meet any unexpected future uncertainty (Keynes 2016). Myers and Rajan (1998) defined the term "cash holding" as a "double-edged sword", meaning that the cash holding can serve as a value-preserving asset and can also be used against uncertain adverse outcomes. On the other hand, under certain conditions, such a cash buffer may hamper rather than strengthen a company's resilience to financial stress.

As per this general rule, the agricultural industry also remains among those which have the largest cash reserves in their balance sheet (Dittmar and Duchin 2012). Nowadays many agrarian enterprises held a significant amount of cash and other liquid assets as compared to their total assets. During the period of profitable agricultural production, these enterprises recorded strong operating performance which resulted in additional cash reserves. It is assumed that additional cash reserves generate immediate returns and a firm has both options either to redistribute the cash into some other mode of assets or to return it in the form of the dividend to the shareholders (Trejo-Pech et al. 2015). In earlier studies, many theoretical models have been developed for cash holding and its management. Some of them which have been widely recognized are trade-off theory, free cash flow (FCF), and the pecking order theory. These theories are commonly used to explain the cash holding among different industries and also may be appropriate for agricultural enterprises. As per trade-off theory, enterprises can identify the optimum cash level by weighting the marginal cost and its benefits which arise from holding such cash (Ferreira and Vilela 2004). The free cash flow theory says that the excess cash arises from the projects having positive cash flows after discounted at the appropriate cost of capital (Jensen 1986). However, agency problem may lie in the free cash flow theory as managers may have pecuniary and non-pecuniary enticement to overinvest in such projects which are having negative net present value

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rather than distribute it to the shareholders. Another theory is the pecking order theory, which states that enterprises provide their first priority to the internally available funds rather than to the external finance (Myers 1984). Sometimes the use of equity may become a problem in pecking order theory, especially for those enterprises which issue too much of equity for raising funds (Frank and Goyal 2003; Fama and French 2005; Leary and Roberts 2007).

As cash holding and its management have been studied since so many years for different cross-industry firms (Kim et al. 1998; Opler et al. 1999; Pinkowitz and Williamson 2001; Ozkan and Ozkan 2004; Bates et al. 2009), no study has been found for management of cash and determinants of cash-holdings for the agricultural industries. Therefore, with this study, we are making the first attempt to address the gap and also analysing the determinants of cash-holding levels for agro-enterprises.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Studies conducted in developed countries have identified the following determinants contributed to firms' cash holding policy: firm size, investment opportunities, capital expenditure, liquid asset substitutes, leverage, dividend payments, cash flows and uncertainty (Chireka and Fakoya 2017). While the cash holdings phenomenon is not limited to the developed countries, little research was conducted in developing countries including India (Gujarati 1968; Choudhury et al. 2011; Al-Najjar 2013). Therefore, this study investigates the determinants of cash holding levels of Indian listed firms in one of India's main economic sector, the agriculture sector. Here, we review the literature related to different determinants which impact the value of cash holding.

Value of cash holding: As cash is an essential part of liquid assets, the measurement and the efficiency of cash holding play a substantial role in firms' value. Cash holding provides firms with much needed financial independence, thereby enabling them to manage profitable opportunities with limited external interference (Boubaker et al. 2015). Sufficient cash management affords managers the flexibility to accept all kind of projects even in negative net present value (NPV) proposals (Ali and Yousaf 2013). Recent studies have confirmed that if cash holding is managed properly, then it allows enterprises to manage the lucrative opportunities; as external financing involves higher cost and also increase the probability of forgoing such opportunities (Hardin et al. 2009).

Size: Previous studies on cash management and its holding levels often stressed the size of the firm. Some theories state that due to economies of scale, larger enterprises hold less cash than those which are small. As borrowing cost has a fixed cost which is not correlated with the size of the loan, the small enterprises hold more cash than the large enterprises (Miller and Orr 1966). However, Ferreira and Vilela (2004) found that larger companies achieve growth through profitability and are likely to retain more cash than smaller ones. Furthermore, the pecking order theory also envisages a positive correlation between firm size and corporate cash holdings (Opler et al. 1999).

Capital expenditure: As for capital expenditure, previous literature found that it is negatively associated with cash holding. Such relationship exerts to enhance the borrowing capacity to make such outlays and undercut the requirement of cash holding (Riddick and Whited 2009). Some authors found the contradictory propositions, and stated that if capital expenditure increases the demand for cash holding increases also (Opler et al. 1999). This is supported by Kusnadi (2003).

Debt policy: The relationship between cash holding and debt policy has gained little attention in the finance literature. This is because of the existence of an association between cash holding and debt policy of the firm. Highly levered enterprises might have held more cash than less levered enterprises because of a higher rate of bankruptcy and default risk (Ferreira and Vilela 2004). Leverage also exerts a negative relationship with cash holding as it can be used in such a manner to reduce the agency cost which could arise for the free cash flow reason (Hardin et al. 2009).

Lucrative opportunities: There is a general consensus that lucrative opportunities impact the value of cash holdings (Ferreira and Vilela 2004; Bates et al. 2009). Liquid assets allow enterprises to manage profitable opportunities if managed properly inside the business. External financing involves higher cost and also increases the probability of forgoing such opportunities (Hardin et al. 2009). Further, a positive relationship was found between cash holding and profitable opportunities, supported by the precaution motive theory of cash holding (Kim et al. 1998; Opler et al. 1999; Ferreira and Vilela 2004; Ozkan and Ozkan 2004; Bates et al. 2009).

Liquid asset substitutes: Those enterprises which have more substitutes of non-cash liquid assets hold

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less cash, they do not prefer another mode during the periods of cash shortage. Here the precaution motive theory states that it is better to hold non-cash liquid assets than cash. The previous theoretical and empirical study provides evidence for a negative impact of liquid asset substitutes on enterprises' cash holding (Ferreira and Vilela 2004; Ozkan and Ozkan 2004; Hardin et al. 2009).

Fund from operations: It is assumed that changes occur in cash holding due to the fund flow from operations. Some prior studies found a negative relationship between cash holding levels and fund flow from operations. Source of liquidity could be raised by such flows which can be used further as a substitute of cash (Kim et al. 1998). However, Opler et al. (1999) suggest a positive relationship in between the fund flow and cash holding, as fund flow provides some back earnings which could be held in the form of cash holding.

Volatility of cash flows: The greater is the firm's cash flow volatility, the greater is the probability that a firm will be short of liquid assets. There is evidence that firms with cash shortfalls are forced to forego viable, profitable opportunities (Minton and Schrand 1999). Thus, firms with higher cash flow volatility are expected to hold extra cash to mitigate the negative circumstances (Ozkan and Ozkan 2004).

Dividend payout: A firm can create a source of the fund at a very minimum cost by retaining back the earnings which have to be distributed in the form of dividend among the shareholders (Opler et al. 1999; Pinkowitz et al. 2006). Bates et al. (2009) made a study on the US industrial companies where they found a negative relationship between dividend payment and cash holding; they also found that over a 26 year period the cash holding ratio increased by more than 100%.

The measurement of each determinant is presented in Table 1.

On the basis of the previous discussion, the following hypotheses were formulated:

H_1: There is a negative relationship between firm size and cash holdings.

H_2: There is a negative relationship between capital expenditure and cash holdings.

Table 1. Measurement of determinants

Determinants	Measurement	Reference
Cash (*CASH*) (dependent variable)	ratio of cash and other marketable securities to total assets	Kim et al. (1998); Opler et al. (1999); Ferreira and Vilela (2004); Ozkan and Ozkan (2004); Bates et al. (2009); Hardin et al. (2009)
Size (*SIZE*) (independent variable)	natural log values of total assets	Miller and Orr (1966); Opler et al. (1999); Ferreira and Vilela (2004); Ozkan and Ozkan (2004); Bates et al. (2009); Hardin et al. (2009)
Capital expenditure (*CAPEX*) (independent variable)	ratio of capital expenditure to total asset	Miller and Orr (1966); Opler et al. (1999); Bates et al. (2009)
Debt policy (*DEBT*) (independent variable)	ratio of total debt to total assets	Ferreira and Vilela (2004); Hardin et al. (2009)
Lucrative opportunities (*LOP*) (independent variable)	ratio of price to book value	Kim et al. (1998); Opler et al. (1999); Ferreira and Vilela (2004); Ozkan and Ozkan (2004); Bates et al. (2009); Hardin et al. (2009)
Liquid asset substitutes (*LAS*) (independent variable)	ratio of current assets (other than cash) to total asset	Ferreira and Vilela (2004); Ozkan and Ozkan (2004); Hardin et al. (2009)
Fund flow from operations (*FFO*) (independent variable)	ratio of earnings after interest, dividends, and taxes but before depreciation and amortization to total assets (FFO)	Opler et al. (1999); Kim et al. (1998)
Volatility of cash flows (*VCF*) (independent variable)	ratio of standard deviation of cash flow to average total assets	Ozkan and Ozkan (2004); Guney et al. (2007)
Dividend payment (*DIVD*) (independent variable)	dummy variable (1 for those who pay dividend, 0 otherwise)	Opler et al. (1999); Pinkowitz et al. (2006)

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$$CASH_i = \alpha_i + \beta_1 SIZE_i + \beta_2 CAPEX_i + \beta_3 DEBT_i + \beta_4 LOP_i + \beta_5 LAS_i + \beta_6 FFO_i + \beta_7 VCF_i + \beta_8 DIVD_i + u_i \quad (1)$$

$$\sum w_i \hat{u}_i^2 = \sum w_i (CASH_i - \hat{\alpha}_i - \hat{\beta}_1 SIZE_i - \hat{\beta}_2 CAPEX_i - \hat{\beta}_3 DEBT_i - \hat{\beta}_4 LOP_i - \hat{\beta}_5 LAS_i - \hat{\beta}_6 FFO_i - \hat{\beta}_7 VCF_i - \hat{\beta}_8 DIVD_i)^2 \quad (2)$$

H_3: There is a negative relationship between debt policy and cash holdings.
H_4: There is a positive relationship between lucrative opportunities and cash holdings.
H_5: There is a negative relationship between liquid asset substitutes and cash holdings.
H_6: There is a positive relationship between fund from operations and cash holdings.
H_7: There is a negative relationship between cash flow volatility and cash holdings.
H_8: There is a negative relationship between dividend payout and cash holdings.

DATA AND METHODOLOGY

In order to make an empirical analysis to test our hypotheses, we used the Prowess database to create a sample of Indian listed agricultural enterprises during the study period of 1995 to 2016. Prowess is an Indian database management system for which the data is collected by Centre for Monitoring the Indian Economy (CMIE). Prowess helps us to track the different agricultural enterprises over the sample. The data has been extracted for 22 years. The final panel dataset has been constructed as follows. Firstly, the firm-years during the study period which have missing values for any of the seven variables were eliminated. Then from these agricultural enterprises, during the study period, we select only those which have a minimum of five continuous time series data observations. After that was eliminated any value, which comes with very high or low significance and does not follow the three standard deviation rules of the mean observation. These criteria provided a dataset of 1 973 firm-year observations for different agriculture enterprises over the 1995–2016 time periods.

EMPIRICAL ANALYSIS

We selected weighted least-square (WLS) regression analysis to examine the determinants of cash holding for agricultural enterprises. For handling the problem of heteroskedasticity we commonly use WLS regression analysis. As heteroskedasticity usually exists in cross-firm regression analysis, it also helps to violate the constant residual assumption of regression analysis (Kleinbaum et al. 1988). The weights we used in our statistical analysis are the reciprocals of the absolute figure of residuals (Equation 3) which we received from the ordinary least-square regression model (Equation 1). Further equations represent the model used in the estimation (Gujarati 2009).

In Equation 1, *CASH* represents ratio of cash and other marketable securities to total assets; *SIZE* stands for natural log of total assets; *CAPEX* is capital expenditure; *DEBT* stands for ratio of total debt to total assets; *LOP* represents ratio of price to book value; *LAS* stands for liquid asset substitutes; *FFO* is fund flow from operations; *VCF* represents volatility of cash flows; *DIVD* is dividend payment; i stands for i^{th} observation.

The weighted residual sum of squares is described in Equation 2. In Equation 2, all the $\hat{\beta}$ are the weighted least-squares estimators and the weights (w_i) are:

$$w_i = \frac{1}{\sigma_i^2} \quad (3)$$

RESULTS

Figure 1 shows the levels of cash holding for Indian agricultural enterprises which have been identified over the 22 years period.

As per Figure 1, the average cash ratio for these enterprises is 0.0108, which states that Indian agricultural enterprises normally hold 1% cash of their total assets. This ratio is not matched with the other Indian publicly traded and industrial enterprises which reported the average cash ratio of 3.4% of total assets in previous studies (Dittmar et al. 2003). In another study, it was 2.5% (Pinkowitz et al. 2013). Al-Najjar (2013) states that the cash holding ratio was 3.3% for Indian enterprises from 2002–2008. In our study, the average ratio for the Indian agricultural enterprises shows minor changes in rising or lowering the levels of cash holding over the period of 1995–2016.

The descriptive statistics outputs are presented in Table 2. It can be seen that the mean ratio of cash is 1.08% for Indian agriculture enterprises and the standard deviation is 0.82%, which means that there is a very low right-skewed distribution for cash. The mean value of the capital expendi-

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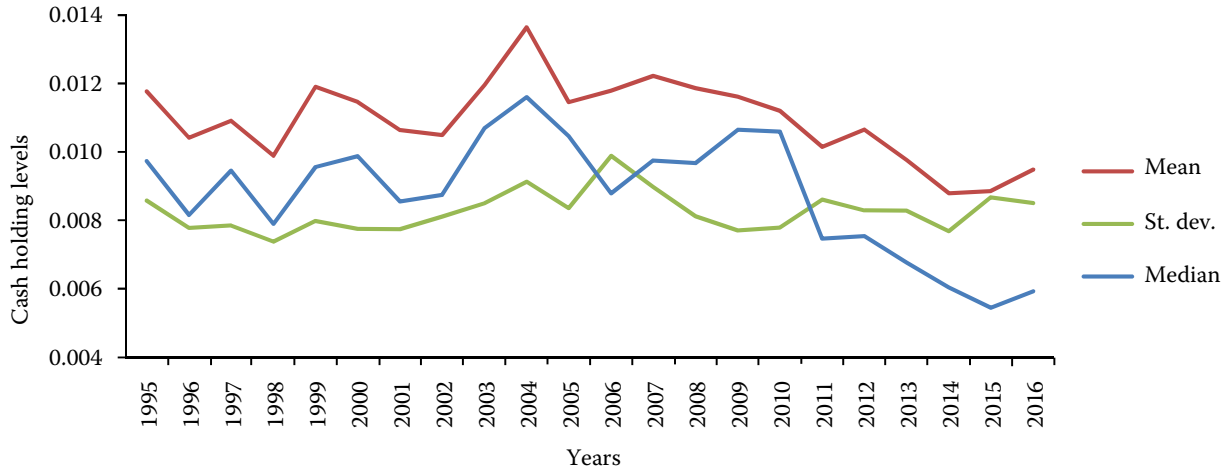

Figure 1. Descriptive analysis of cash holding levels of Indian agricultural enterprises

cash-holding level is measured by the ratio of cash and marketable securities to total assets

Source: authors' calculations

ture is 0.628; it indicates an investment expenditure of 0.628 INR for every single Indian Rupee invested in the overall assets. For the firm size, the mean value is 5434.27 million INR, and the standard deviation is 12986.89 million INR, indicating a wide variance among all the enterprises. Because of such a wide variance, we used natural log values of total assets in our analysis. On April 1, 2018, the exchange rate for 1 USD was 65.11 INR. The mean figure of lucrative opportunities 0.71 indicates a positive market value for the agro-enterprises and it is not at a very high premium rate. For leverage, the average value 0.43 reveals that the Indian agrarian enterprises do not very much rely on debt and prefer to use equity than debt. The mean value for the fund from operations 0.06 indicates that fund used in operations is 6% of the total assets. For liquid asset substitutes, the mean value is 0.0008, suggesting that the amount of liquid asset substitutes is 0.08% of total assets. In last, the average value of dividend payment for which we use dummy variable 0 and 1 is 52.41%, indicating more than half enterprises were paying the dividend.

Before estimating the WLS regression model, we used the Pearson correlation coefficient for examining the independent variable's association with the ratio of cash:

Table 2. Descriptive analysis

Variables	Mean	St. dev.	Minimum	Median	Maximum
CASH	0.01088	0.00821	0.00010	0.00868	0.03351
SIZE (million INR)	5 434.27	12 986.89	39.20	1 430.90	126 128.60
CAPEX	0.62896	0.25621	0.00655	0.63561	1.31774
DEBT	0.42742	0.18715	0.00020	0.44797	0.95422
LOP	0.70573	0.48476	0.00000	0.59000	2.03000
LAS	0.00082	0.00070	0.00000	0.00059	0.00264
FFO	0.05567	0.07638	–0.14200	0.05296	0.25352
VCF	0.02287	0.02812	0.00013	0.01512	0.53365
DIVD	0.52408	0.49955	0.00000	1.00000	1.00000

number of observations = 1 973; the exchange rate 1 USD = 65.11 INR (April 1, 2018); *CASH* – ratio of cash and other marketable securities to total assets; *SIZE* – natural log of total assets; *CAPEX* – capital expenditure; *DEBT* – ratio of total debt to total assets; *LOP* – ratio of price to book value; *LAS* – liquid asset substitutes; *FFO* – fund flow from operations; *VCF* – volatility of cash flows; *DIVD* – dividend payment

Source: authors' calculations

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$$r = \frac{\sum\left(X_i - \bar{X}\right)\left(Y_i - \bar{Y}\right)}{\left[\sum\left(X_i - \bar{X}\right)^2 \sum\left(Y_i - \bar{Y}\right)^2\right]^{1/2}}$$

where r = Pearson correlation coefficient, X_i and Y_i represent the values of any two variables for the i^{th} observation (Lee and Nicewander 1988).

The variable cash is positively and significantly correlated with lucrative opportunities, liquid asset substitutes, fund from operations, volatility of cash flows and dividend payment but negatively and not significantly associated with size, capital expenditure, and leverage (Table 3). As mentioned in earlier studies, a heteroskedasticity could occur in cross-sectional data (Studenmund 2006), so in order to examine the heteroskedasticity, we conducted the White (1980) test. The statistics of the White test for our regression model was 82.42 ($P < 0.0000$), which means that we can reject the null hypotheses which state that there is homoscedasticity. To correct the heteroskedasticity errors we used WLS regression model.

Table 4 provides WLS regression results in which we identify the factors which can affect the levels of cash holding of Indian agricultural enterprises. The *F* value 1 810.81, with significance level 0.01 indicates that the model is significant and able to clarify all the determinants which we have taken in our study to see the impact on selected enterprises. The value of adjusted *R*-square is 0.88 showing all eight variables have described 88% disparity in the levels of cash holding of agricultural enterprises. The positive coefficients of *t*-statistics for *CAPEX*, *LAS*, *FFO*, *VCF* and *DIVD* indicate that the levels of cash holding are positively affected by capital expenditure, liquid asset substitutes, fund from operations, volatility of cash flows and dividend payout. The negative coefficient of *SIZE*, *DEBT* and *LOP* indicate that the levels of cash holding are negatively affected by size, debt policy and lucrative opportunities. As reported by *t*-statistics, *DEBT* is not statistically significant at the 0.05 significance level.

In order to detect the multicollinearity, we used Durbin-Watson (D) test. The computed values of Durbin–Watson statistic is 1.908, and it lies in a no serial correlation zone, which indicates that there is no serial correlation in our model. We also obtained the variation inflation factors (VIFs) statistics to check for multicollinearity. In our model, the values of VIFs related to all the independent variables are very much lower than 10. So we can say that in our WLS regression model multicollinearity is not a concern.

Table 3. Pearson correlation coefficients

	CASH	*SIZE*	*CAPEX*	*DEBT*	*LOP*	*LAS*	*FFO*	*VCF*	*DIVD*
CASH	1	–0.007	–0.033	–0.031	0.071**	0.057*	0.113**	0.603**	0.184**
SIZE	–0.007	1	–0.047*	0.070**	0.233**	–0.364**	0.036	0.020	0.349**
CAPEX	–0.033	–0.047*	1	0.109**	0.048*	0.003	0.243**	–0.486**	–0.046*
DEBT	–0.031	0.070**	0.109**	1	–0.045*	–0.084**	0.004	–0.043	–0.102**
LOP	0.071**	0.233**	0.048*	–0.045*	1	–0.131**	0.008	0.051*	0.210**
LAS	0.057*	–0.364**	0.003	–0.084**	–0.131**	1	–0.007	0.021	–0.109**
FFO	0.113**	0.036	0.243**	0.004	0.008	–0.007	1	–0.064**	0.150**
VCF	0.603**	0.020	–0.486**	–0.043	0.051*	0.021	–0.064**	1	0.099**
DIVD	0.184**	0.349**	–0.046*	–0.102**	0.210**	–0.109**	0.150**	0.099**	1

*correlation is significant at the 0.05 level (2-tailed); **correlation is significant at the 0.01 level (2-tailed); *CASH* – ratio of cash and other marketable securities to total assets; *SIZE* – natural log of total assets; *CAPEX* – capital expenditure; *DEBT* – ratio of total debt to total assets; *LOP* – ratio of price to book value; *LAS* – liquid asset substitutes; *FFO* – fund flow from operations; *VCF* – volatility of cash flows; *DIVD* – dividend payment

Source: authors' calculations

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Table 4. Weighted least square regression model analysis

Variables	Coefficient	*t*-statistic	Significance	VIF
Constant	–0.00244	–8.96	0.000	–
SIZE	–0.00010	–3.95**	0.000	2.987
CAPEX	0.01130	53.24**	0.000	2.294
DEBT	–0.00036	–1.56	0.119	1.119
LOP	–0.00033	–3.65**	0.000	1.816
LAS	0.42825	6.45**	0.000	1.837
FFO	0.00644	11.42**	0.000	1.812
VCF	0.25055	83.98**	0.000	1.929
DIVD	0.00184	18.85**	0.000	2.023
Observation		1 973.00		
Adjusted *R*-squared		0.88		
F		1 810.81**		
Durbin-Watson statistic (D)		1.963		

**significant at the 0.01 level; VIF – variation inflation factors; *CASH* – ratio of cash and other marketable securities to total assets; *SIZE* – natural log of total assets; *CAPEX* – capital expenditure; *DEBT* – ratio of total debt to total assets; *LOP* – ratio of price to book value; *LAS* – liquid asset substitutes; *FFO* – fund flow from operations; *VCF* – volatility of cash flows; *DIVD* – dividend payment

Source: authors' calculations

DISCUSSION

In the WLS statistics, the negative coefficient of size indicates that due to transaction motive a negative relation exists. As per economies of scale, enterprises enable themselves to make the fixed cost of borrowing less difficult. It also influences the large enterprises rather to borrow than to hold the cash (Miller and Orr 1966). In order to have greater access to capital markets, enterprises also hold less cash (Opler et al. 1999). But for small enterprises, evidence was found that they carry more cash as they do not have proper information asymmetry and also to avoid financial distress. The positive coefficient of capital expenditure supports the argument that if there is an increase in capital expenditure then the demand for cash holding increases (Opler et al. 1999). As per the trade-off theory, capital expenditure raises the probability of financial distress (Bates et al. 2009). Therefore, to avoid the financial distress companies often hold more cash (Riddick and Whited 2009). The debt policy has statistically insignificant results. This negative and not statistically significant relationship supports the previous arguments that debt can increase a firms' access to the capital market and also reduce agency cost which could arise for the free cash flow reason (Hardin et al. 2009). In our analysis, the coefficient of lucrative opportunities shows a negative impact on the cash holding which was not expected. Earlier studies indicated that enterprises with more profitable opportunities have to build more cash against shortage (Hardin et al. 2009). The finding shows that agro firms with more lucrative opportunities tend to hold less cash. This could be because the Indian agro firms have high liquid asset substitutes that can be easily converted into cash without incurring significant transaction cost (Chand 2001). There is a positive relationship between liquid asset substitutes and agricultural enterprises' cash holdings, indicating that agro firms with more net working capital hold more cash. The implications of precautionary motive theory can be seen in our results as current assets other than cash cannot be quickly liquidated to generate funding. Fund from the operations has a positive and also statistically significant relationship to cash holding. It supports the previous arguments that cash from high fund flows could be build up as a reserve for future uncertainties and to take advantage of new opportunities as and when available. (Opler et al. 1999). Cash flow volatility has a positive impact on cash holdings indicating firms to hold more cash as a precaution against adverse situations (Ozkan and Ozkan 2004). Dividend payout variable has positive and statistically significant statistics which mean that

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dividend paying enterprises hold more cash as they do not have easier access to capital markets.

CONCLUSION

This study is focused on the examination of the determinants of Indian listed agro firm's cash holdings in 1995–2016 period. Our study makes concern for many academic implications. First, large Indian agro-enterprises incline to hold less cash as they have cost-effective and easier access to capital markets. Their ability to access the market and lower dependence on internal finance motivate them to hold less cash and weaken their precautionary motives for cash holding.

Second, capital expenditures are often made to increase capacity or efficiency of an asset that require higher cash holding level (Bates et al. 2009). Hence, agricultural firms increase their cash level with capital expenditure level.

Third, our study shows that agro-enterprises with more lucrative opportunities have a weaker incentive to hold more cash, because it incurs higher opportunity cost (Opler et al. 1999).

Furthermore, the results show that agricultural firms increase their cash holding levels with the level of liquid asset substitutes. This positive relationship supports the Ozkan and Ozkan (2004) proposition that current assets other than cash cannot be quickly liquidated to generate funding.

Fund from operations is found positively associated with cash holding, supporting the fact that fund from operations helps to build up a reserve which can be used for possible future concerns. The volatility of cash flows exerts a positive relationship with cash holding as cash is required to meet any unexpected future uncertainty (Keynes 2016). The dividend payment is found positively related to the cash holding, implying that agrarian enterprises do not follow the trend seen across industries. Other industries treat dividend payout as a substitute for cash that can be cancelled in times of financial need (Kim et al. 2011). Overall, the results show the efficacy of trade-off theory to define cash holding for agrarian enterprises, which is driven mostly by both the precautionary and transitive motives for making the decisions. Our results bring practical implications for all stakeholders in the agro-industry. The findings can provide an understanding of the relationship between firm-specific variables and cash holding. Investors and other stakeholders can make decisions about investment after monitoring these determinants.

As cash holding has been widely used as the main source for different corporations (Jensen 1986), these results are practical implications in the agricultural sector. By making an analysis of all these specific variables with relationship to cash holding, we can more accurately apply the results on agricultural enterprises. Further studies can be made to find out the optimum level of cash holdings in the agricultural industry; the relationship between cash holding and the value of the firm can also be examined.

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