Corporate Ownership Structure and Firm Excess Cash Holdings: Evidenced from Emerging Markets, Pakistan

HamidUllah
Bacha Khan University, Charsadda
Email: ims.hamid@gmail.com
Shafiq ur Rehman
Department of Management Studies
University of Malakand
Gouhar Saeed,
Field Research Specialist at
Pakistan Academy for Rural Development, Peshawar
Alam Zeb
Department of Management Studies
University of Malakand

Abstract

This study investigated the impact of firm different type of ownership structure on firm cash holdings while using sample data randomly collected for the 180 firms listed in KSE-All index for the time period of eight years ranging from 2003 to 2010. The analysis suggested that firms with higher institutional ownership have high amount of cash holdings. Firm managerial ownership has negatively related with the cash holdings. The more dispersed ownership structure of firm would lead the manager to keep more cash to be liquid enough and lower chance of bankruptcy. Higher the amount of block holders the lower will be the cash kept by the firm due to strong monitoring mechanism of the block holders. The foreign shareholders would preferred cash dividend as to capital gain therefore there is negative relationship between the cash holdings with foreign ownership and dividend payout.

Keywords: Cash holdings, managerial ownership, institutional ownership, foreign ownership

The ownership structure plays a vital role in determining the optimal level of cash holdings by firm. The importance of cash holding in a firm overall financial health is reflected in the business view that "cash is king" A firm could have a large amount of physical assets/accounts receivable on its balance sheet, but may

still run out of cash, resulting in bankruptcy. Opler et al.(1999) and Harford and Maxwell (2008) investigated different determinants of firm cash holdings such as agency problem, business risk, growth and financial policy. Brown, Chen and Shekhar (2001) consider institutional ownership as important determinant of corporate cash holdings. However, other types of ownership such as managerial ownership, foreign ownership, widely dispersed ownership and block holdings has not been considered so far.

This study therefore, aims to investigate these issues and therefore, it is one of the main contributions of this study. To the best of authors' knowledge, this is the first study that documents the relationship between the firm cash holdings and ownership structure of non-financial firms.

Literature Review and Theoretical Frame work

Myers and Majluf (1984) investigated that if firm has a valuable investment opportunity than it should have increased cash by issuing common stock. Moreover, firms would have relied on internal sources and if internal fund is not sufficient than external financing would be required and in external finance, firms prefer debt over equity. Jenson (1986) investigated the issues of conflict between managers and shareholder. The researcher has explained the payment of cash to shareholders and optimal size of the firm. Large free cash flows produce very strong conflicts in firms because it raises more cash than investment opportunities.

Harford (1999) studied the relationship between corporate cash reserves and acquisitions and it has been determined that firms having high cash or high cash reserves have expected to attempt more acquisitions than less cash reserve firms. Stulz et al. (1999) examined the determinants and implications of holdings of cash and marketable" securities. Their findings show that firms have stronger growth opportunities and uncertain cash flows relatively hold higher cash to total assets ratios but those firms that have maximum capital market access are likely to hold lower cash

to total assets ratios. These results held constant when external funds are expensive and when cash flow has too slow comparatively to investment planned. These firms held liquid assets to make sure that firms would have been able to continued investment. However in short run smaller impact has been observed on capital expenditures, acquisition spending and payouts to shareholders by excess cash.

Dittmar, and Servaes (2003) concluded that agency problem is very important factor of corporate cash holdings. Researchers consider a sample of 45 countries and concluded that countries where the protection of shareholder rights is low, cash is twice held up then countries where the protection is high, also when the shareholder protection is low then the need for cash holding cause different factors, such as asymmetric information and investments opportunities become irrelevant.

Faleye (2004) studied the relationship between cash and corporate control and suggested that market takeover has resultant of agency problems of excessive corporate cash holdings. But recent studies showed different facts that have been focused of corporate liquidity on the takeover deterrence and implied a proxy contest that has an effective alternative control mechanism. Findings show that 23% more cash hold by proxy fight targets than similar firms, and suggested that the chance of proxy contest has been increased in excess cash holdings and return of proxy fight has been increased in excess cash.

Williamson et al. (2006) observed investors with poor protection investor's rights held more cash. Results show that the average cash-to-assets ratio have been double for American industrial firms, this increase in cash holdings have paid its entire firm debt obligation at the end of the sample period. However cash flow of firms has become more risky that why cash ratios increased. It has been concluded that firms hold less cash and spend more cash on R&D as for the cash holdings the protective purpose have play significant role in explaining the increase in

cash ratios. Faulkner and Wang (2006) studied cross-sectional variations that have occurred from corporate financial policy in the marginal value of corporate cash holdings. By investigated that over fiscal year the difference in excess return, researchers have discovered that with the higher cash holding, leverage higher, access to capital market improved then the marginal value of cash has been declines .Further suggested that firm prefer higher dividend as a cash distribution relatively than repurchases

Dittmar and Mahrt-Smith (2007) studied that how value of firm can be affected by the corporate governance. The researchers analyze the influence of utilization of cash resources and its value by managerial entrenchment and the lack of shareholders supervision. Their concentration was how the management can efficiently spent a large fraction of corporate assets in operation rather than the cash holdings because cash was not needed for investments. They find that the firm value and cash policy has been affected by the corporate governance. They investigate that poorly governed management can cut down the market value of excess cash reserves by up to one-half and it cause the separation of excess cash more quickly and also low accounting returns in assets. The researchers concluded that these negative points can be remove if the management makes a good policy of corporate governance and apply it through proper channel.

Harford and Maxwell (2008) studied the concept of corporate governance and a firm's cash holdings by using governance metrics that has based on anti-takeover provisions and inside ownership. Findings show that a firm with weak corporate governance structure in fact has lesser cash reserves. Firms having weak corporate governance structure preferred repurchased rather than dividends with future payments commitments avoided. It is further argued that weaker shareholder rights and excess cash lead to increase acquisitions and capital expenditure, decrease profitability and valuations of firms. Bates and Stulz (2009) studied why US industrial firms did not hold more cash rather than to used it. Their findings show that asset ratio has been increased by 129%,

due to increase in cash to asset ratio, American firms hold cash to pay leverage at the end, and so no debt would have been measured. Researchers concluded that this transformation not due to some large firm hold high cash but it has due to secular trend in cash ratios and net debt. It determined between those firms that has not paid the dividends. It has been proved that U.S. firms net earnings or resource were uncertain so firms spend more cash on Research and Development (R&D) rather than to maintained cash. The cash ratio has been increased due to preventive motives by U.S. firms

Fresard et al. (2010) studied that American listed firm has moderated risk that have been turned their cash hold firms in to private benefit by the insiders. It has observed that surplus reserve cash is directly related to the investor's value and significantly larger for foreign listed firms. Further it has argued that excess cash reserve is not because of govt. rules and requirements, but from the greater informal monitoring pressure that accompanied a US listing. It has been analyzed that how the surplus or excess cash used by investors which equaled the investor's valuation, concluded that excess corporate cash resources not efficiently used by the insiders of US listed firms.

Chen and Xiao (2010) concluded that firms hold less cash when government has in good position. It is suggested that governments take part in corporate cash holding decisions. The result also indicated that control of government quality has greater for private firm than for state-owned enterprise (SOEs). Sun and Wang (2011) analyzed the impact of business possession framework/corporate ownership structure on the value of unwanted money in China listed companies. It has been founded that the value of unwanted money is less in companies managed by many than in those companies managed by the govt.

Research Designed and Methodology

Sample Frame work

The sample of the study consists of sixty nine non-financial firms selected randomly from Karachi stock exchange (KSE). The secondary data has been collected for eighty annual reports of the KSE listed firms and from Balance sheet analysis of State Bank of Pakistan (SBP) for the period of 2003 to 2009. The analysis is considering 640 observations initially but there were some abnormalities in the data that were dropped and finally 533 observations used based on which the results were estimated.

Models

The relationship between Ownership Structure and Firm cash holdings can be determined by using following models.

$$Cashr = \alpha + \beta 0\ INST + \beta 1MO + \beta 2INDO + \beta 3\ BLOCK5 + \beta 4\ FORG + \beta 5\ FS + \beta 6FP + \beta 7FG + \beta 8\ FCF + \beta 9NDTS + \beta 10TANG + \beta 11DRATIO + \beta 12TOBINSQ + \beta 13\ DE + \beta 14\ ROA + e_i$$

Whereas Cashr stands Cash Holdings which is dependent variable and other independent variable are INSTO stands for Institutional Ownership, MO for Management Ownership, INDO for Individual Ownership, Block5 for Blockholder 5 and control variables are FORG for Foreign Share Holder, FS for Firm Size, FP for Firm Profitability, FG for Firm Growth, FCF for Firm Cash Flow and NDTS for Non Debts Tax Shield, tang for Tangibility, DRATIO for Dividend Ratio and DE for Debt Equity ratio

Statistical Techniques

Different statistical tools have been used to analyze the data such as descriptive statistics, correlation and multiple regressions.

Definition of Variables

Cash ratio has calculated by dividing the total cash hold by the firm (cash in hand and cash at bank) to that of the total assets. It shows the portion of the assets held by the firm out of the total

assets. Managerial ownership means the percentage of the firm ownership out of the total share ownership. It has calculated by ownership held by directors, executives their spouses and children to total share ownership. Institutional ownership represents the percentage of the firm ownership held by the financial institutions including banks insurance firm etc. to that of the total share capital of the firm. Individual ownership represents the percentage of the firm ownership held by the dispersed owners to that of the total share capital of the firm. Foreign ownership represents the percentage of the firm ownership held by the foreigner shareholders to that of the total share capital of the firm. It shows the firm capital investments from outside the country. Firm size has calculated by taking log of the total assets. Its shows that the firm is belong to small medium or large position in the industry. The larger is the size of the firm the higher would be the cash requirements (Crutchley & Hanson 1979). Firm profitability shows the net profit margin ratio of the firm that has calculated by the firm net income after profit to the sale. The higher is the profit ratio the lower would be the excess cash required by the firm (Myers and Majluf 1974). Firm growth has calculated by changes in the fixed assets of the firm in terms of percentages. The higher is the firm growth the higher would be the cash hold by the firm to support the growth activities (Smith and Watts 1992). Tangibility represents the amount of fixed assets held by the firm to that of the total assets. The higher is the firm tangible assets the lower would be the excess cash requirements of the firm (Long and Malitz 1975). Leverage represents the amount of debts to equity of the firm. It has proxy for the capital structure of the firm. The higher is the ratio means the higher the debts has been used by the firm and the higher would be the cash requirements of the to repay their debts on time so they have to keep more cash. (Miguel and Pindado 2001). Free cash flow has calculated from the profits from operations to that of the total assets of the firm. The higher the free cash flows from operations the higher would be the firm cash held by the firm (Brailsford, Oliver and Pua 2002).

Empirical Analysis of the Study

This section is composed of different types of analysis that has conducted for the investigation of the cash and ownership structure. Descriptive statistics for both the main variables as well as control variable has provided; correlation and regression analysis has in order to investigate the relationship between the variables of interest.

Descriptive statistics of ownership and cash holding

In order to overview the distributional proprieties of the main variables of interest descriptive statistics has been calculated as shown in table 4.1. Minimum value of institution managerial foreign ownership and individual ownership is zero while its maximum values are 0.47, 0.953, 0.92 and 0.831 respectively. Moreover, block holder and cash as minimum value of 0.053 and 3.23 while maximum value is 0.996 and 10.58 respectively.

Descriptive statistics of Control variable

The distributional properties have shown in table 4.2. It shows that firm size has minimum of 1.06 maximum of 9.78 mean 3.6 and standard deviation of 1.07. Firm profit has minimum of -0.28 maximum of 2.13 mean of 0.14 and standard deviation of 0.2123. Leverage has minimum 0.08 maximum of 2.13 mean 0.55 and standard deviation of0.25 and so on.

Table 1

Descriptive statistics of ownership and Cash holding

	N	Minimum	Maximum	Mean	Std. Deviation
INST.O	553	.00	0.47	.4033	.03596
M.O	553	.000	.921	.18846	.239941
IND.O	553	.000	.831	.21888	.167227
Block5	553	.053	.996	.65690	.197881
FORG	553	.000	.965	.07681	.198782

Cash.R	553	3.23	10.58	7.8865	1.10857

Table 2
Descriptive statistics of Control variable

	N	Minimum	Maximum	Mean	Std. Deviation
F.S	553	1.08	9.78	3.6300	1.07141
F.P	553	-.28	2.13	.1416	.21256
F.G	551	-1.00	14.15	.2190	.75786
NDTS	553	.000	.411	.03703	.035664
TANG	553	.000	.927	.46982	.238252
D.Ratio	553	-.44	2.78	1.1536	.23923
Tobin's Q	553	-333.62	1936.65	58.7998	172.15148
D/E	553	.08	2.31	.5960	.26087
ROA	553	-.28	2.13	.1389	.21182

Regression Analysis of Cash Holdings and Ownership Structure

In order to check the impact of different types of firm ownership on the firm Cash holding, multiple regressions has estimated as shown in table 4.4. Cash holdings is dependent variable while institutional shareholding, managerial shareholding, individual shareholding, foreign shareholding has used as explanatory variables while controlling for firm size, firm growth, firm profit, net debt tax shield, tangibility and leverage. The impact of the institutional ownership on cash holdings is positive and significant by the coefficient of 0.02154 and the t-test value is 6.9 which is greater than the critical value i.e. 2.32 at 1% significant level and calculated p-value is 0.000 which is less than the 1% critical value so thus it has concluded that there has significant positive relationship between the institutional ownership and cash holdings. If the institutional share ownership increases in the firm the firm cash holdings will be increased due to the reason that they will be able to have more opportunity of getting cash from those financial institutions that has ownership in the firm.

However, managerial ownership, individual ownership and foreign ownership has negative impact on the firm cash holdings and the relationship is significant. The coefficient of managerial ownership with cash holding is -0.7368 and its t-test value is -5.3 which is greater than the critical value -2.32 at significant level of 1% and calculated p-value is 0.000 which is less that critical value i.e. 1% . Therefore it has suggested that there has a significant negative relationship between the firm managerial ownership and cash holdings. The negative relationship is due to the reason that when the acting managers are also the owner so they take more aggressive decision and keep less cash in the firm as the cash as negative impact on the firm profitability. If the firm has more idol cash on hand so there profitability will be reduced but the liquidity will be increased, when the managerial ownership increases the manager become aggressive and they tread off between the firm profitability with liquidity. Similarly the coefficient of foreign ownership with cash holding is -0.4145 and its t-test value is -1.8 which is greater than the critical value -1.86 at significant level of 10% and calculated p-value is 0.06 which is less that critical value i.e. 10%. Therefore it has suggested that there has a significant negative relationship between the firm foreign ownership and cash holdings. The coefficient of block holdings with cash holding is -0.448 and its t-test value is -2.024 which is greater than the critical value -2.0 at significant level of 5% and calculated p-value is 0.04 which is less that critical value i.e. 5% . Therefore it has suggested that there has a significant negative relationship between the firm block holding and cash holdings. This is in conformity of the view that the block holders are the large group of shareholders they can have capability of enforcing managers to invest more and keep less in hard cash so that they earn more profit but simultaneously sacrifice for the liquidity.

The relationship between the cash holdings and ownership structure has controlled for other factors that can have significant impact on the cash holdings. Firm size, free cash flows and leverage has positive impact on the cash holding suggested that large size firm have more daily expenses and need more cash for

the payments, levered firm needs more cash so that they can easily pay off their debts or interest burdens on time, the higher is the availability of the free cash flow with the firm the higher would be the cash holdings. However firm growth, firm profit; tangibility has negative impact on the cash holdings of the firm. The firms that are growing has less money on hand due to growth, the firm with higher profit would have less cash on hand as due to more investments the profit has increased but sacrifice for the liquidity. The higher is the tangibility the firm normally holds less cash with the view that they are more stable firm.

The explanatory power of the model has shown by coefficient of determination known as R-square which is 49.4%. which suggested that mean changes in cash holdings is explained by institutional ownership, managerial ownership, individual ownership foreign ownership and blockholding while controlling for firm size, firm growth, firm profit, net debts tax shield, leverage etc. while 50.6% of the variation in cash is explained by other variables that have not been consider in the model.

The overall model significance has shown by the ANOVA test also known as F-test. In our case F-test value is 40.4 which has greater than critical value at 1%. Therefore the above model fit test suggested that the model is best fit and it can be used for policy making and further forecast.

Table 3

Multiple Regression Analysis of Cash Holdings and Ownership Structure

Variables	*Coefficient*	*Std. Error*	*t-ratio*	*p-value*	
Const	5.14068	0.363934	14.1253	<0.00001	***
Insto	0.021543	0.00310396	6.9405	<0.00001	***
Mo	-0.736837	0.137035	-5.3770	<0.00001	***
Indo	0.501933	0.230252	2.1799	0.02970	**
block5	-0.448663	0.221607	-2.0246	0.04340	**
Forg	-0.414078	0.223802	-1.8502	0.06483	*
Fs	0.651254	0.0499552	13.0368	<0.00001	***
Fp	-0.566442	0.168711	-3.3575	0.00084	***

Fg	-0.136648	0.0455948	-2.9970	0.00285	***
Fcf	1.3809e-07	1.77175e-08	7.7940	<0.00001	***
Ndts	-1.9321	1.45487	-1.3280	0.18474	
Tang	-0.453081	0.129963	-3.4862	0.00053	***
Dratio	-0.50798	0.155589	-3.2649	0.00116	***
De	0.0626293	0.128318	0.4881	0.62569	
R-squared	0.49				
Adjusted R-squared	0.48				
F-value	40.43 (0.000)				

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

Note. Dependent variable (Cash Holdings)

Fixed vs. Random Effect Model of Cash Holdings and Ownership Structure

The random or fixed effects in the data can bias the results. If the firm level factors changed over the time period in that case random effect has more useful but if the firm specific features remain fixed over the time thus there will be fixed effect and fixed effect model will be preferred over the random effect model. The empirical results of both fixed and random effect model is in the annexure A1 and A2. Hausman test has conducted for this purpose. Test has Chi-square value of 19.094 which is greater than critical value at 5% that is 4. Similarly calculated p-value is 0.0045 which is less than critical value that is 5%. Thus based on the above results it can be concluded that there has fixed effect in the data and firm specific features remains constant over time. The Hausman test supports the use of fixed effect.

Ordinary Least Square (OLS) Assumption

Before performing regression analysis OLS assumption has been fulfilled such as the data has followed a normal distribution and outliers has been dropped from the data as shown in the normality plot in annexure A.6. Multicollinearity problems is another issue that need to be addressed. In order to diagnose multicollinearity variance inflation test has used which clearly

showed that there is no multicollinearity among the explanatory variables as the test value has less than 10 as shown in the annexure A.5. In panel data one common problem is heterogeneity that has tested through Breusch-Pagan /Cook-Weisberg test for heteroskedasticity and Cameron & Trivedi's decomposition of IM-test both of these test support that there has homoscedasticity in nature of data as shown in the annexure A.3. In order to check for specification biasness of the model, link test has estimated which suggested that the model has correctly specified and there are no important variables omitted from the model as shown in annexure A.4.

Conclusion

Cash is one of the important assets among the firm current assets. The amount of cash that should be kept in the business for the free flow operation has play important role in providing liquidity to the firm but the higher the cash maintained by the firm the lower will be the profitability as there is trade-off between the firm liquidity and profitability. This study aims to investigate the impact of firm different type of ownership structure and its impact on the cash holdings while using sample data randomly collected for the sixty eight firms listed in KSE-100 index for the time period of eight years ranging from 2003 to 2010. Results show that firms with higher institutional ownership have high amount of cash holdings due to fact that higher ownership would leads to more favorable ratings to raise more debts that would increases the firm interest burden and thus firm would be able to pay them out of their cash holdings.

Firm managerial ownership has negatively related with the cash holdings. Firms where the management ownership is more, keep less cash due to the fact that management take such decision that maximize profit rather than keeping more cash on hand thus they tradeoff between the firm profitability and liquidity. The more dispersed firm ownership structure would leads managers to keep more cash to be liquid with lower chance of bankruptcy. The

higher is the amount of block holders the lower would be the cash kept by the firm for the reason that block holders have good controlling power on firm's management that would leads managers to use more cash in order to improve firm profitability but sacrifice for the liquidity. The foreign shareholders would preferred cash dividend as to capital gain therefore they have negative relation with the cash holdings and thus dividend payments would leads to reduction of cash holdings of firm.

References

Bai, C.-E., Liu, Q., Lu, J., Song, F. M., & Zhang, J. (2004). Corporate governance and market valuation in China. *Journal of Comparative Economics*, *32*(4), 599-616. Bates, T. W., Kahle, K. M., Stulz, R. M., Cochrane, J., Deangelo, H., Fama, G., Graham, J., et al. (2009). Why Do U . S . Firms Hold So Much More Cash Than They Used To ?

Nair, V. B. (2005). Governance Mechanisms and Equity Prices, *LX* (6). Journal, T. E. (1996). The economic journal, (March), 309-319.

Dittmar, A., & Mahrt-Smith, J. (2007). Corporate governance and the value of cash holdings. *Journal of Financial Economics*, *83*(3), 599-634.

Fama, E. F., & French, K. R. (2007). Taxes, Financing Decisions, and Firm Value. The Journal of Finance, *53*(3), 819-843.

Faleye, O. (2004). Cash and Corporate Control, *LIX* (5), 2041-2060.

Fan, J., Wong, T., & Zhang, T. (2007). Politically connected CEOs, corporate governance, and Post-IPO performance of China's newly partially privatized firms☆. *Journal of Financial Economics*, *84*(2), 330-357.

Faulkender, M., & Wang, R. (2006). Corporate Financial Policy and the Value of Cash, *LXI*, (4), 1957-1990.

Green, S., & House, C. (2004). The privatization two-step at China's listed firms. *Stanford Center for International Development, Working Paper No, 232*.

Gompers, P. A., Ishii, J. L., & Metrick, A. (n.d.). Financial Institutions Center.

Gul, F. a., Kim, J.-B., & Qiu, A. a. (2010). Ownership concentration, foreign shareholding, audit quality, and stock price synchronicity: Evidence from China. *Journal of Financial Economics*, *95*(3), 425-442.

Harford, J., Mansi, S. a., & Maxwell, W. F. (2008). Corporate governance and firm cash holdings in the US. *Journal of Financial Economics*, *87*(3), 535-555.

Lee, C. M. C. (2009). Tunneling through Inter-corporate Loans : The China Experience Tunneling through Inter-corporate Loans : The China Experience, (70532002).

Masulis, R. W., Wang, C., & Xie, F. E. I. (2007). Corporate Governance and Acquirer Returns, *LXII*(4).

Mulherin, H., Nash, R., Nellis, J., Poulsen, A., Ramamurti, R., & Rose-, S. (2001). From State to Market : A Survey of Empirical Studies on Privatization, *XXXIX*(June), 321-389.

Opler, T., Pinkowitz, L., Stulz, H., & Williamson, R. (1999). The determinants and implications of corporate cash holdings, *52*.

Gill, A., & Shah, C. (2011). Determinants of Corporate Cash Holdings: Evidence from Canada. *International Journal of Economics and Finance*, *4*(1), 70-79.

Jensen, M. C. (n.d.). Agency Costs of Free Cash Flow , Corporate Finance , and Takeovers Agency Costs of Free Cash Flow , Corporate Finance , and Takeovers, *76*(2), 323-32.

Kalcheva, I., & Lins, K. V. (2007). International Evidence on Cash Holdings and Expected Managerial Agency Problems. *Review of Financial Studies*, *20*(4), 1087-1112.

Chen, D., Li, S., & Xiao, J. Z. (2010). The Effects of Government Quality on Corporate Cash Holdings: Evidence From China. *SSRN Electronic Journal*, 1-44.

7. Annaxure

A1. Random Effect Model of Cash Holdings and Ownership Structure

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Random-effects GLS regression                   Number of obs      =       146
Group variable: fid                             Number of groups   =        68

R-sq:  within  = 0.1235                         Obs per group: min =         1
       between = 0.7140                                        avg =       2.1
       overall = 0.7035                                        max =         7

Random effects u_i ~ Gaussian                   Wald chi2(15)      =    142.63
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000
```

cashr	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
insto	-.6854942	.3968506	-1.73	0.084	-1.463307	.0923187
mo	-.6502427	.3838041	-1.69	0.090	-1.402485	.1019995
indo	-.4788819	.5270942	-0.91	0.364	-1.511967	.5542038
block5	-.5711811	.4549575	-1.26	0.209	-1.462881	.3205193
forg	-.4844103	.4771124	-1.02	0.310	-1.419533	.4507128
fs	1.022665	.1150685	8.89	0.000	.7971353	1.248196
fp	-2.641667	1.366968	-1.93	0.053	-5.320875	.0375403
fg	.0615829	.151338	0.41	0.684	-.2350342	.3582
fcf	-6.48e-07	2.03e-07	-3.20	0.001	-1.05e-06	-2.50e-07
ndts	.7014924	3.511826	0.20	0.842	-6.181559	7.584544
tang	-1.265646	.3445862	-3.67	0.000	-1.941023	-.5902698
dratio	.272712	.1945775	1.40	0.161	-.108653	.654077
tobinsq	.0027429	.0013363	2.05	0.040	.0001238	.0053619
de	.6290937	.3016495	2.09	0.037	.0378716	1.220316
roa	2.706086	1.368993	1.98	0.048	.0229095	5.389263
_cons	4.908745	.6907011	7.11	0.000	3.554996	6.262494
sigma_u	.53699859					
sigma_e	.39337331					
rho	.65078074	(fraction of variance due to u_i)				

*Table A.1 **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).*

A2. Fixed Effect Model of Cash Holdings and Ownership Structure

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Fixed-effects (within) regression               Number of obs      =       146
Group variable: fid                             Number of groups   =        68

R-sq:  within  = 0.3095                         Obs per group: min =         1
       between = 0.0600                                        avg =       2.1
       overall = 0.0310                                        max =         7

                                                F(14,64)           =      2.05
corr(u_i, Xb)  = -0.9987                        Prob > F           =    0.0274
```

cashr	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
insto	-1.445923	1.327215	-1.09	0.280	-4.097339	1.205493
mo	2.188056	1.746003	1.25	0.215	-1.299986	5.676098
indo	1.021944	1.314574	0.78	0.440	-1.604219	3.648107
block5	-1.037486	1.361692	-0.76	0.449	-3.757779	1.682807
forg	-.9873124	10.42633	-0.09	0.925	-21.81629	19.84167
fs	.3141372	.2944492	1.07	0.290	-.2740927	.9023671
fp	-.2806102	.1658973	-1.69	0.096	-.6120281	.0508078
fg	-.0542153	.1741432	-0.31	0.757	-.4021064	.2936758
fcf	.0000573	.0000354	1.62	0.111	-.0000135	.000128
ndts	-1.478598	6.162371	-0.24	0.811	-13.78935	10.83215
tang	-1.319046	.680831	-1.94	0.057	-2.679162	.0410707
dratio	.0105577	.3407097	0.03	0.975	-.6700882	.6912035
tobinsq	.0017859	.002496	0.72	0.477	-.0032005	.0067722
de	.8512272	.4149623	2.05	0.044	.0222447	1.68021
roa	(omitted)					
_cons	5.496713	1.944798	2.83	0.006	1.611533	9.381893
sigma_u	29.713017					
sigma_e	.39337331					
rho	.99982476	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(67, 64) =     3.44                 Prob > F = 0.0000
```

*Table A.2 **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).*

Hausman test

Chi-square(19) = 19.094 p-value = 0.00450823

A3. Heteroskedasticity Test

Breusch-Pagan test

Chi-square(1) = 2.62135 p-value = 0.105435

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	102.50	104	0.5233
Skewness	10.59	13	0.6453
Kurtosis	1.15	1	0.2841
Total	114.23	118	0.5810

A4. Model Specification Test

Source	SS	df	MS
Model	335.967924	2	167.983962
Residual	339.437131	548	.619410823
Total	675.405055	550	1.22800919

Number of obs = 551
F(2, 548) = 271.20
Prob > F = 0.0000
R-squared = 0.4974
Adj R-squared = 0.4956
Root MSE = .78703

cashr	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
_hat	2.029242	.5964521	3.40	0.001	.8576295	3.200854
_hatsq	-.0635999	.0367604	-1.73	0.084	-.1358084	.0086086
_cons	-4.122888	2.407325	-1.71	0.087	-8.851602	.6058256

A5. Multicollinariaty Test

Variable	VIF	1/VIF
fs	1.69	0.591834
indo	1.51	0.662022
fcf	1.42	0.703930
block5	1.37	0.731098
tang	1.35	0.741661
de	1.26	0.794112
dratio	1.23	0.812955
mo	1.23	0.816149
ndts	1.21	0.823250
forg	1.20	0.834134
fp	1.10	0.911573
fg	1.07	0.936644
insto	1.02	0.980519
Mean VIF	1.28	