Corporate liquidity management of listed firms in Ghana

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Abstract

Purpose – The purpose of this paper is to examine corporate liquidity management of companies listed on the Ghana Stock Exchange (GSE) with the aim of ascertaining the determinants of corporate liquidity holdings.

Design/methodology/approach – The paper adopts a dynamic panel model where a lagged dependable variable is introduced as an explanatory variable. Annual data from the annual reports and financial statements of the firms together with the *GSE Factbook* are used in the gathering of data spanning 1991-2007. The Arrellano-Bond estimator is used which incorporates the Sargan test for over identification.

Findings – Leverage is found to be not significant to Ghanaian-listed firms' liquidity demand perhaps due to the developmental stage of the financial market. However, liquidity is found to be statistically significantly influenced by a target liquidity level, size of the firm, return on assets and net working capital.

Originality/value – This is the first of its kind in the country despite the numerous studies carried out on the GSE.

Keywords Corporate strategy, Liquidity, Stock exchanges, Ghana

Paper type Research paper

1. Introduction

Corporations are motivated by various reasons to hold certain amount of liquid balances. These reasons, in the spirit Keynesian postulations of the money demand, include precautionary, speculative and transactional purposes. Thus, how much liquid balance is held by a corporation is influenced by factors such as transaction costs, opportunity costs and informational asymmetries (Bruinshoofd and Kool, 2004). Informational asymmetries between firms and capital markets are an important precautionary motive for corporate liquidity demands (Bruinshoofd and Kool, 2004) because liquid balances on balance sheets mean different things to different groups. For example, arguments about overinvestment (Jensen, 1986; Jensen and Meckling, 1976) or underinvestment (Myers and Majluf, 1984) hinges on the implications of the balance of liquidity held by a firm. With cash being significant in valuation, corporate liquidity management practices of listed firms is crucial.

In this regard, Myers and Rajan (1998) show that if a firm started with liquid core assets it could obtain external finance for less-liquid projects; that is, raise capital on the capital markets. However, the communication of the financial management practices of the firm to the market is influenced by problems of information asymmetries. Other firm level issues have implications for corporate liquidity management and for that matter,

the firm's demand for liquidity. Ditmar *et al.* (2003) examine the influence of corporate governance issues on corporate demand for liquidity. Myers and Rajan (1998) postulate that greater asset liquidity gives owners control over managers but greater liquidity as well gives managers the power to transforms assets in their own favour. The reasons for this paradox are that managers have implicit rights in the liquidity of assets and altering asset liquidity would affect these implicit rights. However, financiers control over managers is enhanced by greater asset liquidity. This is in essence a conflict of interest problem between owners and managers.

Firm level liquidity management behaviour is not absolved from the macroeconomic liquidity management trends. Bruinshoofd and Kool (2004) observe that studies in macroeconomics, that is money demand, suggest that corporations do not actively manage liquidity holdings. That is to say, the corporations adopt largely, passive liquidity management strategies. The reason has been that low rates of adjustments have been found, at the aggregate level, with respect to changes in corporate liquidity holdings in response to changes in the stock of money in studies based on stock-adjustment models. Bruinshoofd and Kool (2004) provide contrary evidence to these results from their paper, which is based on firm level data. Bruinshoofd and Kool (2004) examined the concept of a targeted convergence in corporate liquidity holdings and found that changes in corporate liquidity holdings are driven by short-run shocks as well as the urge to converge towards targeted liquidity levels.

This study looked at the determinants of liquidity in the case of Ghanaian firms listed on the stock market. The aim of this study was to provide evidence of liquidity management by Ghanaian firms. The choice of listed firms was to enable us to study the effects of the informational asymmetry problems. We look at the question of targeted level of liquidity as examined by Bruinshoofd and Kool (2004) from the position of an emerging capital markets. Our study spans the period of 1991-2007. There are several reasons for this from our survey of the literature of studies of the Ghanaian stock market. A number of papers written about the Ghanaian stock market have considered issues including the efficiency of the market (Osei, 2002), the capital structure of listed firms (Abor and Biekpe, 2004), the foreign exchange exposure of listed firms (Salifu *et al.*, 2007), and corporate disclosures (Tsalemenyi *et al.*, 2007) among others. However, none of these studies have shed light on liquidity management of listed firms. This paper, thus, fills a gap in the literature.

The paper is organized as follows. The next section discusses the literature on liquidity and in Section 3 the model and description of data variables are presented. The model is analyzed in Section 4 and the results discussed in Section 5 along with conclusions of the study.

2. Literature review
The seminal work of Keynes (1936) sets forth the motives for liquidity demand by investors in relation to monetary policy. These motives – precautionary, speculative and transactional – have been applied at the firm level to determine the factors that influence corporate liquidity demand (Bruinshoofd and Kool, 2004). Motives aside, Bruinshoofd and Kool (2004) offer determinants of corporate liquidity demand that includes transaction cost, opportunity cost and information asymmetries. These factors have been incorporated into cash management models of Baumol-Tobin (Baumol, 1952; Tobin, 1956; Miller and Orr, 1966). Firm liquidity levels are adjusted as management

learns about the firm's need for liquidity (Huberman, 1984) and as business cycle and other economic events unfold. This adjustment is what is influenced by the determinant variables of corporate liquidity holdings proffered by Bruinshoofd and Kool (2004). Where management reacts to such changes and adjusts liquidity levels, then it is assumed that management is following an active liquidity management policy rather than a passive approach to liquidity management. Bruinshoofd and Kool (2004) argue that passive adjustment might reflect the pecking order theory in finance or buffer stock property of liquidity in the short-term and a return to a long-term target. Passive adjustment is related to the theory of buffer stock liquidity (Carr and Darby, 1981). Bruinshoofd and Kool (2004) explain this theory as indicating that firms will not have any short-term liquidity targets but rather long-run liquidity targets.

In financial markets, transaction costs exist, and holding liquid balances means some returns are forgone. These costs and lost opportunities ensure that firms have to maintain optimal levels of liquid balances (Bruinshoofd and Kool, 2004). The cash management models of Baumol-Tobin and Miller-Orr are premised on inventory management models which bring working capital variables sharply into focus as proxies for liquidity. Dealing with working capital items (current assets and liabilities) relates to precautionary demand for money. Precautionary demand for money is demand for money to meet expected payments that are uncertain in amount in the future. Bruinshoofd and Kool (2004) associate precautionary demand for liquidity with expectations of future investment opportunities, and uncertainty regarding future cash inflows and outflows. They observed that cash flow volatility would lead to a desire for high-liquid balances. This could possibly be explained by the observation of Walter (1953) that fixed commitment reserves constitute a major part of precautionary balances maintained by large corporations after observing a positive covariation between relative changes in current liabilities and liquid asset holdings.

Informational asymmetries problems also create precautionary demand for liquidity because the presence of information asymmetries increases the difficulty and cost of raising external finance (Holmström and Tirole, 1998). Myers and Rajan (1998) hold that higher liquid balances may exacerbate the information asymmetry problem and thus lead to increased cost of external finance. This position is explained by Bruinshoofd and Kool (2004) who observe that firms with higher leverage would have an uncertain future and would thus keep higher liquid balances. Indeed, high leverage would mean that a firm is growing more risky hence external financiers would demand higher returns for the increased risk. A firm would be in a vicious cycle if the market is to read higher liquid balances as signals of positions taken to hedge payment of leverage obligations. Bruinshoofd and Kool (2004) provides a counter argument to Myers and Rajan (1998) that through the monitoring channel, increased leverage could lead to reduced levels of liquidity because monitoring limits managers' discretion as the relationship with financial intermediaries might induce production of information and monitoring activities on managers.

The development of the Ghana Stock Exchange (GSE) came at the time when the only possible sources of finance for firms had been bank lending in some cases with no alternative capital markets. Bank relationship has been observed to influence liquidity holdings of companies in Japan (Pinkowitz and Williamson, 2001). The evidence provided by the authors satisfies the hypothesis of Macey and Miller (1997) that banks might attempt to reduce corporate risk taking by requiring a firm to hold high levels of

precautionary liquidity (cited in Bruinshoofd and Kool, 2004). Huberman (1984) opined that liquidity of an asset is more closely related to the reversibility of the investment in that asset. In that regard, the asset structure of a firm would be important to its liquidity demand because fixed investment are less reversible compared to investment in working capital.

3. Data and variable definition

In order to gain the maximum possible observations, pooled panel crossed-section regression data are used. Panel data analysis involves analysis with a spatial and temporal dimension and facilitates identification of effects that are simply not detectable in pure cross-section or pure time series studies. Thus, degrees of freedom are increased and co-linearity among the explanatory variables is reduced and the efficiency of economic estimates is improved. Data for the study were obtained from the *GSE Factbook* for the years 1991-2007. There are six financial institutions on the GSE today. These were excluded from the dataset because they have peculiar liquidity management decisions. The definitions of variables are presented below. Not all the 23 non-financial firms considered for this study were on the exchange from the year 1991 when the exchange started trading. Therefore, unbalanced panel have been employed for the study. Five years of data points were required for a firm to be included in the dataset (Table I).

3.1 Model

Our approach to analysis of determinants liquidity holdings among listed companies on the GSE was by the general panel data model as follows:

$$Y_{it} = \boldsymbol{\beta}'_n x_{it} + \eta_i + \nu_{it} \tag{1}$$

where Y_{it} is the dependent variable for firm i at time t, $\boldsymbol{\beta}'_n$ is a vector of independent variable and coefficients, x_{it} includes a constant as well as independent variables. η_i and ν_{it} are firm-specific and white noise. To enable a test of whether or not firms have a target level of liquidity, we follow Agarwal and Mohtadi (2004) by employing the following general form using a lag of the dependent variable in tests for target capital

Symbol	Variable	Definition
LIQDRAT	Liquidity ratio	Cash and marketable securities over net assets
LIQD	Liquidity	Logarithm of liquidity of (cash and marketable securities)
SIZE	Size	Logarithm of net assets
NETWOKAP	Net working capital	Ratio of short-term claims less short-term debt to net assets
NLIQD	Near liquidity	Ratio short-term claims to net assets
TOTDEBT	Total debt	Total debt over total assets
SHOTDEBT	Short debt	Ratio of short-term debt to total debt
INVST	Investment	Changes in tangible fixed assets over net assets
ROA	Return on assets	Earnings after depreciation, interest, taxes, but before dividends to net assets
RISK	Earnings uncertainty	Firm specific three-year rolling standard deviation of ROA
INTERST	Average interest rate	Interest expense as a fraction of total debt

Table I.
Variable definitions

structure level:

$$Y_{it} = \alpha Y_{it-1} + \boldsymbol{\beta}'_n X_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (2)$$

From this general model, the model equation for our purpose is derived as follows:

$$\begin{aligned}
\text{LIQD}_{it} = \text{LIQD}_{it-1} &+ \boldsymbol{\beta}_1 \text{LIQDRAT}_{it} + \boldsymbol{\beta}_2 \text{SIZE}_{it} + \boldsymbol{\beta}_3 \text{NETWOKAP}_{it} \\
&+ \boldsymbol{\beta}_4 \text{NLIQD}_{it} + \boldsymbol{\beta}_5 \text{TOTDEBT}_{it} + \boldsymbol{\beta}_6 \text{SHOTDEBT}_{it} \quad (3) \\
&+ \boldsymbol{\beta}_7 \text{INVST}_{it} + \boldsymbol{\beta}_8 \text{RISK}_{it} + \boldsymbol{\beta}_9 \text{INTRST}_{it} + \varepsilon_{it}
\end{aligned}$$

This formulation therefore required a dynamic panel data estimation approach because of the use of the lag dependent variable as an explanatory variable. The Arrellano-Bond estimator procedure in STATA (Version 9.0, xtabond), which incorporates the Sargan test for over identification of restrictions, was employed in the estimation of the model.

4. Empirical results
4.1 Descriptive statistics
Table II presents the descriptive statistics of the dependent and independent variables in the sample of firms over the period. The sample covers 23 firms listed on the GSE over a 17 period, spanning 1991-2007. It reports the mean and standard deviation for overall, between and within of all the variables used in the study as well as the number of firm-year observations over the sample period.

Liquidity mean score is 5.26 with a standard deviation of 1.29 which suggests a variation in this variable over the period across the sample size. Liquidity ratio has mean value of 0.21 and there is variation in this variable in the overall sample as well as between and within firms. The size of the firm registers an overall mean of 5.97 with a minimum and maximum value of 1.80 and 10.02, respectively. For firms net working capital, the overall mean registers 0.33 and also exhibits variations in the overall sample as well as between and within firms.

Near liquidity also viewed as short-term highly liquid investments which are easily convertible into known amount of cash has an average score of 1.12 and again shows variations in the overall sample as well between and within. Total debt also registers overall mean of 0.69 whilst short-term debt has overall mean value of 1.44 and there are large variations in these variable throughout the study period. Firm investment registers overall mean of 0.37 with return on assets (ROA) averaging 0.11 over the period across the sample size. Risk records overall mean of 0.10 whilst interest registers mean value of 0.05 throughout the period.

4.2 Regression results
A dynamic panel regression was employed and the various diagnostic tests are reported in Table III. The dependent variable is liquidity holdings. There is statistically significant positive relationship between target liquidity holdings and firms' liquidity demand. This implies that firms' desired level of liquidity influences how much liquid assets they hold at a point in time. Consistent with Huberman (1984), it suggests that firm liquidity levels are adjusted as management learns about the firm's need for liquidity. Liquidity ratio exhibits positive and statistically significant

Variable		Mean	SD	Min	Max	Observations
LIQD	Overall	5.257003	1.298993	1.802973	8.531462	$N = 264$
	Between		0.8027912	3.884913	7.381021	$n = 23$
	Within		1.114969	1.412956	7.982252	T-bar $= 11.4783$
LIQDRAT	Overall	0.2111788	0.3840504	0	4.625484	$N = 264$
	Between		0.2064881	0.0253567	0.8150422	$n = 23$
	Within		0.3361798	-0.5527885	4.042406	T-bar $= 11.4783$
SIZE	Overall	5.971779	1.857181	1.802973	10.01869	$N = 264$
	Between		0.7045026	5.134274	7.483038	$n = 23$
	Within		1.737538	1.120118	9.758137	T-bar $= 11.4783$
NETWOKAP	Overall	0.3248792	0.4354499	-0.5853295	2.232869	$N = 264$
	Between		0.4264026	0.04792	1.892192	$N = 23$
	Within		0.3136912	-0.8358869	1.604619	T-bar $= 11.4783$
NEARLIQD	Overall	1.121401	1.527918	-0.8349	10.10459	$N = 264$
	Between		1.936984	0.1374542	9.228521	$n = 23$
	Within		0.9825186	-1.236033	6.476257	T-bar $= 11.4783$
TOTDEBT	Overall	0.693464	1.18365	-0.4550998	10.50668	$N = 264$
	Between		1.93515	0.1075711	9.564973	$n = 23$
	Within		0.5437546	-0.9429353	4.048221	T-bar $= 11.4783$
SHOTDEBT	Overall	1.441736	2.209244	-0.031	19.24229	$N = 264$
	Between		1.161031	0.3866304	5.494802	$n = 23$
	Within		1.800965	-3.838351	17.79338	T-bar $= 11.4783$
INVST	Overall	0.3673963	0.7786623	-0.9989274	6.346225	$N = 258$
	Between		0.556355	0.0869453	2.469757	$n = 23$
	Within		0.7054582	-1.530096	5.958613	T-bar $= 11.2174$
ROA	Overall	0.1099129	0.1862555	-0.701	0.7905937	$N = 264$
	Between		0.0864353	-0.0615088	0.3497196	$n = 23$
	Within		0.1626134	-0.6462996	0.6882235	T-bar $= 11.4783$
RISK	Overall	0.1008361	0.1068277	0.0012965	0.4520755	$N = 220$
	Between		0.0684292	0.0143506	0.2546717	$n = 23$
	Within		0.0868924	-0.0657759	0.4142762	T-bar $= 9.56522$
INTERST	Overall	0.0519457	0.094779	-0.6198	0.3861419	$N = 180$
	Between		0.0602666	0	0.2129209	$n = 23$
	Within		0.0804133	-0.5835384	0.3296072	T-bar $= 7.82$

Table II.
Descriptive statistics

relationship with liquidity holding. Liquidity ratio which measures the firm's ability to honour its short-term financial obligations is a good predictor of firm liquidity demand.

The size of the firm is a good predictor of firms' liquidity holding as there is statistically positive relationship between firms' size and liquidity demand. In line with Bruinshoofd and Kool (2004), our findings indicate a positive and statistically significant relationship between net working capital and firms' liquidity holding. Firms operating with positive net working capital have great liquidity position and can turn themselves around in the shortest possible time. Contrary to this, near liquidity exhibits a negative and statistically significant relationship with liquidity holding. Even though, Bruinshoofd and Kool (2004) observe that firms with higher leverage would have an uncertain future and would thus keep higher liquid balances, our result indicates a positive but insignificant relationship between leverage (total debt ratio) and liquidity holdings. Debt structure portrays a rather a negative relationship with liquidity holdings.

Variable	Coefficients	Z-score	Prob.
Lagged liquidity	0.19	3.78	0.000
Liquidity ratio	1.34	4.40	0.000
Size	0.61	9.19	0.000
Networking capital	0.34	2.36	0.018
Near liquidity	− 0.10	1.69	0.092
Total debt	0.13	1.19	0.235
Short-term debt	− 0.01	0.49	0.621
Investment	0.04	0.94	0.346
ROA	0.35	1.76	0.078
Risk	0.45	1.26	0.206
Interest	0.60	1.63	0.103
Constants	− 0.01	0.64	0.522
No. of observations	161	N/A	N/A
Sargan	$\chi^2(99) = 161.54$		
	$p > \chi^2 = 0.0001$	N/A	N/A
M1	$Z = -1.65$		
	$p > z = 0.0985$	N/A	N/A
M2	$Z = -0.11$		
	$p > z = 0.9149$	N/A	N/A

Table III.
Regression results

There is a positive but statistically insignificant relationship between investment and corporate liquidity demand. Firm profitability is a good predictor of corporate liquidity management. ROA, a proxy of the overall earnings power of the firm, shows a positive and statistically significant relationship with corporate liquidity demand. This implies that more profitable firms are likely to have more liquid assets by way of cash or cash equivalent all things equal.

There is a positive but insignificant relationship between risk and corporate liquidity holding. Risk exposure of firms plays insignificant role in corporate liquidity demand as indeed, is interest payment. Likewise, leverage plays little role in how much liquid assets firms hold. Perhaps, the insignificance of interest payment is a result of the insignificance of leverage in influence liquidity demand. Ideally, in theory it is expected that, firms with high-debt obligation will hold a lot of cash and cash equivalent to honour the interest obligations.

5. Discussion and conclusions
Our finding of a strong relationship between lagged liquidity holdings and liquidity holdings compares to the findings of Bruinshoofd and Kool (2004) and suggests that corporate liquidity is actively managed rather than passively in adjustment to financing decision in other sectors of the firm. For instance, changes in inventory levels, for example, have implications for cash holdings of a firm. The significance of the size variable is also of interest. This shows that the larger the firm the larger the cash holdings the company would demand. Thus, larger firms on the GSE tend to hold more liquid balances. Also, none of the firms considered for the purpose of this study have issued debt securities; thus, debt is more short-term debt and long-term borrowings from banks. This indeed might be the reason for the insignificant influence of both short- and long-term debt on liquidity holdings as observed in this study.

And the evidence presented here shows that leverage does not predict the liquidity holdings of Ghanaian-listed firms (Aboagye, 1996).

Apparently, the evidence about leverage in this instance also highlights to the theoretical arguments as to whether or not leverage leads to higher liquidity holdings (Hubbard, 1998; Ees *et al.*, 1998) or reduced liquidity holdings (Holmström and Tirole, 1997). Or perhaps it reflects the relationship expressed by Saidenberg and Strahan (1999) that when financial markets are developing, firms may be comfortable holding lower levels of liquidity as banks are in those instances are the main providers of liquidity and with strong relations to a bank a firm would be covered. The Ghanaian case, as the evidence suggests, quite mirrors the case of developing financial markets and bank relations as the source of the insignificance of the debt in influencing liquidity holdings of Ghanaian-listed firms. However, another explanation could be found in the study of Abor and Biekpe (2004) who concluded that capital structure decisions of listed firms in Ghana followed the pecking order theory, when they found evidence that leverage was negatively associated with profitability. That is, listed firms rely much on internal generated fund – cash reserves – with not significant use of debt.

In the light of the study of Bruinshoofd and Kool (2004), who argued that that lower maturity of debt increases liquidity, our study shows that listed firms on the GSE are perhaps more reliant on internal sources funds, for which reason debt structure does not indicate a significant influence on their liquidity holdings. Thus, in considering the ranking of preference in terms of financing by the pecking order theory, Ghanaian listed firms are leaning on internally generated liquidity.

The insignificance of average interest to liquidity holdings as observed could be related to the insignificance of debt. Interest fluctuations would have induced speculative motive for liquidity demand. Our results of a significant relationship between ROA and liquidity compare to the findings of Bruinshoofd and Kool (2004) likewise our finding of insignificance for investment to incite liquidity holdings. ROA as defined in this study is a liquidity variable, and is found to be associated with liquidity consistent with literature. It might be that firms with higher ROA are performing better and by that are induced to pay dividends which would demand liquidity. This could induce demand for liquidity for transaction purposes among firms. This confirms the conclusions of Opler *et al.* (1999), Pinkowitz and Williamson (2001), Ditmar *et al.* (2003) and Bruinshoofd and Kool (2004). However, our findings on the relationship between size and liquidity holdings shows that increases in scale requires an increase in liquidity in contrast to the findings of Bruinshoofd and Kool (2004) who found that size was negatively related to scale, indicating that scale increases induced a reduced demand for liquidity. In our case, it reflects the possibility that long-term investments are financed with short-term liquidity or from internal funds as the measure of liquidity in this case included cash book balances, which is affected by cash generated by operating activities in the light of less usage of debt among the sample firms.

We conclude that leverage is not a determinant for corporate cash holdings of Ghanaian-listed firms perhaps due to the level of development of the financial markets. Also, Ghanaian-listed firms are engaged in active liquidity management perhaps due to the fact they use a significantly more short-term debt than long-term debt.

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