Liquidity, Size and Firm Value: Evidence from Nigeria Economy

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Abstract
This study examines the effects of firm liquidity and size on firm value for 34 quoted firms in Nigeria from 2007 to 2016. While firm value is measured by market value per share, liquidity and size of firm are measured by the ratio of current assets to current liability and natural logarithm of total assets respectively. Contrary to the argument that liquidity decision is among the important corporate financial decisions in terms of its effect on firm market value, our results show that firm liquidity has no significant effect on market value per share. But our findings justify the view that firm size has a significant effect on firm market value, though the relationship is negative. Therefore, we recommend that corporate investors in Nigeria prefer smaller firms than larger firms.

Key words: *liquidity, size, Market Value per Share*

Introduction
The question of what factors determine firm market value has continued to be the main concern for corporate managers, investors and researchers. Modigliani and Miller (1958, 1961) started the empirical debate in the modern corporate finance literature when they argue that a firm value is determined by its ability to earn profit as well as its business risk. This implies that only firms' investment decision can determine their external value. However, this assertion has been refuted in both the theoretical and empirical literature as most authors contend that both financing and dividend decisions also affect firm value. For example, while Myers and Majluf (1984) contend that the choice between internal and external financing has implication for a firm's market value, Bhattacharya (1979, 1980) and Miller and Rock (1985) are of the view that dividend announcements have information contents that can be incorporated in the firm valuation model.

Again, Amihud and Mendelson (2008) argue that apart from corporate profitability and business risk, liquidity decisions of a firm is also among the important explanatory factors for its market value. However, it appears that this argument has not been fully established in the literature as there are little empirical studies focusing on the effect of liquidity decisions on firm value. This study, therefore, contributes to the growing empirical literature in this line of inquiry by examining the effects of firm liquidity and size on firm market value in Nigeria within the panel data framework using a comprehensive sample consisting of 340 firm-date observations.

This study is distinct in two important ways. First, we use market value per share as a measure of firm market value. None of the reviewed empirical studies used this approach as almost all of them measure firm value using either Tobin Q (for example, Connolly and Hirschey (2005), Goh and Simanjuntak (2018), Rizqia and Sumiati (2013), Wang (2002)) or market to book value ratio (for example, Setiadharma and Machali (2017)) or both (for example, Martínez-Sola, García-Teruel and Martínez-Solano (2013)). Second, we estimate our firm value model

using two competing panel data methods; fixed effects and random effects. The purpose is to compare their estimates so as to determine whether unobserved firm-specific factors or managerial practices (culture, style and policies) are related to liquidity decisions of the firm. Previous studies disregard this aspect of the liquidity-value relationship.

The remainder of this study is structured as follows: The next section contains both conceptual and empirical literature review. Section 3 contains the empirical strategy (data and methods). Section 4 contains empirical results and discussion of findings. Section 5 contains summary and conclusion.

Literature Review
Starting from Modigliani and Miller (1958, 1961), the question of what determines the market value of a firm market has continued to receive considerable attention in the corporate finance literature. However, there appears to be a consensus among researchers that a firm's market value is determined not only by its investment decision, but also by both financing and dividend decisions.

Modigliani and Miller (1958) proposed the popular M and M theory which forms the basis of modern thinking in capital structure. The theory has two aspects cited as propositions 1 and II. The first proposition states that in a perfect market, the value of the firm is not affected by how that firm is financed. This means that firms are indifferent among all possible levels of capital structure. Proposition II deals with the overall weighted average cost of capital as a basis to determine the value of firm. The central point about this proposition is that an increase or decrease of a component of capital structure e.g. debt does not determine the overall weighted average cost of capital (WACC). This is so because such an increase or decrease is likely to be neutralized by an increase or decrease in the cost of another component such as equity thereby pushing overall weighted average cost of capital to a point of no effect. Therefore the weighted average cost of capital is likely to be constant at all levels of capital structure and ultimately having no effect on firm value. This presupposes a linear relationship between cost of equity and debt-equity ratio.

However, a traditional view emerged which maintained that the firm can maximize its value through the judicious use of leverage which agrees with Modigliani and Miller (1963). This development is credited to the fact that the initial view of the two popular economists did not consider circumstances of the real world characterized by a number of factors among which are the following:
1. There are numerous cost elements associated with funding a business.
2. Shareholders or investors per se are bound to face some limitations in terms of access to material information due to asymmetric forces that exist in the world of business.
3. Businesses are also prone to various types of risk which are determined by among other things the different circumstances under which they operate.
4. Other than the physical costs noted above, economic transactions also have lemon costs that have the tendency to affect the value of firm.
5. Investors are highly rational and therefore cannot behave the same way under different business conditions.

In recognition of the above factors and the consistent intense argument on the irrelevancy of the M and M initial propositions, several alternative theories have emerged demonstrating in various ways how the relationship between capital structure and firm value exists. Prominent among them are the trade off theory, the pecking order theory, the agency theory and lately the market timing hypothesis all providing explanation for the relevancy of capital structure. According to Pandey (2005) the trade off theory provides the nexus which lies on the effect on

profits emanating from corporate tax under debt financing suggesting that the incidence of tax is avoided because interest charges precede tax computations.

Apparently, the cost of capital decreases as the proportion of debt increases which means managers would ordinarily prefer a no equity situation for the firm. But this is limited to the point where bankruptcy cost overides the benefits derived from the use of debt. So the preference for applying debt is seen from the tax benefit a company enjoys which becomes apparent as cost of capital decreases for an increased use of debt due to tax savings. Then this could continue until a point where bankruptcy cost would set in and the marginal benefit of further increases in debt declines with increases in debt as the marginal cost of bankruptcy increases. At this point, a trade off emerges which optimizes the overall value of the firm which becomes a suitable benchmark for choosing how much of debt and equity the company desires. We can also express the effect that the tax shields and bankruptcy cost could have on the value of a firm using leverage as follows:

$$VL = D + E = VU + PV(\text{tax shields}) - PV(\text{bankruptcy cost}) \qquad (1)$$

where VL is market value of a levered firm, VU is the market value of the unlevered firm and the present values of tax shield and bankruptcy cost are denoted respectively as PV.

So within the context of the traditional approach to debt management, we have two advantages for the use of debt. First is the low cost of debt and secondly its flexibility which are two important benefits a profitable company needing external finance to grow and develop could have. It is often a fairly low-cost source of finance. Interest on debt is an allowable charge for tax purposes and the cost of debt for a profitable company is therefore its after-tax cost derived as $Ta = I(1-T)$; where Ta is after tax cost of debt and I is interest on debt which is applied to the reciprocal of the tax rate. For example, if the tax rate on corporate profit is thirty percent (30%), the effective after-tax cost of a debt with 20% interest is just 14% derived as follows:

20/100 applied to the reciprocal of the tax rate given as

30% i.e. $20/100 \times 70/100 = 2/10 \times 7/10 = 14\%$.

Devereux, Maffini and Xing (2018) found evidence of the effect of corporate tax on leverage showing statistically a positive relationship existing between capital structure and firm value which is traced to tax shield firms enjoy as a result of the use of debt. The findings from that study which utilized annual data from the United Kingdom provide good proof that leverage can respond positively to decreases in corporate tax in marginal terms particularly in the developed world. According to the authors, tax returns provide better explanatory power than data from the published statements of accounts suggesting that any research using data from the annual tax returns filed in by companies is likely to have superior results in the developed countries.

A cross sectional study by Antwi, Mills and Zhao (2012) also examined the impact of capital structure on firm value in Ghana. They made a regression analysis utilizing secondary data from all the thirty four companies listed on the Ghana Stock Exchange (GSE) for the year ended 31st December 2010. Using the ordinary least square method of estimation, the study proved that equity capital has less effect than long term debt in the positive influence they both have on firm value. This result reveals that in an emerging economy like Ghana, equity capital as a component of capital structure is relevant to the value of a firm but Long-term-debt was found to be the major determinant of a firm's value which is also explained by the weight of tax and other non-debt shields firms enjoy that promote the use of debt. To this end, corporate managers in Ghana are advised to employ more of long-term-debt than equity capital in financing their operations. Thus, both theoretical and empirical literature have focused mainly on these three corporate decision areas.

As argued by Amihud and Mendelson (2008), the liquidity decisions of a firm are also among the important determinants of its market value. However, it appears that this argument has not been fully established in the literature as there seems to be little empirical studies focusing on the effect of liquidity decisions on firm value. Even so, a review of the few empirical studies shows that there are mixed evidence on the effect of liquidity on firm value.

Wang (2002) examines whether liquidity management of a firm has a significant relationship with its operating performance and corporate value for quoted firms in both Tokyo and Taiwan. They find that good liquidity management leads to higher operating performance and firm value which is measured by Tobin Q.

Connolly and Hirschey (2005) consider the effects of firm size and R&D on firm market value in US using a sample of 15,709 firm-year observations for both manufacturing and non-manufacturing firms from 1997 to 2011. Among their empirical findings is that the effect of R&D intensity on firm value (Tobin Q) is positively related to firm size.

Rizqia and Sumiati (2013) examine the impact of managerial ownership, financial leverage, firm size, investment opportunity and profitability on dividend policy, and the effect of these variables on firm value for 15 manufacturing companies in Indonesia. The sample covers the period from 2006 to 2011. They find amongst others that firm size, measured by natural logarithm of total assets, has a positive and highly significant effect on firm value being measured by Tobin Q.

Martínez-Sola, García-Teruel and Martínez-Solano (2013) examine the effect of cash holding on firm value for an unbalanced panel of 472 US industrial firms from 2001 to 2007 using the Arellano and Bond's (1991) panel GMM framework. While firm value is measured by both Tobin Q and market to book value ratio, cash holding is measured by the ratio of cash and cash equivalents to total assets. Variables such as intangible assets to total assets ratio (growth), natural logarithm of gross sales (size) and debt to equity ratio (Leverage) are used as control factors. They find amongst others that cash holding has a nonlinear concave relationship with firm value.

Siahaan (2014) use the multiple regression framework to consider among other objectives the relationship between firm size and firm value for a sample of 28 quoted manufacturing firms in Indonesia from 2007 to 2011. Other variables included in the firm value model are leverage and three corporate governance variables which are audit committee, size of board commissioners and proportion of board independence. The results show amongst others that firm size and firm value are significantly positively related.

Mule, Mukras and Nzioka (2015) use the panel data framework to examine the effect of corporate size on both profitability and market value for 53 quoted companies in Kenya. The sample covers from 2010 to 2014 while the data are observed annually. While firm value and firm size are measured by Tobin Q and logarithm of sales revenue respectively, profitability is measured by both ROA and ROE. Further, ownership concentration, financial leverage, firm age, management efficiency and asset tangibility all are modelled as control factors. The results show that while firm size has a negative but not significant effect on firm market value, it has a positive effect of profitability.

Du, Wu and Liang (2016) use the Pearson correlation analysis to examine the relationship between firm liquidity and corporate value for listed companies in China for the 2013 financial year. Firm liquidity is measured by cash ratio while firm value is measured by Tobin Q. Control variables included in the model are profitability (ROE), size (natural logarithm of total assets), growth, leverage and industry concentration. They find amongst others that while firm value is positively related to liquidity, it is negatively related to size. These relationships are also statistically significant.

Setiadharma and Machali (2017) examine both the direct and indirect effects of asset structure and firm size on the firm value for 34 quoted property and real estate firms in Indonesia over the period from 2010 to 2014. The indirect effects are from the two explanatory variables which are modelled through capital structure. Then firm value is measured by the ratio of market to book value while asset structure, firm size and capital structure are measured by the ratio of fixed assets to total assets, natural logarithm of total assets and debt-equity ratio respectively. The results show amongst others that both the direct and indirect effects of firm size on firm value are positive but statistically not significant.

Goh and Simanjuntak (2018) examine the effects of firm size, export ratio and earnings variability on firm value for sample of 132 quoted companies from 2011 to 2016 in Indonesia using path analysis. The study also considers the indirect effects of these variables on firm value through economic exposure as an intervening variable. While firm size is measured by natural logarithm of total assets, firm value is measured by Tobin Q. They find amongst others that firm size has a significant negative relationship with firm value.

Methodology
Our data is panel consisting of 10 yearly observations on 34 quoted companies from 2007 to 2016. Thus, we have a total of 340 firm-year observations. However, we have an unbalanced panel as we encountered some cases of missing date observations during data collection. While market value per share (MVS) is the dependent variable, liquidity ratio (LR = current assets/current liability) and firm size (TA = total assets) both are explanatory variables. All data were sourced from the annual reports and accounts of the individual firms for different years downloaded from their official websites. The summary statistics for the observed variables are given in Table 1.

Table 1: Descriptive statistics for MVS, Liquidity Ratio and Total Assets

Variable	$\bar{x}$	σ	Skewness	Kurtosis
MVS	24.20	47.53	3.53	17.25
LR	1.43	2.06	3.47	16.35
TA	8.76	2.59	-0.53	3.64

Source: SPSS output

Table 1 shows that the mean value for market value per share (MVS) is ₦24.20 with very high standard deviation ($\sigma = 47.53$), indicating that most of the observations on MVS are dispersed from the mean. The skewness and kurtosis coefficients of 3.53 and 17.25 show that MVS has a positively skewed and leptokurtic distribution. The Table also shows that the mean of liquidity ratio (LR) is 1.43 ($\sigma = 2.06$) with a much lower standard deviation. This implies that on average, the selected firms have the financial strength to meet their short-term obligations. The skewness coefficient of 3.47 shows that firms whose liquidity ratio is higher than the 1.43 average are significantly higher than firms whose liquidity ratio is lower than the average. The kurtosis of 16.35 also shows that LR has a distribution that is more peaked than the normal distribution. For total assets, the skewness and kurtosis coefficients of -0.53 and 3.64 indicate that total assets has a negatively skewed and leptokurtic distribution.

Model Specification
The relationship between the market value of firm i and the two explanatory factors; namely, liquidity ratio and total assets, at time t is empirically defined as follows:
$$LMVS_{it} = \alpha + \gamma_i + \beta_1 LR_{it} + LTA_{it} + \epsilon_{it}$$
$$(i = 1,2, \dots, N; t = 1,2, \dots, T)$$

Where;
$LMVS$ = logarithm of market value per share, LR = liquidity ratio and LTA = logarithm of total assets (a proxy for firm size) and ϵ = error term. Further, while α (group mean) and β's (slopes) are constant both cross-sectional and over time, γ_i, which represents the latent factors relating to firm-specific effects, vary cross-sectionally but does not vary over time.

One estimation problem associated with panel data regression is how γ_i can be treated. In this regard, there are two main approaches; fixed effects and random effects. While the fixed effects approach treats γ_i as an important explanatory factor which also correlates with the other explanatory variables (LR and LTA), the random effects approach treats γ_i as a random variable that deviates from the group mean, α. However, the usual practice is to estimate the specified model using the two methods, and then compare their results using the Hausman test. While the Hausman test follows the Chi-square distribution, its assumption is consistent with the random effect theory.

Empirical Analysis
Estimation Results
Table 2 shows both fixed effects and random effects estimation results and goodness of fit statistics for our specified panel data model. Table 3 shows the Hausman specification test results for model selection.

Table 2: Fixed effects and random effects estimation results

Variable	Fixed Effects	Random Effects
Constant (α)	4.246	3.3003
	(0.0000)	(0.0000)
$LR(\beta_1)$	-0.0174	-0.0251
	(0.5286)	(0.3573)
LTA (β_2)	-0.2800	-0.1734
	(0.0008)	(0.0099)
R^2	0.8703	0.0230
$\bar{R}^2$	0.8547	0.0169
F-statistic	55.629	3.803
	(0.0000)	(0.0233)
Durbin-Watson	0.8848	0.7531

Source: E-Views output; Bracket ( ) contains p-values

Table 3: Model selection tests

Test	Chi-square statistic	p-value
Hausman Test	6.1513	0.0462

Source: E-Views output

From Table 2, we can see that the sign and significance of the estimated betas are similar for both fixed effects and random effects methods. Unfortunately, β_1, which captures the effect of liquidity on firm market value, is negative but is associated with high probability for both methods. This shows that liquidity has a negative but statistically not significant relationship with market value per share. On the other hand, β_2, which captures the effect of total assets, is negative but its associated probability is almost zero for both methods. This shows that firm size has a negative and statistically significant relationship with market value per share.
Further, we can see that the fixed effects method has a much better goodness of fit than its competitor. The $\bar{R}^2$ of 0.8547 and 0.0169 indicates that while the fixed effects estimates explain

as much as approximately 85% of the variance of market value per share, the random effects estimates explain as low as less than 2% of the market value per share variance. Thus, under the fixed effects framework, our panel model is highly fitted, while under the random effects framework, our empirical model is very poorly fitted. Further, although, the F-statistic (p-value < 0.05) is significant for both methods, the fixed effects F-statistic is however, much higher than that of the random effects, which further confirms the superiority of the former over the latter.

From Table 3, we can see that the Hausman statistic (p-value = 0.0462) is significant at 5% level, thus, rejecting the random effects theory. This implies that the fixed effects theory, which holds that γ_i correlates with LR and LTA, is consistent with our panel data. Thus, in the context of our panel data, the unobserved firm-specific effects are not only significant determinants of firm value, but also correlate with liquidity ratio and total assets in our specified model.

Discussion of Findings
Our results suggest that although a firm's liquidity and its market value per share move in opposite direction, changes in the former would, however, not statistically affect the former. The fixed effects beta for liquidity ratio is -0.0174 which suggests that a 1% increase in current assets relative to current liability would reduce firm market value by less than 0.02%, controlling for firm size. This implies that the effect of liquidity adjustment is also not economically significant. Thus, contrary to the argument by Amihud and Mendelson (2008), firm liquidity decision is not among the corporate financial decisions that affect firm market value in Nigeria. This finding also disagrees with the findings of Wang (2002), Martínez-Sola, García-Teruel and Martínez-Solano (2013) and Du, Wu and Liang (2016). We argue that this contradicting evidence is due to the difference in the measurement of firm market value.

Our evidence also suggests that the higher the firm size the lower the market value per share. The fixed effects beta of -0.2800 shows that a 1% increase in firm total assets would lead to about 0.28% reduction in firm market value. This may suggest that investors in Nigeria prefer smaller firms than larger firms. This evidence is consistent with the findings of Mule, Mukras and Nzioka (2015) and Goh and Simanjuntak (2018) but contradicts the findings of Rizqia and Sumiati (2013), Siahaan (2014) and Setiadharma and Machali (2017).

Conclusion
This study investigates the effects of firm liquidity and size on firm market value in Nigeria within the panel data framework. The data used consist of 340 firm-year observations on 34 quoted firms of different sectors from 2007 to 2016. Firm market value is measured by market value per share while firm liquidity and size are measured by current ratio and natural logarithm of total assets respectively.

Our regression results show that fixed effects method performs much better than the random effects method both in terms of goodness of fit and model specification test. Thus, the unobserved firm-specific factors such as management style and organizational culture have significant effects on firm market value both directly and through their interactions with firm liquidity and total assets.

The fixed effects results show that approximately 85% of the variance of firm market value is due to changes in firm liquidity, size and the latent factors. Further, contrary to the argument that liquidity decision is among the corporate financial decisions that affect firm market value, we find that firm liquidity has no significant effect on market value per share. Also, our results show that the higher the size of a firm in terms of its total assets, the lower its value in the stock market.

Recommendation

Therefore, we recommend that corporate investors in Nigeria prefer smaller firms to larger firms when making investment decisions judging from the findings of our study.

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