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An Investigation of the Moderating Effect of Liquidity on the Relationship between Debt and Financial Performance of REITs in Malaysia: An Optimal Liquidity Estimation

Zalina Zainudin[1*], Mazhar Hallak Kantakji[2], Omer Bin Thabet[3], Nur Syairah Ani[4], Nursyuhadah Abdul Rahman[5]

ABSTRACT

Numerous studies on Real Estate Investment Trusts (REITs) have claimed that the high dividend payout requirement has constrained the ability of REITs to use internal earnings and that they have to rely on debt financing to support their funding requirements. However, there is also some empirical evidence showing that the use of debt by REITs has adverse effects on the financial performance of REITs. To reconcile the empirical evidence that is obtained from the REITs literature, this study aims to empirically examine how and to what extent the effects of debt on financial performance are contingent on other factors. In this regard, liquidity is hypothesized to moderate the relationship between debt and financial performance and this study will simultaneously estimate the optimal liquidity level that could optimize the financial performance of REITs. The sample for the study consists of all MREITs for the time period from 2005-2016. The study applies the continuous sequential breakpoint threshold regression model specifications of WarpPLS 5.0 (Bai & Perron, 2003; Kock, 2015; Hansen, 2001; Perron, 2006) to analyze the moderating effects of liquidity and the optimal liquidity level on the debt-financial performance relationship, respectively. The findings reveal that the correlation between financial performance and debt is conditioned by liquidity while preserving a certain level of liquidity is negatively related to the debt and financial performance relationship. Thus, an appropriate level of liquidity needs to be maintained to attain the optimal level of liquidity and to optimize financial performance. It is found that each MREITs needs a liquidity level of more than 5.78% of its total net assets to optimize its financial performance. The findings offer a useful guide for MREITs to manage their optimal liquidity level.

KEY WORDS: Debt, Financial Performance, Liquidity, Optimal, REITs

JEL Classification: G29, G30, G32

[1,2,34,5] Business School, Universiti Kuala Lumpur, Malaysia

Correspondence concerning this article should be addressed to: **Zalina Zainudin**, Business School, Universiti Kuala Lumpur, Malaysia, No 74, Jalan Raja Muda Abdul Aziz, Kampung Baru, 50300 Kuala Lumpur, Malaysia. E-mail: zalina@unikl.edu.my

1. Introduction

The number of existing assets that a firm holds and the value of the firm's future investment growth opportunities determine the value and performance of a firm. However, the value of potential future investment can only be attained if the firm has the financial capacity to execute the investment. The presence of excessive debts on a firm's balance sheet may distort its opportunities to acquire a potentially valuable investment. This notion is termed as debt overhang by Myers (1977), who argues that too much debt creates a disincentive to execute future investments because the debt holders share the upside. Myers (1977) summarized the issue of firms' debt overhang using a simple illustration where a high debt level indicates that lenders take a large fraction of any investment pay-off and this, in turn, raises the exercise price for the investment and lowers the value for the shareholders. The increase in the costs of borrowing will significantly lessen a firm's future cash flows, thus increasing the firm's debt overhang. In this light, a firm might lose valuable investment opportunities when it has too much debt.

There is a need for REITs to grow in order to increase their revenues and, consequently, enhance their value. By paying a high dividend, REITs limit their opportunities to use internal funds to finance their investment growth, thus forcing them to seek external funding, either through debt financing or issuing new equity (Ghosh & Sun, 2014). With this point in mind, REIT managers have to choose valuable investment opportunities and determine an appropriate financing decision to finance these investments. For REITs, external financing decisions (since internal financing is almost impossible for REITs) have both positive and negative implications. In principle, the decision to fund growth through debt may imply an expected reduction in cash flows. In this light, it is important to bear in mind that for firms like REITs with marginal tax rates of zero (REITs do not pay tax at the corporate level if they distribute 90% of their income as dividends to shareholders), they do not receive any tax deductible benefits for their interest payments. A high debt ratio in an REIT's balance sheet may significantly increase their expected costs and the possibility of default, especially during adverse market conditions (Titman, Twite, & Sun, 2014). While issuing additional shares is only applicable if the share price of an REIT is sufficiently overvalued or by issuing new shares using the existing number of shares in principle, this may reduce the dividend per share since the wealth that is available to shareholders needs to be moved from existing shareholders to the new shareholders after the issuance of new shares. This may upset the shareholders. Meanwhile, empirical evidence has indicated that REITs prefer to use debt financing to finance their growth (see, for example, Campbell, Devos, Maxam, & Spieler, 2008; Chan, Erickson, & Wang, 2003; Hardin & Wu, 2010; Riddiough & Wu, 2009). However, there is also evidence showing that the use of debt by REITs has adverse effects on the financial performance of REITs (see, for example, Oppenheimer, 2000; Titman et al., 2014). Specifically, Titman et al. (2014) argued that REITs using high levels of debt has resulted in a sharp reduction in the interest and dividend rates. Moreover, high levels of debt exposes REITs to significant financial distress that is accordingly reflected in the share prices of REITs. This adverse effect may worsen during times of crisis.

This study extends the expression of debt overhang theory and the empirical evidence presented in Titman et al. (2014) by empirically examining how and to what extent the effects of debt on financial performance may be contingent on other factors in order to find alternative explanations instead of further amplifying the disadvantages of debt. To examine this concern, the study used a sample of all REITs in Malaysia (MREITs) for the 2005-2016 time period. In an effort to find an alternative explanation for the debt-financial performance relation, the study examines whether liquidity (holding cash and cash equivalents) is able to moderate the adverse effects of debt on the financial performance of MREITs. This is based on the view that MREITs have unique business frameworks, which results in the need to offer new insights on the importance of managing a liquidity policy in an REIT business environment. This study also attempts to provide a solution by estimating the optimal level of liquidity for MREITs and assists MREIT managers in managing their liquidity policies. This study will contribute to the present literature by analyzing the moderating effects of liquidity and identifying an optimal liquidity level.

The result underlines an important insight in which MREITs are able to alter the negative correlation between their financial performance and debt level by

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holding sufficient liquidity. In this regard, although REITs are known to have little retained earnings, MREITs are able to alter the negative relationship between debt and financial performance by holding sufficient liquidity. Consequently, the negative relationship between debt and financial performance only affects MREITs with lower liquidity. Most interestingly, the study finds that in order to achieve the optimal level of liquidity, MREITs shall preserve their liquidity levels at higher than 5.86% of their total net assets. At this optimal level, the use of debt has positive implications for the financial performance of MREITs. It is logical to highlight that despite the regulated limitations on the ability to accumulate internal funding due to the high dividend payout requirements that are encountered by MREITs, the policies on liquidity management should not be absolutely ignored. Consequently, MREITs preserving sufficient liquidity will enable REIT management to sustain their business operations and financial performance. In addition, it is important to note that in Malaysia, the rules on asset composition is that all REITs are allowed to maintain not more than 25% of their total asset value in non-real estate related assets, such as cash and investments in money market instruments. As such, the findings of this study may assist MREIT managers to optimally manage their firm's liquidity level due to its important moderating effects on the relationship between the debt and financial performance of REITs.

The remainder of this paper will start with reviewing the relevant literature, which is followed by presenting the methodology and data, discussing the findings and, finally, presenting the conclusion.

2. Literature review and hypotheses

One of the most important questions in corporate finance is how firms should determine which set of securities they will issue to finance their assets or investments (Sierpińska-Sawicz & Bąk, 2016). For REITs, high mandated dividend pay-outs constrain REITs from accumulating sufficient internal cash balances. Therefore, it leaves REIT managers with the options of debt financing or issuing new equity to finance their capital needs. It is well known that REITs do not pay taxes at the corporate level and, based on the conventional wisdom of static trade-off theory, debt is used as a tax shield. Therefore, when REITs choose to use debt financing to support their funding needs, the concern is raised whether the choice will enhance or worsen their financial performance. Intuitively, static trade-off theory states that REITs will receive negative net tax gains as a result of their borrowing. Howe and Shilling (1988) and Chan et al. (2003) pointed out that REITs will be at a comparative disadvantage when using debt financing because they have to pay the same interest rate as tax-paying firms and this may substantially increase their costs of borrowing (Chan et al., 2003; Titman et al., 2014). Similarly, according to the debt overhang theory of Myers (1977), the relationship should be negative based on the argument that debts distort the optimal value of investment growth opportunities and this distortion may result in underinvestment.

Underinvestment may also occur in response to depletion of a firm's cash flows due to high external financing costs. In this light, firms with internal cash constraints have to forgo any profitable investment when it arises (Froot, Davis, & Stein, 1993; Heaton, 2002). Furthermore, past studies on REITs, such as Campbell et al. (2008), pointed out that the use of bank credit is insignificant to REIT performance. Similarly, Feng, Ghosh and Sirmans (2007) and Chikolwa (2011) illustrated a nonsignificant (less impactful) relation between debt and financial performance. Meanwhile, an earlier study by Hsieh, Poon and Peihwang (2000) found no significant stock price reaction to the announcement of debt issuance in both the long-term and short-term for REITs in the 1965-1992 period while studies such as Oppenheimer (2000), Morri and Cristanziani (2009), Boudry, Kallberg and Liu (2010), Harrison, Panasian and Seiler (2011), and Titman et al. (2014) illustrated a negative correlation between financial performance and debt. Indeed, Titman et al. (2014) concluded that financial leverage was the main factor that destroys the value and share prices of REITs, particularly during the financial crisis.

However, in the case of REITs, debt financing may also be associated with higher investment growth. This is because debt financing acts as a "buffer" for entities with limited retained earnings, as well as an alternative to liquidity to support the funding of investment and operational needs (Ghosh & Sun, 2014; Hardin & Hill, 2011; Riddiough & Wu, 2009). There is numerous evidence that REITs rely on debt financing to facilitate their property investment growth. For instance, Feng

et al. (2007) illustrated that debt financing is used by REITs with potentially superior growth to finance their growth. Studies by Chan et al. (2003), Campbell et al. (2008), Riddiough and Wu (2009) and Hardin and Wu (2010) also indicated that for internally cash constrained REITs, the REITs often choose leverage as a substitute for cash and property acquisition. Lambrecht and Myers (2014) also contended that "Debt is the shock-absorber for operating income and investment"; hence, firm managers opt for debt financing to ensure that their investments are in an optimal state, which enables them to operate the business smoothly and obtain the maximum revenue from the undertaken investment. Lambrecht and Myers further mentioned that debt is used as a tool to determine investments and manage operating needs, including paying dividends to shareholders. However, the decision should not be determined by the debt constraint that in the long run may harm the firm's performance.

The effect of debt on financial performance, particularly in the REIT business framework, is not easy to describe. As a theoretical argument, static trade-off theory, debt overhang, and some empirical evidence discourage the use of debt by REITs since debt adversely affects financial performance. However, there is also some empirical evidence that claims that REITs have to rely heavily on debt in order to grow (see, for example, Campbell et al., 2008; Chan et al., 2003; Hardin & Wu, 2010; Riddiough & Wu, 2009). As such, there is a need to interpret the hypotheses arising from trade-off theory and debt overhang theory and the findings from previous studies that link debt and financial performance in different ways. A new explanation beyond those that are commonly considered is required to find a new explanation for this relationship. Thus, it is important to observe whether the magnitude of the correlation between financial performance and the debt level changes in the presence of moderation factors.

Given this, the study postulates the relationship between debt and financial performance is moderated by liquidity (cash holding) since a greater liquidity level could potentially induce a greater interaction between debt and financial performance. The rationale is that liquidity is seen as an instrument that offers flexibility. Past studies have suggested that liquidity facilitates firms' financial flexibility (Gamba & Triantis, 2008). A recent study by Zainudin, Izani, Razak and Hafezali (2017a), Zainudin, Izani, Hafezali and Razak (2017b) also found that liquidity has a positive relationship with the financial performance of MREITs. Similarly, Hussain, Shamsudin, Anwar, Salem and Jabarullah (2018) and Razak, Rehan, Zainudin and Hafezali (2018) conclude that managing liquidity risks is associated with lower bankruptcy risks for Syari'ah compliant firms. This indicates that higher liquidity levels increase the profitability of firms. Specifically, this implies that liquidity plays important roles in the financial performance of MREITs. Therefore, the liquidity of business entities is important since it is deemed as a medium of exchange that permits management to conduct various business functions and to take advantage of any investment opportunity that arises. This importance has been discussed in numerous studies, including early works by Keynes (1936).

In a broader perspective, Keynes (1936) contended that the vital role of liquidity in a business entity is associated with the degree to which it has the ability to access external funding resources. In this regard, liquidity will become an essential concern for financially constrained entities with limited accessibility to external funding resources. Conversely, entities with no financial constraints would have easier access to external markets and, hence, the liquidity issue becomes less relevant. In the same vein, Almeida (2004) and Faulkender and Wang (2006) asserted that financially constrained firm need more liquid reserves. Indeed, Bates, Kahle and Stulz (2009) report that firms with financial constraints are more likely to have higher cash holdings. Moreover, Lins, Servaes and Tufano (2010) view that cash holdings protect firms against uncertainty about future cash needs, especially during challenging times, and having appropriate liquidity reserves may avoid a liquidity crisis from occurring in which firms do not have access to enough cash to make payments that are due. It was further argued that firms build up their cash holdings principally to cater to their operational needs.

Therefore, the study's hypotheses are described as follows:

H1: There is a negative correlation between financial performance and debt, and

H2: The correlation between financial performance and debt is moderated by liquidity.

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In an investigation on the relationship between liquidity and profitability, Eljelly (2004) noted that the direct effect of liquidity on a firm's profitability arises from the obligation of the firm to obtain external funding by using borrowing to finance their operational needs and cash deficits. The author further elaborated that for a business entity with tax-exempt status, using internal cash to support their operational needs will increase the firm's profits more than using debt. The rationale is that nontax paying firms such as MREITs will be at comparative disadvantages when they use debt to finance their operational needs because they have to pay the same interest rate despite not being able to take advantage of tax savings (Chan et al., 2003; Zaremba, 2017). Furthermore, liquidity (cash balances), preserving an excess debt capacity and permitting REITs to undertake valuable investments will subsequently intensify the positive effect on firms' financial performance (Marchica & Mura, 2010). Thus, although it seems that REITs are not able to preserve higher liquidity assets due to the high mandated payout regulation, essentially, REITs have the ability to reserve more cash internally due to the large depreciation of the noncash outflow items on REITs' balance sheets (Feng et al., 2007; Riddiough & Wu, 2009).

It cannot be denied that there is a cost to holding liquid assets in the form of cash because cash does not generate earnings, which is an opportunity cost that will be incurred when a firm holds highly liquid assets (cash and cash equivalent). Thus, considering the importance of liquidity for a business's survival and the costs that are associated with holding higher liquidity assets, this study investigates the right (optimal) level of liquidity that needs to be preserved by MREITs in order to achieve optimal financial performance. Hence, this study hypothesizes the following:

H3: There is an optimal liquidity level that optimizes the financial performance of MREITs.

3. Data and Methodology

This study uses the Bursa Malaysia data, which consists of 16 MREITs from the period of January 2005 to December 2016. The study timeframe began in 2005 when MREITs were introduced. In other words, the study covers the full period since the establishment of REITs in Malaysia until the recent year of 2016. Thus, the study uses secondary data that were extracted from the audited financial reports of MREITs (available from Datastream International and Bursa Malaysia). In this regard, MREITs tend to concentrate their invested assets in various property sectors, such as hospitals (healthcare), retail stores, plantations, offices and industrial plants. There are also MREITs that have diversified their property assets in various property segments.

To examine the objective of this study, which is to determine whether liquidity moderates the relationship between debt and financial performance, the WarpPLS 5.0 software that was developed by Kock (2015) was used to estimate the model's equation. There are two advantages of the WarpPLS application: First, it allows for the direct estimation of the moderating analysis, and second, PLS analysis is claimed to be more appropriate to test moderating effects than other statistical approaches (Henseler & Fassott, 2010; Limayem, Hirt, & Cheung, 2007; Pavlou & Sawy, 2006). The equation of the model is presented as follows:

$$Financial\ Performance_{i,t} = \beta_0 + \beta_1 Debt_{i,t} + \\ + \beta_2 (Liquidity_{i,t} * Debt_{i,t}) + \beta_j Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

Financial performance was measured using the net profit margin (NP). The NP is defined as the funds from operations (FFO) divided by total rental income. Most of the studies on REITs have utilized FFO instead of EBIT or EAT as the index to represent their operating profits. In this regard, Harrison et al. (2011) opines that FFO is a better index than net income in regard to the measurement of the operating performance of REITs. Some relevant studies that examined the relative quality of FFO are Ghosh, Giambona, Harding and Sirmans (2010), Hardin and Hill (2011), Harrison et al. (2011), Hill, Kelly and Hardin (2012), Titman et al. (2014), Ghosh & Sun (2014). Debt is measured as total debt divided by total net assets. Debt refers to interest bearing debt, including commercial papers, loans and revolving credit.

This study, however, did not include the financial liabilities that MREITs may have, such as loans from subsidiaries or parent companies. In addition, this study used the total net assets, which is measured as total assets minus cash, as proposed by Sufi (2009), as a scaled factor for most of the variables. Liquidity was measured by the ratio of cash and cash equivalent to

total net assets. This study also incorporated several control variables that have been reported in previous studies to impact the financial performance of REITs and non-REITs.

The control variables included the size, cash flow uncertainty, invested asset growth and dividend payments of MREITs. Previous studies have shown that these variables affect firms' financial performance. For instance, Ambrose and Linneman (2001), Ambrose, Highfield and Linneman (2005), and Ertugrul & Giambona (2010) report that larger REITs acquire more profits. Myers (2001) reports that firms with high cash flow uncertainty are expected to have lower financial performance. Lipson, Mortal & Schill (2011) observe that high asset growth firms experience growth following the adoption of high accounting standards, while Fama and French (2006) indicate that firms with higher growth have higher stock returns. Meanwhile, Ross Westerfield, Jaffe and Jordan (2016) show that the higher the dividend payment is, the better the firm's performance.

An MREIT's size is measured by the log of total assets, cash flow uncertainty is measured by the SD of FFO divided by net assets, invested asset growth is measured by the market value of investments in real property, and dividend payment was specified as total dividend per annum divided by net assets.

To further investigate the optimal level of liquidity, this study employs the continuous sequential breakpoint threshold regression (Bai & Perron, 2003; Hansen, 2001; Perron, 2006) to evaluate the benefits of holding liquid assets on financial performance. The threshold regression model (using Eviews 9 software) tests the heterogeneous correlation between financial performance and the liquidity level in order to identify the ideal liquidity level of MREITs. This model obtains the estimated threshold value for the unknown threshold. Considering the specifications of the threshold regression model, the study applies the model of Perron (2006) and Bai and Perron (2003), which is based on the breakpoint least squares regression and reorders the data with the respect to the threshold variable. The threshold estimation and the single threshold of the two-regime model equations are as follows.

The observation for regime i is as follows:

$$V_{it} = \mu_i + \theta' h_{it} + \alpha_1 d_{it} + \varepsilon_{i,t} \quad (2)$$

The two regime models are as follows:

$$V_{it} = \begin{cases} \mu_i + \theta' h_{it} + \alpha_1 Liq_{it} + \varepsilon_{i,t} & if \quad Liq_{it} < \gamma_1 \\ \mu_i + \theta' h_{it} + \alpha_2 Liq_{it} + \varepsilon_{i,t} & if \quad \gamma_1 \leq Liq_{it} < \infty \end{cases} \quad (3)$$

$$\theta = (\theta_1, \theta_2)'$$

$$h_{it} = (L_{i,t}, Cf_{i,t}, Ga_{i,t}, Div_{i,t})'$$

V_{it} represents the financial performance of the MREITs, which is measured by the net profit margin. The liquidity is denoted as Liq_{it}. The liquidity variable's coefficients specify the regime where the regressors are split into at least two regimes. γ_1 represents the recognizable estimated value of the threshold and h_{it} represents the control variables that could impact financial performance. The four control variables are $L_{i,t}$, $Cf_{i,t}$, $Ga_{i,t}$, and $Div_{i,t}$, which represent the size, cash flow uncertainty, invested asset growth and dividend payments of the MREITs, respectively.

Meanwhile, θ_1 and θ_2 represent the coefficient estimates of the control variables, and μ_i controls the MREITs' heterogeneity. Furthermore, i denotes the MREIT cross section and t represents time. In this regard, α_1 is the coefficient of $Liq_{i,t}$ if the threshold variable's value is less than γ_1 and α_2 is the coefficient for $Liq_{i,t}$ if the threshold variable's value is higher than γ_1. It is assumed that the threshold variable $Liq_{i,t}$ is present and the value of the threshold is increasing ($\gamma_1 < \gamma_2 < \ldots\ldots \gamma_m$); thus, it is in regime j if and only if $\gamma_j \leq d_{it\ m+1,}$ where is set to $\gamma_{m+1} = \infty$. Lastly, the errors $\varepsilon_{i,t}$ are implied to be independently and identically distributed with zero mean. Meanwhile, the finite variance is $\sigma^2(\varepsilon it \sim i.i.d\ (0, \sigma^2))$.

To estimate the optimal level of liquidity, in this study, we search for the initial value of the threshold that minimizes the sum of the squares. Simultaneously, we obtain the initial value of the threshold that minimizes the sum of the squares to determine the following probable threshold (starting from 1 until the maximum where the null hypothesis was not rejected). Moreover, we estimate the model's parameters using the nonlinear least squares approach. Consequently, it was found that using the nonlinear least squares approach to estimate the model's parameters is acceptable. We obtain the threshold regression estimation

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Table 1. Results for the Moderating Effect of Liquidity on the relationship between Debt and Financial Performance – Equation: Financial Performancei,t = β0 + β1Debt i,t + β2(Liquidityi,t* Debti,t)+ βj Controlsi.t + εi,t

Dependent Variable: Net Profit Margin	Coefficient	VIF
Total debt	-0.155*	1.379
Liquidity*Total debt	0.412***	4.425
Size	0.117	1.327
Asset growth	0.014	1.105
Cash Flow Uncertainty	0.184*	1.279
Dividend Payment	0.300***	1.585
R^2	0.653	

Notes: ***, ** and * indicate significance at the 1, 5% and 10% levels, respectively.

using S (δ, θ, γ). The sum of the squares is presented below:

$$S(\delta, \theta, \gamma) = \sum_{t=1}^{i} (y_t - h_t' \theta - \sum_{j=0}^{m} 1_j(d_t, \gamma).\, d_t' \alpha_j)^2 \qquad (4)$$

For a given γ, such as $\bar{\gamma}$, the minimization of the focused objective S(δ, θ, $\bar{\gamma}$) is a simple least squares problem. Thus, the estimation can be viewed as obtaining the set of thresholds and matching the OLS coefficient estimates that minimize the sum-of-squares among all possible sets of m-threshold regimes. The model specification can be further modified to various thresholds by using a similar procedure ($\gamma_1, \gamma_2, \gamma_3, \gamma_4 \ldots \gamma_m$). For instance, if there are double thresholds, the model equation can be presented as follows:

$$V_{it} = \begin{cases} \mu i + \theta' h_{it} + \alpha_1 Liq_{it} + \varepsilon_{i,t} & if\ Liq_{it} < \gamma_1 \\ \mu_i + \theta' h_{it} + \alpha_2 Liq_{it} + \varepsilon_{i,t} & if\ \gamma_1 \le Liq_{it} < \gamma_2 \\ \mu i + \theta' h_{it} + \alpha_3 Liq_{it} + \varepsilon_{i,t} & if\ \gamma_2 \le Liq_{it} < \infty \end{cases}$$

4. Empirical Results

4.1 The Moderating Effect of Liquidity on the Relationship between Debt and Financial Performance

To extend debt overhang theory and the empirical evidence presented in Titman et al. (2014), this study empirically examined the role of liquidity as a moderating factor on the correlation between the financial performance of MREITs and the debt level. The model's goodness of fit measurement and indices are presented in Appendix B. In accordance with Kock (2015), the model for the moderating effect of liquidity on the relationship between debt and financial performance provides an adequately good fit to the data in this study. This makes the present model applicable for the further analysis and testing of the study's hypotheses. The evidence of the effect of liquidity as a moderating variable can be clearly seen in Table 1.

The evidence of the correlation between financial performance and debt and the effects of liquidity as a moderating variable on the debt-financial performance relationship can be clearly seen in Table 1. The results support the study's hypothesis that the financial performance of MREITs has a negative correlation with the debt level without the interaction of liquidity (cash holdings). The result also confirms that liquidity has a moderating effect on the relationship between debt and financial performance by changing the direction of the relationship from negative to positive when liquidity interacts with the debt in the relation between the two.

This also indicates that a greater liquidity level could potentially induce a positive interaction between debt and financial performance. Most importantly, without the effect of liquidity on the relationship between debt and financial performance, the results show a signifi-

Table 2. Panel Unit Root Test

Variables	LLC t-statistic	IPS t-statistic	ADF-Fisher t-statistic
Net Profit Margin	-13.629***	-5.525***	62.461***
Debt ratio	-17.869***	-7.288***	80.998***
Liquidity	-13.447***	-5.907***	76.631***
Cash flow volatility	-21.831***	-10.773***	95.604***
Growth	-89.861***	-19.890***	96.192***
Size	-8.6771***	-3.6715***	63.695***
Dividend	-28.455***	-13.892***	148.425***

Notes: *** indicates significance at the 1% level. Levin, Lin & Chu (2002) is represented as LLC; Im, Pesaran & Shin (2003) is represented as IPS; and Dickey and Fuller (1979) is represented as ADF.

cantly negative relationship. Intuitively, this implies that the use of debt among MREITs with no tax benefit will relatively erode their financial performance greater than that of non-REITs, which enjoy tax shield benefits. The finding (without the interaction of liquidity) is consistent with Titman et al. (2014) and debt overhang theory. This result provides a focal insight that indicates the importance of liquidity in the relationship between debt and profitability in which the negative relationship between debt and profitability only holds for MREITs with lower liquidity.

With regard to the control variables, the results reveal that both cash flow uncertainty and dividend payments have a positive relationship with the financial performance of MREITs. However, the size and growth of assets have no relation to the financial performance of MREITs. An additional remark that is not directly related to the study's hypotheses but is applicable to this study is that the size and growth of assets are not statically significantly related to the financial performance of MREITs. This suggests that the financial performance of MREITs is not influenced by the size and growth of assets. Inherently, it was observed that as MREITs operate in a constrained environment with limited internal earnings, the growth of assets is funded using debt. This may lead to a negative relationship with the financial performance of MREITs. The rationale is that the high use of debt will incur a higher interest expense for MREITs, which consequently causes net profits to be relatively low. In contrast, a dividend payment has been found to have a positive relationship with the performance of MREITs, which suggests that a higher performing MREIT will pay a higher dividend to their shareholders.

4.2 Optimal Liquidity Level

The second objective of this study is to identify the optimal liquidity that optimizes the financial performance of MREITs. To ensure the accuracy of the estimated parameters, the panel unit root test was performed to ensure that all of the variables in the model that are used to estimate the optimal liquidity level are stationary. Levin, Lin and Chu (2002), Im, Pesaran and Shin (2003) and Augmented Dickey an Fuller (1979) tests were employed to assess the null hypotheses of a panel unit root test of all variables. Table 2 shows the results of the panel unit root test where the nulls are rejected. This indicates that all variables in the optimal liquidity level model are stationary. Consequently, the full analysis that estimates the optimal liquidity level could be performed.

Table 3 presents the findings that are obtained from the threshold regression analysis that summarizes the regression slope coefficients of the White-corrected standard errors after taking into account the heteroscedasticity for each identified regime.

The findings, as demonstrated in Table 3, show the existence of double thresholds with three (3) liquid-

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Table 3. Threshold Regression Estimation of the Optimal Liquidity Level and Financial Performance

Variables		Coefficient	SE_{White}	t_{White}
1st Regime				
Liquidity < 2.79 (γ1)				
Liquidity	*a1*	-0.0071	1.6041	-0.0044
Total Debt		-1.1025***	0.2196	-5.0194
Size		2.3129	2.3376	0.9894
Asset Growth		0.1988***	0.0721	2.7559
Cash Flow Volatility		0.5942	3.3649	0.1765
Dividend Payment		4.2338	1.9497	2.1715
C		36.893	48.130	0.7665
2nd Regime				
2.79(γ1) ≤ Liquidity< 5.86 (γ2)				
Liquidity	*a2*	-4.4885	2.2914	-1.9588
Total Debt		-0.1875	0.1521	-1.2320
Size		-2.5904	2.3494	-1.1025
Asset Growth		0.0914***	0.0325	2.8174
Cash Flow Volatility		4.9935	2.5068	1.9922
Dividend Payment		2.0261	2.0046	1.0106
C		99.452	27.680	3.5291
3rd Regime				
Liquidity ≥5.86 (γ2)				
Liquidity	*a3*	0.1792***	0.0662	2.7053
Total Debt		0.2185**	0.0960	2.2749
Size		-3.5123	2.4733	-1.4200
Asset Growth		0.2223***	0.0702	3.1675
Cash Flow Volatility		13.936***	4.5169	3.0854
Dividend Payment		5.6764***	1.2507	4.5386
C				
R-squared		0.8410		
F-statistic		21.958***		

Notes: The coefficient for $d_{it} < \gamma_1$ is a_1, the coefficient for $d_{it}\ \gamma_1 \leq d_{it} < \gamma_2$ is a_2, and the coefficient for $d_{it} \geq \gamma_2$ is a_3. The threshold regression with White heteroscedasticity is denoted as SE_{White}, and the t-statistic is denoted as t_{White}. ***, ** and * indicates significance at 1%, 5% and 10%, respectively. The value of ample trimming is 0.10, and the confidence interval is 95%. We use the continuous sequential determined threshold method and a threshold number of 2 to fine tune the optimal threshold outcome.

ity threshold (breakpoints) regimes that are generated from the regression analysis of the continuous sequential threshold. In the first and second regimes, the liquidity ratio was less than 2.79% and the liquidity ranged from 2.79% to 5.86% of the MREITs' net assets. This shows that there is no relation between most of the variables, including liquidity and financial performance, except for asset growth and total debt. It was observed that total debt has a negative relationship with financial performance, particularly when liquidity ratio is less than 2.79%. The most striking and important observation that emerged from this result is that when the liquidity ratio is more than 5.78%, liquidity has a positive relationship with financial performance. The result suggests that liquidity impacts the financial performance of MREITs when the liquidity level is more than 5.78% (3rd regime). Consequently, at this liquidity level, the debt ratio also has a positive relationship with financial performance. It is also important to note that most of the other controlled variables were observed to have significant relationships with financial performance in the 3rd regime except for MREIT size, which was reported to have no relation to financial performance.

In short, the finding clearly implies that MREITs need to preserve their liquidity level to more than 5.78% of their total net assets in order to achieve the optimal financial performance. The findings also suggest that by preserving liquidity at more than 5.78%, MREITs' use of debt will have a positive impact on their financial performance. This result is in line with the previous empirical evidence stating that liquidity plays an important role in the performance of firms since a high level of liquidity shall increase firms' financial performance and their chances for survival (Moyer, Mcguigan, & Kretlow, 2001).

5. Conclusion

Debt overhang theory and the empirical evidence that is presented in Titman et al. (2014) claim that the high use of debt has a negative effect on the financial performance of REITs. This study extends this finding by examining the role of liquidity as a moderating variable that may affect the degree and sign of the debt-financial performance relationship and estimates the optimal liquidity level. The analysis of this study provides new insights into the relationship between debt and financial performance, particularly in the REIT context. In this regard, although REITs are known as entities that have little internal earnings due to the high mandated pay-out dividend, the findings of this study reveal that liquidity (cash holdings) plays an important role in changing the negative correlation between financial performance and debt. The findings also highlight the importance of MREITs optimally managing their liquidity level, and this distinction is consistent with the view that liquidity has positive effects on firms' financial performance. MREIT managers can improve their financial performance by making optimal investment decisions with respect to property selection and also by managing their liquidity and debt financing policy. Managing liquidity in the MREIT business environment should not be disregarded. This study documents that, ideally, MREITs should retain their liquidity level at more than 5.78% of their total net assets to attain the optimal liquidity that optimizes their financial performance and debts will have indirect positive effects on financial performance.

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Appendix A

Model fit measurement and quality indices for the moderating effect of liquidity on the debt-financial performance relationship

Measures	Value	Cut-off Point
Average path coefficient (APC)	0.197, P=0.006	Acceptable
Average R-squared (ARS)	0.653, P<0.001	Acceptable
Average adjusted R-squared (AARS)	0.635, P<0.001	Acceptable
Average block VIF (AVIF)	1.788	acceptable if <= 5, ideally <= 3.3
Average full collinearity VIF (AFVIF)	2.236	acceptable if <= 5, ideally <= 3.3
Tenenhaus GoF (GoF)	0.808	small >= 0.1, medium >= 0.25, large >= 0.36
Simpson's paradox ratio (SPR)	0.833	acceptable if >= 0.7, ideally = 1
R-squared contribution ratio (RSCR)	0.973	acceptable if >= 0.9, ideally = 1
Statistical suppression ratio (SSR)	1.000	acceptable if >= 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	0.917	acceptable if >= 0.7

Notes: VIF represents variance inflation factor.

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