The effect of managerial choices around liquidity, leverage, and company size on corporate bond yield: a case study from Indonesia

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Abstract: This study uses structural equation modelling (SEM) to chart the effects on bond yield of managerial choices around capital structure, as captured by company size, leverage and liquidity. Results are based on a sample of 22 Indonesian companies, over the period 2012–2016. The study contributes to an understanding of the effects that managerial choices around financing strategies exert on bond yield. It finds that only company size has a statistically significant direct effect on bond yield. When company size is held as a moderator variable, both leverage and liquidity display positive indirect effects. The aggregate effect of leverage on yield is positive, and that of liquidity is negative, when company size is employed as a moderator variable. A secondary result is that different accounting definitions of leverage and liquidity may alter the direction of the estimated effect, thereby recommending caution in basing financing strategies solely on accounting metrics.

Keywords: liquidity; leverage; company size; bond yield; Indonesia.

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1 Introduction

Management is tasked with devising financial strategies for meeting the needs arising from a company's capital structure, which must be chosen so as to maximise the value of the company. In turn, the funding sources a company relies upon might affect its future cash flow. In practice, if a company only relies upon debt financing, it will be burdened by interest and instalments for the restitution of the principal, entailing a reduced or even negative cash flow. Instead, if a company relies primarily on its own capital, it will face bottlenecks for investment and working capital, due to the limited extent of its capital stock. Of course, companies may issue shares for meeting their funding needs, but the consequence of that is that existing owners must be willing to share ownership with other shareholders.

Beyond the impact on cash flow, managerial financing strategies must also measure up with market pricing of those securities issued to meet the company's financial needs. Specifically, capital markets allow trading of various financial instruments or long-term securities, representing debt (bonds) or equity (shares), issued by public bodies as well as private companies (Von Hagen et al., 2011; El-Shagi and von Schweinitz, 2018). Capital markets play a pivotal role in increasing national economic activity by facilitating the efficient allocation of funds, gathering investment opportunities, and ensuring professional and transparent scrutiny over corporate strategies (Denis and Mihov, 2003; Edwards et al., 2007; Arena, 2011; Asquith et al., 2013).

An example attesting to the importance of capital markets for financing economic activity is the rapid growth observed in the Indonesian bond market, moving from IDR 187.36 trillion worth of securities in 2012 to IDR 339.43 trillion in the first semester of 2017, considering bonds issued by both the Indonesian government and the corporate sector. In view of this, it must be borne in mind that a central consideration for an investor in bonds is their yield. Yield is the return reaped by investors against the funds employed for purchasing the bond, with bonds that involve a greater risk attracting a higher yield. The yield rate of bonds also changes in line with economic conditions, both at a micro and at a macro level. The yield of a bond determines its performance, which can later be used by investors when deciding to undertake further financial commitments.

In view of the foregoing, this study attempts to explore how managerial choices concerning financial structure might reverberate on the yield of a company's bonds. In order to undertake such exploration, this study considers several accounting variables that help describe a company's financial structure, namely: company size, liquidity and leverage.

Company size can be measured using total assets, sales, or equity (Haggard et al., 2015; Ma et al., 2019), and indicates a company's availability of assets to back its bonds, so that a smaller asset base translates into a greater risk to investors (Lin et al., 2011; Huang et al., 2012; Lettau et al., 2014; Amran and Devi, 2007). This entails an inverse relationship between company size and bond yield: if a small company bears a higher default risk, then investors will demand a higher yield commensurate with such risk. On this basis, company size also displays a strong positive correlation with total indebtedness (Andry, 2005).

Liquidity denotes a company's ability to meet its short-term financial obligations on time (Chen et al., 2007; Friewald et al., 2012). A company's liquidity level is gleaned from such accounting measures as the current ratio, the quick ratio and the cash ratio.

When current assets suffice to pay off short-term liabilities, the company is in a liquid position (Sejati, 2011), which in turn reverberates on its bond yield.

Leverage is a ratio that reveals the weight of debt in financing investments (Gomes, 2001; Chava and Roberts, 2008; Nini et al., 2009; Cakici et al., 2013; Hanauer and Linhart, 2015; Lou and Otto, 2018), and which can be calculated using the debt-to-equity (DER) and the debt-to-asset (DAR) ratios (Cakici et al., 2013; Hanauer and Linhart, 2015). Pecking order theory suggests that a company's preferred source of funding ought to be internal, drawn from operating results. If internal funds are insufficient, additional sources will come from the proceeds of bond offerings, and finally new share issues. The lower the leverage ratio, the smaller the proportion of assets funded through debt. Since large amounts of debt can lead to bankruptcy (Altman et al., 2010; Azis, 2015; Shin, 2016), leverage affects the risk profile of a company, and its bond yield. In addition, Meilani and Amboningtyas (2017) report that leverage has a positive effect on company size: where leverage increases, the size of the company will also increase because funds obtained through leverage will usually be employed to invest in further assets, whether fixed, current, or non-current.

These variables help chart managerial choices around financial structure. In this paper, the impact of those choices on bond yield will be analysed by investigating the following effects on a sample of 22 companies (over the period 2012–2016) listed by the Indonesian Bond Pricing Agency (IBPA) and the Indonesia Stock Exchange:

a The direct effect of liquidity, leverage and company size on bond yield.

b The direct effect of liquidity and leverage on company size.

c The indirect effect of liquidity and leverage on bond yield, through company size as a moderator variable.

d The aggregate effect of liquidity and leverage on bond yield, through company size as a moderator variable.

2 Literature review

Bonds are fixed income debt securities, where the issuer agrees to pay a certain amount of interest/yield, commonly called a coupon, for a certain period of time and to repay the principal amount at maturity. According to Adrian and Boyarchenko (2012) and Adrian et al. (2015), bonds can be described as letters of long-term debt: a bond is a debt statement from the borrower to the lender (Keown et al., 2011; Adrian et al., 2015, 2017).

Keown et al. (2011) summarise some essential characteristics of bonds as follows:

a bonds amount to claims on future income against ordinary shares and preferred shares

b the nominal value of a bond is the value stated on the bond that will be returned to the bondholders at maturity

c the coupon interest rate on bonds discloses the percentage of interest on the nominal value of bonds to be paid each year.

Additionally, Brigham and Houston (2010) add that

d bond maturity refers to the length of time until the bond issuer returns the value of the bond to the bond holder

e indenture is a legal agreement between a bond issuing company and a trustee representing bondholders, which provides specific terms regarding loan approval, such as a description of the bond, the rights of bondholders, the rights of the issuing company, and the responsibilities of the trustee

f current bond yield refers to the profit made by a party who buys the bond, based on the interest that has been set against the market price of bonds

g bond yield incorporates an assessment of the potential future risks surrounding a bond.

Moreover, the literature describes several types of corporate bonds, such as mortgage bonds, unsecured bonds, conversion bonds, bonds accompanied by a warrant, zero-coupon bonds, bonds with floating rate, puttable bonds, forward bonds and sovereign bonds (Booth et al., 2014; Galariotis et al., 2016; Ahmad et al., 2018).

Table 1 describes different possible measures for bond yield, with their associated uses.

Table 1 Definitions of bond yield

Type of yield	*Application*
Nominal yield	Measuring coupon rates
Current yield	Measuring current income levels
Yield to maturity (YTM)	Measuring the level of expected returns if the bonds are kept until maturity
Yield to call (YTC)	Measuring the expected return to be paid (call) before maturity
Realised (horizon) yield	Measuring the actual return for bonds sold before maturity

2.1 Company size

Company size is a measure that is meant to estimate the scale of a company's operations (Cakici et al., 2013). Machfoedz (1994) suggests it ought to be measured by the total assets of a company, where by asset it is meant a resource controlled by the company as a result of past events, and from which future economic benefits are expected to flow. Gomez-Puig (2006), Cakici et al. (2013) and Hanauer and Linhart (2015) suggest that a measure for company size might be derived from the amount of equity value, sales value, or asset value. Machfoedz (1994) adds that the estimation of a company size, whether based on total assets, log size, or stock market value, might lead to a three-way classification into large, medium-sized and small companies. The larger a company is according to this measure, the easier will it be for it to attract capital on financial markets (Eyer, 2014; Hanauer and Linhart, 2015).

2.2 Liquidity

Liquidity tracks a company's ability to meet its short-term obligations, such as monthly bills, employee salaries, or debts that are due in the near future and, in general, coming to maturity within one year (Brigham and Houston, 2011; Lei and Wang, 2012; Anderson,

2017). Anderson (2017) claims that the liquidity ratio can be used to ascertain a company's ability to remain solvent in the short-term, i.e., its ability to maintain working capital to meet operational needs, pay interest at maturity, and preserve a favourable credit level (Zhang et al., 2014; Shin, 2016; Li et al., 2017). Chen et al. (2007), Li et al. (2009), Lin et al. (2011) and Cakici et al. (2013) further clarify that liquidity ratios capture a company's ability to pay off current liabilities when they fall due, also in view of their current long-term obligations (Jankowitsch et al., 2014; Chung et al., 2019). In sum, liquidity can be understood as a company's ability to pay all of its short-term financial obligations using the current assets it has available (Jiang et al., 2012; Jankowitsch et al., 2014). For this purpose, a company's liquidity encompasses any asset that can be traded on an active market, so that it might be converted quickly into cash at the prevailing market price to meet outstanding obligations (Longstaff et al., 2005; Covitz and Downing, 2007; Jiang et al., 2012; Bai et al., 2018).

Liquidity is typically gleaned from a ratio of current assets to current debt. A 2:1 ratio is sometimes taken as a rule of thumb for a desirable ratio, but it cannot be held as an absolute, as a judgment around liquidity ought also to make allowances for the type of business and financial policies of each company.

2.3 Leverage

Leverage, or solvency, is the ratio of corporate debts to capital that captures a company's ability to fulfil both its short-term and its long-term obligations (Ang et al., 1997; Harahap, 2013). This ratio helps see how far the company is financed by debt or external parties, in contrast to its self-financing capabilities (Altman, 2005). Byoun and Xu (2013) offer an alternative definition of leverage as a metric for analysing financial statements, so as to show the amount of collateral available to creditors in the event of company liquidation. According to Ehrhardt and Brigham (2011), companies that finance their business activities through debt (financial leverage) face three important implications. First, by increasing funds through debt, shareholders can maintain control of the company without having to increase their investment. Second, if the company's profit from investments financed by debt exceeds interest paid on that debt, the return to shareholders increases, as does also their risk of defaulting on debt. Third, creditors will regard capital owned by the company as a security margin: the higher the proportion of funds held by shareholders, the lower the risk faced by creditors. Peterson and Fabozzi (2002) distinguish two main types of leverage ratios. Component percentages compare debt with the company's total capital (debt plus equity) or its equity. Instead, coverage ratios reflect a firm's ability to satisfy fixed financing obligations, such as interest, principal repayment, or lease payments.

Rajan and Zingales (1995) specify that it is the objective of a study that ought to guide the choice of a particular measure of leverage. For instance, they observe that total liabilities to total assets, whilst being the broadest definition of leverage, might not be a good proxy for financial risk, since many balance sheet items included in total liabilities are used for transaction rather than for financing purposes. After settling on a definition of leverage, the next step is to decide on an appropriate measure. Indeed, the use of either book or market values can produce different outcomes, as reported by Gomes and Schmid (2010) and Cakici et al. (2013). Titman and Wessels (1988) clarify that coefficients in the factor model may vary, depending on whether book or market values are used. Although the use of market values of debt can have advantages over book value

(Altman, 2005; Hens and Steude, 2009; Norden and van Kampen, 2013; Adrian et al., 2015; Halling et al., 2016; Eyer, 2018), this study uses market values of equity for estimating returns, instead of market values of debt.

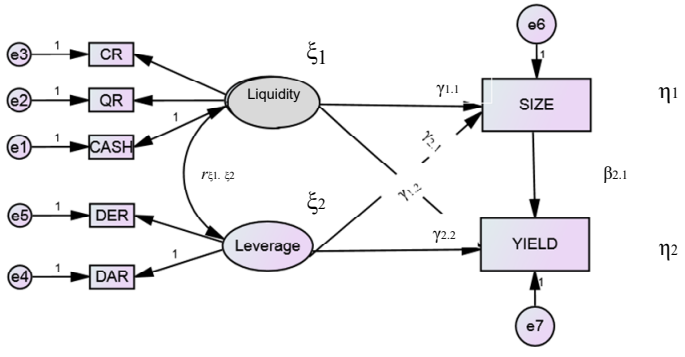
3 Methodology

This study investigates causality relations by trying to elucidate the effect of liquidity and leverage on company size and bond yield. For this purpose, it employs latent and observed variables. Latent variables are variables that cannot be directly observed or measured, but which can be represented or measured by indicators (Hair et al., 2009). Instead, observed or manifest variables are those that can be measured directly. Table 2 defines the main variables used in this study.

Table 2 Operational variables

Variable	*Indicator*		*Formula*
Exogenous variable: liquidity (ξ_1)	1 Current ratio	1	–
	2 Quick ratio	2	$Quick\ ratio = \frac{Cash, short\text{-}term\ investments, and\ net\ receivables}{Current\ liabilities}$
	3 Cash ratio	3	
Leverage (ξ_2)	1 DER	1	–
	2 DAR	2	–
Endogenous variable: bond yield (η_2)	Current yield		*Yield* = annual coupon bond/current price of the bond
Moderator variable: company size (η_1)	Company size		*Company size* = Ln(*total assets*)

Figure 1 Model structure of direct and indirect effects of liquidity (ξ_1) and leverage (ξ_2) on yield (η_2) through company size (η_1) (see online version for colours)



Data is explored using structural equation modelling (SEM), which allows simultaneously to test a series of interconnected relationships between measured and latent variables (Hair et al., 2009). In Figure 1 is a picture of the path diagram model used in this study.

The model structure above can be translated into the following equations:

$$\eta 1 = \gamma 1.1\xi 1 + \gamma 1.2\xi 2 + e6$$

$$\eta 2 = \gamma 2.1\xi 1 + \gamma 2.2\xi 2 + \beta 2.1\eta 1 + e7$$

Last, but not least, the relationships posited in Figure 1 is tested using a sample of 22 companies from the Indonesia Bond Pricing Agency (IBPA) and Indonesia Stock Exchange in Jakarta. Companies in the sample were selected using a purposive sampling technique from 41 companies over 5 years from 2012–2016.

4 Results and discussion

4.1 Goodness of fit

The goodness of fit of this research can be gleaned from the size of chi-square statistic ( ), from dividing the minimum sample discrepancy function by the degree of freedom (CMIN/DF), from the root mean squared error of approximation (RMSEA), and from the comparative fit index (CFI). Having looked at the above, the following results obtain. First, the chi-square value is 16.017, with a *p*-value of 0.099, which means that it is greater than 0.05 ($p > 0.05$), validating the proposed research model. Second, the CMIN/DF value is 1.602 and, since a model is considered acceptable if that value is not greater than 2.0, the proposed research model is acceptable also according to this parameter. Third, the RMSEA value is 0.076, and smaller than the 0.08 threshold, which again endorses the research model. Finally, the expected CFI value is greater than 0.95, namely it comes to 0.984 for this study, once again substantiating the fitness of the research model.

4.2 Research results with path analysis

4.2.1 Direct effect of liquidity, leverage and company size on bond yield

The direct effect of liquidity, leverage and firm size on bond yield is –0.123, 0.028, and –0.161, respectively. This result can be restated in the following equation:

$$Yield = -0.123\ liquidity + 0.028\ leverage - 0.161\ size$$

Liquidity has a negative effect on yield (–0.123), meaning that, if liquidity increases by one unit, the yield will decrease by 0.123 units. Leverage, instead, has a positive effect on yield (0.028), so that each increase in one unit of leverage will cause the yield to increase by 0.028 units. Finally, company size has a negative direct effect on the yield (–0.161), so that each increase in one unit in company size will cause the bond yield to decrease by 0.161 units.

Table 3 displays the test results for statistical significance for the examined variables, which are as follows:

a The effect of liquidity (ξ_1) on yield (η_2) is not significant, because the *p*-value is 0.243 > 0.05. This is in line with research conducted by Indarsih (2013), showing that liquidity has no effect on yield, and it also aligns with the results reported by Santoso et al. (2017), who also find that liquidity does not affect bond yield directly.

b The effect of leverage (ξ_2) on yield (η_2) is not significant because the *p*-value is 0.703 > 0.05. While leverage proxies such as DER and DAR display a direct positive effect on bond yield, that effect is not statistically significant. This confirms the result obtained by Giovanni and Saadah (2018), whereby leverage does not have a significant effect on yield.

c The effect of company size (η_1) on yield (η_2) is statistically significant, because the *p*-value is 0.022 < 0.05. Hence, company size has a direct negative effect on yield that meets the threshold of statistical significance, confirming the result already reported by Eyer (2014).

Table 3 Significance tests for the direct effects of liquidity, leverage and company size on bond yield

			Estimate	*SE*	*CR*	*P*	*Label*
Yield	←	leverage	0.166	0.437	0.381	0.703	par_4
Yield	←	liquidity	–0.290	0.248	–1.168	0.243	par_7
Yield	←	size	–0.188	0.082	–2.294	0.022	par_8

Source: Processed results of the AMOS 24 program

On this basis, it can be concluded that company size has a statistically significant direct effect on bond yield, while liquidity and leverage do not seem significantly to affect the yield of bonds listed by the IBPA during the 2012–2016 period. This result makes it possible to resolve the hypothesis that leverage, liquidity and company size have a direct effect on bond yield. Namely, this proposition must be rejected for leverage and liquidity, while it can be retained for company size. The effect of liquidity and leverage on bond yield cannot be observed directly, but it is likely channelled by moderator variables that are encapsulated by company size. This possibility is supported by company size theory (Hanauer and Linhart, 2015), which states that assets are resources controlled by a company as a result of past events, and which are expected to yield future economic benefits. Since, as mentioned earlier, company size is drawn from equity value, sales value, or asset value (Altman, 2005; Cakici et al., 2013; Eyer, 2014; Hanauer and Linhart, 2015), this variable can therefore be taken as a proxy for the size of assets held by a company, which might be the source of future economic benefits. This implies that a large company size entails a relatively small risk of default, lowering the bond yield.

4.2.2 The direct effect of liquidity and leverage on company size

The following equation expresses the direct effect of liquidity and leverage on company size:

$$Size = -0.133\ liquidity - 0.204\ leverage$$

In other words, liquidity has a direct negative effect on company size, such that each increase in one unit of liquidity will cause the size of the company to decrease by 0.133 units. Additionally, leverage also has a direct negative effect on firm size, such that each increase in leverage by one unit will decrease company size by 0.204 units.

Table 4 Significance tests for the direct effects of liquidity and leverage on company size

			Estimate	*SE*	*CR*	*P*	*Label*
Size	←	liquidity	–0.617	0.312	–1.978	0.048	par_5
Size	←	leverage	–1.405	0.700	–2.008	0.045	par_6

Source: Processed results of the AMOS 24 program

The effect of liquidity (ξ_1) on firm size (η_1) is statistically significant, with a *p*-value of 0.048, hence smaller than 0.05. Leverage (ξ_2) too has a statistically significant effect on firm size (η_1), with a *p*-value of 0.045, which is smaller than 0.05. If liquidity has a statistically significant, direct negative effect on company size, this means that it has an opposite effect on company size, which contradicts earlier work by Meilani and Amboningtyas (2017), who report that liquidity partially has a positive and statistically significant effect on company size. The difference between the findings of this study and theirs is that 'current liabilities' has included, for the purpose of our study, items that were not included by Meilani and Amboningtyas (2017). Namely, third party business debt, debt by related parties and bank debt were counted as 'current liabilities', along with shifting bond debt, sukuk debt and other types of long-term debt commitments, whenever they were due for maturity in less than one year. For this reason, the increase in current liabilities, unmatched by a parallel expansion in the definition of 'current assets', simply increases the denominator resulting in a decreasing liquidity ratio.

Leverage, too, has a statistically significant, direct negative effect on company size. This entails that it yields an opposite effect on the size of a company. This finding also contradicts previous research by Gomez-Puig (2006), Cakici et al. (2013), Eyer (2018) and Meilani and Amboningtyas (2017), all of whom argue that leverage has a partially positive, statistically significant effect on company size. The difference can be attributed to a more encompassing definition of 'equity' to include the number of outstanding shares, additional paid-in capital, retained balances, the difference between non-controlling party transactions and equity that can be distributed to the owner of the parent entity. This translates into a larger denominator in the DER ratio. The same occurs in connection to the DAR ratio, as the set of assets funded by equity is expanded.

In view of the foregoing, however, the second effect mentioned in the introduction, whereby leverage and liquidity directly impact company size, is corroborated by our findings and is therefore to be accepted.

4.2.3 The indirect effects of liquidity and leverage on yield

The indirect effects of liquidity and leverage on yields were found to be as follows:

$$Yield = 0.021\, liquidity + 0.033\, leverage$$

Liquidity has an indirect positive effect on yields, such that each increase in one unit of liquidity will cause bond yield to increase by 0.021 units. Leverage, instead, has an indirect positive effect on yield, whereby a one-unit increase in leverage will bring bond yield up by 0.033 units.

Neither liquidity (ξ_1) nor leverage (ξ_2) have a statistically significant direct effect on bond yield (η_2), since their *p*-values are 0.243 and 0.703, therefore far beyond the significance threshold of 0.05. However, since company size has a significant direct effect on yield, this lends credit to the conclusion that company size mediates the impact

of liquidity and leverage, which therefore have indirect positive effects on bond yield provided company size is treated as a moderator variable. This confirms the third type of effect, as described in the introduction, whereby company size is suitable of being treated as moderator variable for the impact of leverage and liquidity on bond yield.

4.2.4 Aggregate effect of liquidity and leverage on yield

The aggregate effect of liquidity and leverage on bond yield, holding company size as moderator variable, is summarised in Table 5.

Table 5 Aggregate effect of liquidity and leverage on yields, with firm size as moderator variable

	Leverage	*Liquidity*	*Size*
Size	–0.204	–0.133	0.000
Yield	0.061	–0.101	–0.161

Source: Processed results of the AMOS 24 program

By aggregate effect it is meant the total influence obtained by summing the direct and indirect effects of leverage and liquidity on bond yield, as illustrated by the following equations:

a Aggregate (total) effect of liquidity (ξ_1) on yield (η_2) through company size (η_1):

$$\eta_{2total1} = \gamma_{2.1} + (\gamma_{1.1} \times \beta_{2.1})$$
$$\eta_{2total1} = -0.123 + (-0.133 \times -0.161)$$
$$\eta_{2total1} = -0.123 + 0.021$$
$$\eta_{2total1} = -0.101$$

b Aggregate (total) effect of leverage (ξ_1) on yield (η_2) through company size (η_1):

$$\eta_{2total2} = \gamma_{2.2} + (\gamma_{1.2} \times \beta_{2.1})$$
$$\eta_{2total2} = 0.028 + (-0.204 \times -0.161)$$
$$\eta_{2total2} = 0.028 + 0.033$$
$$\eta_{2total2} = 0.061$$

The above leads to an aggregate effect of liquidity on bond yield of –0.101, and to an aggregate effect of leverage on bond yield of 0.061. In both cases, company size is held as a moderator variable. The next equation sums up these findings:

$$Yield = -0.101\, liquidity + 0.061\, leverage - 0.161\, size$$

If the aggregate effect of liquidity on yield is negative, when company size is used as a moderator variable, this means that a one-unit increase in liquidity will cause bond yield to decrease by 0.101 units, assuming leverage to be held constant. Symmetrically, if the aggregate effect of leverage on bond yield is positive when company size is used as a moderator variable, this means that a one-unit increase in leverage will cause yield to increase by 0.061 units, assuming liquidity to be held constant. The effect of company size on yield remains –0.161, so that a one-unit increase in company size will bring bond yield down by 0.161 units, assuming liquidity and leverage remain constant. These

findings therefore clarify the magnitude and direction of the fourth effect that this paper set out to explore, i.e., the aggregate effect of leverage and liquidity on bond yield, when company size is held as a moderator variable.

5 Discussion and implications

This study has employed SEM to investigate the causal relationships between latent and observed variables, in order to elucidate the repercussions of managerial decisions on leverage, liquidity and company size on bond yield. The investigation has been carried out on a sample of 22 companies listed by the IBPA and the Indonesia Stock Exchange, between the period 2012–2016.

Running the model against the sample has helped establish the following propositions. First, only company size has a statistically significant direct effect on bond yield. That effect is negative, because company size likely entails a broader asset base to back any debt commitments, thereby reducing the risk taken on by bondholders. Liquidity and leverage also have direct effects on bond yield, respectively negative and positive, neither of which is statistically significant. Second, both liquidity and leverage have statistically significant, direct negative effects on company size, which is therefore suitable to act as moderator variable, mediating the repercussions of leverage and liquidity decisions on bond yield. Third, when company size is used as moderator variable, liquidity and leverage have indirect positive effects on bond yield. Fourth, when direct and indirect effects are added together, for liquidity and leverage respectively, liquidity shows an aggregate negative effect, while leverage an aggregate positive effect.

What these results show is that managerial decisions concerning leverage and liquidity affect bond yield through company size. In the aggregate, the more a company is liquid, the more it is able to meet its short-term obligations, thereby reducing the risk of default to bondholders, so that the yield they might demand on capital markets is reduced. Leverage, instead, increases the risk profile of a company (while also allowing it to increase its profits) and therefore tends to increase the yield that bondholders might demand. At the same time, our analysis has equally revealed the limitation, whereby the magnitude and direction of the effects of leverage and liquidity on yield is susceptible of being affected by the adoption of more or less encompassing accounting definitions of such variables as ‘current liabilities’ and ‘equity’, which affect leverage and liquidity ratios. Therefore, careful dissection of the accounting ratios used in support of financial decision-making is necessary, in order to guide future research and consulting work.

References

Adrian, T. and Boyarchenko, N. (2012) *Intermediary Leverage Cycles and Financial Stability*, Working Paper, Becker Friedman Institute for Research in Economics, University of Chicago, Chicago, IL, 16 August.

Adrian, T., Boyarchenko, N. and Shachar, O. (2017) ‘Dealer balance sheets and bond liquidity provision’, *Journal of Monetary Economics*, Vol. 89, No. C, pp.92–109.

Adrian, T., Boyarchenko, N. and Shin, H.S. (2015) *The Cyclicality of Leverage*, Staff Report, Federal Reserve Bank of New York, New York, NY, October.

Ahmad, W., Mishra, A.V. and Daly, K.J. (2018) ‘Financial connectedness of BRICS and global sovereign bond markets’, *Emerging Markets Review*, Vol. 37, No. C, pp.1–16.

Altman, E.I. (2005) 'An emerging market credit scoring system for corporate bonds', *Emerging Markets Review*, Vol. 6, No. 4, pp.311–323.

Altman, E.I., Gande, A. and Saunders, A. (2010) 'Bank debt versus bond debt: evidence from secondary market prices', *Journal of Money, Credit and Banking*, Vol. 42, No. 4, pp.755–767.

Amran, A. and Devi, S.S. (2007) 'Corporate social reporting in Malaysia: an institutional perspective', *World Review of Entrepreneurship, Management and Sustainable Development*, Vol. 3, No. 1, pp.20–36.

Anderson, M. (2017) 'A causal link between bond liquidity and stock returns', *Journal of Empirical Finance*, Vol. 44, No. C, pp.190–208.

Andry, W. (2005) 'Analisis faktor-faktor yang mempengaruhi prediksi peringkat obligasi', *Buletin Ekonomi Moneter dan Perbankan*, Vol. 8, No. 2, pp.243–262.

Ang, J.S., Fatemi, A. and Tourani-Rad, A. (1997) 'Capital structure and dividend policies of Indonesian firms', *Pacific-Basin Finance Journal*, Vol. 5, No. 1, pp.87–103.

Arena, M.P. (2011) 'The corporate choice between public debt, bank loans, traditional private debt placements, and 144A debt issues', *Review of Quantitative Finance and Accounting*, Vol. 36, No. 3, pp.391–416.

Asquith, P., Covert, T. and Pathak, P. (2013) *The Effects of Mandatory Transparency in Financial Market Design: Evidence from the Corporate Bond Market*, Working Paper, National Bureau of Economic Research, Cambridge, MA, September.

Azis, A. (2015) 'Analisis perbandingan kinerja keuangan bank devisa dan bank non devisa di Indonesia', *Jurnal Online Mahasiswa (JOM) Bidang Ilmu Ekonomi*, Vol. 2, No. 1, pp.1–15.

Bai, J., Bali, T.G. and Wen, Q. (2018) 'Common risk factors in the cross-section of corporate bond returns', *Journal of Financial Economics*, Vol. 131, No. 3, pp.619–642.

Booth, G.G., Gurun, U.G. and Zhang, H. (2014) 'Financial networks and trading in bond markets', *Journal of Financial Markets*, Vol. 18, No. C, pp.126–157.

Brigham, E.F. and Houston, J.F. (2010) *Dasar Dasar Manajemen Keuangan*, Salemba Empat, Jakarta.

Byoun, S. and Xu, Z. (2013) 'Why do some firms go debt free?', *Asia-Pacific Journal of Financial Studies*, Vol. 42, No. 1, pp.1–38.

Cakici, N., Fabozzi, F.J. and Tan, S. (2013) 'Size, value, and momentum in emerging market stock returns', *Emerging Markets Review*, Vol. 16, No. C, pp.46–65.

Chava, S. and Roberts, M.R. (2008) 'How does financing impact investment? The role of debt covenants', *The Journal of Finance*, Vol. 63, No. 5, pp.2085–2121.

Chen, L., Lesmond, D.A. and Wei, J. (2007) 'Corporate yield spreads and bond liquidity', *The Journal of Finance*, Vol. 62, No. 1, pp.119–149.

Chung, K.H., Wang, J. and Wu, C. (2019) 'Volatility and the cross-section of corporate bond returns', *Journal of Financial Economics*, forthcoming.

Covitz, D. and Downing, C. (2007) 'Liquidity or credit risk? The determinants of very short-term corporate yield spreads', *The Journal of Finance*, Vol. 62, No. 5, pp.2303–2328.

Denis, D.J. and Mihov, V.T. (2003) 'The choice among bank debt, non-bank private debt, and public debt: evidence from new corporate borrowings', *Journal of Financial Economics*, Vol. 70, No. 1, pp.3–28.

Edwards, A.K., Harris, L.E. and Piwowar, M.S. (2007) 'Corporate bond market transaction costs and transparency', *The Journal of Finance*, Vol. 62, No. 3, pp.1421–1451.

Ehrhardt, M.C. and Brigham, E.F. (2011) *Corporate Finance: A Focus Approach*, 4th ed., South Western Cengage Learning, Manson, OH.

El-Shagi, M. and von Schweinitz, G. (2018) 'The joint dynamics of sovereign ratings and government bond yields', *Journal of Banking & Finance*, Vol. 97, No. C, pp.198–218.

Eyer, J. (2014) *Does Size Matter? The Effect of Firm Size on Fracking Safety*, Unpublished Manuscript.

Eyer, J. (2018) 'The effect of firm size on fracking safety', *Resource and Energy Economics*, Vol. 53, No. C, pp.101–113.

Friewald, N., Jankowitsch, R. and Subrahmanyam, M.G. (2012) *Liquidity, Transparency and Disclosure in the Securitized Product Market*, Unpublished Manuscript, New York University Stern School of Business, New York, NY.

Galariotis, E.C., Krokida, S.I. and Spyrou, S.I. (2016) 'Bond market investor herding: evidence from the European financial crisis', *International Review of Financial Analysis*, Vol. 48, No. 1, pp.367–375.

Giovanni, A. and Saadah, S. (2018) 'Analisis yield spread obligasi berdasarkan faktor default dan faktor non-default: studi empirik pada obligasi korporasi di sektor keuangan', *Prosiding Working Papers Series in Management*, Vol. 10, No. 1, pp.35–52.

Gomes, J.F. (2001) 'Financing investment', *American Economic Review*, Vol. 91, No. 5, pp.1263–1285.

Gomes, J.F. and Schmid, L. (2010) 'Levered returns', *The Journal of Finance*, Vol. 65, No. 2, pp.467–494.

Gomez-Puig, M. (2006) 'Size matters for liquidity: evidence from EMU sovereign yield spreads', *Economics Letters*, Vol. 90, No. 2, pp.156–162.

Haggard, K.S., Howe, J.S. and Lynch, A.A. (2015) 'Do baths muddy the waters or clear the air?', *Journal of Accounting and Economics*, Vol. 59, No. 1, pp.105–117.

Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2009) *Multivariate Data Analysis*, 7th ed., Pearson Prentice Hall, Upper Saddle River, NJ.

Halling, M., Yu, J. and Zechner, J. (2016) 'Leverage dynamics over the business cycle', *Journal of Financial Economics*, Vol. 122, No. 1, pp.21–41.

Hanauer, M.X. and Linhart, M. (2015) 'Size, value, and momentum in emerging market stock returns: integrated or segmented pricing?', *Asia-Pacific Journal of Financial Studies*, Vol. 44, No. 2, pp.175–214.

Harahap, S.S. (2013) *Analisis Kritis Atas Laporan Keuangan*, 1st ed., Rajawali Pers., Jakarta.

Hens, T. and Steude, S.C. (2009) 'The leverage effect without leverage', *Finance Research Letters*, Vol. 6, No. 2, pp.83–94.

Huang, W., Liu, Q., Rhee, S.G. and Wu, F. (2012) 'Extreme downside risk and expected stock returns', *Journal of Banking & Finance*, Vol. 36, No. 5, pp.1492–1502.

Indarsih, N. (2013) 'Pengaruh Tingkat Suku Bunga SBI, Likuiditas dan maturitas terhadap yield to maturity obligasi', *Jurnal Ilmu Manajemen*, Vol. 1, No. 1, pp.125–136.

Jankowitsch, R., Nagler, F. and Subrahmanyam, M.G. (2014) 'The determinants of recovery rates in the US corporate bond market', *Journal of Financial Economics*, Vol. 114, No. 1, pp.155–177.

Jiang, J.X., Stanford, M.H. and Xie, Y. (2012) 'Does it matter who pays for bond ratings? Historical evidence', *Journal of Financial Economics*, Vol. 105, No. 3, pp.607–621.

Keown, A.J., Farnworth, M.J. and Adams, N.J. (2011) 'Attitudes towards perception and management of pain in rabbits and guinea pigs by a sample of veterinarians in New Zealand', *New Zealand Veterinary Journal*, Vol. 59, No. 6, pp.305–310.

Lei, Q. and Wang, X. (2012) 'Flight to liquidity due to heterogeneity in investment horizon', *China Finance Review International*, Vol. 2, No. 4, pp.316–350.

Lettau, M., Maggiori, M. and Weber, M. (2014) 'Conditional risk premia in currency markets and other asset classes', *Journal of Financial Economics*, Vol. 114, No. 2, pp.197–225.

Li, H., Wang, J., Wu, C. and He, Y. (2009) 'Are liquidity and information risks priced in the treasury bond market?', *The Journal of Finance*, Vol. 64, No. 1, pp.467–503.

Li, H., Wu, C. and Shi, J. (2017) 'Estimating liquidity premium of corporate bonds using the spread information in on- and off-the-run treasury securities', *China Finance Review International*, Vol. 7, No. 2, pp.134–162.

Lin, H., Wang, J. and Wu, C. (2011) 'Liquidity risk and expected corporate bond returns', *Journal of Financial Economics*, Vol. 99, No. 3, pp.628–650.

Longstaff, F.A., Mithal, S. and Neis, E. (2005) 'Corporate yield spreads: default risk or liquidity? New evidence from the credit default swap market', *The Journal of Finance*, Vol. 60, No. 5, pp.2213–2253.

Lou, Y. and Otto, C.A. (2018) *Debt Heterogeneity and Covenants*, Research Paper, May, HEC Paris.

Ma, Z., Stice, D. and Williams, C. (2019) 'The effect of bank monitoring on public bond terms', *Journal of Financial Economics*, in press.

Machfoedz, M.U. (1994) 'Financial ratio analysis and the prediction of earnings changes in Indonesia', *Kelola*, Vol. 7, No. 3, pp.114–134.

Meilani, L. and Amboningtyas, D. (2017) 'Analisis pengaruh rasio likuiditas, leverage, dan profitabilitas terhadap dividend payout ratio (Dpr) dengan firm size sebagai variabel intervening pada perusahaan manufaktur yang terdaftar di bursa efek Indonesia periode tahun 2012–2016', *Journal of Management*, Vol. 3, No. 3, pp.1–9.

Nini, G., Smith, D.C. and Sufi, A. (2009) 'Creditor control rights and firm investment policy', *Journal of Financial Economics*, Vol. 92, No. 3, pp.400–420.

Norden, L. and van Kampen, S. (2013) 'Corporate leverage and the collateral channel', *Journal of Banking & Finance*, Vol. 37, No. 12, pp.5062–5072.

Peterson, P.P. and Fabozzi, F.J. (2002) 'Traditional fundamental analysis II: financial ratio analysis', in Fabozzi, F.J. and Markowitz, H.M. (Eds.): *The Theory and Practice of Investment Management*, pp.227–274, Wiley, Hoboken, NJ.

Rajan, R.G. and Zingales, L. (1995) 'What do we know about capital structure? Some evidence from international data', *The Journal of Finance*, Vol. 50, No. 5, pp.1421–1460.

Santoso, Y.D., Ahmar, N. and Mulyadi, J.M.V. (2017) 'Penyajian pendapatan komprehensif lain dan komponennya pada industri keuangan', *Liquidity*, Vol. 6, No. 1, pp.19–31.

Sejati, G.P. (2011) 'Analisis faktor akuntansi dan non akuntansi dalam memprediksi peringkat obligasi perusahaan manufaktur', *Bisnis & Birokrasi Journal*, Vol. 17, No. 1, pp.70–78.

Shin, H.S. (2016) 'Market liquidity and bank capital', Paper presented at the *Perspectives 2016: Liquidity Policy and Practice Conference*, London Business School, London, 27 April [online] https://www.bis.org/speeches/sp160506.pdf (accessed 1 April 2019).

Titman, S. and Wessels, R. (1988) 'The determinants of capital structure choice', *The Journal of Finance*, Vol. 43, No. 1, pp.1–19.

Von Hagen, J., Schuknecht, L. and Wolswijk, G. (2011) 'Government bond risk premiums in the EU revisited: the impact of the financial crisis', *European Journal of Political Economy*, Vol. 27, No. 1, pp.36–43.

Zhang, X., Yang, J., Su, H. and Zhang, S. (2014) 'Liquidity premium and the Corwin-Schultz bid-ask spread estimate', *China Finance Review International*, Vol. 4, No. 2, pp.168–186.