Capital Structure and Company's Sustainability: Case Study of Public Listed Oil and Gas Companies in Indonesia and Malaysia

Jubaedah Nawir,
Universitas Pembangunan Nasional Veteran Jakarta
Jl. Rs.Fatmawati No.1 Pondok Labu Jakarta
INDONESIA

Abdul Razak Abdul Hadi*,
Universiti Kuala Lumpur
1016 Jalan Sultan Ismail, Kuala Lumpur
MALAYSIA

Farah Deana Roslan,
Universiti Kuala Lumpur
1016 Jalan Sultan Ismail, Kuala Lumpur
MALAYSIA

*Corresponding Author: abdrazak@unikl.edu.my

Abstract

This study is driven by the motivation to investigate the impact of liquidity position (as measured by cash balance) on the performance of oil and gas companies listed in Bursa Efek Indonesia as well as in Bursa Malaysia. We use the assumptions of Trade-off Theory to substantiate our empirical model. The oil and gas industry has remained robust in both countries despite the economic challenges in the energy sector from 2016 till 2021. This study has selected 10 and 30 companies whose revenues have been detrimentally affected by the recent oil price crisis from Bursa Efek and Bursa Malaysia respectively. Using secondary data from the two stock exchanges coupled with the deployment of Generalized Method of Moments (GMM) as an estimation tool, the study discovers that liquidity position is a significant predictor in determining the performance of oil and gas companies only in Malaysia. This is not the case for those in Bursa Efek and both lagged price as well as leverage (as measured by D/E ratio) are insignificant in both stock exchanges. The empirical findings in Bursa Efek are very much consistent with the Efficient Market Hypothesis in that the prevailing market price of a security truly reflects its future price.

International Journal
of **Instructional Cases**

Introduction

Capital structure is defined as the combination of debts and equity used to finance an organization or an investment (Myers, 2000). Capital structure can also be described as a financing mix consisting of debts, preferred shares and common equity. It is known that the main purpose of financing is to acquire company's productive assets which will support business operations. Business sustainability refers to the company's ability to continue its operations at a particular level for a long period of time.

Numerous studies have been conducted on examining the effect of capital structure on company's performance. Most of these studies, however, fail to conclude the real credible factors that truly determine company's optimal capital structure. Optimal capital structure is defined as the right combination of debts and equity which is aimed at maximizing value of a business and at the same time minimizing its cost of capital (Hadi & Suryanto, 2016). It is almost impossible to find one single model that could perfectly fit into all companies with different market structures. As such, the quest for an optimal capital structure continues across all industries all over the world.

Hence, this study is motivated to examine the nature of capital structure and its effect on those oil and gas companies in Indonesia and Malaysia. These two countries have been the key producers of oil and gas in the Asia Pacific region since early 1970s. In 2003, Indonesian government stepped up its corporate governance practices on its state-owned companies, particularly in the oil and gas industry. As a result, this important industry started to show signs of significant improvements in terms of production capacity (Vickers, 2013). Like Indonesia, Malaysian government understands the importance of this industry in generating government revenue. Today, Malaysia takes pride in producing over 1.7 million barrels of oil daily (Petronas, 2022). According to U.S Energy Information Administration, Malaysia is the second largest oil and gas producer in Southeast Asia and the world's fifth largest exporter of liquefied natural gas (U.S. Energy Information Administration, 2021).

Established in August 1968, PT Pertamina is an Indonesian state-owned oil and gas company and currently the largest corporation in Indonesia (Kasali, 2008). The setting up of Petroliam Nasional Bhd or Petronas took place six year later in August 1974. Similar to Pertamina, Petronas is the first Malaysia's fully integrated oil and

gas company. Today, both Pertamina and Petronas have become part of the Fortune 500 companies and have joined the ranks of globally recognized companies such as Royal Dutch Shell Plc and Exxon Mobil Corporation (The Malaysian Reserve, 2018). As these two neighbouring countries celebrate the success of their oil and gas industry, they have also been challenged by the external factors which are beyond their controls. For instance, the oil crisis 2014 exerts tremendous impact on the market players. The crude oil price has plummeted from USD 100 per barrel to USD 28 per barrel (The Malaysian Reserve, 2018). The oil and gas companies were mostly burdened with debts that many were unable to repay their loans on time. As a result, almost all of the oil and gas-related projects were terminated as the return on investment could not justify the its costs (The Malaysian Reserve, 2018).

There have been a lot of studies on capital structure theories and empirical evidence on its effect on business's performance. However, the question as to whether capital structure of companies will influence their financial performance remains as an interesting topic for further discussion. Hadlock and James (2002) analyse 500 non-financial companies in United States and they discover that total debt and profitability are positively related. It is because companies in United State prefer debt financing as they anticipate higher return on investment from higher debt level. Their findings are supported by Roden and Lewellen (1995) who share almost the same results. The study by Roden and Lewellen (1995) discovers systematic relationships between the type of debt in the buyout financing package and the target firm's earnings rate, earnings variability, growth prospects, and its tax and liquidity position.

However, there are also studies that reveal negative relationship between capital structure and company performance. Rajan and Zingales (1995) choose a sample size of 4,557 corporations across G-7 countries (United States, Japan, Germany, France, Italy, Britain and Canada) and they find that profitability is negatively related with financial leverage.

In the Malaysian context, San and Heng (2011) perform a study on 49 construction companies in three different sizes from year 2005 till 2008. As for the large construction companies, there is a positive relationship between return on capital and earnings per share. Also, a positive relationship between return on capital and total debt to equity is visible in this segment. In the case of medium-sized companies, their study shows that only long term debt to common equity has a significant impact on company's performance. However, the opposite results are revealed in the small-sized category. Their earnings per share is negatively related to total debt to capital ratio.

Most of the literature put their emphasis on the role of capital structure in influencing firm's value and little attention is given on issue related to firm's liquidity. As such, this study is tailored towards examining the effect of liquidity (proxied by cash balance) on firm's historical performance (as represented by firm's closing price). This study is intended to investigate the effect of firm's liquidity and closing price on firm's future value. There are two main hypotheses in this study:

H1: Cash is significant in influencing the company's future values

H2: Lagged closing price is significant in influencing the company's future values

Literature Review

There are a number of competing capital structure theories in the study of corporate finance. Below are the four celebrated theories and each explores the relationship between the company's choice of financing and its market value from different perspectives.

The foundations to capital structure were first set by Modigliani and Miller in 1958. They argue that firm's value is not dependent on the combination of debt and equity (with the assumption of the presence of perfect markets). In other words, they assert that capital structure is irrelevant in a perfect market which ignores the corporate tax and transaction cost. This notion results in a renewed research by Jensen (1986). He comes out with the Agency Cost Theory advocating that managers are least interested in maximizing the wealth of the shareholders and rather more interested in maximizing their personal wealth. And so, this conflict of interest is now associated with the agency costs. In 1963, Modigliani and Miller revised their assumptions and added the personal income taxes and corporate taxes. This revised theory concludes that an optimal capital structure occurs when the company is fully financed by debts as it benefits completely from the interest-tax shields. The foundation set by Modigliani and Miller has risen many other researchers to continue their study on optimal capital structure. However, the results still vary and remain inconclusive.

According to Static Trade-off Theory, optimal debt ratio is determined by a trade-off between costs and benefits of the debts, company's assets and investment plans. The value of interest-tax shields will be balanced by the firms against cost of bankruptcy. Despite the existence of controversy on the value of the tax shields, it does provide some insights (Myers, 1984). It has been recognized that firms will not be able to continuously minimize the cost of capital. Therefore, as per the theory, the firm needs to make a trade-off between equity and debt. This theory is justified if there are no costs of adjustments, hence the debt-to-value of the firm will be optimal. However, cost will definitely exist since firms will need to adjust the actual debt ratio and the target debt ratio to account for these costs. In most cases, managers are unaware of the adjustment costs or ignore the adjustment cost, thus the optimal debt ratio remains unknown (Myers, 1984). For example, the firm might reach a point beyond in which debts becomes more expensive due to increased risk of bankruptcy. This theory suggests that, when such cases happen creditors will be demanding for high interest rate or might choose not to grant additional debts for the firms. Subsequently, the firms will be putting in effort to increase the equity financing to trade off the debt financing as the high level of debts put the shareholder's position at risk. Too high debts increase the cost of capital, therefore, a proper combination of debt and equity may help minimize the cost of capital of the firm.
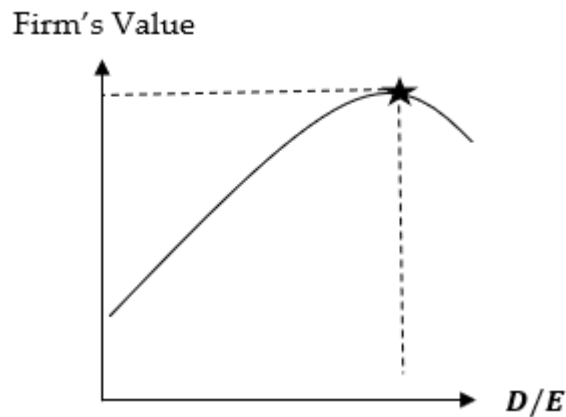
Firm's Value

D/E

Figure 1: Trade-off Theory by Modigliani and Miller (1958)

The Dynamic Trade-off theory addresses the issues of time dimension, roles of expectations and adjustment costs. In this theory, the financing decision of the firm is highly dependent on the financing margin which is anticipated in the next period (Luigi & Sorin, 2009). In general, firms expect to pay out their funds in the next period, whereas other firms will have an expectation to raise funds (Luigi & Sorin, 2009). If firms were to raise funds, they would either take debt or equity or a combination of these two. The dynamic theory is first explored by Stiglitz (1973), whereby the effects of taxation have been examined. Kane, Marcus, and McDonald (1984) develop the first dynamic model which considers the trade-off between tax savings and bankruptcy cost. The study by Kane et al. (1984) take into account the elements of uncertainties such as taxes and bankruptcy cost using a continuous time model. However, the model ignores transaction cost.

The Pecking Order Theory is based upon internal financing approach and only seeks for equity financing as its last resort. This theory suggests that firms will be utilizing their internal and existing funds from issuance of debts and once depleted, they will resort to equity financing. Myers (1984) argue that internal funds such as retained earnings are a better choice than debts and debts are better than equity. The hierarchy on the choices of financing according to this theory is its priority on internal financing followed by debt financing. The last resort is equity financing due to its high floatation costs. The hierarchy in which the firm chooses depends highly on its financial growth cycle. In some cases, equity financing may come first. This is the case for venture capitalist who sees uncertainty in startup companies. The issue that has been identified in this theory is the assumptions themselves. The theory assumes managers are acting in the best interest of shareholders. The theory does not explain why managers should be concerned over the value of the issuance of stocks. Hence, the decisions on the optimal capital structure are not guaranteed. Moreover, the theory fails to provide explanations on the issue of asymmetric information. Managers are more aware of the information available today and this information will only be available to shareholders in future date. Last but not least, the Pecking Order Theory is developed in a simple financial setting in which firms are only given a choice between equity and debt

financing. In actuality, the financial markets are evolving very rapidly and more sophisticated financial products are now being offered to the managers.

The Market Timing Theory is based on the premise that firms are likely to issue new equity or stock if they perceive the prices are going to be overvalued. In the event of lackluster market, firms would buy back their own shares (Luigi & Sorin, 2009). As a results, the capital structure of the firm is influenced by the sentiments and conditions in the stock market (Luigi & Sorin, 2009). There are two assumptions which leads to the Market Timing Theory. Firstly, the theory makes an assumption that there is a rationale behind the economic agents. When there is a positive information release that reduces the asymmetry issues between the stockholders and management, the firms are assumed to issue equity. On the other hand, if there is a lack of information asymmetry between them, then firms will be creating their own timing opportunities. Secondly, the theory makes an assumption that the economic agents are irrational (Baker & Wurgler, 2002). When economic agents are irrational, there will be time dependent of the stocks to be mispriced. In this situation, the financial managers will be issuing equity as they believe that the cost is low. Baker and Wurgler (2002) present empirical evidence that there is a persistent effect on the capital structure due to equity market timing. They conclude that the capital structure of a firm is a combination of results produced from past attempts to time the equity market.

The Efficient Market Hypothesis (EMH) is put into test in this study as some of the capital structure theories seem violate its prophecy. This theory argues that current share price reflects all available information and shared with all market participants (Eugene, 1970). The theory also asserts that share prices always trades at their fair market value. The followers of efficient market hypothesis believe that if stocks always trade at their fair market value, then no market timing strategy will yield opportunities to outperform the market. There are three variations of EMH:

I. Weak-Form Efficient

The investors assume that prices will not reflect new information that has not yet been made available to the public. It also assumes that past prices do not influence future prices, which will instead be informed by new information. If this is the case, then technical analysis is a fruitless endeavour. The weak-form efficient market hypothesis leaves room for a talented fundamental analyst to pick stocks that could outperform in the short run based on his or her ability to predict the upcoming new information.

II. Semi-strong Form Efficient

Semi-strong form takes the same assertions of weak-form and includes the assumption that all new public information is instantly incorporated into the prevailing market price. In this way, neither fundamental nor technical analysis can be used to generate excess return.

III. Strong-Form Efficient

Strong-form EMH believes that all pertinent information (public and private) has been embedded into the company's current price. Hence, insider information has no value to any investors.

Data and Methodology

This study focuses on annual data from 2016 till 2021 involving 10 and 30 listed companies from Bursa Efek Indonesia and Bursa Malaysia respectively. The secondary data are extracted from the exchange databases. The panel data in this study are analysed using SAS Base programming. With regard to Indonesian dataset, the study only considers annual data from 2016 till 2020.

Specifically, the study focuses on the key variables in the empirical model. The independent variables are made up of debt to equity ratio and cash balances, while share price is the model's dependent variable. Table 1 shows the details of each variable.

Table 1: Variables, Definitions and Data Sources

Variable	Definition	Data Source
Cash	Amount of cash to meet future financial obligation	Bursa Efek and Bursa Malaysia
Share Price	The firm's prevailing market price	Bursa Efek and Bursa Malaysia
Debt to equity	A financial ratio that is used to evaluate a company's financial leverage and is calculated by dividing a company's total liabilities by its shareholders equity	Bursa Efek and Bursa Malaysia

The underpinning theory for this study is the Trade-off theory advocated by Modigliani and Miller (1958). In a functional form, the theory states that V_f= f (D/E), in which V_f represents the value of the firm and D/E is the debt-to-equity ratio. The theory further explain that value of a firm would begin at a certain point (the point where its offered price is declared during IPO) and this value would continue to increase in tandem with the increase in the debt-to-equity ratio. However, this upward movement would only get to a certain point and as the debt-to-equity ratio is further increased, the firm's value starts declining. This situation is attributed to the trade-off between the costs of debt and the benefits of debt financing. As mentioned earlier, the theoretical model of this study is adapted from the Trade-off Theory. Specifically, our estimated model is postulated as follows:

CP= f (D/E, CASH)   (1)

In this empirical model, CP denotes the firm's closing price while D/E represents the debt-to-equity ratio and it is also designated as the model's control variable. Meanwhile, cash is the proxy of firm's cash balance and our variables of interest in this study are CP and CASH.

Generalized Method of Moments (GMM) is used as estimation tool to test the firm's value and their relation with the firm's closing price and cash balance because this study is dynamic in nature as advocated by Foo et al. (2015). Also, GMM is the best method that provides the panel data with efficient econometric estimators and it is an efficient tool that can reduce the endogeneity problem. The GMM research framework is shown in Figure 3 below. It is developed to test the capital structure on a firm's value by using a different diagnostic test called Sargan test and examined by the Autocorrelation test.
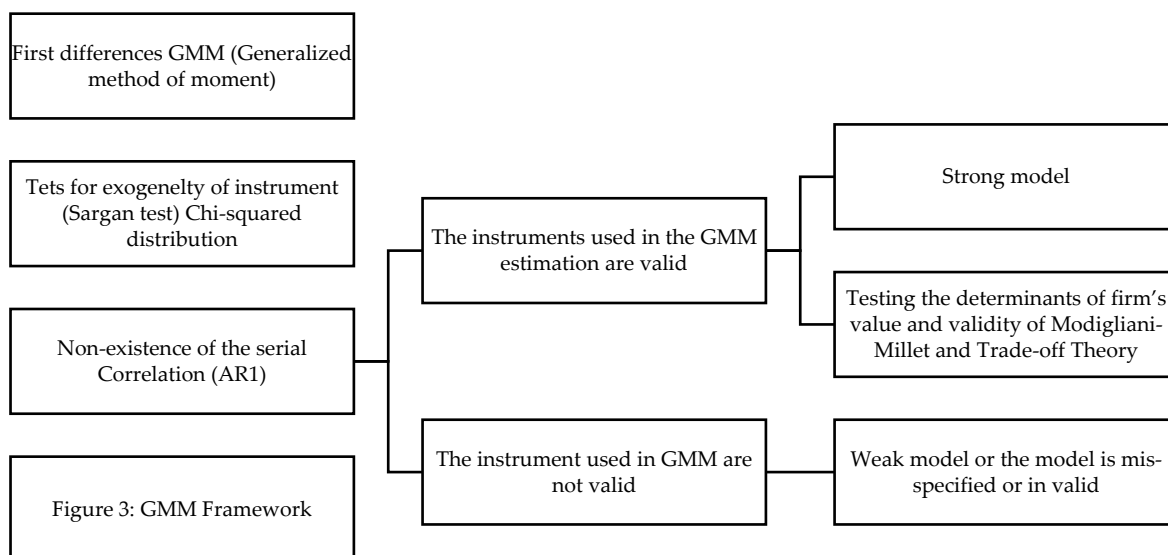

Figure 2: GMM Framework

A two-step GMM method is used to solve endogeneity problem for independent and explanatory variables in order to control the correlation error over time. The Sargan test (also known as Sargen-Hansen test) is proposed by Sargan (1958) and it is a statistical test used to examine the exogeneity of the instruments and their consistency. The model would be classified as a weak model if the Sargan test is invalidated.

Figure 2 below shows the econometric procedure that this study must adhere to in order to confirm the empirical model used is adequate and efficient.
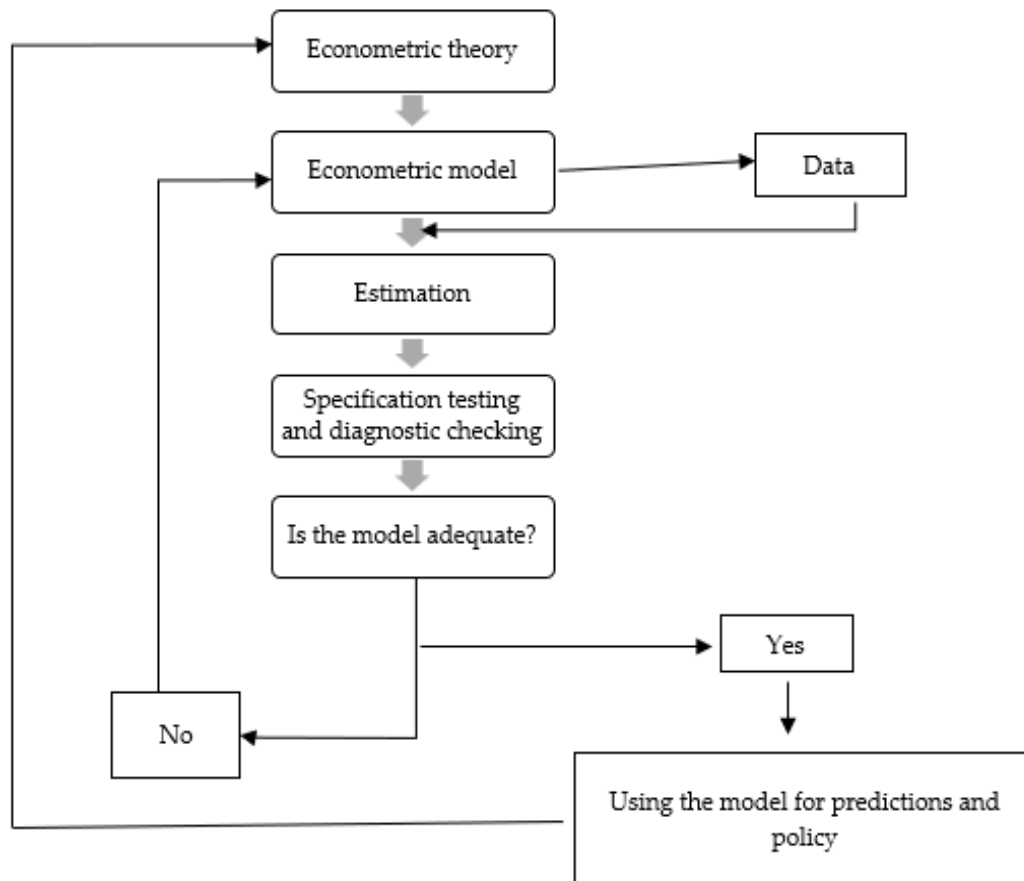
Figure 3: Econometric Procedure

Empirical Findings

All the datasets, namely closing price (CP), Debt-to-equity ratio (D/E) and cash are analysed by SAS program. In order to get the statistical results of GMM, the panel data are coded into SAS programming language. The results of the panel GMM2 are presented below.

Table 2: Correlation Coefficients on Indonesia model

Pearson Correlation Coefficient, N=144 (P-value)				
	CP	**DE**	**CASH**	**ROE**
CP	1.00000	-0.0773 (0.6055)	0.2697 (0.0582)	0.0650 (0.6537)
DE	-0.0773 (0.6055)	1.00000	-0.0975 (0.5142)	-0.0401 (0.7885)
CASH	0.2697 (0.0582)	-0.0975 (0.5142)	1.00000	0.0496 (0.7321)
ROE	0.0650 (0.6537)	-0.0401 (0.7885)	0.0496 (0.7321)	1.00000

Table 2 above shows the correlation matrix of all the variables used in the Indonesian model. The Pearson correlation analysis helps explaining the degree of association between two variables. The correlation coefficients take values between -0.07 and 0.27. It is interesting to note that the degree of association between CP and Cash is rather weak at 0.27 but it is significant at 10 percent level.

Table 3: Correlation Coefficients on Malaysian model

Pearson Correlation Coefficient, N=144 (P-value)				
	CP	**DE**	**CASH**	**ROE**
CP	1.00000	0.00665 (0.9369)	0.07907 (0.3462)	0.06777 (0.4197)
DE	0.00665 (0.9369)	1.00000	-0.05099 (0.5439)	0.00613 (0.9419)
CASH	0.07907 (0.3462)	-0.05099 (0.5439)	1.00000	0.03341 (0.6910)
ROE	0.06777 (0.4196)	0.00613 (0.9419)	0.3341 (0.6910)	1.00000

Looking at the Malaysian model in Table 3, none of the coefficient is significant and the degree of association between CP and CASH is also weak at 0.08. It is worthwhile to point out that there is almost no relationship between CP and D/E in this Malaysian context.

Table 4: Sargan Tests

Sargan Tests					
DF	**Statistic**	**Prob> ChiSq (Indonesia)**	**DF**	**Statistic**	**Prob> ChiSq (Malaysia)**
2	2.17	0.3384	6	4.18	0.6519

Table 3 shows the results of the Sargan tests. This test is important as it evaluates the validity of instrumental variable. The null hypothesis of this test specifies that the instrumental variables are uncorrelated to some set of residuals, and therefore they are regarded as valid and credible. If the P-value is higher than 5 percent, then the null hypothesis is accepted. In both Indonesian and Malaysian cases, their P-value are rather high and therefore there is an absence of endogeneity issue for both models.

Table 5: Autocorrelation Tests

AR (m) Test					
Lag	**Statistic**	**Pr > |Statistic| (Indonesia)**	**Lag**	**Statistic**	**Pr > |Statistic| (Malaysia)**
1	-0.26	0.7940	1	-0.82	0.4099

AR(m) test is another diagnostic test that must be performed in GMM analysis and the test results are presented in Table 5. Looking at the high P-value in Indonesian and Malaysian models, it is confirmed that the autocorrelation problem is non-existent.

Table 6: Parameter Estimates of Indonesian model

Parameter Estimates						
Variable	DF	Estimates	Standard Error	t Value	Pr > |t|	Label
LCP_1	1	0.6748	1.3266	0.51	0.6145	Lagged 1 log CP
LDE	1	-0.3358	0.2510	-1.34	0.1933	Log DE
LCASH	1	-0.0255	0.4644	-0.06	0.9566	Log CASH

Parameter estimation provides our model's parameter values from the measured panel data. From Table 6, it is evident that lagged CP and CASH in the Indonesian model do not exert any significant influence on the company's value. It shows that the EMH might be relevant in explaining variations in company's value.

Table 7: Parameter Estimates of Malaysian model

Parameter Estimates						
Variable	DF	Estimates	Standard Error	t Value	Pr > |t|	Label
LCP_1	1	0.64647	0.1054	0.64	0.5226	Lagged 1 log CP
LDE	1	-0.07739	0.1926	-0.40	0.6888	Log DE
LCASH	1	0.657132	0.1492	4.40*	<.0001	Log CASH

* Significant at 5% level.

The empirical findings in the Malaysian model is somewhat in line with our expectation. The parameter estimate for CASH is 0.6571 and its relationship with CP is significant at 5 percent level. This implies that for every unit increase in CASH, the CP will increase in tandem by 0.6571 unit, holding all other factors constant. It may appear that cash is an important prerequisite in sustaining an oil and gas company in Malaysia. Business sustainability requires sound cash management and good coordination between social and financial demands. As such, concerns over good business practices would ultimately ensure ongoing success and increased profitability.

Conclusion

This study primarily aims at examining the effect of liquidity on oil and gas company's performance as proxied by its closing prices. This study has selected 10 and 30 listed companies from Bursa Efek and Bursa Malaysia respectively. Using

secondary data from the two stock exchanges together with the deployment of Generalized Method of Moments (GMM) as an estimation tool, the study discovers that cash position is the only significant predictor in determining the performance of oil and gas companies only in Malaysia. This finding is consistent with the work of Roden and Lewellen (1995). Obviously, this finding also violates the theory of efficient market that suggests no other factor could influence the firm's value other than its share price. This is not the case for those Indonesian companies and both lagged price as well as leverage (as measured by D/E ratio) appear insignificant in both stock markets. Unlike Bursa Malaysia, the empirical evidence from Bursa Efek Indonesia are fairly consistent with the EMH in that the prevailing market price of a security truly reflects its future price.

This research contributes to the body of knowledge by providing systematic evidence on how company's liquidity position could influence its future performance. Having sufficient amount of cash coupled with good corporate governance are the key success factors in the oil and gas business. Any business that wishes to venture into this industry needs to embrace good business practices, particularly in liquidity management. The collapse of some of the giant oil companies in Indonesia and Malaysia give us a clear sign on how volatile that this industry can be.

References

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The journal of Finance, 57*(1), 1-32. https://doi.org/10.1111/1540-6261.00414

Eugene, F. (1970). Efficient capital markets: A review of theory and empirical work. *The journal of Finance, 25*(2), 383-417. https://doi.org/10.2307/2325486

Foo, V., Jamal, A. A. A., Karim, M. R. A., & Ulum, Z. (2015). Capital structure and corporate performance: Panel evidence from oil and gas companies in Malaysia. *International Journal of Business Management and Economic Research, 6*(6), 371-379. http://www.ijbmer.com/docs/volumes/vol6issue6/ijbmer2015060606.pdf

Hadi, A. R. A., & Suryanto, T. (2016). Capital Structure Determinants: Evidence From Palestine and Egypt Stock Exchanges. *Ikonomika: Jurnal Ekonomi dan Bisnis Islam, 1*(2), 118-130. https://doi.org/10.24042/febi.v1i2.147

Hadlock, C. J., & James, C. M. (2002). Do banks provide financial slack? *The journal of Finance, 57*(3), 1383-1419. https://doi.org/10.1111/1540-6261.00464

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American economic review, 76*(2), 323-329. https://dx.doi.org/10.2139/ssrn.99580

Kane, A., Marcus, A. J., & McDonald, R. L. (1984). How big is the tax advantage to debt? *The journal of Finance, 39*(3), 841-853. https://doi.org/10.1111/j.1540-6261.1984.tb03678.x

Kasali, R. (2008). *Mutasi DNA powerhouse: Pertamina on the move*. Gramedia Pustaka Utama. https://scholar.ui.ac.id/en/publications/mutasi-dna-powerhouse

Luigi, P., & Sorin, V. (2009). A review of the capital structure theories. *Annals of Faculty of Economics, 3*(1), 315-320. https://www.researchgate.net/publication/41163549

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review, 48*(3), 261-297. https://www.jstor.org/stable/1809766

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review, 53*(3), 433-443. https://www.jstor.org/stable/1809167

Myers, S. C. (1984). *Capital structure puzzle*. National Bureau of Economic Research Cambridge, Mass., USA. https://www.nber.org/papers/w1393

Myers, S. C. (2000). Capital structure: Some legal and policy issues. In *OECD Conference on Company Law Reform, Stockholm, Sweden* (pp. 1-11). Organisation for Economic Co-Operation and Development. https://search.oecd.org/daf/ca/corporategovernanceprinciples/1857283.pdf

Petronas. (2022). *Malaysia's Oil & Gas Landscape*. Malaysia Petroleum Management (MPM). https://www.petronas.com/partner-us/malaysia-oil-gas-outlook

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of Finance, 50*(5), 1421-1460. https://doi.org/10.1111/j.1540-6261.1995.tb05184.x

Roden, D. M., & Lewellen, W. G. (1995). Corporate capital structure decisions: evidence from leveraged buyouts. *Financial Management, 24*(2), 76-87. https://doi.org/10.2307/3665536

San, O. T., & Heng, T. B. (2011). Capital structure and corporate performance of Malaysian construction sector. *International Journal of Humanities and Social Science, 1*(2), 28-36. http://www.ijhssnet.com/journals/Vol._1_No._2%3B_February_2011/3.pdf

Sargan, J. D. (1958). The estimation of economic relationships using instrumental variables. *Econometrica: Journal of the econometric society, 26*(3), 393-415. https://doi.org/10.2307/1907619

Stiglitz, J. E. (1973). Recurrence of techniques in a dynamic economy. In *Models of economic growth* (pp. 138-167). Springer.

The Malaysian Reserve. (2018). *Tracing Malaysia's illustrious O&G history*. The Malaysian Reserve. https://themalaysianreserve.com/2018/08/30/tracing-malaysias-illustrious-og-history

U.S. Energy Information Administration. (2021). *Country Analysis: Executive Summary Malaysia*. EIA. https://www.eia.gov/international/content/analysis/countries_long/Malaysia/malaysia.pdf

Vickers, A. (2013). *A history of modern Indonesia*. Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511801020.015