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Determinants of capital structure and firm financial performance—A PLS-SEM approach: Evidence from Malaysia and Indonesia

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ABSTRACT

We examine the impact of capital structure determinants on firm financial performance together with the mediation effect of firm leverage in Malaysia and Indonesia over the period of 1990–2010. Our results show that certain of the capital structure determinants directly affect firm financial performance. We also observe that only the Malaysian sample has a positive significant correlation between firm leverage and firm financial performance. Malaysian firms use external financing instead of internal financing to heighten performance. Our results also show that firm leverage plays a mediating role in Malaysia but not for the Indonesian sample. The asset structure, growth opportunities, liquidity, non-debt tax shield and interest rate are the attributes that were indirectly influenced by firm leverage on firm financial performance. Further analysis for multi-group analysis (MGA) in PLS was also used to test the equality of the parameter estimates. We observe that certain attribute coefficients in the determinants of capital structure and firm financial performance are significantly different between Malaysia and Indonesia.

1. Introduction

Previous research has highlighted the important factors that influence firm leverage such as firm-specific and country-specific attributes (Bancel & Mittoo, 2004; Chang, Chen, & Liao, 2014; De Jong, Kabir, & Nguyen, 2008; Deesomsak, Paudyal, & Pescetto, 2004; Huang, 2014; Zeitun, Temimi, & Mimouni, 2017). These attributes are also known as capital structure determinants[1] (Rajan & Zingales, 1995; Titman & Wessels, 1988). Over the last decade, international studies began to appear investigating the relationship between firm leverage and firm financial performance (Abdel-Kader, Bacha, Masih, & Asutay, 2017; Berger & Bonaccorsi di Patti, 2006; Margaritis & Psillaki, 2007,2010). However, few studies have systematically investigated the direct relationship of capital structure determinants on firm financial performance and if leverage financing mediates or indirectly influences such a relationship (Bandyopadhyay & Barua, 2016; Detthamrong, Chancharat, & Vithessonthi, 2017; Fosu, 2013).

Our research extends the state-of-the-art research in the field and reconciles the mixed results from previous studies for two different countries (Malaysia and Indonesia). This study is interesting because the cross-cultural differences between countries determine the capital structure and firm performance (Acedo-Ramiırez & Ruiz-Cabestre, 2014; Akhtar, 2017; Detthamrong et al., 2017; Vo, 2017). For instance, although the use of higher leverage or a lower equity capital ratio can increase firm financial performance, the firm may also consider investing in fixed assets in to enhance shareholders' wealth. In other words, the role of asset tangibility as collateral in borrowing might lead to an increase in the firm financial performance via increases in its leverage. Based on our best knowledge, only a few studies have investigated the mediating effect of firm leverage between capital structure determinants and firm financial performance (Claude, 2016; Detthamrong et al., 2017; Fosu, 2013; Ramadan & Chen, 2012; Ramli & Nartea, 2016). Ramadan and Chen (2012) clarify that firm leverage has a mediating

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[1] Numerous studies have tried to define the determinants of capital structure and determinants of firm financial performance. For example, determinants of capital structure, i.e., asset growth, firm size, liquidity (SET A), and determinants of firm financial performance, i.e., firm size, business risk, ownership etc. (SET B). Thus, it is expected that determinants of capital structure overlap with some determinants of firm financial performance.

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effect between capital structure determinants and firm financial performance in the UK market, but their study only includes the firm-specific attributes and ignores country-specific ones. In addition, the findings of Claude (2016) show contrasting results with Ramadan and Chen (2012) on some relationships between the determinants of capital structure and firm performance. These persistent gaps in the literature provide valuable opportunities for our current work to re-examine these relationships.

The theory of capital structure determinants can be formulated as a causal model (Chang, Lee, & Lee, 2009; Titman & Wessels, 1988). The attributes identified as determinants of capital structure are usually considered as non-directly observed variables or latent variables,[2] i.e., there will be no single accounting indicator that can be used as an exact representation of each attribute (Chang et al., 2009; Titman & Wessels, 1988; Yang, Lee, Gu, & Lee, 2010). We use the PLS-SEM approach which combines features from principal component analysis and multiple regression (Lee, Liang, Lin, & Yang, 2016; Ramli, Latan, & Nartea, 2018). PLS-SEM is a statistical approach to model the non-directly observed variable that can be measured by a variation of single and multiple observable indicators or proxies (Hair, Hult, Ringle, & Sarstedt, 2017; Latan & Noonan, 2017). This approach can also overcome the multi-collinearity that sometimes occurs in traditional regressions (Avkiran et al., 2018).

In the last decade, capital structure studies have become increasingly well known for comparing different countries (Acedo-Ramiırez & Ruiz-Cabestre, 2014). Some studies implicitly assume that the effects of firm-specific factors on firm leverage are the same in each country (Booth, Aivazian, Demirguc Kunt, & Maksimovic, 2001; Giannetti, 2003; Song, 2004). Recently, studies that cover the U.S. and European countries argue that the environment of a country's institutions and international operations influences the behavior of finance managers as well their finance policies (Bancel & Mittoo, 2004; Brounen, De Jong, & Koedijk, 2006). De Jong et al. (2008) report that corporate leverage should be appropriately analyzed because they find that the determinants of capital structure have significant direct and indirect results for 42 countries. Additionally, they find that some attributes are not equal across countries. However, so far no studies have effectively made a comparative analysis across countries, i.e., are firm- and country-specific attributes in capital structure and firm financial performance significantly different across countries? Instead, previous studies examined only the coefficient estimator per country for the firm-specific determinants of leverage. The path attribute coefficients for different countries are almost always different in a mathematical sense (Hair et al., 2017; Matthews, 2017). Thus, the question is raised as to whether these differences are statistically significant. This study will specifically contribute by comparing parameters (usually path coefficients) between countries by focusing on Malaysia and Indonesia. Because this study uses the PLS-SEM approach, its ability to perform additional analyses, such as the Multi-Group Analysis procedures in PLS path modelling (hereafter referred to as "PLS-MGA"), can address this issue. Comparison with PLS-MGA does not require the proportion of sample groups to be the same (Matthews, 2017) and the minimum sample size to be met by each group is 30 cases (Hair, Sarstedt, Ringle, & Gudergan, 2018). By comparing the estimated path coefficients between countries for capital structure determinants and firm financial performance, this study acknowledges that capital structure and firm financial determinants can differ across countries.

The remainder of this paper is organized as follows. The next section discusses the literature and hypotheses. Then, the methodology of the PLS-SEM approach and the proposed theoretical model are discussed. Following that, the data analysis and empirical results analysis are discussed. The final section presents the conclusions of the study.

2. Literature and hypotheses

2.1. Firm-specific attributes

2.1.1. Asset structure

The asset structure is defined by two measurements: collateral value and tangible assets. The proxy for collateral value is the ratio of the inventory plus the gross plant and equipment to total assets (Berger, Ofek, & Yermack, 1997; Chang et al., 2009; Titman & Wessels, 1988). As suggested by Rajan and Zingales (1995), if a firm provides high tangible assets, the agency costs of the debt can be reduced because tangible assets are easy to collateralize. Thus, an indication of a reduced agency cost of debt will generate more productivity in the firm value. Consequently, (i) *it is hypothesized that there is a positive relationship between asset structure and firm leverage* (C1); *and (ii) there is a positive relationship between asset structure and firm financial performance* (F1).

2.1.2. Growth opportunity

This is defined by four measures. The first proxy is the ratio of the percentage change in total assets. The second and third proxies are the market value of assets to the debt and equity (Ramadan & Chen, 2012) and the ratio of the firm's total market value (Deesomsak, Paudyal, & Pescetto, 2009; Deesomsak et al., 2004). Finally, Tobin's Q will also be used as another proxy because it reflects how investors regard the company (Goyal, Lehn, & Racic, 2002; Rajan & Zingales, 1995). In the agency theory (AT) of capital structure, a firm will employ less debt in firm financing when there are higher growth opportunities to reduce the conflict of interest between the debt holder and shareholder, which may transfer the wealth of debt holders to shareholders. According to this theory, the power of the firm's managers will increase, which can lead to firm benefits in enhancing the firm financial performance through the use of their authority. Greater growth opportunity is an indication of healthy business performance and access to finance in a competitive market is easier. A study by Brush, Bromiley, and Hendrickx, (2000) notes that growth opportunity will have a positive relationship with firm financial performance. From these theories, (i) *it is hypothesized that there is a positive relationship between growth opportunities and firm leverage* (C2)*; and* (ii) *there is a positive relationship between growth opportunity and firm financial performance* (F2).

2.1.3. Firm size

This is defined as the logarithm of total assets and the logarithm of sales. Most studies have found a positive relationship between size and firm leverage (Deesomsak et al., 2004; Rajan & Zingales, 1995). This is consistent with the trade of theory (TOT) whereby larger firms have a higher tendency to use more debt. However, Chen (2004) and Ooi (1999) argue that there is an inverse relationship between size and firm leverage. This is because smaller firms have limited access to equity capital and are more likely to use bank loans. The larger size enables firms to generate higher returns on assets and sales, and this leads to better firm financial performance through the ability to gain higher production value. Consequently, (i) *it is hypothesized that firm size might have a positive relationship with firm leverage* (C3); and (ii) *there is a positive relationship between firm size and firm financial performance* (F3).

2.1.4. Liquidity

This is defined as the ratio of current assets to current liabilities. Firms that are liquid are able to meet short term obligations. It is

[2] A latent variable (also called construct) is a variable that is inferred from the measured indicators/items or is measured by a number of observable indicators.

expected that firms with greater liquidity will increase firm leverage and, thus, a positive relationship is expected. As the current ratio in the financial statements of a firm is a measure of liquidity, a firm with a higher current ratio indicates that it will have better performance; therefore, it will be able to face any short or long term financial problems. The opposite is true for weak firms; they have a low current ratio because they have less liquidity. Consequently, (i) *it is hypothesized that there is a positive relationship between liquidity and firm leverage* (C4); and (ii) *there is a positive relationship between liquidity and firm financial performance* (F4).

2.1.5. Business risk

This is defined as the absolute difference between the annual percentage difference in earnings before interest and tax and the average of this change over the sample period. Risk proxies result in a contraction or insignificant relationship between business risk and debt level. The result of a negative relationship is consistent with the trade of theory (TOT) in that a risky firm will find debt less attractive (Wald, 1999). This theory assumes that a firm will not be able to fulfil its debt commitments because of higher bankruptcy and financial distress risk. Based on the asymmetric information theory, a less profitable firm with lower growth and thus more risky will suffer more from information asymmetry than a more profitable firm. Therefore, there will be a negative relationship between business risk and firm financial performance. Deesomsak et al. (2009) find a vague relationship between the volatility of earnings and firm leverage. Therefore, (i) *it is hypothesized that there is a negative relationship between business risk and firm leverage* (C5); and (ii) *there is a negative relationship between business risk and firm financial performance* (F5).

2.1.6. Non-debt tax shield

The revenue, operating income or earnings before interest and tax is used in the measurement to standardize the non-debt tax shield. Titman and Wessels (1988) use operating income as the proxy of the non-debt tax shield instead of total assets, which results in a positive relationship. In debt financing, a substitute for a tax benefit is the non-debt tax shield, which is an alternative method of reducing the tax burden (DeAngelo & Masulis, 1980). Most prior studies, e.g., DeAngelo and Masulis (1980), document and confirm this prediction of the tax substitution hypothesis. Therefore, (i) *it is hypothesized that there is a positive relationship between a non-debt tax shield and firm leverage* (C6); and (ii) *there is a positive relationship between a non-debt tax shield and firm financial performance* (F6).

2.2. Country-specific attributes

2.2.1. Stock and bond market development

This is defined by the ratio of stock market capitalization to GDP and the ratio of private and public bond market capitalization to GDP, respectively. Many studies have investigated how stock returns and prices reflect a firm's financing structure. For example, Welch (2004) reveals that the stock return indicators are essential in explaining the debt equity ratio in a firm's capital structure. Welch (2004) finds that there is little to counteract the influence of stock price changes on the capital structure in U.S. firms. The result in the capital structure of the debt to equity ratio is that it varies because of fluctuating stock prices. Welch notes that managers are not encouraged to actively engage in altering their capital structure. This is because different countries have different leverage financing regulations. Demirgüç-Kunt and Maksimovic (1996) suggest that the firms' financing is related to the market development in a particular country. For example, when there is increased stock market activity, a firm's preference for equity over debt increases. As a result, stock market activity is expected to be inversely related to debt, which supports Deesomsak et al. (2004). De Jong et al. (2008) state that, in a developed country, firm leverage tends to be greater because bond issuing is much easier than in a developing country. Demirgüç-Kunt and Maksimovic (1996) note that when the stock market development is higher, information quality is improved and monitoring and corporate control may be enhanced leading to better firm financial performance. Consequently, there are two direct effects of stock and bond market development: (i) *the higher the country stock market development, the lower the leverage* (C8); and (ii) *the higher the country bond market development, the higher the firm leverage* (C7). *Additionally, these two direct effects of bond and stock market development are expected to have a positive relationship on firm financial performance* (F7; F8).

2.2.2. Economic growth

This is defined in two ways: first, annual gross domestic product (GDP); and second, the gross domestic investment (GDI) which is the sum of fixed assets of the economy with net changes in the level of inventories. Firms will likely use debt during expansion and growth in GDP (Frank & Goyal, 2009). According to the pecking order theory (POT), during economic expansion, leverage should decline since there are sufficient funds from internal sources. Investment opportunities are correlated with the economy, thus there should be a relationship between the profitability of individual firms and the growth rate of the economy (Claude, 2016; Ramli & Nartea, 2016). Firms will use higher debt levels in their financing when the country has higher economic growth. *Therefore,* (i) *it is hypothesized that a country with higher economic growth will be expected to have higher leverage* (C9); and (ii) *higher economic growth tends to increase profit levels* (F9).

2.2.3. Interest rate

This is measured by the lending rate (BLR) of commercial banks. Changes in interest rates are expected to affect the capital structure of firms because of taxation and bankruptcy costs. Usually, firms are more likely to employ debt when borrowing costs are lower. Regarding the interest rate, in debt financing, the tax benefits are an attractive aspect. This may benefit business activity to improve firm financial performance because the interest cost is tax deductible. Generally, firms borrow more whenever the cost of borrowing declines because it enables firms to the disburse interest on borrowed money (Fosu, 2013; Ramli & Nartea, 2016). If a company's position is stable and profitable, there is a greater ability to fulfil its interest payments. Therefore, (i) *it is hypothesized that when interest rates are low, many firms have a low interest coverage ratio and will tend to employ a high leverage* (C10); and (ii) *low interest rates will lead to higher performance* (F10).

2.2.4. Inflation rate

This is measured by the annual consumer price index percentage and the annual growth rate of the GDP is an implicit deflator that the price changes as a whole in the economy. Feldstein, Green, and Sheshinski, (1978) derive an equation in theoretical terms that inflation affects the debt level either positively or negatively, depending on economic conditions. During a recession, financial leverage will be less associated with inflation and the depressed economic conditions; firms will face difficulty repaying their debts (Leeth & Scott, 1989). Most managers evaluate the estimated future returns of competing investments that may involve more risk. For example, one alternative may fairly assure future cash flows, whereas another may have a chance of yielding higher cash flows but may also result in lower returns. Fan, Titman, and Twite, (2010) note that inflation may affect corporate financial decisions on debt. This is because lenders are normally discouraged from providing long term debt during high inflation. Therefore, (i) *it is hypothesized*

Table 1
Hypotheses.

Hypotheses 1–capital structure determinants and firm financial performance (F1-F11)		
Capital structure determinants have a statistically significant relationship with firm financial performance		
Hypotheses 2– capital structure determinants (C1-C11)		
Firm- and country- specific attributes have a significant relationship with firm leverage		
Hypothesis 3-leverage effect		
Firm leverage has a positive relationship with firm financial performance		
Hypotheses 4–equality of firm- and country coefficient effects		
Hypothesis	E1	The path coefficients of capital structure determinants are not equal across countries.
Hypothesis	E2	The path coefficients between the capital structure determinants and firm financial performance are not equal across countries.
Hypothesis	E3	The path coefficient between firm leverage and firm financial performance is not equal across countries.
Hypothesis 5–indirect/mediating effects		
Leverage has an indirect/mediating effect on the relationship between capital structure determinants and firm financial performance		

that a country with higher inflation will have a lower debt ratio (C11); and (ii) *higher inflation leads to poor performance* (F11).

2.3. Firm leverage and firm financial performance

The seminal work of Modigliani and Miller (1958) assumes that a firm's capital structure is independent of the firm value and does not matter in a perfect market, with no tax, bankruptcy cost, agency cost or information asymmetry. Unfortunately, in reality, because of market imperfections, the capital structure of a firm considerably affects the firm's value. With the modified theory of Modigliani and Miller (1963) using liabilities, firm value leads to a positive relationship via the firms' reduction in taxation. McConnell and Servaes (1995) and Dessí and Robertson (2003), using U.S. and U.K. firms, respectively, split the data into 'low growth' and 'high growth' for an indicator of firm financial performance of Tobin's Q, with a range of variables including debt. They find different results: McConnell and Servaes (1995) claim that low growth firms tend to have less debt in their capital structure, which is consistent with Jensen's free cash flow hypothesis but contrasts with Dessí and Robertson (2003). McConnell and Servaes (1995) also find that high growth firms are consistent with the Myers (1977) hypothesis that 'too much' debt induces managers (acting in shareholders' interests) to by-pass positive net present value projects. This contrasts with Dessí and Robertson (2003) who find that firms with more volatile cash flows tend to have more debt in their capital structure, which is predicted by agency theory. Other studies reveal that high leverage leads to lower performance, thus indicating a negative relationship (Abor, 2005; Booth et al., 2001; Ramadan & Chen, 2012). Ramadan and Chen (2012) who examined the U.K. market, find a significant negative relationship between firm leverage and firm financial performance because the U.K. market uses other mechanisms such remuneration to enhance performance. Harris and Raviv (1991) also argue that debt could give information to the investor about a firm's quality, management and efficiency strategy. Similarly, according to the trade of theory (TOT) by Miller (2005), there will be a positive relationship between firm leverage and firm financial performance where a firm has the incentive to use debt, because of the benefit of an interest deduction thus leading to a positive relationship. This is reinforced by the results of the study from Detthamrong et al. (2017) and Fosu (2013), who found that there was a positive relationship between leverage and firm performance. Consequently, *it is hypothesized that there is a positive relationship between firm leverage and firm financial performance.*

2.4. Indirect/mediation effects

We examine the impact of the firm-and country-specific attributes on firm financial performance as mediated by firm leverage. This assumes that a firm's financing structure influences the way in which the firm and country characteristics impact the firm financial performance. For example, with respect to the asset structure, firms with more tangible assets have more collateral to support higher debt levels. This is consistent with the agency theory in that it can reduce the agency cost of debt which will in turn, generate more productivity in the value of the firm. This high level of tangible assets may also indicate a good reputation in getting funds, and thus, is useful for a profitable project leading to more returns. Therefore, it is hypothesized that capital structure (leverage) has an indirect/mediation effect on capital structure determinants (i.e., the firm- and country-specific attributes) and firm financial performance. Table 1 summarizes the hypotheses for the firm-and country-specific attributes.

Fig. 1 shows the proposed theoretical model. In this study, firm leverage (M) is the mediator variable for the relationship between capital structure determinants (X) and firm financial performance

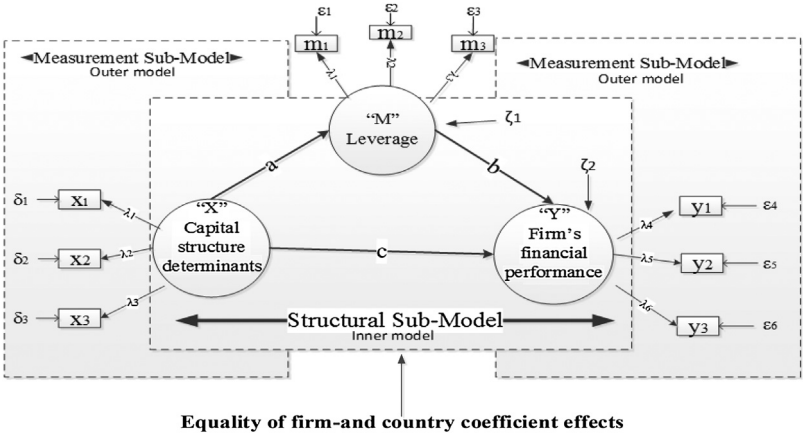

Fig. 1. Conceptual model and relationship among variables.

Table 2
Descriptive statistics for the exogenous indicators (firm-specific attributes for Malaysia and Indonesia).

		Malaysia				Indonesia			
Exogenous variable	Proxies	Min	Max	Mean	Std.	Min	Max	Mean	Std.
Asset structure	TANG	0	0.975	0.389	0.20	0	0.957	0.385	0.216
	CV	0	0.992	0.529	0.21	0	13.13	0.583	0.39
Growth opportunities	GRW-1	−1	37.85	0.129	0.92	−0.69	118.3	0.281	2.881
	GRW-2	0	6.334	0.2	0.23	0	1.029	0.286	0.221
	GRW-3	−0.198	1.664	0.401	0.20	−0.59	1.812	0.514	0.227
	Tobin Q	−1.117	1.101	0.248	0.21	−0.03	1.942	0.365	0.271
Firm size	SIZEta	3.356	8.013	5.582	0.59	6.766	11.04	8.921	0.71
	SIZEsales	1.398	7.532	5.322	0.62	5.357	11.11	8.828	0.751
NDTS	NDTSOI	−1.81	0.748	0.072	0.09	−1.71	1.677	0.103	0.136
Business risk	BR	−871.	122	−0.29	12.8	−980.	692.7	0.237	36.61
Liquidity	LIQ	0.07	253.0	3.089	6.60	0.03	54.31	2.263	2.809
Eco. growth	GDP	−7.35	10	4.989	3.84	−13.1	8.396	4.827	3.79
	GDI	18	44	25.11	6.67	11	33	26.72	4.63
Inflation rate	IFcpi	0.583	5.441	2.594	1.46	3.72	58.38	10.12	10.09
	IFgdp	−6	10	3.952	4.43	5	75	13.43	12.87
Interest rate	LendingIR	5.023	12.13	6.897	1.76	13.25	32.15	17.08	4.32
Stock mkt dev.	SMD	0.84	3.289	1.508	0.49	0.086	0.509	0.295	0.121
Bond mkt dev.	BMD	0.052	0.132	0.085	0.02	0.001	0.027	0.012	0.008

Notes: The firm-specific attributes and their indicators or proxies are as follows: asset structure (AS) with its indicators collateral value (CV) and tangibility (TANG); growth opportunity (GRW) with its indicators growth to percentage of total assets (GRW1-%TA), growth of financial debt (GRW 2-FD), growth of market to book value (GRW 3-MV/BV) and Tobin Q; firm size (FS) with its indicators size of log sales (SIZE-Sales) and size with log total assets (SIZE-TA); Business risk (BR) with its indicator earning volatility; Liquidity (LIQ) with its indicator current ratio; and non-debt tax shield (NDTS) with its indicator operating income to total assets (NDTS-OI). The country specific attributes and their indicators or proxies are as follows: the stock market development (SMD) and its indicator is the stock market capitalization to GDP, bond market development (BMD) and its indicator bond capitalization to GDP; economic growth (EG) and its indicator gross domestic product (GDP) and gross domestic investment (GDI); interest rate (IR) and its indicator lending interest rate (Lending-IR); and finally inflation (INF) with its indicators consumer price index (IF-CPI) and GDP deflator of annual % (IF-GDP).

(Y). X, M and Y are referred to as latent variables that will be measured by manifest indicators, $x_1..x_3$, $m_1..m_3$ and $y_1..y_3$, respectively. The measurement equation can be expressed as follows: Let's say, $x_i = \lambda_{i1}X_1 + \varepsilon_{i1}$, where; x_{i1} is the vector of the i^{th} manifest indicator of the vector of the latent variable of X_i, λ_{i1} is the matrix of factors loading for the i^{th} manifest indicator of x_{i1} to the latent variable of X_i (a matrix of regression coefficient of x_{i1} on X_i) and ε_{i1} is a vector of the measurement error in the model. The measurement model represents the measurement model for X capital structure determinants. This equation can be represented according to the symbol for the manifest indicator, and the measurement error in the path diagram, e.g., the symbols for the indicator and measurement error for firm leverage are *m* and ε, and for firm financial performance are *y* and ε. The structural model equation is $Y = \beta_0 + \beta X + \beta M + \varepsilon$, where: Y is the endogenous latent variable, β is the vector matrix of regression coefficient to the vector of exogenous latent variables X and M, and ε is the residual for the structural equation model (inner model). The standard error and the estimation parameter in the measurement and structural models are estimates using the bootstrap procedure.

3. Research method

3.1. Sample data

Sample data from two countries, i.e., Malaysia and Indonesia, were taken for the period from 1990 to 2010. The choice of the study period is dictated by data availability since before the year 1990, most of the data are missing. We obtained the data from the Malaysia stock exchange and the Indonesia stock exchange (IDX). Data for the firm-specific factors were gathered from the DataStream database; the internet was used to acquire more information and data for the country-specific factors from sources such as Asian Development Bank (ADB) (2012), http://www.adb.org/; Central Intelligence Agency (CIA) (2012), http://www.ifc.org/; and financial structural database of the World Bank (2012), http://www.worldbank.org/. From the total sample, any incomplete records were excluded from the analysis. Financial firms such as banks, insurance companies and investment companies, which generally have different characteristics from other companies, and might be affected by their regulations' requirements (e.g., minimum capital required) have also been excluded. The final sample consists of 7819 firm year observations; the subsamples for Malaysia and Indonesia are 5975 and 1844 firm year observations, respectively. The study has 13 constructs (LVs) for 28 indicators whose proxies have been calculated.

Tables 2 and 3 summarize the descriptive statistics for the endogenous variables indicators (firm performance) and exogenous variables indicators (firm-specific attributes) used. In this work, exogenous variables are predictors that influence firm performance, while an endogenous variable is an outcome that should be explained according to previous studies (Detthamrong et al., 2017; Fosu, 2013; Ramadan & Chen, 2012; Ramli et al., 2018). The summary statistics show that the mean values for all indicators in Malaysia and Indonesia are similar. To the best of our knowledge, no previous study has employed gross domestic investment (GDI) as an indicator for economic growth and the inflation GDP deflator as an indicator for the inflation rate. Both of these indicators have a

Table 3
Descriptive arithmetic mean statistics for the endogenous variable (i.e., capital structure and firm financial performance) for each country.

Capital structure (firm leverage)			Firm financial performance		
Endogenous	Malaysia	Indonesia	Endogenous	Malaysia	Indonesia
TADR	19.91%	28.58%	ROE	8.12%	−4.077
TDTC (BV)	23.64%	35.76%	ROA	4.63%	5.00%
TDTC (MV)	85.00%	87.74%	ROIC	7.87%	9.99%
LTDTC (BV)	13.00%	22.35%			
LTDTC (MV)	74.39%	69.17%			
STDTC (BV)	15.66%	23.76%			
STDTC (MV)	81.22%	84.44%			
Average	44.69%	50.26%			

Notes: Capital structure (leverage) is measured by total debt ratio (TADR), total debt to capital (TDTC) for book and market value (BV and MV), and the long term and short term debt to capital are measured for book value and market value, LTDTC (BV), STDTC (BV), LTDTC (MV) and STDTC (BV), respectively. The firm financial performance is measured by return on equity (ROE), return on assets (ROA), and return on investment capital (ROIC).

Table 4
The measurement model.

Country	[a]Pooled		Malaysia		Indonesia	
	AVE	CR	AVE	CR	AVE	CR
Exogenous						
Asset structure	0.8343	0.9097	0.9122	0.9541	0.7233	0.8383
Economic growth	0.7081	0.8257	0.7244	0.8392	0.7395	0.8470
Growth opportunities	0.6376	0.8416	0.6203	0.8300	0.6779	0.8634
Inflation rate	0.9446	0.9715	0.8218	0.9021	0.9658	0.9826
Firm size	0.9860	0.9929	0.9043	0.9498	0.9358	0.9668
Interest rate	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Liquidity	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Non-debt tax shield	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Stock market development	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Bond market development	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Business risk	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Endogenous						
Firm leverage	0.5799	0.9052	0.5896	0.9088	0.5877	0.9069
Firm financial performance	0.6041	0.7980	0.7123	0.8772	0.6061	0.8038

high and significant impact on capital structure determinants and firm financial performance.

3.2. Data analysis

The data analysis approach used is a component-based SEM, where the partial least squares-structural equation modeling (PLS-SEM) method is selected. Some of the advantages we considered when selecting this method instead of regression analysis (Ramli et al., 2018; Petter, 2018; Latan, 2018) are as follows: 1) PLS-SEM allows for testing complex relationships, where there are many constructs and indicators in the model; 2) PLS-SEM can handle different types of data in a single model; 3) The PLS-SEM results remain robust despite outliers and missing values. To achieve all the research objectives, several steps have been conducted. The first step assesses the two constituents in PLS-SEM, the measurement and structural sub-models (Chin, 2010; Latan & Noonan, 2017; Ramli et al., 2018). The second step assesses the structural model that explains the relationship between the exogenous and endogenous variables (Latan, 2018). This structural model was tested in PLS-SEM for its statistically significant value. The third step assesses the multi-group analysis (MGA) to see whether there was any significant difference between the path coefficients for the two countries (i.e., Malaysia and Indonesia). In the final step the bootstrap t-statistics (Hair et al., 2017; Nitzl, Roldan, & Cepeda, 2016) and Sobel Test (1982) were used to test whether leverage mediates the effect between the determinants of capital structure and firm financial performance.

3.3. Measurement model results

In PLS-SEM, construct validity is essential because it indicates the adequate measurement of all constructs (Bandalos, 2018; Price, 2017). This can be assessed by the convergent validity (i.e., Average Variance Extracted (AVE)) and construct reliability[3] (Hair et al., 2017; Henseler, Hubona, & Ray, 2017). Table 4 presents the results for each model of the equation for the parameter estimates for the pooled, Malaysian and Indonesian data. The pooled sample is also included in the sample even though the main purpose of the study is to compare parameters between countries. All measures meet the commonly suggested criteria for measurement model assessment (Henseler et al., 2017; Ramli et al., 2018). The analyses for the pooled and per country data show that most constructs displayed AVE values above 0.5. Likewise, the composite reliability (CR) value for most constructs achieved a value of at least 0.7. A robustness check was carried out by adding more indicators for the non-debt tax shield construct such as depreciation, depletion and amortization to total assets (NDTS-DEP), and the interest rate construct such as real interest rate (Real-IR). However, the factor loading and the AVE resulted in low cut-off values. An indicator for firm financial performance such as the price-earnings ratio exemplifies the low factor loading and lower AVE. Those indicators have been removed to avoid spurious results and to improve the statistical validity of the results (Latan, 2018; Aguinis, Ramani, & Alabduliader, 2018; Hair et al., 2017). The construct (LV) and its manifest variables were tested for multi-collinearity. We estimated a robust data analysis since the reflective construct (asset structure, growth opportunity, firm size, inflation rate and economic growth) estimates are VIF less than 10 (Field, 2016), and the formative construct (bond market development, stock market development, liquidity, interest rate, non-debt tax shield and the business risk) estimates are less than 3.3 (Petter, Straub, & Rai, 2007). Overall, we find that the data exhibit convergent validity and construct reliability.

4. Structural model results and discussion

We used the SmartPLS 3 program for data analysis (Ringle, Wende, & Becker, 2015) by selecting a weighting scheme (path); the maximum number of iterations on the PLS algorithm is 300. At the bootstrapping stage, we chose a bias-corrected and accelerated (BCa) bootstrap with a sample number of 5000 and 5% significance (one-tailed). The coefficient of determination (R^2) in Table 5 shows that the model's explanatory power has a better predictive ability for the dependent variable because it is above 0.8 (80%)[4]. We also measured the R^2 values for book and market leverage. However, for low market leverage, it is approximately 0.35, because it excludes some important measures of book leverage. This shows that capital structure studies should include all possible leverage measurements to produce strong explanatory power in the PLS models.[5] The structural coefficient estimates among the latent variables (LVs) for each model are also presented in Table 5.

4.1. Capital structure determinants and firm financial performance

The relationships between capital structure determinants and firm financial performance (Group 1 hypotheses) for the three samples, i.e., pooled, Malaysia and Indonesia seem to have mixed results in terms of significance values. Most relationships for the pooled and Malaysia samples are significant, but they are mostly insignificant for Indonesia. Asset structure and growth opportunities reveal a significant negative relationship with firm financial performance (1-F1 and 1-F2), and this is inconsistent with TOT and previous studies (Brush et al., 2000; Ramadan & Chen, 2012; Shergill

[3] AVE is the parameter to measure convergent validity that estimates the "degree to which two measures of the same concept are correlated (Hair et al., 2017)". Specifically, it measures the degree of multiple items in the same construct. The cut-off value for good convergent validity in AVE is set as 0.5 or above. That score of 0.5 means that 50% of the measurement variance is accounted for (Fornell & Larcker, 1981; Hair et al., 2017). Composite reliability (CR) is assessed by means of all the indicators assigned that have strong mutual correlations to the same construct. So, CR is used to check how well all indicators relate to the construct. The acceptable threshold cut-off value for CR is 0.7 or above, but cut-off values of 0.5 and 0.6 have also been acceptable (Henseler et al., 2017).

[4] R^2 values of 0.67,0.33, or 0.19 in the inner path model for the endogenous variable are defined as substantial, moderate or weak, respectively (Chin, 1998, p. 323). Chin suggests that R^2 should be at least at a substantial level if the endogenous latent variable relies on several exogenous variables.

[5] All proxies for asset structure, growth opportunity, firm size, and inflation variables are used to obtain parameter estimation from PLS-SEM.

Table 5
Statistically significant value (the structural model).

Model[a]	Pooled			Malaysia			Indonesia		
	coef. (β)	Std.error	Critical ratio	coef.(β)	Std.error	Critical ratio	coef. (β)	Std.error	Critical ratio
Panel A									
Asset structure ->firm leverage (C1)	0.076	0.0061	12.3702***	0.0814	0.0065	12.617***	0.071	0.01	7.1126***
Growth opportunity ->firm leverage (C2)	0.9108	0.0082	111.689***	0.9011	0.0104	86.75***	0.904	0.0107	84.406***
Firm size ->firm leverage (C3)	−0.0203	0.0112	1.8103*	−0.004	0.0076	0.6226	0.045	0.0105	4.3268***
Liquidity ->firm leverage (C4)	−0.0254	0.0057	4.4208***	−0.027	0.0072	3.9515***	0.008	0.0124	0.721
Business risk ->firm leverage (C5)	−0.0009	0.0027	0.3379	0.0009	0.0032	0.3042	0.003	0.0076	1.8196*
Non-debt tax shield -> firm leverage (C6)	−0.0378	0.0095	3.9949***	−0.052	0.0085	6.1462***	−0.016	0.0193	0.8415
Bond market development ->firm leverage (C7)	−0.0233	0.0065	3.5872***	−0.01	0.0057	1.7399*	0.001	0.0134	0.0836
Stock market development ->firm leverage (C8)	−0.0062	0.0069	0.9023	0.0049	0.0061	0.8048	−0.004	0.009	0.4915
Economic growth ->firm leverage (C9)	−0.0155	0.005	3.0878***	−0.0171	0.0059	2.9171***	0.088	0.0206	4.304***
Interest rate -> firm leverage (C10)	−0.0399	0.009	4.4079***	−0.043	0.0059	7.3667***	0.078	0.0155	5.0539***
Inflation rate -> firm leverage (C11)	0.0001	0.0091	0.0148	0.0126	0.0061	2.0655**	0.016	0.0211	0.7731
Panel B									
Asset structure -> firm performance (F1)	−0.0295	0.0053	5.5662***	−0.053	0.0075	7.0946***	−0.013	0.011	1.1841
Growth opportunity -> firm performance (F2)	−0.1331	0.0645	2.0642**	−0.174	0.0604	2.8845***	−0.152	0.1081	1.4067
Firm size -> firm performance (F3)	−0.027	0.0206	1.3079	0.0211	0.0071	2.9825***	−0.027	0.0191	1.0865
Liquidity -> firm performance (F4)	−0.0031	0.0052	0.6016	−0.007	0.0046	1.6846***	0.005	0.014	0.4048
Business risk -> firm performance (F5)	−0.0039	0.0034	1.1556	−0.001	0.0025	0.6903	−0.004	0.0102	0.4473
Non-debt tax -> firm performance (F6)	0.9027	0.019	47.4175***	0.8939	0.0143	62.526***	0.900	0.0187	48.168***
Bond market dev -> firm performance (F7)	−0.0033	0.0061	0.5355	−0.0158	0.0054	2.936***	−0.040	0.0208	1.9337*
Stock market dev -> firm performance (F8)	0.0177	0.0102	1.7413*	0.0132	0.0081	1.6275	0.005	0.0092	0.6331
Economic growth -> firm performance (F9)	0.0154	0.0062	2.4743**	0.0213	0.0082	2.5852***	0.011	0.0207	0.5728
Interest rate -> firm performance (F10)	−0.0194	0.0091	2.1173**	0.0144	0.0093	1.5377	−0.058	0.0292	2.0005**
Inflation rate -> firm performance (F11)	−0.0226	0.0088	2.5669**	−0.0058	0.0083	0.7041	0.004	0.0208	0.2368
Firm leverage -> firm performance	0.0899	0.0824	1.0904	0.1093	0.0502	2.1771***	0.148	0.1546	0.9616
R-Squared (R2)- firm leverage	0.867			0.864			0.884		
R-Squared (R2)- firm performance	0.8277			0.837			0.825		

Note: ***, **, and * indicate statistical significance at the 1 per cent, 5 percent and 10 percent levels, respectively.

[a] The robustness test for the book and market leverage are found to have slightly different coefficients and significance estimates. We also performed robustness checks by defining the STD and TDR of book and market leverage and find consistent results.

& Sarkaria, 1999). This indicates that firm performance would not necessarily increase when the firm has high growth opportunities and asset structure. It assumes that the firm within the sample might be affected by the crises (i.e., AFC and GFC) and because of the inclusion of the leverage in the analysis. The firm might use an inappropriate amount of debt that could lead to low performance. For Malaysia, the firm size (positive) and liquidity (negative) shows significant relationships with firm financial performance (1-F3 and 1-F4, respectively). The positive relationship of firm size and firm financial performance is consistent with TOT and previous studies (Ramadan & Chen, 2012; Shergill & Sarkaria, 1999), whereas a negative relationship of liquidity and firm financial performance is inconsistent with TOT and previous studies such as Wang (2002). This indicates that large firms perform well and gain higher production value by generating a higher return on assets and sales.

However, in this study sample, high liquidity position does not necessarily lead to high performance. A possible reason is that, a firm with high liquidity finds external financing less attractive and, thus, with low debt, it could lessen the firm value. Therefore, it is strongly suggested that high liquidity firms employ more debt when they are able to meet the debt obligations to increase their performance. In all the samples, the relationship between business risk and firm financial performance is inconsistent with hypothesis 1-F5, but the relationship of the non-debt tax shield (1-F6) is consistent with a significant positive effect on firm financial performance. A possible explanation for a positive relationship between the non-debt tax shield and firm performance is because of the inclusion of the leverage in the analysis. Hypothesis 2-C6 shows that the increase in the non-debt tax shield will affect leverage negatively. DeAngelo and Masulis (1980) argue that such non-debt tax shields are substitutes for the tax benefits of debt financing. Hence, a low amount of debt might help to reduce the business risk and thus could enhance the firm performance. However, the positive correlation between the non-debt tax shield and firm financial performance is inconsistent with Forbes (2002), who finds a negative effect. Bond and stock market development has mixed results, i.e., bond market development for Malaysia and Indonesia shows a negative significant coefficient (1-F7). This shows that the development of the bond market in both countries is low and leads to difficulty in issuing bonds; thus, the firm could not perform well. Stock market development has a positive significant value only for the pooled sample (1-F8), consistent with previous studies (Core, Guay, & Rusticus, 2006; Desai & Jain, 1999). This indicates that when the stock market activity within the pooled sample is higher, information quality is improved and, monitoring and corporate control may be enhanced leading to better firm performance. The remaining hypotheses for economic growth, interest and inflation rate on firm performance (Hypotheses 1-F9, 1-F10, 1-F-11, respectively) are consistent with the previous studies (Tan & Peng, 2003). A possible explanation is because these three attributes are highly correlated, i.e., a country with higher economic growth, low cost of borrowing and depressed economic conditions will expect a firm to gain high profit.

We reveal that the determinants of capital structure also contribute to a direct significant relationship with firm financial performance. The firm- and country-specific attributes seem to be quite different in terms of sign, magnitude and t-statistic values for the pooled, Malaysian and Indonesian samples.

4.2. Capital structure determinants

The Group 2 hypotheses examine the relationship between firm- and country-specific attributes and firm leverage. According to the predicted sign and significance values for the capital structure determinants presented in the pooled, Malaysian and Indonesian samples, there are mixed results for the capital structure determinants. Most pooled and Malaysian samples have similar results, Indonesia is sometimes different, and the pre-

dicted signs are consistent with the capital structure theory. Asset structure and growth opportunities for all samples are statistically significant and positive and are consistent with the theoretical hypotheses (2-C1 and 2-C2, respectively). This is consistent with most of the previous studies (Myers, 1984; Sayılgan, Karabacak, & Kucukkocaoglu, 2006) and predicted theories, i.e., POT, TOT and AT. This indicates that Malaysian and Indonesian firms are likely to issue debt when they have better growth opportunities and high tangible assets as this asset can act as a guarantee for debt. In the pooled sample, firm size shows a negative significant relationship with firm leverage, which is consistent with Chen (2004); Ooi (1999), POT and asymmetric information theory.

However, the Indonesian sample shows a positive significant relationship between firm size and firm leverage which is consistent with hypothesis 2-C3 and most previous studies (Deesomsak et al., 2004; Rajan & Zingales, 1995). The contradictory signs of the coefficient are probably because the negative coefficient sign from the Group sample is influenced by the portion of the Malaysian sample (Rajan & Zingales, 1995). The POT suggests that firm size is negatively related to leverage because the problem of information asymmetry is less severe in large firms compared with small firms and thus, large firms prefer to issue equity instead of debt (Rajan & Zingales, 1995). The finding for the pooled and Malaysian samples for a firm's liquidity is inconsistent with the hypothesis (2-C4). This is probably because samples with high liquidity find external financing less attractive and tend to use internal financing for the firm's operation, i.e., consistent with POT and AT and Deesomsak et al. (2004). With respect to business risk, only the Indonesian sample shows a significant negative relationship with firm leverage (2-C5) which is consistent with the TOT in that a risky firm will find debt less attractive (Wald, 1999), but this is inconsistent with Dessí and Robertson (2003) who find a positive relationship, which supports the AT and managerial risk aversion. We assume that the Indonesian firm facing the high cost of bankruptcy and financial distress due to inability to fulfil their debt commitments and thus reducing the firm's incentive to employ debt financing. However, the results for the pooled and Malaysian sample for the non-debt tax shield (2-C6), bond market development (2-C7) and economic growth (2-C9) are contrary to my hypotheses, with a significant negative relationship between those attributes and firm leverage. This result, however, supports the TOT because of the avoidance of corporate tax and it is probably because Malaysian firms have sufficient funds from internal sources thus it is unnecessary to employ more debt during economic expansions. Hypothesis 2-C8, regarding stock market development, is rejected for all the samples. The insignificant result of stock market development is inconsistent with Deesomsak et al. (2004) and De Jong et al. (2008) who find a negative significant relationship. This indicates that stock market activity is not an important criterion in determining financing policy for either of the countries within the sample. In developing stock markets, large firm becomes high leveraged as the stock market develops. However the smallest firms do not appear to be significantly affected by stock market development (Demirgüç-Kunt & Maksimovic, 1999).

This might be the reason for the insignificant coefficient between the stock market and leverage financing. The interest rate result supports the hypothesis of a negative significant coefficient (2-C10), which is consistent with Drobetz and Wanzenried (2006) who expected that firms are more likely to employ debt when there are lower borrowing costs. This indicates that within the sample, the firm has a high tendency to use external financing when the interest rate is low. The inflation rate shows a positive significant relationship only for the Malaysian sample (2-C11) probably because using period data that embrace the economic crises of Asian financial crisis (AFC) 1997-98 and Global financial crisis (GFC) 2007-08 may lead to a positive significant coefficient. This is consistent with the predictions of the TOT, studies by DeAngelo and Masulis (1980), and Feldstein et al. (1978) which all suggest a positive relationship, where higher inflation leads to higher firm leverage.

4.3. Leverage and firm performance

Hypothesis 3 predicts a positive relationship between firm leverage and firm financial performance. Table 5 shows that only the Malaysian sample has a positive significant correlation between firm leverage and financial performance ($t = 2.177$ $p < 0.05$). This is consistent with most previous studies (Harris & Raviv, 1991; Jensen, 1986; Modigliani & Miller, 1963) and the TOT regarding the alternative of the interest/tax shield hypothesis, which predicts a positive relationship between firm leverage and financial performance. This provides a further reason to reject the argument from previous studies (Rajan & Zingales, 1995; Ramadhan et al., 2012; Titman & Wessels, 1988), based on the POT and the asymmetric information hypothesis (Myers & Majluf, 1984; Myers, 1977). The positive correlation between firm leverage and financial performance could be due to the tendency of firms in Malaysia to use external financing instead of internal financing to enhance firm financing performance[6]. However, based on that descriptive statistic, if the average firm leverage level exceeds 45%, firm financial performance tends to diminish; this occurred in the AFC. In addition, it has been theorized in the capital structure literature that a firm might use more debt inappropriately for the two following reasons: (i) the conflict between debt holders and shareholders because of the risk of default that is generated from 'underinvestment', the cost of bankruptcy, reorganization or liquidation, as well as 'overhang' problems (Myers, 1977); and (ii) the conflict between the debt alignment interests of the manager and shareholders(Harris & Raviv, 1991). These two reasons suggest more leverage than appropriate and, if this is the case, the higher leverage level would result in lower performance. This implies that the cause of diminished firm financial performance might be because of those factors. The study also suggests that Malaysian firms that have sufficient funds should attempt to choose a less risky route because Malaysia is recognized as a "market-based" instead of a "bank-based" country (Deesomsak et al., 2004; La Porta, Shleifer, Lopez-de-Silanes, & Vishny, 1998) (see Table A2 in Appendix A).

As seen, most of the proposed capital structure determinants are significantly related to the level of firm leverage, except for firm size, business risk and stock market development. We find that Malaysian firms tend to use external financing instead of internal financing to enhance firm financial performance. We also suggest that Malaysian firms should maintain their average debt level up to 45% to sustain their performance.

4.4. Multi group analysis

Table 6 shows the differences in the comparison of the path coefficient estimates (Malaysia vs. Indonesia), and provides the results of the multi-group comparison based on two methods of measuring, i.e., assumed equal standard errors and assumed unequal standard errors (Matthews, 2017; Hair et al., 2017). We find consistent results for both measurements, which indicate that we cannot reject the null hypothesis that most of the path coefficients are equal across the two countries, Malaysia and Indonesia. In this case, we can conclude that, for the capital structure determinants (which include firm- and country-specific attributes), we reject the

[6] A positive correlation is also evident for the group and the Indonesian sample but it is not significant.

Table 6
Multi-group comparison test results (PLS-MGA).

	[diff]	Equal standard errors assumed	Unequal standard errors assumed
Panel A			
Asset structure (AS) -> firm leverage (LEV)	0.01	0.7707	0.8327
Growth opportunity (GRW) ->firm leverage (LEV)	0.0036	0.1836	0.2436
Firm size (FS) ->firm leverage (LEV)	0.0408	3.3658***	3.8257***
Liquidity (LIQ) ->firm leverage (LEV)	0.0189	2.5606***	2.5937***
Business risk (BR) -> firm leverage (LEV)	0.0023	2.1448**	1.7995*
Non-debt tax shield (NDTS) ->firm leverage (LEV)	0.0361	1.9325*	1.7122*
Bond market dev. (BMD) ->firm leverage (LEV)	0.0089	0.8802	0.7721
Stock market dev. (SMD) ->firm leverage (LEV)	0.0005	0.7694	0.8490
Economic growth (EG) ->firm leverage (LEV)	0.0717	6.8378***	5.0107***
Interest rate (INT) -> firm leverage (LEV)	0.035	8.9490***	7.4474***
Inflation rate (INF) -> firm leverage (LEV)	0.0037	0.2292	0.1670
Panel B			
Asset structure (AS) -> firm performance (FFP)	0.0403	2.7155***	3.0089***
Growth opportunity (GRW) -> firm performance (FFP)	0.0222	0.1786	0.1790
Firm size (FS) -> firm performance (FFP)	0.0004	2.5222**	2.0613**
Liquidity (LIQ) -> firm performance (FFP)	0.002	1.1758	0.9037
Business risk (BR) -> firm performance (FFP)	0.0028	0.3917	0.2717
Non-debt tax shield (NDTS) -> firm performance (FFP)	0.0067	0.2419	0.2875
Bond market dev. (BMD) -> firm performance (FFP)	0.0244	1.6208	1.1408
Stock market dev. (SMD) -> firm performance (FFP)	0.0074	0.4795	0.6075
Economic growth (EG) -> firm performance (FFP)	0.0094	0.5015	0.4205
Interest rate (INT) -> firm performance (FFP)	0.044	3.1392***	2.3985**
Inflation rate (INF) -> firm performance (FFP)	0.0009	0.5625	0.4700
Firm leverage (LEV) -> firm performance (FFP)	0.0394	0.2846	0.2368

Notes: ***, **,*Statistically significant at the 1 per cent, 5 per cent and 10 per cent levels, respectively.

null hypothesis that all path coefficient estimates for Malaysia and Indonesia are equal. This result supports De Jong et al. (2008) and Psillaki and Daskalakis (2009), who found that the impact of firm specific attributes on firm leverage is not necessarily equal across countries. Ourresult also indicates that there is no significant difference between Malaysia and Indonesia in terms of the effect of firm leverage on firm financial performance (hypothesis 4-E3). This means that the countries tend to have equal impact on firm leverage (particularly using external financing instead of internal financing) to enhance firm financial performance. This is consistent with Harris and Raviv (1991); Jensen (1986) and TOT, which predict a positive relationship.

4.5. Mediation effects

By excluding the mediator variable (firm leverage) from the model, the total direct effect path "*c*" is significant for most paths except for business risk, inflation and interest rate (see Table A3 of Appendix A). The effect of including the mediator variable as summarized in Table 7 shows that most of the paths "*a*" X → M are significant, except for firm size, business risk and stock market development. Path "*b*" M → Y, i.e., firm leverage and firm financial performance is significant. Thus, Table 7 shows that there is a significant mediation effect and both t-statistics tests, i.e., bootstrapping and the Sobel t-statistics are consistent. This shows that some specific factors have a strong mediation effect in the Malaysian sample i.e., asset structure (AS), growth opportunities (GRW), non-debt tax shield (NDTS) and interest rate (IR). When the mediation t-statistics are significant, then the next step is to obtain the magnitude of the effect, which is given by the ratio of the indirect or mediating effect to the total effect[7]. For instance, the mediating effect of specific attributes via leverage is exemplified by a high Variance Accounted For (VAF) value (e.g., if the VAF is 40%, it indicates that only half of the total effect of the specific attribute on firm financial performance is explained by the mediating effect). The VAF is evaluated by the formula: VAF $= \frac{a \times b}{a \times b + c}$ where: a, b and c are the path coefficients.

Therefore, based on the structural model in Table 5, the specific attributes that are presumed to be mediated by firm leverage (i.e., asset structure, growth opportunities, and non-debt tax shield) can be described as "competitive mediation". Take for example, H_1: the higher the firm asset structure (X), the higher the firm financial performance (Y). The logic of this simple cause-effect relationship is shown in Fig. 2: higher tangible assets are a signpost of security for lenders that act as collateral, which indicates a good reputation for getting funds and, thus, are useful for a profitable project leading to the generation of more returns. However, when estimating the relationship before including the mediator (firm leverage) in Fig. 2 (i.e., the correlation between the asset structure and firm financial performance), we obtain results that indicate significant negative relationships (c=−0.0445, t = 7.0522, p < 0.01 in Table A3 of Appendix A). There is good reason to expect a positive relationship, but something might be missing in the model. In this example, the inclusion of firm leverage (M) makes sense for the indirect effect.

Hence, H_2 would posit that firms with more tangible assets are strong in facing financial distress because of having high collateral to support higher debt levels. H_3 would posit that the firm has the incentive to use debt because of the benefit of interest deduction and, thus, lead to higher performance. When the two hypotheses H_2 (path *a*) and H_3 (path *b*) are combined (*a*b*) in one model, the complex cause-effect relationship will appear as an indirect effect (Fig. 2). The combination of H_1 to H_3 is needed to establish a complete mediation model (Fig. 2) and, hence, H_4 is developed (the relationship between the asset structure and firm financial performance is mediated by the firm leverage). Therefore, the full explanation for this example can be expressed from Table 5: the estimation path *a* between asset structure and firm leverage is a positive significant relationship: a = 0.0814, t = 12.617, p < 0.01, path *b* between firm leverage and firm financial performance shows a positive significant relationship: b = 0.1093, t = 2.1771, p < 0.05, and the relationship between asset structure and firm financial per-

[7] The total effect of X and Y can be expressed as the sum of the direct effect and indirect effect: c = c'+ab. Equivalently, c' is the difference between the total effect of X on Y and the indirect effect of X on Y through M, that is, c'=c-ab.

Table 7
Mediation test analysis results.

Path mediating effects	Model A	
Malaysia	Bootstrapt-statistics	Sobelt-statistics
Asset structure (AS) -> leverage (LEV) -> firm performance (FFP)	1.914*	2.145*
Growth opportunities (GRW)-> leverage (LEV) ->firm performance (FFP)	1.817*	2.176**
Firm size (FS) -> leverage (LEV) -> firm performance (FFP)	0.853	0.594
Business risk (BR)-> leverage (LEV) -> firm performance (FFP)	0.343	0.297
Liquidity (LIQ)-> leverage (LEV) -> firm performance (FFP)	1.646*	1.909*
Non-debt tax shield (NDTS) -> leverage (LEV) -> firm performance (FFP)	1.8097*	2.053**
Inflation (INF)-> leverage (LEV) -> firm performance (FFP)	1.5098	1.4985
Interest rate (IR)-> leverage (LEV) -> firm performance (FFP)	1.792*	2.086**
Economic growth (EG) -> leverage (LEV) -> firm performance (FFP)	1.608	1.7408
Stock market dev. (SMD) -> leverage (LEV) -> firm performance (FFP)	0.853	0.7536
Bond market dev. (BMD) -> leverage (LEV) -> firm performance (FFP)	1.393	1.366

** and * indicate statistical significance at the 5 percent and 10 percent levels, respectively, using standard errors that have been generated from the 5000 random bootstrapping procedure samples (with replacement). The null hypothesis will be rejected if the t-value exceeds 1.96 (at $p < 0.05$), i.e., there is no mediating/indirect effect between the determinants of capital structure and firm financial performance. Even though, the bootstrap t-statistics is above $p < 0.05$ which is $p < 0.10$, the significant value still consider the mediation effect if the Sobel-test appeared to exceed 1.96 ($p < 0.05$).
Note: The mediation tests are measured as follows:
(i) The bootstrap t-statistic is measure by $t_{emp} = \frac{w}{se(w)}$ where: t_{emp} is the empirical t-value, w is the original PLS estimate of a certain path coefficient, and se(w) is the bootstrapping of the standard error. This significance test estimates are claimed to perfectly suit the PLS-SEM technique (Hair et al., 2017; Preacher & Hayes, 2008); and.
(ii) The Sobel test (1982) is measured by $z = \frac{a \times b}{\sqrt{b^2 \times s_a^2 + a^2 \times s_b^2 + s_a^2 \times s_b^2}}$, where a and b are the original samples of the path coefficient values, S_a^2 is the standard error for the path coefficient a→b and S_b^2 is the standard error for the path coefficient c→c.

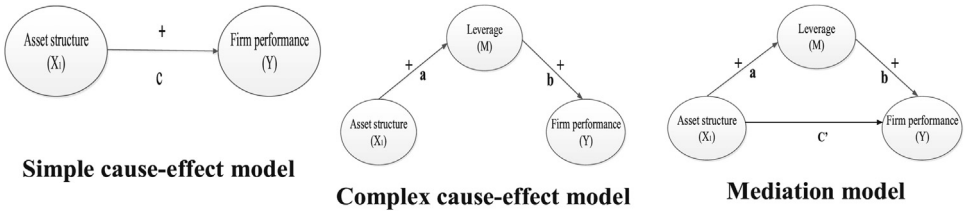

Fig. 2. Cause-effect models of mediation analysis.

formance through leverage is c'=−0.0533, t = 7.0946, p < 0.01. This overall model for indirect effect *ab* and direct effect *c'* has a different sign (the three path coefficients *a x b x c* are significant and multiplying the three coefficients results in a negative value). Thus, this mediation model is categorized as competitive mediation. Previous studies (Hair et al., 2013; MacKinnon, Krull, & Lockwood, 2000; Zhao, Lynch, & Chen, 2010) argue that the VAF value will become larger than one or, even become negative for competitive mediation. The size of the effect (VAF) for the above discussion is consistent with the argument of a negative value (i.e., VAF −0.20 or −20%). Based on Hair et al. (2017), this situation is normally the exception to the VAF-based assessment of mediation effects.

The practical implication is that firms with larger tangible assets that tend to be strong in facing financial distress would appear to increase their firm leverage, which, in turn, leads to an increase in firm financial performance. Accounting for the mediation effect of firm leverage results in the "true" relationship between asset structure and firm financial performance. This relationship is systematically affected by the level of firm leverage, which in turn can be explained by the firm's asset structure. There are other, potentially larger, significant mediation effects that might be associated with a firm asset structure that reduces firm financial performance. This means that the unexplained negative sign for the direct effect (asset structure and firm financial performance) provides a clue that the relationships might be reflected by three reasons: (i) the correlation of other exogenous variables, (ii) the sample data with inclusion of two financial crises, i.e., AFC and GFC or (iii) the possibility of an omitted second mediator (Collins, Graham, & Flaherty, 1998; MacKinnon et al., 2000; Zhao et al., 2010). Thus, future studies can look further into alternative mediators. This theoretical implication provides a silver lining for future theory building especially for a capital structure study. This example shows similar arguments for the growth opportunities and non-debt tax shield variable that could potentially have mediation effects. Finally, we find that the interest rate is considered an "indirect-only mediator variable". The term "indirect-only mediation" defines a situation where the indirect path *ab* is significant but the direct effect is not significant (Iacobucci & Duhachek, 2003; MacKinnon, Warsi, & Dwyer, 1995; Zhao et al., 2010). In this case, Zhao et al. (2010) and Hair et al. (2017) argue that this situation represents full mediation: the effect of the interest rate on firm financial performance is being fully mediated by firm leverage. The direct effect path c shows an insignificant relationship (c = 0.0097, t = 1.261), path *a* shows a negatively significant relationship (a=-0.0432, t = 7.3667, p < 0.01), path *b* shows a positively significant relationship (b = 0.1093, t = 2.1771, p < 0.05), and path c' shows an insignificant relationship (c' = 0.0144, t = 1.5377). Therefore, the firm is drawn into more borrowing whenever the cost of borrowing declines. If a company's position is stable and profitable, there is a greater ability to fulfil its interest payments. During a period of low interest rates, many firms have a low interest coverage ratio and are expected to have a high debt ratio, which will lead to higher performance. For example, the Malaysian percentage range for the interest rate is a mean of 6.8%, up to 12% (see descriptive statistics and Table A1 of Appendix A).

5. Conclusions

This study empirically test the relationship between determinants of capital structure and firm financial performance in Malaysia and Indonesia for the period from 1990 to 2010. The key focus of this study is to simultaneously examine the impact of capital structure determinants on firm financial performance together

with the mediation effect of firm leverage. The results of the bootstrap and Sobel tests indicate that firm leverage plays a mediating role in Malaysia but not in Indonesia. The results indicate that, in Malaysia, the effect of asset structure, growth opportunities, non-debt tax shield, and interest rate on firm financial performance are mediated by firm leverage. We find that the average Malaysian firm uses debt as a control mechanism to maximize the performance as stated by AT and TOT. We find that firm and country characteristics do not just directly affect firm financial performance.

Our results have important implications for managerial decisions, that is, the capital structure decision tends to be affected by the firm's own characteristics, i.e., asset structures, growth opportunities, non-debt tax shield and country characteristic, i.e., interest rate of the country(ies) in which the firm operates. It is important that management knows the "way" and "how" its firm value would increase (decrease) from the firm and country characteristics and its appropriate capital structure decision from the mediation model. Identification of the mediation effect is essential for the development of theories in corporate finance in two ways. First, the theory of capital structure determinants can be formulated as a causal model (Chang et al., 2009; Jairo, 2009; Titman & Wessels, 1988). Second, the direct path is rarely expected and clarified. The assertion of unexplained "direct" paths is often evidence of the effects of one or more omitted mediators. It is common for theoretical independent variables to affect the dependent variables through two (or more) mediators (Zhao et al., 2010). In that case, the unexpected sign in this study of the direct effect that emerged in "competitive mediation" can provide guidelines for theory building. The unexplained sign of the direct effect can provide a clue in future work for a second mediation mechanism. Rucker, Preacher, Tormala, and Petty, (2011) and Zhao et al. (2010) suggest that the total effect might possibly be reflected by two or more omitted mediators with different signs. Third, the introduction of factor analysis in PLS-SEM provides a silver lining in capital structure theory because it can help (i) detect the overall model structure in the relationships between variables and (ii) identify the underlying correlational pattern (indicators) shared by the variables to test the theoretical models.

Several international studies assume that the effects of capital structure determinants are equal across countries (Booth et al., 2001; Giannetti, 2003; Song, 2004). We provide evidence that this assumption is unfounded. We reject the null hypothesis that all path coefficient estimates for Malaysia and Indonesia are equal. We acknowledge that some of the impact of firm and country specific attributes on firm leverage and performance differ in terms of sign, magnitude and significance level in Malaysia and Indonesia. This study has provided a valuable contribution by testing the equality of coefficient effects from each country's path coefficient estimates. This result gives more robust answers to the contradictory results presented by various studies in international capital structure assumptions, that is, as this researcher had assumed, that the firm-specific factors' effects on firm leverage are equal.

This research has limitations that should be considered. First, this study does not consider other factors that may affect leverage and firm performance such as corporate governance and market competition (Detthamrong et al., 2017; Fosu, 2013). Second, we only consider testing leverage as mediation without considering other variables such as managerial ownership (Wahba, 2014), that can moderate this relationship. Finally, this study uses only two countries as samples, so different results may be obtained when the model is tested in other countries. A follow-up study in this area can strengthen and replicate this models in different countries to improve the generalization of our findings, which may be fruitful for future research.

Appendix A.

Table A1
The lending interest rate and inflation of the sample countries.

Country	Year	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
Indonesia	LendingIR (%)	20.8	25.5	24	20.6	17.8	18.9	19.2	22	32.2	27.	18.5	18.5	18.9	16.9	14.1	14.1	16	13.9	13.6	15	13.3
Malaysia	LendingIR (%)	8.8	9.3	10.2	10	8.8	8.7	9.9	11	12.1	8.6	7.7	7.1	6.5	6.3	6	6	6.5	6.4	6.1	5.1	5
Indonesia	Inflation, CPI	7.8	9.4	7.5	9.7	8.5	9.4	8	6.2	58.4	20.5\	3.7	11.5	11.9	6.6	6.2	10.5	13.1	6.4	9.8	4.8	5.1
Malaysia	Inflation, CPI	2.6	4.4	4.8	3.5	3.7	3.5	3.5	2.7	5.3	2.7	1.5	1.4	1.8	1	1.5	3	3.6	2	5.4	0.6	1.7

Note: *Lending interest rate:* the rate charged by banks on loans to prime customers. Lending rate is the bank rate that generally meets the short- and medium-term financing needs of the private sector. This rate is usually differentiated according to creditworthiness of borrowers and objectives of financing. *Inflation*: the measured by the consumer price index (CPI) reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. *Sources:* World Development Report (World Bank), Financial Structure Database.

Table A2
Major aspects of corporate governance and institutional environment in the South-East Asian countries (Malaysia and Indonesia).

	Malaysia	Indonesia	Sources
Financial orientation	Market-based oriented	Bank-based oriented	Demirgüç-Kunt and Maksimovic (2002)
Legal origin	Common law	Civil law-French origin	La Porta et al. (1998)
Rule of Law			
Efficiency of judicialsystem	9.00	2.50	La Porta et al. (1998)
Rule of law	6.78	3.98	La Porta et al. (1998)
Legal protection			
Shareholder rights	4	2	La Porta et al. (1998)
Creditor rights	4	4	La Porta et al. (1998)

Note: *Efficiency of judicial system:* The assessment of the "efficiency" and integrity of the legal environment as the business and particularly foreign firms is affected that had been produced by the country risk rating agency Business International Corp. This represents investors' assessments of the country's condition on a scale from zero to 10; with lower scores, lower efficiency levels "zero" (least efficient) to 10 (most efficient). *Rule of law:* The law assessment and the tradition of the order in the country produced by the risk rating agency International Country Risk (ICR) in the particular country. The scale is from zero to 10; with the lower score for less tradition (0) to most tradition (10). *Creditor right:* An index aggregating different creditor rights. The index ranges are from zero (weakest) to four (strongest). *Shareholder right:* The cumulative voting variable that cover the right minority shareholders for the proportional representation which added the variable on pre-emptive right of the minority shareholders to buy new issues of stock. The index ranges from zero to four.

Table A3
Statistically significant value for total effect in Malaysia.

	coeff. β	std. error	t-stats
Asset structure -> firm financial performance	−0.0445	0.0063	7.0522
Growth opportunity -> firm financial performance	−0.0758	0.01	7.5861
Firm size -> firm financial performance	0.0206	0.0072	2.8714
Liquidity -> firm financial performance	−0.0107	0.0044	2.4684
Business risk -> firm financial performance	−0.0016	0.0025	0.642
Non-debt tax shield -> firm financial performance	0.8882	0.0133	66.6393
Bond market development -> firm financial performance	−0.0169	0.0054	3.1085
Stock market development -> firm financial performance	0.0137	0.008	1.7232
Economic growth -> firm financial performance	0.0194	0.0086	2.2527
Interest rate -> firm financial performance	0.0097	0.0077	1.261
Inflation rate -> firm financial performance	−0.0044	0.0081	0.5491

The table demonstrates the PLS-SEM statistically significant estimates for the total direct effect path "c", i.e., the relationships between the determinants of capital structure and firm financial performance. PLS path modelling measures the Beta (β) coefficient, standard error and statistically significant value using resampling from the bootstrapping procedures for 5000 samples for all samples; total sample for Indonesia N = 5975.
Note: ***, **,*statistically significant at the 1 per cent, 5 per cent and 10 per cent levels (one –tail), respectively.

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