# Comparative Analysis of Effect of Capital Structure to Profitability in Manufacturing Sector in Indonesia and Malaysia in 2009 - 2014

Hatane Semuel, Hartmann H. Ngono, Sautma R. Basana

**Abstract**—The effect of capital structure on profitability is often debated by many financial investigators. The application of the tradeoff theory and pecking order theory to analyze this relationship may generate different views. Each company has its own strategies to achieve its objectives and the external environment, such as state policy which has a broad impact on the relationship with the capital structure of the company's profitability. Malaysia is the country closest to Indonesia that had a similar growth rate of GDP and industrial production with Indonesia, but Malaysia has a lower inflation rate than Indonesia. This study was conducted to compare the performance of manufacturing sector between two countries when entering the era of the ASEAN Economic Community (AEC). The samples for this study were 69 companies in Indonesia and 242 companies in Malaysia that engaged in the manufacturing sector. The study uses panel data analysis. The study found that capital structure has a positive effect on the profitability of manufacturing companies in Indonesia, and it transforms to a negative effect on manufacturing companies in Malaysia. The results also showed that there are significant differences in short-term debt towards profitability of manufacturing companies in the two countries, Indonesia and Malaysia.

**Keywords**—Capital structure, Indonesia, Malaysia, Manufacturing, Profitability.

# I. INTRODUCTION

ENTERING 2016, the ASEAN Economic Community (AEC) came into effect throughout entire ASEAN region. Through the AEC, free trade is being implemented between countries that make up the ASEAN region, which are Indonesia, Malaysia, Brunei, Thailand, Singapore, Vietnam, Cambodia, Laos, Philippines and Myanmar. The main characteristics of the AEC are single market and production base, economic regions with high competitiveness, region with equitable economic development, and regions that fully integrate into the global economy.

The products that are exported from Indonesia other than oil and gas can be divided into three categories, namely primary products, manufactured products, and other products. Data from the Bank Indonesia has showed that about half of the products that are exported from Indonesia are manufacturing

products from 2011 to 2015. Data from the World Trade Organization (2015) shows that the manufacturing sector has the highest trade of volume growth compared with other consumer groups at 7% per year.

Malaysia is the country closest to Indonesia that has some similarities and differences. Data from the World Trade Organization (2015) shows that Indonesia and Malaysia have a similar growth rate of GDP and industrial production. Data from the Central Intelligence Agency (2015) shows that the majority of Indonesian workers are focused in the fields of agriculture and services, while Malaysia's workforce are more in industry and services. Malaysia has a lower inflation rate than Indonesia, while Indonesia has higher interest rate and prime lending rate than Malaysia. When viewed from the industrial sector, Indonesia and Malaysia have some similar field of industry, such as food, beverages, cigarettes, pharmaceuticals, wood, machinery, chemicals, textiles, electronics, metals, pulp and paper, and automotive.

During the period of 2009 - 2014, manufacturing companies in Indonesia and Malaysia made a change in the composition of the company's debt and equity capital. It can be seen in Fig. 1 and Fig. 2 below.

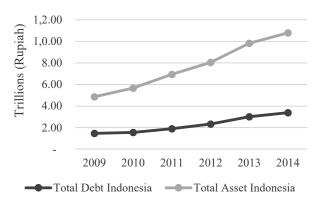


Fig. 1 Total debt and total asset of manufacturing companies in Indonesia 2009-2014

Source : Bloomberg (reprocessed)

H. Semuel, Professor Management of Faculty of Economics, Petra Christian University, Surabaya, Indonesia (e-mail: samy@petra.ac.id).

H H. Ngono Postgraduate student from Faculty of Economics, Petra Christian University, Surabaya, Indonesia (e-mail: hartmannhn@yahoo.co.id).

S. R. Basana, Lecturer of Finance Management Department from Faculty of Economics, Petra Christian University, Surabaya, Indonesia (e-mail: sautma@peter.petra.ac.id).

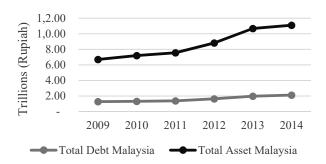


Fig. 2 Total debt and total asset of manufacturing companies in Malaysia 2009-2014

Source: Bloomberg (reprocessed)

From Fig. 1 and Fig. 2 above, it shows that the increase in total assets of the company, followed by an increase in total debt of companies in manufacturing companies in both Indonesia and Malaysia. However, it appears that the proportion of the increase in total assets and total debt is unbalanced. The big difference in the proportion of increase in total assets and total debt shows the changes in capital structure ratios from year to year. This study will compare the effects of capital structure on profitability in manufacturing companies in Indonesia with manufacturing companies in Malaysia.

This study aims to determine the differences between the effects of capital structure on profitability in manufacturing companies in Indonesia with manufacturing companies in Malaysia. The results of this study can be used as a reference for academicians and also utilized by practitioners such as financial managers of manufacturing companies in Indonesia. Through this research, practitioners have a reference in determining the composition of the capital structure of their company to improve the company's profitability and provide advantage in the face of free trade in the future.

# II. THEORETICAL REVIEW

Financing is a way for a company to support the production or distribution of goods or services. A company has several financing alternatives, including equity financing, debt financing, and financing with a combination of debt and equity [1]. Theories regarding capital structure originated from the theory of Modigliani-Miller (MM Theory). MM Theory use the perfect market as the basic of research. Perfect market condition is a condition where there are no taxes, no differences in interest rates given to borrowers in the form of an individual or company, and the absence of transaction costs [1]. Perfect market conditions are in fact not possible in the real market because there will always be taxes, the difference in interest rates earned by individuals and the company, and the transaction costs.

Trade-off theory proposed by Kraus and Litzenberger [2] and is often also known as the theory of static order. Kraus and Litzenberger developed the theory of capital structure to actual market conditions where there is a tax, interest rate differentials received between individuals and companies, and

transaction costs. The results shows that there is a positive relationship between the ratios of debt to the company's profitability [2]. The positive relationship occurs because of the reduction in tax expenses to be borne by the company as a result of debt (tax shield) [2]. Cost is calculated on income tax deductible interest if the company did with the debt financing. Tax costs are not reduced significantly by the company with equity financing. This is what underlies [2] suggested a positive relationship between the ratios of debt to profitability. Although debt financing reduces tax expenses borne by the company, financing cannot be completely done with debt. It is caused by an increased risk of experiencing financial distressed companies. Therefore, the company must find an optimal point with the debt and equity financing resulting in savings as a result of the debt but to avoid the risk of financial distressed. A condition of optimal capital structure is the condition when the values of the tax shield to be equal to the value of bankruptcy costs [3]. References [4]-[8] show that capital structure has a positive effect on profitability.

Pecking order theory popularized by Myers [9] along with Myers and Majluf [10] states that a company should finance their activity using retained earnings from the company as much as possible. Companies use debt if the financing by retained earnings is not enough to finance the its activities. If debt financing is not sufficient, the company financing their activity by issuing new shares in the company so the capital in the company will increase. Based on the pecking order theory, the composition of the capital structure does not affect the profitability of the company [9]. Pecking order theory is often considered irrelevant because it does not take advantage of the tax shield arising from their debt. References [11]-[14] show that capital structure does not affect profitability.

# III. RESEARCH METHODS

The data used in this research is from manufacturing companies listed on the Bursa Efek Indonesia and Bursa Malaysia, which has as many as 69 Indonesian manufacturing companies and 242 Malaysia manufacturing companies. Regression analysis is done with the dummy variable D as an indicator of the state, the value of D = 0 for Indonesia and D = 01 for Malaysia. Regression analysis performed for each dependent variable indicator of the overall independent variables with D\_STDTA, D\_LTDTA, and D\_TDTE as a dummy variable interaction between the independent variables. Indicators of capital structure are STDTA, LTDTA, and TDTE, while the profitability indicators are ROA, ROE, and GPM. Analysis of the data in this study is using panel data regression analysis. Panel data regression analysis can be done with three types of models, namely Common Effect Model or Pooled Least Square (PLS), Fixed Effects Model (FE), and Random Effects Model (RE). To be able to determine the estimation model used, it is necessary to perform Chow test, Hausman test, and Lagrange Multiplier test.

The research framework in this study are shown in Fig. 3 below.

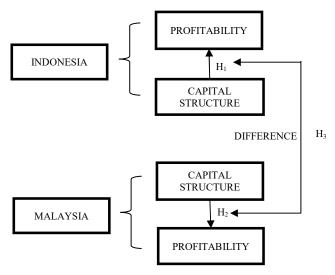


Fig. 3 Research framework

The research hypotheses are as follows:

**H1**: There is an influence of capital structure to profitability in the Indonesian manufacturing company.

**H2**: There is an influence of capital structure to profitability in manufacturing companies in Malaysia.

**H3**: There is a difference between the effects of capital structure on the profitability of Indonesian manufacturing companies with those of Malaysia.

The relationships between the dependent variables with independent variables in this study are shown in a linear regression model to the following equation:

$$ROA_{i,t} = \alpha + \alpha_i + \beta_1 STDTA_{i,t} + \beta_2 LTDTA_{i,t} + \beta_3 TDTE_{i,t} + \varepsilon_{i,t}$$
 (1)

$$ROE_{it} = \alpha + \alpha_i + \beta_1 STDTA_{it} + \beta_2 LTDTA_{it} + \beta_3 TDTE_{it} + \varepsilon_{it}$$
 (2)

$$GPM_{i,t} = \alpha + \alpha_i + \beta_1 STDTA_{i,t} + \beta_2 LTDTA_{i,t} + \beta_3 TDTE_{i,t} + \varepsilon_{i,t}$$
 (3)

where:

ROA = net income divided by total assets of the company i in year t.

ROE = net income divided by the market value of equity of firm i in year t.

GPM = gross income divided by sales of firm i in year t.

STDTA = short-term debt divided by total assets of the company i in year t.

LTDTA = long-term debt divided by total assets of the company i in year t.

TDTE = total debt divided by the market value of equity of firm i in year t.

# IV. DISCUSSION

Table I below shows the results of the panel data regression ROA indicator for manufacturing companies of Indonesia and Malaysia.

TABLE I REGRESSION ROA INDICATORS

Model	Indicators	Coeff.	Std. Err.	T	p-value
MIDGEL	STDTA	-0.1445310	0.0609	-2.37	0.0180
	LTDTA	-0.1054423	0.0584	-1.81	0.0710
	TDTE	-0.0058283	0.0045	-1.29	0.1980
PLS	α	0.0982696	0.0126	7.80	0.0000
125	D	-0.0206198	0.0140	-1.48	0.1400
	$D_STDTA$	-0.0160115	0.0724	-0.22	0.8250
	D_LTDTA	0.0469637	0.0810	0.58	0.5620
	D_TDTE	0.0010545	0.0057	0.19	0.8530
	STDTA	-0.0246746	0.0789	-0.31	0.7540
	LTDTA	-0.1038957	0.0923	-1.13	0.2610
	TDTE	-0.0061403	0.0066	-0.93	0.3530
DD.	α	0.0934476	0.0113	8.26	0.0000
FE	D		0 (omittee	<i>l</i> )	
	D_STDTA	-0.2289945	0.1211	-1.89	0.0590
	D_LTDTA	-0.2059018	0.1360	-1.51	0.1300
	D_TDTE	0.0090043	0.0079	1.14	0.2540
	STDTA	-0.0926496	0.0654	-1.42	0.1560
	LTDTA	-0.1105547	0.0672	-1.65	0.1000
	TDTE	-0.0064499	0.0051	-1.27	0.2040
D.F.	A	0.0917122	0.0180	5.75	0.0000
RE	D	-0.0106910	0.0816	-0.59	0.5520
	D_STDTA	-0.0830548	0.0948	-1.02	0.3090
	D_LTDTA	-0.0201809	0.0063	-0.21	0.8310
	D_TDTE	0.0048844	0.0160	0.78	0.4350

The results of the panel data regression above are then tested with Chow test, Hausman test, and Lagrange Multiplier test to determine the most appropriate estimation model used. Table II below shows the results of the estimation model test for indicators of ROA.

TABLE II
TEST RESULTS OF ROA INDICATORS

Test	Result	p-value	Description	
Chow	0.646	0.421	PLS model is more accurate than FE	
Hausman	11.670	0.069	RE model is more accurate than FE	
LM	197.320	0.000	RE model is more accurate than PLS	

From the test results, it was determined that the RE model is more appropriate to used for panel data regression analysis ROA indicator. Based on the RE model, (4) shows the results of panel data regression ROA indicators for Indonesian manufacturing companies, while (5) for Malaysian manufacturing companies is as follows:

ROA = 0.0917 - 0.0926STDTA - 0.1105LTDTA - 0.0064TDTE (4)

ROA = 0.0810 - 0.1757STDTA - 0.1307LTDTA - 0.0015TDTE (5)

From the results of the regression analysis in Table I, for the RE model, we found a p-value > 0.05 for STDTA (0.156),

LTDTA (0.100), and TDTE (0.204) indicators. From (4) and (5), we found that ROA is negatively affected by STDTA, LTDTA, and TDTE. For every 1% increase of STDTA, ROA of an Indonesian manufacturing company fell by 0.093%, while for the Malaysian manufacturing companies it fell by 0.176% if other indicators of capital structure remains. For every 1% increase of LTDTA, ROA of Indonesian manufacturing company fell by 0.11%, while for Malaysian manufacturing companies it fell by 0.13% if other indicators of capital structure remain. For every 1% increase of TDTE, ROA of an Indonesian manufacturing company fell by 0.006%, while the Malaysian manufacturing companies it fell by 0.001% if other indicators of the capital structure remains. The coefficient of determination (R<sup>2</sup>) for ROA model for manufacturing companies in Indonesia and Malaysia is equal to 0.0329 or 3.29%. The *p-value* for the interaction variables D\_STDTA (0.309), D\_LTDTA (0.831), and D\_TDTE (0.435) has a value > 0.05 for ROA, which indicated that there is no difference in the effect of STDTA, LTDTA, and TDTE towards the ROA indicator among Indonesian and Malaysian manufacturing companies.

Table III below shows the results of the panel data regression ROE indicator of Indonesian and Malaysian manufacturing companies.

TABLE III
REGRESSION ROE INDICATORS

REGRESSION ROE INDICATORS							
Model	Indicators	Coeff.	Std. Err.	t	p-value		
	STDTA	0.1461032	0.1093	1.34	0.1810		
	LTDTA	0.2254435	0.1048	2.15	0.0320		
	TDTE	-0.0258708	0.0081	-3.18	0.0010		
PLS	A	0.0221514	0.0226	0.98	0.3270		
PLS	D	0.0726858	0.0250	2.90	0.0040		
	D_STDTA	-0.2095323	0.1300	-1.61	0.1070		
	$D_LTDTA$	-0.2991426	0.1453	-2.06	0.0400		
	D_TDTE	0.0139002	0.0102	1.37	0.1720		
	STDTA	0.5843156	0.1510	3.87	0.0000		
	LTDTA	0.1002001	0.1769	0.57	0.5710		
	TDTE	-0.0758876	0.0127	-5.99	0.0000		
EE	A	0.0780580	0.0217	3.60	0.0000		
FE	D		0 (omittee	1)			
	D_STDTA	-0.5997015	0.2319	-2.59	0.0100		
	D_LTDTA	-0.1101282	0.2605	-0.42	0.6730		
	D_TDTE	0.0550654	0.0151	3.64	0.0000		
	STDTA	0.2622177	0.1155	2.27	0.0230		
	LTDTA	0.2305180	0.1143	2.02	0.0440		
	TDTE	-0.0344076	0.0088	-3.92	0.0000		
DE	A	0.0141106	0.0256	0.55	0.5810		
RE	D	0.0802986	0.0286	2.81	0.0050		
	D_STDTA	-0.3153434	0.1400	-2.25	0.0240		
	D_LTDTA	-0.2928868	0.1599	-1.83	0.0670		
	D TDTE	0.0204646	0.0109	1.88	0.0600		

The results of the panel data regression above are then tested with Chow test, Hausman test, and Lagrange Multiplier test to determine the most appropriate estimation model used. Table IV below shows the results of the estimation model test for the ROE indicator.

TABLE IV
TEST RESULTS OF ROE INDICATORS

Test	Result	p-value	Description		
Chow	4.017	0.045	FE model is more accurate than PLS		
Hausman	2.940	0.401	RE model is more accurate than FE		
LM	35.220	0.000	RE model is more accurate than PLS		

From the test results, it was determined that the RE model was more appropriate to used for the panel data regression analysis of the ROE indicator. Based on RE model, (6) shows the results of panel data regression ROE indicator of Indonesian manufacturing companies, while (7) for Malaysian manufacturing companies, it is as follows:

$$ROE = 0.0141 + 0.2622STDTA + 0.2305LTDTA - 0.0344TDTE$$
 (6)

$$ROE = 0.0944 - 0.0531STDTA - 0.0623LTDTA - 0.0139TDTE$$
 (7)

From the results of the regression analysis of RE model in Table III, it is found that the *p-value* of < 0.05 for STDTA (0.023), LTDTA (0.044), and TDTE (0.000) on ROE. From (6), it is found that ROE is positively influenced by STDTA and LTDTA, however negatively affected by TDTE. From (7), it is found that ROE is negatively affected by STDTA, LTDTA, and TDTE. For every 1% increase of STDTA, ROE of Indonesian manufacturing companies rose by 0.26%, while for the Malaysian manufacturing companies it fell by 0.05% if other indicators of capital structure remains. For every 1% increase of LTDTA, ROE of manufacturing companies in Indonesia increased by 0.23%, while for Malaysian manufacturing companies it fell by 0.06% if the other indicators of capital structure remains. For every 1% increase of TDTE, ROE of Indonesian manufacturing companies fell by 0.03%, while for the Malaysian manufacturing companies fell by 0.01% if other indicators of capital structure remains valuable. The coefficient of determination (R<sup>2</sup>) to ROE model for manufacturing companies in Indonesia and Malaysia is 0.0148 or 1.48%. The *p-value* for interaction variables D LTDTA (0.067) and D TDTE (0.060) has a value > 0.05 for ROE indicated that there is no difference in the effect of LTDTA and TDTE towards the ROE indicator among Indonesian and Malaysian manufacturing companies. The pvalue for interaction variables D STDTA (0.024) has a value of < 0.05 for ROE indicated that there are differences in the effect of STDTA towards the ROE indicator among Indonesian and Malaysian manufacturing companies.

Table V below shows the results of GPM panel data regression of Indonesian and Malaysian manufacturing companies.

The results of the panel data regression above are then tested with Chow, Hausman test, and Lagrange Multiplier test to determine the most appropriate estimation model used. Table VI below shows the results of the estimation model test for GPM indicator.

TABLE V REGRESSION GPM INDICATORS

REGRESSION GPM INDICATORS							
Model	Indicators	Coeff.	Std. Err.	T	p-value		
	STDTA	-0.2767862	0.0530	-5.22	0.0000		
	LTDTA	-0.1521299	0.0508	-2.99	0.0030		
	TDTE	-0.0053654	0.0039	-1.36	0.1730		
PLS	α	0.2665704	0.0110	24.33	0.0000		
rls	D	-0.0835511	0.0121	-6.88	0.0000		
	$D_STDTA$	0.0959874	0.0630	1.52	0.1280		
	$D_LTDTA$	0.1109658	0.0705	1.57	0.1160		
	D_TDTE	0.0036481	0.0049	0.74	0.4600		
	STDTA	-0.0134728	0.0393	-0.34	0.7320		
	LTDTA	0.0183014	0.0461	0.40	0.6910		
	TDTE	-0.0005345	0.0033	-0.16	0.8710		
PP	α	0.1663246	0.0056	29.49	0.0000		
FE	D		0 (omitted	)			
	D_STDTA	-0.0073930	0.0604	-0.12	0.9030		
	D_LTDTA	0.0397854	0.0678	0.59	0.5580		
	D_TDTE	0.0002159	0.0039	0.05	0.9560		
	STDTA	-0.0516876	0.0381	-1.36	0.1750		
	LTDTA	-0.0245574	0.0433	-0.57	0.5700		
	TDTE	-0.0024694	0.0031	-0.79	0.4320		
DE	A	0.2146487	0.0160	13.42	0.0000		
RE	D	-0.0481776	0.0184	-2.62	0.0090		
	D_STDTA	-0.0341214	0.0542	-0.63	0.5290		
	D_LTDTA	0.0425903	0.0628	0.68	0.4970		
	D_TDTE	0.0024047	0.0038	0.64	0.5240		

TABLE VI TEST RESULTS OF GPM INDICATORS

Test	Result	p-value	Description
Chow	0.016	0.900	PLS model is more accurate than FE
Hausman	4.340	0.227	RE model is more accurate than FE
LM	2465.470	0.000	RE model is more accurate than PLS

From the test results, it was determined that the RE model is more appropriate to be used for the analysis of panel data regression GPM variables. Based on the RE model, (8) shows the results of the indicator panel data regression GPM of Indonesian manufacturing companies, while (9) to Malaysian manufacturing companies as follows:

$$GPM = 0.2146 - 0.0516 STDTA - 0.0245 LTDTA - 0.0024 TDTE$$
 (8)

GPM = 0.1664 - 0.0858STDTA + 0.0180LTDTA - 0.0000647TDTE (9)

From the analysis of the regression RE model in Table V, it is found that the *p-value* > 0.05 for STDTA (0.175), LTDTA (0.570) and TDTE (0.432) indicators to the GPM, so that there is no influence of STDTA, LTDTA, and TDTE to GPM variable of Indonesian and Malaysian manufacturing companies. From (8), it is found that GPM is negatively affected by STDTA, LTDTA and TDTE. From (9), it is found that GPM positively influenced by LTDTA, but negatively affected by STDTA and TDTE. For every 1% increase of STDTA, GPM of Indonesian manufacturing companies fell by 0.05%, while for Malaysian manufacturing companies fell by 0.08% if other indicators of capital structure remain. For every 1% increase of LTDTA, GPM of Indonesian manufacturing

companies fell by of 0.02%, while for Malaysian manufacturing companies rose by 0.018% if other indicators of capital structure remains. For every 1% increase of TDTE, GPM of Indonesian manufacturing companies fell by 0.002%, while for Malaysian manufacturing companies fell by 0.00006% if other indicators of capital structure remain. The coefficient of determination (R²) for GPM model for manufacturing companies in Indonesia and Malaysia is equal to 0.0545 or 5.45%. The *p-value* for interaction variables D\_STDTA (0.529), D\_LTDTA (0.497), and D\_TDTE (0.524) has a value > 0.05 for GPM indicator so there is no difference in the effect of STDTA, LTDTA, and TDTE towards the GPM indicator among Indonesian and Malaysian manufacturing companies.

Table VII below shows the nature of the influence of capital structure on profitability in Indonesian and Malaysian manufacturing companies.

TABLE VII
EFFECT OF CAPITAL STRUCTURE PROPERTIES TO PROFITABILITY

	Indonesia			Malaysia		
	ROA	ROE	GPM	ROA	ROE	GPM
STDTA		(+)*			(-)*	
LTDTA	(+)			(-)		
TDTE	(-)		(-)			

## V.CONCLUSIONS

Based on this research, we concluded as follows:

- The capital structure is shown to have an influence on the profitability of manufacturing companies in Indonesia. Indicators of capital structure such as STDTA and LTDTA have a positive influence on the value of the company's ROE and the indicators TDTE of capital structure have a negative effect on the value of the company's ROE. This shows that the use of debt, both long-term debt and short-term debt have a positive effect on the profitability of manufacturing companies in Indonesia. By using debt, the company is able to leverage their manufacturing company, take advantage of the debt to finance the company's assets that can be used to increase production capacity and sales in order to increase the company's revenue. Manufacturing companies can also use financing by issuing new equity as a source of financing. The funds obtained with the issuance of new equity can be used to finance the assets or the company's expansion.
- 2. The capital structure is shown to have an influence on the profitability of manufacturing companies in Malaysia. STDTA, LTDTA, and TDTE indicators have a negative influence on the value of the company's ROE. This shows that the use of debt, both long and short-term have negative effect on the profitability of manufacturing companies in Malaysia. The higher the debt of the company, the greater the burden of interest costs borne by the company, thus reducing the company's net income.
- **3.** There is a difference between the effects of capital structure on profitability in Indonesian manufacturing

companies and Malaysian manufacturing companies. Short-term debt has a positive effect on profitability in Indonesian manufacturing companies, and have negative impact on profitability in Malaysian manufacturing companies. Differences of influence in short-term debt shows that manufacturing companies in Indonesia have different ways to take advantage of short-term debt for the business activities compared to manufacturing companies in Malaysia. In addition, differences in the effect shows that Indonesian manufacturing companies utilize debt as leverage and profit tax shield to enhance the profitability of the company, while Malaysian manufacturing companies have a preference for using internal financing rather than external financing in the capital structure of companies.

## VI. LIMITATIONS AND RECOMMENDATIONS

The results showed that there are differences in capital structure influence on the profitability of manufacturing companies between Indonesia and Malaysia, but has not revealed the cause of the difference. With these limitations, it is expected that further research may reveal the cause of the differences in these effects.

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