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THE SUSTAINABLE GROWTH RATE OF FIRM IN MALAYSIA: A PANEL DATA ANALYSIS

Kadar Pembangunan Firma di Malaysia: Analisis ke Atas Data Panel

Norfhadzilahwati Rahim*; Maryam Badrul Munir
Universiti Sains Islam Malaysia

*fhadzilahwati@raudah.usim.edu.my / fhadzilahrahim@gmail.com

Abstract

This research analyzes the impact of financial indicators as a key factor on the sustainable growth rate with panel data for time period, 2005-2015. Sustainable growth rate as a dependent variable, regressed with four different independent variables such as debt to equity ratio, dividend payout ratio, profit margin, and asset turnover ratio. Three different models like Ordinary Least Squares (OLS), Random Effect Model (REM), and Fixed Effect Model (FEM) were used for the analysis. This research gathered for eight sectors of firm in Malaysia for eleven years that lead to use the panel data analysis, whereas panel data may have Breusch-Pagan LM test, and Hausman test. Heteroscedasticity, Modified Wald test for group wise heteroscedasticity, the Wooldridge serial correlation test will apply in this research. The results found that three models get same results which debt to equity ratio (DTER), dividend payout ratio (DPR), profit margin (PM), and sales to assets (STA) are positive impact of the sustainable growth rate. This research contributes to the literature by contributing understandings of the sustainable growth rate practice for companies.

Keywords: random and fixed effect, sustainable growth rate, financial indicators, panel data analysis.

Abstrak

Kajian ini menganalisis kesan indikator kewangan sebagai faktor utama kadar pembangunan mampan dengan menggunakan data bagi tempoh 2005-2015. Kadar pembangunan mampan adalah pembolehubah bersandar, manakala empat pembolehubah tidak bersandar adalah nisbah hutang kepada ikuiti, nisbah pembayaran dividen, margin keuntungan dan nisbah perolehan aset. Tiga model berlainan iaitu *Ordinary Least Squares (OLS), Random Effect Model (REM),* dan *Fixed Effect Model (FEM)* telah digunakan bagi tujuan analisis. Kajian ini mengumpulkan data daripada 8 sektor organisasi di Malaysia selama 11 tahun menggunakan analisis panel data. Panel data seperti *Breusch-Pagan LM test, and Hausman test. Heteroscedasticity, Modified Wald test for group wise heteroscedasticity, the Wooldridge serial correlation test* akan digunakan di dalam kajian ini. Hasil kajian menunjukkan tiga model iaitu nisbah hutang kepada ikuiti (DTER), nisbah pembayaran dividen (DPR), margin keuntungan (PM), dan jualan kepada aset (STA) menunjukkan impak yang positif ke atas kadar pembangunan mampan. Kajian ini memberi sumbangan kepada kajian terdahulu dengan memberikan pengetahuan tentang amalan kadar pembangunan mampan di organisasi.

Kata kunci: Kesan rawak dan tetap, kadar pembangunan mampan, indikator kewangan, analisis panel data.

INTRODUCTION

The term sustainable growth rate has come to be used to refer to the maximum a firm can grow without borrowing more money and selling new equity. The definition was first suggested by Higgins (1977). A firm's sales and assets can grow if the company sells no new equity and needs to retain its capital structure (Platt, Platt, & Chen, 1995). The sustainable growth rate is seen as a factor strongly related to firm performance and it can play an important role in addressing the issue of maximizing growth rate in sales without to increase firm debt or issues new equity. The sustainable growth rate is a key indicator to the firm in gauging their business prosperity performance. According to Srinivasa (2011), the combination of the operating and financial elements in one of the comprehensive measurements is a great importance in sustainable growth because it can increase the value of the firms. Moreover, a review by Phillips, Anderson, & Volker (2010) found that one of the financial dynamics that influence firm growth is capital structure while the key valuation models of the company is earnings growth. Based on Higgins (1977), sustainable growth in the business context is the maximum platform or benchmark for the company to grow their company revenue without reducing its financial resources. The combinations of a company's operating element (i.e. profit margin

and asset efficiency) and financial elements (i.e. capital structure and retention ratio) into a single measurement become a very valuable financial performance for every company.

Issues of sustainability are among the areas that have been receiving more comprehensive attentions by managers and investors when handling their business investment. Sometimes, too much growth rate causes financial stress to the company and therefore, firm will face higher costs, higher debt, bankruptcy, financial losses, and declining market share (Fonseka, Ramos, & Tian, 2012). A company can maintain its growth by determining the factors that affect sustainable growth. According to Johnson & Soenen (2003), the company's strategic planning by handling the company's limitations and constraints of policy, referring to leverage and dividend pay-out, companies can sustain their growth.

The remainder of the paper is organized as follows. Section 2 discusses the related literature. Section 3 highlights the research method and Section 4 continues with the findings. Lastly, section 5 concludes the discussion.

LITERATURE REVIEW

In a quantitative research, firm's financial characteristics have a higher affect to the direction of sustainable growth (Fonseka et al., 2012). Moreover, in the previous study by Amouzesh, Zahra, & Zahra (2011), the deviation of the actual growth rate from the sustainable growth rate is associated with return on assets and price to book ratios. Based on previous studies by Amouzesh, Zahra, & Zahra (2011), firm's sustainable growth rate depends only on the earnings' retention rate (r) and the return on equity. The calculation of the sustainable growth rate is retention ratio multiple return on equity. Mostly, capital structure, profitability (profit margin), asset efficiency and retention ratio are associated with sustainable growth rate. Capital structure, profitability, asset efficiency and retention ratio are a combination of operating and financial elements.

A review of literature regarding the sustainable growth rate model by Escalante, Turvey, & Barry (2009) found the relevance of the sustainable growth challenge (SGC) model in explaining farm's financial and operating decisions. The research used 197 grains and 54 livestock farms during the period of 1995-2001. The farms' tendencies to attain balanced growth seem to be more influenced by asset productivity and leverage decisions, which are given different emphasis by grain and livestock farms due to differing operational structures and constraints. Moreover, the concept of sustainable growth rate by Ashta (2008) is a useful concept for firms that are growing very fast and also for firms that are facing financial distress by

modifying the calculation that can improve financial analysis and clarity by calculating a firm's sustainable growth rate. The author's findings prove that the modification of the sustainable growth rate formula is consistent when the calculation is used in the opening assets in the asset turnover ratio. Therefore, both the assets and equity should have a specific term in the calculation of leverage ratio. And, the assets should have beginning of period value under the asset turnover ratio.

The previous research by Lee, Liang, Lin, & Yang (2016) found that the investment of the firm has a positive impact on debt financing and debt financing has a positive impact on the investment. The funds available to outlay the investment can enhance by increase in debt financing and the increase in investment. This increased the willingness of firms to fund supply by the increase their investment's future profitability and mortgage of capital investment. The raised investment also can further improve the firm's debt capacity. Meanwhile, there is significant negative impact between debt financing and dividend which means more ability for firms to pay dividend when the firms have lower leverage level. Hence, in order to get the finding, they suggest the use of the 2SLS, 3SLS, and GMM method to analyze the jointly determined of the three corporate decisions and also the interaction among them which should be taken into account in a simultaneous equations framework. The sample of this study is from the US listed firm's annual data between 1965 and 2012.

A review regarding the dividend policy by Johnson & Soenen (2003) found that the most successful companies with a high degree of sustainable growth rate are large profitable firms that have a certain degree of uniqueness in their business and have an efficient working capital management. In addition to the successful companies, handling the constraints and limitation of policy on leverage and dividend policy is one of the key issues in planning toward successful future growth of a company. In fact, the sustainable growth rate is the highest growth rate a firm can achieve without increasing its financial leverage (Higgins, 1977). Further, Chen, Gupta, Lee, & Lee (2013) empirical results support the mean-reverting process of the growth rate and the importance of covariance between the profitability and the growth rate in determining dividend payouts. The intertemporal behavior of the covariance may shed some light on the fact of disappearing dividends by using 31,255 firm data during the period from 1969 to 2011.

There is a positive or negative relationship between the payout ratio and risk when the growth rate is higher or lower than the rate of return on total assets (Lee, Gupta, Chen, & Lee, 2015). Theoretically, a negative relationship between the payout ratio and growth ratio means that high growth firms need to reduce the payout ratio and retain more earnings to build up "precautionary reserves," but low growth firms are

likely to be more mature and already built up their reserves for flexibility considerations. Another previous research by Rozeff (1982), Fama & French (2001), Blau & Fuller (2008) and others argue that high growth firms will tend to pay out less in dividends and have higher investment opportunities. They predict that high growth firms pay higher dividends and this result is obtained when a risk factor is not explicitly considered.

By focusing on enhancing business prosperity, Amouzesh et al. (2011) investigated the relationship between sustainable growth rate, liquidity and firm's performance. Obtain the findings, the sample of the study comprised 54 listed companies in the Iran financial market and the method used to analyze the relationship between each variables was linear regression. The authors found that the deviation of the actual growth rate from the sustainable growth rate is related to return on assets and price to book ratios. Another previous study by Bivona (2000) examined the relationship between sustainable growth policies in a changing market and profitability performance. The author stated that the sustainable growth policies of companies represented the combination of three main elements such as a structure regarding resources, management activities and operational activities. It was found that a feedback approach could be a useful support to small business entrepreneurs by looking into business growth strategies. In addition, this feedback approach can fulfill the profitability level, external key factors' requirements, and a desired balance of financial structure.

METHODOLOGY

Variables Used

The study analyzes the impact of financial indicators as a key factor on the sustainable growth rate with panel data analysis. Yearly data are collected from the Thomson Reuters database for the period of 2005 until 2015 (4,917 observations). Sustainable growth rate (SGR) is used as the proxy for the dependent variable. Debt to equity ratio (DTER), Dividend payout ratio (DPR), Profit margin (PM), and Asset turnover ratio (ATR) represents as the proxy for independent variables. Table 1 shows the statistical summaries of each variable.

Table 1: Descriptive Statistics of Sustainable Growth Rate and Each Key Financial Factor

		Mean	Standard deviation	Variance	Min	Max	Observations
SGR	Overall	0.0127985	0.4965	0.2468	-20.76	12.52	N =
	Between		0.1514	0.0229	-1.3263	0.99	4917 n =
	Within		0.4732	0.2239	-19.5027	11.5428	447
							T = 11
DTER	Overall	0.8551088	2.0829	4.3387	-47.08	89.65	N =
	Between		0.9162	0.8394	-3.5273	9.5082	4917 n =
	Within		1.8711	3.5009	-47.0794	80.9969	447
							T = 11
DPR	Overall	0.3490319	3.2828	10.7765	-75	150	N =
	Between		1.0705	1.1459	-6.5891	14.3191	4917 n =
	Within		3.1037	9.6329	-68.0619	136.0299	447
							T = 11
PM	Overall	7.326258	182.0145	33129.2782	-4659.66	9064.13	N =
	Between		61.1849	3743.5920	-405.9682	987.3773	4917 n =
	Within		171.4447	29393.2852	-4246.366	8084.079	447
							T = 11
STA	Overall	0.0074619	0.0188	0.0004	-0.04	1.24	N =
	Between		0.0075	0.0001	0	0.1145	4917 n =
	Within		0.0172	0.0003	-0.1071	1.1329	447
							T = 11

Based on Table 1, for sustainable growth rate (SGR) the overall variance is 0.4965 2 = 0.2468, of which the within variance is 0.4732 = 0.2239, or just 22.3 percent. The result implies that within variance for sustainable growth rate is higher than between variance. The time series variation is more dominated than cross sectional variation. Similar with debt to equity ratio (DTER), dividend payout ratio (DPR), and sales to asset ratio (STA) variables the within variance component dominates. While, for a profit margin (PM), the overall variance is 182.01452 = 33129.2782, of which the within variance is 171.44472 = 29393.2852 and between variance is 61.18492 = 3743.5920. This result indicates that between variance or cross sectional variance is dominated than within variance (time series variation).

Model Equation

Sustainable growth rate (SGR) as a dependent variable, regressed with four different independent variables such as debt to equity ratio (DTER), dividend payout ratio (DPR), profit margin (PM), and asset turnover ratio (STA). Three different models like Ordinary Least Squares (OLS), Random Effect Model (REM), and Fixed Effect Model (FEM) were used for the analysis. This research gathered for eight sectors of firm in Malaysia for eleven years that lead to use the panel data analysis.

The framework for this analysis is a regression model of the form

$$yit = \beta 0 + \beta 1x1it + \beta 2x2it + \beta 3x3it + \beta 4x4it + \varepsilon it \quad (1)$$

Based on pooled model, it is pooling all data together into one dataset and imposing a common set of parameters across units and time. And, pooled model essentially has the same intercept and slope across unit and time. But, the result of pooled model may result in heterogeneity bias. Therefore, random effect and fixed effect assume that each unit has their own intercepts.

To solve such a heterogeneity bias, error term can be form as

$$\varepsilon it = \lambda i + \mu it \quad (2)$$

In order to apply random effect and fixed effect denotes as:

$$yit = \beta 0 + \beta 1x1it + \beta 2x2it + \beta 3x3it + \beta 4x4it + \lambda i + \mu it \quad (3)$$

The null hypothesis for random effect and fixed effect is as below

i. Random effect is when λi is uncorrelated with each variable (xit) shown as Cor (λi, xit) = 0. The hypotheses to choose either pooled OLS or Random effect is more appropriate as shown below:-

H0: $\sigma 2\lambda = 0$ (pooled OLS model) H1: $\sigma 2\lambda > 0$ (random effects)

ii. Fixed effect is when λi is correlated with each variable (xit) shown as Cor (λi, xit) $\neq 0$. The hypotheses to choose which one is more appropriate either random effects or fixed effects can be form as

H0: Cov (λi, xit) = 0 (no correlation between λi and xit: Random effect) H1: Cov (λi, xit) $\neq 0$ (correlation between λi and xit: Fixed effect)

FINDINGS AND DISCUSSION

Results

The correlation matrix is conducted to see the relationship between each variable which are sustainable growth rate (SGR) have relationship between debt to equity ratio (DTER), and dividend payout ratio (DPR), profit margin (PM), and sales to assets (STA). The results of correlation matrix is presented in Table 2. The pooled OLS effect model, random effect model, and fixed effect model are conducted to test which model are more suitable for the regression analysis. The results of panel data analysis are presented in Table 3.

Table 2: Correlation Matrix between each variables

	SGR	DTER	DPR	PM	STA
SGR	1.0000				
DTER	-0.3810***	1.0000			
	(0.0000)				
DPR	-0.0508***	-0.0123	1.0000		
	(0.0004)	(0.3888)			
PM	0.1205***	-0.0141	0.0034	1.0000	
	(0.0000)	(0.3218)	(0.8111)		
STA	0.0279*	0.0012	0.0107	-0.0056	1.0000
	(0.0501)	(0.9356)	(0.4525)	(0.6951)	

Notes: ***, **, and * denote correlation is significant at 1%, 5% and 10% levels, respectively.

Based on table 2, the result found that the negative correlation between the sustainable growth rate (SGR), debt to equity ratio (DTER), and dividend payout ratio (DPR) at 1 percent level of significance. In other words, sustainable growth rate increasing will make debt to equity ratio (DTER), and dividend payout ratio (DPR) is decreased. Moreover, the relationship between sustainable growth rate (SGR) and profit margin (PM) is positively correlated at 1 percent level of significance. Meaning that the sustainable growth rate increased would increase the profit margin of the company. And, there are significant relationship between sustainable growth rate (SGR) and sales to assets (STA) at 10 percent level of significance. The results suggest that the sustainable growth rate (SGR) have a relationship between debt to equity ratio (DTER), and dividend payout ratio (DPR), profit margin (PM), and sales to assets (STA).

Table 3: Results of Panel Data Analysis with Dependent Variable is Sustainable Growth Rate (SGR)

Variables	Model 1 Pooled OLS	Model 2 Random Effect	Model 3 Fixed Effect
Constant	0.0851*** (0.00777)	0.0858*** (0.00764)	0.0946*** (0.00751)
DTER	-0.0906*** (0.00313)	-0.0914*** (0.00344)	-0.101*** (0.00311)
DPR	-0.00850*** (0.00198)	-0.00846*** (0.00207)	-0.00806*** (0.00198)
PM	0.000315*** (3.57e-05)	0.000315*** (3.75e-05)	0.000320*** (3.56e-05)
STA	0.784** (0.347)	0.772** (0.374)	0.625* (0.346)
BP Test		5.71*** (0.0084)	
Hausman Test			42.62*** (0.0000)
Observations	4,917	4,917	4,917
R-squared	0.162		0.175
Number of company		447	447

Notes: Standard errors in parentheses except for Breusch-Pagan LM test, and Hausman test, which are p-values. ***, **, and * denote significant at 1%, 5% and 10% levels, respectively.

The pooled effect model analysis creates the results of uses all variation in the data which mean that the intercept and the slope are the same across units and time. Based on table 2, the results in Model 1 (Pooled OLS) show that all the variables which are debt to equity ratio (DTER), and dividend payout ratio (DPR), profit margin (PM), and sales to assets (STA) have significant impact to the sustainable growth with the same intercept and slope across units and time. The results are significant at 1 percent and 5 percent. But, pooled model effect may result in heterogeneity bias. Therefore, there are some test to eliminate the heterogeneity bias by running random effect model and fixed effect model where this model assumes that each company have their own intercept and the slope to be homogenous. Table 2 also shows the results of Breusch- Pagan LM test, and Hausman test.

The random effect model analysis produces the results based on individual effects (λi) which the intercept based on individual. The results of model 2 (Random effect) indicate that debt to equity ratio (DTER), and dividend payout ratio (DPR), profit margin (PM), and sales to assets (STA) have significant impact to the sustainable growth at 1 percent and 5 percent level of significance, respectively. In order to test whether a random effect (GLS) or pooled OLS is more appropriate for the heterogeneity biases. Based on Breusch-Pagan LM test, the null hypothesis is rejected because p-value is less than 0.05 ($\sigma 2\lambda > 0$). Therefore, the random effect model is more appropriate than OLS (pooled OLS model). Since the results is

random effect model, therefore, there are company specific effects which is heterogeneity in the data.

Moreover, the fixed effect model analysis is more accurate when focusing on a specific set of company which means that are not randomly selected but fixed selected from some large of a population. Based on the results fixed effects in table 3, the results indicate that debt to equity ratio (DTER), and dividend payout ratio (DPR), profit margin (PM), and sales to assets (STA) have significant impact to the sustainable growth which are same like pooled OLS and random effects model. The results are significant at 1 percent and 5 percent level of significance, respectively. We continue the analysis by using the Hausman test to find which one is more appropriate either random effects model or fixed effect model. The null hypothesis tested is Cov (λi, xit) = 0. The results indicate that it is significant at the 5% level. Hence, we choose a fixed effect model due to rejected the null hypothesis indicated that there are correlated between λi and xit.

The further analysis, we have to detect heteroscedasticity by using the Modified Wald test for groupwise heteroscedasticity in the residuals of a fixed effect regression model (Greene, 2012). The results are shown as below

H0: sigma(i)^2 = sigma^2 for all i chi2 (447) = 2.8e+08
Prob>chi2 = 0.0000

This result found that the p-value is less than 0.05 or 5 percent level of significance. It is indicated that the variances are not constant which mean that there is a heteroscedasticity problem.

The following analysis is to analyze the serial correlation or autocorrelation in panel data by using Wooldridge test. The results form as

H0: no first-order autocorrelation
F(1, 446) = 1.986
Prob > F = 0.1594

Since p-value is more than 0.05 or 5 percent level of significance, we accept the null hypothesis. This means that there is no first-order autocorrelation.

CONCLUSION

This research uses linear regression model to analyze the impact of debt to equity ratio (DTER), and dividend payout ratio (DPR), profit margin (PM), and sales to assets (STA) on the sustainable growth rate of firm in Malaysia. The results found that all the variables have prositive and negative impact to the sustainable growth rate. In other words, the increasing or decreasing on financial indicators (debt to equity ratio (DTER), and dividend payout ratio (DPR), profit margin (PM), and sales to assets (STA)) may affect to the growth performance of company (sustainable growth rate (SGR)).

There are three model such as pooled effect model, random effect model and fixed effect model to test whether there are different results on the impact of financial indicators towards the sustainable growth rate. The results found that all the model gets same results which debt to equity ratio (DTER), and dividend payout ratio (DPR) are negative impact on the sustainable growth rate while profit margin (PM), and sales to assets (STA) are positive impact to the sustainable growth rate. By identifying heterogeneity bias, the analysis used Breusch-Pagan LM test, and Hausman test to find which model is more appropriate. And, the final results we get that fixed effect is more appropriate to be choosing from the specific set of company. The results also found that there is a heteroscedasticity problem and no first-order autocorrelation. The information about this research would be useful where each company has their own specialty in order to become a successful company and to sustain the growth performance of company in the future. The information can contribute to the literature by contributing understandings of the sustainable growth rate practice for companies. Future research may identify the firm effect or time effects whether the residuals may be correlated across firms or across time.

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