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Assessing and evaluating financial performance of technology firms using DuPont model: Evidence from Malaysia

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Abstract

This study aims to investigate the financial performance of technology firms in Malaysia by utilizing the DuPont model. Within the DuPont model framework, the return on equity (ROE) is used as the main component to measure the company's financial health. The ROE is breakdowns into its key components to predicts the individual influence of each factor. These elements are net profit margin (NPM), assets turnover (AT), and equity multiplier (EM). The findings of this study are based on the multiple linear regression analysis, whereas all three elements have positively and significantly influenced the ROE. The sample size of this study consists of 190 of technology companies in Malaysia and the research period span a decade, from 2013 to 2022. Through the analysis, this research goal is to enhance the understanding of financial performance in the technology sector.

Keywords: DuPont model, financial performance, return on equity, net profit margin, assets turnover, equity multiplier

Introduction

Financial performance of a firm is used to measure its ability to earn revenue and is typically employed as a broad indicator of overall financial health. The most important resource in analyzing company's financial health is through the annual financial reports. Public listed companies (PLCs) in Malaysia provided the yearly report in Bursa Malaysia website for easy accessed by everyone. These financial statements are greatly important, as many investors rely on this information to make economic decision regarding a company. Investors make predictions of the financial health of a company based on the analysis that can be obtained from the reports (AÇIKGÖZ & KILIÇ, 2021) ^[1].

Financial analysis is an important assessment that can be done in order to reveal the financial status and the company's standing in order to survive in the market. The methods and models used by this analysis could emphasize the financial health of a firm (Shabani *et al.*, 2021) ^[21]. The long-term monitoring and analysis of a company's financial performance is essential for its future success & improvement purposes (Mushafiq *et al.*, 2021) ^[15].

The main motives of any business managers is to increase the company's profitability. Managers are always in search of methods to improve the earnings within the firm. In order to assess the profitability of a business, several key ratios are used to evaluate the attractiveness of a business as an investment. The DuPont equation is one of the most commonly used to measure firm's profitability. DuPont equation is widely used because known as sub-part of ratio analysis methodology to monitor and enhance a business's profitability and 'return'. The ratios that can describe the drivers of profitability for a business firm and the return to the shareholders are Return on Assets (ROA) and Return on Equity (ROE) (Padake & Soni, 2015) ^[16]. The relationship between profits and the investment is illustrated by a 'return on', indicating the firm's ability to generate profits (Liesz and Maranville, 2011) ^[12].

This particular method has commonly utilized in financial analysis due to the comprehensiveness of Return on Assets (ROA) in influencing both profitability and efficiency measures. In 1970s, financial analysis mainly focused on Return on Assets (ROA), leading to a modification of the DuPont model to include total assets to equity. The three distinct versions of DuPont model has contributes to uncover the main drivers of profitability and turnover. It has been widely used as a manual for analyst, directing the analyst to focusing on the strengths and weaknesses that needing improvement within financial statements (Timothy, 2022) ^[23]. Companies that have a complex financial structure also could utilize the DuPont model despite its apparent simplicity.

The profit margin can be broken down into its elements parts like tax burden, interest burden, and operating efficiency. These elements can give a better insights in understanding the individual significance (Khan *et al.*, 2022) ^[9]. Certainly, there are many versions that could be use depending on the research purpose (Rahman & Mia, 2018) ^[17]. In view of this, this study will focused on the objective to discover the parameters that has significant impact on ROE by using the simplicity of DuPont model for better decision making in the context of technology companies based in Malaysia.

The main purpose of this study is to investigate the ratios of the companies based on the DuPont model and ROE covering a period of ten years, from 2013 to 2022 by using the trend analysis. This study also aims to review and explore the financial performance and financial ratios, including profitability, assets turnover and equity multiplier ratios.

Problem Statement

The advancement of technology in Malaysia has become a subject of increasing interest in recent years, hence, it has a significant impact on the financial performance of the industry. In addition, Malaysia's digital transformation and initiatives towards a thriving technology ecosystem have been accelerated. The Fintech sector has also seen significant growth in the industry with a 27% increase in 2022 (Fintech News Malaysia, 2022) ^[8]. Consequently, there is a need to understand the variables that influence the financial performance of these technology-driven companies.

The main obstacle facing Fintech companies in Malaysia is the regulatory environment. The Fintech companies must follow certain aspects to ensure that the products and services that the companies are provided are in line with country's law and regulations, this is mandates by the central bank of Malaysia under Financial Technology Sandbox Framework (Mohsin *et al.*, 2022) ^[13]. For the Fintech startups, this regulatory structure poses a complicated set of challenges because companies must complies with all the requirements while aiming to be innovative and provide the best outstanding value for the consumer.

The Malaysian technology industry has been a key driver to the country's GDP in recent years (Basri *et al.*, 2015) ^[2]. However, there is limited studies on the financial performance within these technology companies using advanced analytical models (Rahim & Zainuddin, 2019) ^[7]. Thus, this study intent to fill the research gap by examined a company's profitability and financial performance of Malaysian technology firms.

Literature Review

There are variety of instruments that could measure and assess the financial status of a firm. Nonetheless, DuPont model is the tool that has been commonly used due to its ability and simplicity in managing the measurement of company's profitability. This tool also very practical in analyzing a company's financial standing and performance. The ROE is breakdown into three components: net profit margin (NPM), assets turnover (AT), and equity multiplier (EM). The previous studies have shown that DuPont model can be useful in simplifying intricate financial analyses and it could give managers access to a tool for strategic planning (Bunea *et al.*, 2019) ^[5].

The applicability of DuPont model has been more than a century and has been effectively used, it is extensively adopted (Waworuntu *et al.*, 2014) ^[25]. The introduction of DuPont was in 1919 by an F. Donaldson Brown who is an electrical engineer at DuPont company. Brown revealed that there is a relationship between net profit margin and assets turnover. These elements has shown a positive effect on the ROA (Mansoor, 2019) ^[14]. However, in 1970s the primary goal of financial management was changed from growing the ROA to maximize the ROE. The reason behind the changes due to the stock market downturn in late 1960s. After a while, the DuPont model was updated by including a new component, the equity multiplier (EM) (Bauman, 2014) ^[3]. This updated model was known as Modified DuPont Model.

In Malaysian context, Benjamin *et al.*, (2018) [4] has also used the modified DuPont model to examined the financial parameters that affect dividend policy and ROE. The revised model in the study are tax burden and operating efficiency. The results found that the elements positively affect the ROE. Then, Teh *et al.*, (2024) ^[24] examined the Goodness of Fit (GoF) by using the DuPont model in Malaysian Publicly Listed Companies (PLCs). The findings shows that the DuPont model can explained only 16.9% of the ROE in Malaysian PLCs. While other variables such as net profit and financial leverage has a weak impact on the ROE compared to total turnover.

The utilization of the DuPont model in Malaysian technology sector is inadequately supported by the literature. However, other countries has utilize the model to observed financial performance of companies in other industries. For instance, furniture industry and energy sector in Romania (Bunea *et al.*, 2019) ^[5]. These studies have shown the value of the DuPont model in analyzing the fundamental causes of return on equity and profitability. The findings stated that higher net profit and assets turnover leads to higher ROE. While the equity multiplier has a negative effect, this suggests that higher debt reduces return on equity.

Raza *et al.*, (2013) ^[18] investigate ROE of insurance industry in the South Asian. The results indicating that ROA and financial leverage has positively affect the profitability in that insurance companies included in the sample of the study. According to Kharatyan *et al.*, (2017) ^[10], companies with greater ROE have a benefits over their rival which resulting in larger investor returns. The analysis of the study has used 90 non-financial NASDAQ-100 firms. To identify the drivers of ROE, the least squares technique was applied. Apart from that, the study also has includes the modified DuPont model's elements such as price-to-earnings, price-to-book, and current ratios. Overall, the study observed eight indicators and found that all the variables impact ROE, but asset turnover has the greatest influence.

Researched by Kusi *et al.*, (2015) ^[11], used an econometric technique to test the significance of each elements of DuPont ratio on the ROE of financial sector in Ghana. There are 25 banks were used as a sampled for 7 years period from 2006 to 2012 and the study used panel regression in the data estimation method. The study shows that all of the elements from the five-step modified DuPont model have a positive and significant influence on ROE including tax and interest burden. However, the study identified a minor issues. Initially, the DuPont model was designed for merchandising companies, but when it was applied to financial sector, this approach failed to account for the unique structure of banks'

income statements which leads to irrelevant used of ‘sales’ term in the context of banking firms.

Methodology

Research Approach

In the current study, the financial performance of technology firms is examined and analyzed based on the theory of DuPont model. This model used ROE as a metric for financial performance while the predictors are net profit margins, assets turnover, and equity multiplier. This study used quantitative method for data collection. The deductive research is applied as a technique to observed the three predictors in explaining variations in financial performance by prior studies or this research uncovers new findings (Khan *et al.*, 2022) [9]. By employing a deductive approach, researchers can get from broad to specific conclusions. Researchers also can create and test the hypothesis and achieve certain result with the aid of deduction from multiple perspectives (Sobh & Perry, 2006) [22].

Research Paradigm

The positivist paradigm serves as the foundation for this study’s research paradigm. This approach assumes that reality is objective and can be examined, measured and analyzed through the empirical evidence. It focused on quantitative data and statistical approaches for testing

hypotheses and establishing causal linkages (Sekaran *et al.*, 2018) [20]. This study aims to identify the financial performance trends and patterns that can be applied across Malaysian technology firms. Utilizing this approach allows researchers to have accurate financial performance knowledge and more systematic strategies in data collection, analysis and interpretation. According to Saunders *et al.*, (2009) [19], when researcher focused on the facts or reality of the related study at hand, then using positivist research approach is the most appropriate method.

Variables and Hypothesis

This current study have one dependent variable (financial performance measured by ROE) and three independent variables (net profit margin, assets turnover, and equity multiplier). The hypotheses below was developed based on prior literature review:

- **H₁**: Net profit margin (NPM) has a positive and significant influence on financial performance.
- **H₂**: Assets Turnover (AT) has a positive and significant impact on financial performance.
- **H₃**: Equity Multiplier has positively and significantly affect the financial performance.

The operationalization and the expression of variables are provided in Table 1.

Table 1: Operationalization and Measurement of Variables

Components	Type	Operationalization	Expression	Source
Return on Equity (ROE)	Dependent Variable	Calculating financial impact of a company's operations	Net Income ÷ Shareholder's Equity	Adopted from CFA, Level-1, Financial Reporting & Analysis, (2018)
Net Profit Margin (NPM)	Independent Variables	Shows the percentage of revenue that becomes profit after expenses	Net Income ÷ Revenue	Adopted from CFA, Level-1, Financial Reporting & Analysis, (2018)
Assets Turnover (AT)	Independent Variables	The potential for a corporate entity to earn income through the use of assets	Revenue ÷ Total Assets	Adopted from CFA, Level-1, Financial Reporting & Analysis, (2018)
Equity Multiplier (EM)	Independent Variables	Capital structure's employment debt	Total Assets ÷ Total Shareholder's Equity	Adopted from CFA, Level-1, Financial Reporting & Analysis, (2018)

Econometric Equation

The econometric model is to express relationship between dependent and independent variables. This study is working with panel data thus, the equation are formed in equation 1 below:

$$Y_{it} = \beta_0 + \beta_1(X_1)_{it} + \beta_2(X_2)_{it} + \beta_3(X_3)_{it} + \epsilon_{it} \quad (1)$$

Where;

- Y: Represents the dependent variable (ROE)
- β₀: Unknown intercept of each entity
- β₁ - β₃: Represent the impact of each predictor on the DV
- X₁: Represents the predictor (NPM)
- X₂: Represents the predictor (AT)
- X₃: Represents the predictor (EM)
- ε: Represents the error term
- i: Number of firms under study
- t: Time period (2013-2022)

Sample and Time Span

The data on sampled companies was collected by Quantitative data collection method using secondary sources. The data on variables can be obtained from the annual report that can be accessed in Bursa Malaysia and

also on Refinitiv Eikon Datastream or now known as LSEG Eikon. The data spans of this study is a period of ten years, from 2013 to 2022.

Data Analysis

This study was analyzed by using descriptive statistical method and multiple linear regression. The statistical software that used in this study is by using STATA version 17.

Empirical Findings of Data Analysis

The statistical analysis is divided into two sections. The first section presents the summary statistics of ROE, NPM, AT and EM (Table 2). The second section is the findings of multiple regression to check the direction and significance of three independent variables on dependent variable (Table 3).

Table 2: Summary Statistics

Variable	N	Mean _i	Std. Dev _i	Min _i	Max _i
ROE	109	0.662	0.119	-0.464	2.04
NPM	109	0.589	0.150	-0.106	0.965
AT	109	0.795	0.293	0.294	1.955
EM	109	1.510	0.389	1.061	2.202

Table 3: Results of Multiple Linear Regression

Predictors	Coef.	Std. Err.	t-stat	p-value	95% Conf.	Interval	Sig
NPM	.774	.102	7.63	0.000	.574	.975	***
AT	.074	.026	2.85	0.005	.023	.125	***
EM	.026	.012	2.08	0.039	.001	.050	**
Constant	-.080	.028	-2.89	0.004	-135	-.025	***
Mean ROE	.064		SD ROE		.119		
R-squared	0.734		No. of observations		190		
F-test	19.85		Prob of F-stat		0.000		

*** $p < .01$, ** $p < .05$

Source: Authors' computation

Table 3 show a multiple linear regression and this model also used Robust standard errors to address potential heteroskedasticity. The standard errors increased minorly, but the coefficients remained the same. This corrective approach is to ensures more reliable p-values and confidence intervals.

The regression results in table 3 shows that NPM has positive coefficient ($\beta=0.774$) which indicates that a unit increase in NPM leads to 0.774 units increase in ROE. The results was also seen statistically significant with p-value < 0.01 . While the AT also observed has positive coefficient of ($\beta=0.074$) with p-value <0.01 , which implies that a unit increase in AT leads to an average increase of 0.074 units in ROE. The positive coefficient of EM was stated to significant with ($\beta=0.026$) and p-value <0.05 . It means that a unit increase in EM cause an increase in ROE by 0.026. In overall, the model fitness was also statically significant (F-test=19.85, $p < .01$). The model's R-squared is high at 0.734, this indicates that 73% of the financial performance (measured by ROE as a proxy) is explained by the three independent variables. Therefore, it can be conclude that the multiple regression model used in this study is better than null model with no metrics.

Discussion and Conclusion

The main purpose of this study was to assess the impact of three main elements from the DuPont model (NPM, AT, and EM) towards the technology companies of Malaysia. The findings of the study are align with the previous literature reviews. The results of net profit margin (NPM) and assets turnover (AT) were found positively and significantly impacted ROE and these findings supported by Bunea *et al.*, (2019) ^[5] and Teh *et al.*, (2024) ^[24], while equity multiplier also shows positive and substantial influence on ROE and this result is align with Raza *et al.*, (2013) ^[18] and Kharatyan *et al.*, (2017) ^[10]. Therefore, it can be concluded that NPM, AT, and EM have significant impact in return available to shareholders of the technology companies in Malaysia. According to Kharatyan *et al.*, (2017) ^[10], companies that have higher ROE have the advantage over their rival in the same industry and will leads to larger investor returns.

This study only includes 190 technology companies thus, future studies could broaden this research by adding a larger and more diverse sample of firms. Moreover, adding other sectors in the study also beneficial in understanding the financial performance across a variety of industry. Lastly, by extending the time period of the study could also provide further insights into the drivers of financial performance.

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