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The Effect of Resource Efficiency on the Firms' Performance and Value: Evidence from Panel Data Analysis among the Publicly Listed Firms in the Philippines

Gerry O. Gatawa

Saint Louis University

holygerry@yahoo.com

Abstract

Resource efficiency is among those priorities of financial managers to optimize the utilization and cycles of the firm's resources. Resource efficiency could eventually improve the firm's financial performance and market value, benefiting the shareholders. This study aims to evaluate the effect of the resource efficiency of listed firms on their performance and value indicators such as net profit margin (NPM), earnings per share (EPS), and market price per share (MPPS). Proxy indicators were used to reflect the firms' resource efficiency, such as inventory turnover (ITO), payables turnover (PTO), working capital turnover (WCTO), cash conversion cycle (CCC), fixed assets turnover (FATO), and total asset turnover (TATO). A quantitative method was employed using panel data from the audited financial statements of 100 listed firms in the Philippines from 2015 to 2019. It was found that resource efficiency has a significant effect on the firm's performance and value, as observed in the effect of CCC and TATO on EPS and the effect of CCC, WCTO, and FATO on NPM, and the effect of FATO on MPPS. This implies that the financial managers' resource efficiency decisions are relevant to the firm's performance and value. Hence, financial managers should focus on the firm's resource efficiency since it is critical to the shareholders' concern about its performance and value.

Keywords: *Resource efficiency, firm's performance, firm value, cash conversion cycle, fixed assets turnover, total assets turnover, earnings per share, net profit margin, market price per share*

Introduction

The firm's performance and value are priority concerns of financial managers to satisfy the shareholders' expectations. Firms can communicate a strong image to the shareholders and stakeholders if they can improve their performance and value. The shareholders are the owners of the firm who expect the corporate leaders and financial managers to create meaningful strategies and activities so that the firm would have a good performance and its market value would be improved. Among those strategies and activities include careful management of resources, which should be utilized efficiently to maximize the returns and earnings they generate. When the firm attains resource efficiency, they create value for the shareholders that could attract further other stakeholders such as investors, creditors, suppliers, and customers. A good firm value attracts more investors and other stakeholders to participate in the firm's continuity and sustainability (Cambariha & Sucuah, 2016). Giving attention to the firm's value sustains the firm's competitive position, and they can continually operate their business and are guaranteed the availability of funds from investors.

Resource efficiency is among the critical aspects of the business. This is a process wherein the firm utilizes its assets (resources) in its everyday business operation to produce good products and services. Firms are efficient if they can use their assets to cope with their business's requirements and maintain reasonable costs while operating. Through their resources, they can maximize their outputs and generate more significant revenue while utilizing their available

resources and possibly minimizing idle resources and costs. It is imperative to consider resource efficiency in the business operation since it could affect the firm's overall profitability, which most shareholders and potential investors look at. Hence, this could affect the firm's market value, whereas investors perceive favorable prospects. According to Patin et al. (2020), the firm's level of resource efficiency could improve the stock price because the firm's competitive position would be improved.

Firms need to manage their resource efficiency to maintain their growth. Firms should have a proper choice of activities, strategies, and policies in order for them to attain sustainable financial performance (Ochieng, 2018). Firms also need to use financial ratios to measure their ongoing processes and compare them with firms in the same industry to evaluate whether they are performing well and implement improvements in their day-to-day activities. With proper resource efficiency management, firms could keep up with the dynamic changes in business operations and be comparably at par with their competitors. Monitoring resource efficiency using ratios can allow the firms to improve, which could allow them to target their desired profitability (Santosuosso, 2014) and set benchmarks that could help their managers to perform proactively and efficiently (Gatawa, 2021).

Financial analysts and investors consider resource efficiency an essential determinant of whether the firm's management performs satisfactorily. They can evaluate if the firm has favorable activities, strategies, and policies related to their resources and compare them with benchmarks to select good firms where they can invest (Martani et al., 2009). They prefer investing in firms with evidence of satisfactory resource management activities because the firm's performance is at stake. Ideally, every investor seeks profitable investments; hence they would invest in firms that are resource' efficient and operationally performing. Businesses should

focus on resource efficiency because it could affect the entire business function and influence the firm's profitability. If a firm becomes profitable, financial analysts and investors are willing to invest, which would improve the firm's market value.

Resource efficiency is a crucial business concept since it could potentially affect the firm's performance and value. However, limited studies focus on measuring the effect of resource efficiency by utilizing resource efficiency ratios on firms' performance and value. Hence, this research intends to fill this literature gap in financial management and bring implications that could be useful to contemporary financial managers regarding their resource management decisions. In light of these, the objectives of the study are:

1. Interpret the resource management of firms based on the efficiency ratios.
2. Determine the relationship of efficiency ratios to firms' profitability and value.
3. Determine the effect of efficiency ratios on firms' profitability and value.

Relevance of Resource Efficiency on Firms' Performance and Value: Empirical Perspective

Among the concerns of firms is to develop financial strategies in order for them to adhere to the expectations of the shareholders who have entrusted their resources in order for them to increase their wealth (Gatawa, 2022). With this, resource efficiency should be a concern of the management in order for them to guarantee proper utilization of resources that leads to improving the firm's performance and value. Favorable performance of the firm could allow the shareholders to receive dividends and thereby attract more investors to the firm. Resource efficiency involves tracking the firm's assets and measuring the cycles to ensure that they are appropriately utilized, and idle assets are minimized. By doing this, the firm's cash flow can be improved, allowing the firm to expand and acquire more resources that will essentially benefit the shareholders. In addition, the firms could reduce their transaction costs and minimize their

operating expenses, allowing them to earn profit. The firm's profit benefits the shareholders since they could earn dividends and eventually benefit them in terms of market value. The study of Qaisi (2020) found that resource efficiency could improve the stock price of publicly traded firms.

Resource efficiency is relevant to firm value since it communicates to the investors how well the firm is exerting its effort to safeguard its resources and improve its cash flow and performance. This would translate to the market price per share since more investors are willing to invest if they can assess that firms are expected to generate cash flow and sustain their resources longer (Marsha & Murrtaqi, 2017; Karaca & Savsar, 2012). Resource efficiency ensures quality in terms of utilization of assets whereby wastages and unnecessary costs are avoided. Investors and financial analysts assess a firm's market price per share by comparing the financial statements of publicly listed firms (Arkan, 2016). They will assess the asset turnovers and relate them to the firm's profit and sales (Bhatnagar et al., 2014).

The Measurement of Resource Efficiency through Ratios

The firm’s resource efficiency can be measured through standardized financial ratios. Ratios are generally used among financial managers, analysts, and investors since they can assess the firm's performance and compare them across firms. Efficiency ratios represent how well the management can utilize or revolve their resources to generate revenue and support their needed expenditures. Efficiency ratios are related to the regular business operation of the firm that enables them to generate revenue or sales. They represent the firm's performance in handling its resources and generating additional cash flow. According to Patin et al. (2020), efficiency ratios are essential to balance how firms use their assets to generate cash flow.

Inventory Turnover (ITO). The ITO is calculated as the cost of goods sold divided by the average inventory. It measures how often the firm could turn over or cycle its inventories. It represents how often the inventories were replenished and sold over a specific period (Mappanyuki & Sari, 2017). In a merchandising firm, inventories are goods for sale, while in a manufacturing or service firm, inventories are raw materials, work-in-process, and finished goods. The ITO results indicate how well the firm is efficient in managing its inventories and how well its products perform in the market. Yornu and Ackah (2020) mentioned that if inventories do not turnover rapidly, then that means that the firm has tied up much of its cash on unproductive or obsoleted inventories; hence the firm's cash will be affected. A speedy ITO is more desirable than a slow ITO.

Payables Turnover (PTO). The PTO is calculated as net credit purchases divided by average trade payables. Payables indicate how well the firm utilized trade credit facilities to support its operation. Although payables are liabilities, they are resources entrusted by suppliers to the firm which could expand the current business of the firm. The PTO is an essential component of the firm's cash conversion cycle. Additionally, it measures the firm's effectiveness in settling its obligations promptly and taking advantage of discounts (Itler, 2020). In the study of Achode and Rothich (2016), PTO refers to the number of times accounts payable have been used over time, demonstrating how firms would pay off their obligations.

Working Capital Turnover (WCTO). The WCTO is calculated as net sales divided by average net working capital. It measures the use of working capital for the firm to generate revenue or sales. It represents the firm's daily operation on how efficiently they are utilizing its net working capital (current assets minus current liabilities) to sustain its operation. It measures the firm's efficiency in its day-to-day use of its internal resources (Chakraborty, 2013). High

WCTO indicates that the firm is efficiently using its working capital, which means that they are fully utilizing its current resources in order to generate revenue or sales. This means that cash is revolving, and current assets are being supported. The WCTO shows how the current assets are supported and immediately converted into cash (Nurlaela et al., 2019).

Cash Conversion Cycle (CCC). The CCC is calculated as the sum of inventory, receivable, and payable days. It is a significant financial metric used to determine the firm's efficiency in selling its inventories, collecting its receivables, and repaying its trade payables. It represents the period that the firm's cash is committed to the operation of the business until such time that it will be reverted as cash. According to Wang (2019), the CCC captures the fundamental feature of the firm's operation: they purchase goods for sale, sell them to customers, collect payments, and repay their liabilities from trade suppliers.

Fixed asset turnover (FATO). The FATO is calculated as net sales divided by average fixed assets. It measures how well the firm generated revenue from using its fixed assets. Firms would invest in fixed assets to support their operation, and they must be able to justify their vast expenditure with their revenue. The FATO indicates how well the firm could generate revenue or sales from their investments, which they should be investing productively (Warrad & Al Omari, 2015). In the study of Sunjoko and Arilyn (2016), they stated that FATO measures the firm's ability to use its fixed assets to generate sales. A high FATO means the firm efficiently uses its fixed assets, investing in fixed assets to support production and sales and avoiding costly investments.

Total asset turnover (TATO). The TATO is calculated as sales divided by average total assets. It measures how well the firm can utilize its resources to generate sales or revenue. It evaluates the firm's overall investment efficiency by totaling the joint effect of both short-term

and long-term assets. In the study of Patin et al. (2020), in the U.S., the TATO is correlated with the stock price among publicly listed firms. This means that when firms are efficient in utilizing their resources, they can communicate to investors and financial analysts that they are doing well in managing their resources. Hence, investors will be attracted to invest.

Firm Performance and Value Indicators

The management of firms exerts their efforts to find an opportunity to improve the firm's performance and value. Firm performance reflects the company's effectiveness in generating profit from its operation and providing benefits to the shareholders. Shareholders would benefit from the earnings per share (EPS) and the increased market value of their shares. The firm value is a concept that reflects the firm's perceived value by the investors as reflected in the market price per share (MPPS). The firm's value increases if more and more investors are willing to join the firm, which results in an increased price of the firm's stock. This way, the shareholders could realize more incredible wealth from their investments. Hence, management is pressured to find and seize any opportunity to improve the firm's performance and value.

Net Profit Margin (NPM). The NPM is calculated as net income divided by net sales. It measures the firm’s ability to generate income from its revenue-generating activities. It is thought to be the most effective instrument for measuring or monitoring the financial status of companies (Avlokulov, 2018). According to Mogonta and Pandowo (2016), it is a measure of the overall effectiveness of management in generating profits from its revenues. Also, Pandey and Diaz (2019) stated that NPM shows a firm’s financial performance by measuring how efficiently a firm uses its assets to produce sales over a year. An increasing NPM means that the firm is effective and efficient in handling costs and expenses in the operating cycle.

Earnings per Share (EPS). The EPS is calculated as net income after paying preferred dividends divided by average outstanding common shares. It indicates the firm's ability to provide profit for the shareholders' money invested (or equity). The EPS is important to investors since they can assess whether their investments are superior. The study by Bergeron (2011) mentioned that investors are interested in the firm's EPS because this is an essential factor in the firm's MPPS.

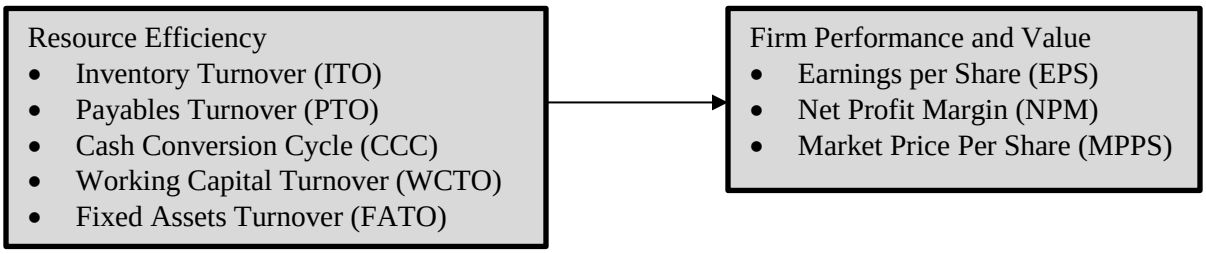
Market Price per Share (MPPS). The MPPS is the market price of the firm's stock on an organized exchange. Publicly listed firms are concerned about their stock price since their shareholders are at stake. At the same time, firms could easily tap greater capitalization when their stock price is in demand among investors. The MPPS represents the firm value per share resulting from the buyers' and sellers' expectations about the firm (Menaje, 2012). The MPPS sets the realistic value of publicly listed firms and is the most famous indicator of firm value.

Framework

The study's conceptual framework is presented below (Figure 1), wherein the firm's resource efficiency is measured through proxy variables such as ITO, PTO, CCC, WCTO, and FATO. The firm performance and value proxy indicators are EPS, NPM and MPPS. The study's independent variable is resource efficiency, and the dependent variable is firm performance and value. The econometric modeling and hypotheses were presented in the methodology section.

Figure 1

Conceptual framework of the study



Methodology

Research Design

This study used panel data analysis of 100 publicly listed firms in the Philippines with a complete and balanced data set. The selection criteria are in terms of the completeness of the data for the independent variables: inventory turnover (ITO), payables turnover (PTO), cash conversion cycle (CCC), working capital turnover (WCTO), fixed asset turnover (FATO), total asset turnover (TATO); and for the dependent variables: earnings per share (EPS), net profit margin (NPM) and market price per share (MPPS). The study is a 5-year panel data that accounts for 2015 to 2019. The years 2020 and 2021 were not included due to incomplete data from the 100 firms.

Treatment of the Data.

The data for MPPS was transposed into natural logarithmic form (ln) base of the number e where e=2.7183 to minimize the non-normality of the data since it is expressed in monetary terms. A natural logarithm was used to interpret the coefficients as approximate in proportional differences (Gelman & Hill, 2007). Afterward, the data were subjected to normality and multicollinearity tests. The Shapiro-Wilk Test was used for normality, and the results suggest the non-normality of the variables at a 0.05 significance level. The multicollinearity of the variables

was determined using the variance inflation factor (VIF) and found no multicollinearity issues (VIF<5). In conducting panel data, rigorous tests must be undertaken to generate unbiased results. Panel data analysis can be done through static or dynamic panel data.

Econometric Modelling

There are three (3) models in static panel data analysis, namely: (1) pooled ordinary least squares (OLS), (2) fixed effect and (3) random effect. Using the efficiency ratios indicators, the static models are presented as:

Pooled OLS:

$$Y^{g} = \alpha + \beta_1 \text{ITO}_1 + \beta_2 \text{PTO}_2 + \beta_3 \text{CCC}_3 + \beta_4 \text{WCTO}_4 + \beta_5 \text{FATO}_5 + \beta_6 \text{TATO}_6 + \varepsilon \quad (1)$$

Fixed Effect:

$$Y_{it}^{g} = \alpha_{it} + \beta_1 \text{ITO}_{1it} + \beta_2 \text{PTO}_{2it} + \beta_3 \text{CCC}_{3it} + \beta_4 \text{WCTO}_{4it} + \beta_5 \text{FATO}_{5it} + \beta_6 \text{TATO}_{7it} + \varepsilon_{it} \quad (2)$$

Random Effect:

$$Y_{it}^{g} = \alpha_{it} + \mu_{it} + \beta_1 \text{ITO}_{1it} + \beta_2 \text{PTO}_{2it} + \beta_3 \text{CCC}_{3it} + \beta_4 \text{WCTO}_{4it} + \beta_5 \text{FATO}_{5it} + \beta_6 \text{TATO}_{6it} + \varepsilon_{it} \quad (3)$$

Where i denote listed firms in the Philippines, year is **t**, and the firm performance and value measures are Y^{g} with g = EPS, NPM, and lnMPPS. The independent variables are inventory turnover (ITO), payables turnover (PTO), cash conversion cycle (CCC), working capital turnover (WCTO), fixed asset turnover (FATO), and total asset turnover (TATO).

The dynamic panel regression model was considered in the study in which the lagged (T-1) dependent variables are included as independent variables. The modified model from its static form into a dynamic model is specified as:

$$Y_{it}^{g} = \alpha_{it} + \beta\, Y_{it-1}^{g} + \delta_1 \text{ITO}_{1it} + \delta_2 \text{PTO}_{2it} + \delta_3 \text{CCC}_{3it} + \delta_4 \text{WCTO}_{4it} + \delta_5 \text{FATO}_{5it} + \delta_6 \text{TATO}_{6it} + \mu_i + \varepsilon_{it} \quad (4)$$

Where $\boldsymbol{Y_{it}^{g}}$ refers to the financial performance and value indicators of the listed firms at a point in time, $\boldsymbol{\alpha}$ is the intercept, $\boldsymbol{\beta}$ is the slope of coefficient (short-run effect of Y_{it-1}), $\boldsymbol{\delta}$ is the slope coefficient of the independent variables, $\boldsymbol{\mu}$ is the individual specific effects, and $\boldsymbol{\varepsilon}$ is the error term. However, as Nickell (1981) points out, equation (4) leads to biased estimators since fixed-effect estimators are inconsistent and are associated with the error component, which violates the vital condition of exogeneity of fixed estimators. As a result, instrumental variables must be used to address endogeneity and inconsistent estimators. As a result, Anderson and Hsiao (1981) defined earlier lag as instrumental factors such as the dependent variable's first or second difference. The proposal may be feasible, but Arellano and Bond (1991) later stated that it is asymptotically inefficient since it does not take advantage of general moment conditions.

Arellano and Bond (1991) developed the dynamic panel data (DPD) into the Generalized Method of Moments (GMM), which tries to capture all available information by adding additional lags of the dependent variables as instrument variables. The GMM employs a two-stage estimator, with the first stage assuming homoscedasticity and independence of the error term. The second step uses the residuals from the first two stages to calculate estimates, ignoring the assumptions of homoscedasticity and independence (Khadraoui & Smida, 2012). Later, Arellano-Bover (1995) and Blundell and Bond (1995) introduced changes to the Arellano-Bond DPD estimator (1998). The modification included lagged levels as well as lagged differences. The original estimator is called *difference GMM*, while the expanded estimator is called *system GMM*. The difference GMM transforms the data by removing the fixed effects to resolve endogeneity, and also, the system GMM resolves endogeneity, heteroscedasticity, and autocorrelation. By adopting the GMM equations, the equation is formulated as:

First difference equation:

$$\Delta Y_{it}^{g} = \alpha \Delta Y_{it-1}^{g} + \beta_1 \Delta ITO_{1it} + \beta_2 \Delta_{ln} PTO_{2it} + \beta_3 \Delta CCC_{3it} + \beta_4 \Delta WCTO_{4it} + \beta_5 \Delta FATO_{5it} + \beta_6 \Delta TATO_{6it} + \Delta \varepsilon_{it} + \gamma \Delta \varepsilon_{it-1} \quad (5)$$

The difference GMM suggests that the farthest lag of ε_{it} is $\varepsilon_{it-2;}$ however, if exclusion criteria could not be met, the system GMM could expand the equation to three or more significant lags. The Sargan (1958) test will be used primarily to determine whether or not the instruments utilized are uncorrelated with the residuals. Thus the additional moment conditions for the equation would be:

$E[\Delta Y_{it-1}^{g} \ \mu_{it}] = 0$ where $\mu_{it} = \eta i + v_{it}$

$E[\Delta Y_{it}^{g} \ \mu_{it}] = 0$

The autocorrelation tests of the residuals are another essential diagnostic of GMM estimation. The difference equation's residuals are assumed to have serial correlation, but the differenced residuals should not have significant AR (2). If AR (2) is insignificant in the first-difference regression, the results are validated because there is no second-order serial correlation.

Results

This research determines the effect firm's resource efficiency on firm performance and value. Panel data analysis was used in this study in order to quantify the influence of resource efficiency on NPM, EPS, and MPPS using a static and dynamic approach. Various tests were undertaken using static and dynamic panel data to assess the validity of the regression models, including tests for multicollinearity, normality, heteroscedasticity, and autocorrelation.

Table 1

Descriptive Statistics, Normality, and Multicollinearity Tests of the Data

Description	ITO	PTO	CCC	WCTO	FATO	TATO	EPS	NPM	MPPS
Mean	8.78	3.18	628.44	11.14	1.96	0.67	7.02	0.1481	97.41
St. Dev.	22.61	4.51	2,256.98	80.77	5.89	0.35	19.94	0.1602	282.06
Max	396.04	55.55	27,016.65	1,760	80.59	4.41	162	1.01	2,229.31
Min	(0.26)	(1.69)	(614.32)	.08	0.02	0.05	(2.70)	(0.21)	0.39
Observ.	500	500	500	500	500	500	500	500	500
Shapiro-Wilk	0.222	0.373	0.0.341	0.078	0.240	0.756	0.391	0.873	0.355
p-value	0	0	0	0	0	0	0	0	0
Normal	No	No	No	No	No	No	No	No	No

Table 1 presents the means and standard deviations of the variables. The mean values of inventory turnover (ITO), payables turnover (PTO), cash conversion cycle (CCC), working capital turnover (WCTO), fixed assets turnover (FATO), and total assets turnover (TATO). As observed, the firms have an average of eight (8) completed inventory cycles and three (3) times payable cycles. The firms have an average of 628 days of CCC, indicating that they have an extended period to recover their cash after utilizing it in their operation. The WCTO shows that the firms were able to utilize their working capital, and they were able to generate revenue (11.14 times) from using their net working capital. The FATO also shows that they were able to generate revenue from the use of their fixed assets. Overall, the TATO indicates that the firms were able to generate revenue from the use of their resources. The firms were able to utilize their resources to generate revenue. However, they have difficulties in turnovers, which causes a delay in recovering their cash. In terms of the firm's EPS, the mean value is 7.02 (Philippine peso), indicating that the firm is generating a return for the shareholders. Also, the firm's net profit margin shows a mean value of 14.81%, which shows that the firms are earning from their revenue-generating activities. The mean value of market price per share (MPPS) is 97.41

(Philippine peso) with a standard deviation of (±282.06) which gives a notion that investors are active in the trading of stocks in the market (i.e., Philippine Stock market)

The results of the Shapiro-Wilk test indicate that the data obtained from publicly traded companies are not normal. The VIF multicollinearity test indicates that ITO (VIF=1,253) and PTO (VIF=1,740.18) have an issue with multicollinearity, which is understandable given that they are theoretically related in the balance sheet. These variables' natural logarithm was used to reduce the influence of non-normality and high multicollinearity, but multicollinearity remains an issue. Hence, they were excluded from the equation.

Analysis of the Static Panel Data Estimations

Table 2

Static Panel Data Estimate for the NPM Model

Variables	Pooled OLS		Random Effect		Fixed Effect	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Constant	0.1846	4.68e-05***	0.1722	0.0005***	0.3101	0.0502*
CCC	-0.0003	0.8710	-0.0009	0.9221	-0.0076	0.2868
WCTO	-2.07e-05	0.8099	5.44e-06	0.3464	7.57e-06	0.8626
FATO	-0.0066	1.13e-07***	0.0086	0.9159	0.0085	2.33e-019***
TATO	-0.0431	1.14e-06***	-0.0131	0.1366	0.0020	0.8727
S.E. of regression		0.1542		5.6692		0.0682
Adjusted R-squared		0.0724		-		0.2233
Observations		500		500		500

Table 3

Static Panel Data Estimate for the EPS Model

Variables	Pooled OLS		Random Effect		Fixed Effect	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Constant	17.658	0.001***	15.7707	0.0365**	16.3432	0.0823*
CCC	-0.3975	0.0950*	-0.3579	0.2749	-0.3874	0.3591
WCTO	-0.0074	0.4826	0.0014	0.5768	0.0014	0.5970
FATO	-0.1070	0.4774	0.0495	0.3470	0.0513	0.3466
TATO	-2.5894	0.0158**	-1.4433	0.0456**	-1.3288	0.0800
S.E. of Regression		18.84		18.884		4.0539
Adjusted R-squared		0.0102		-		0.0098
Observations		500		500		500

Table 4

Static Panel Data Estimate for the lnMPPS model

Variables	Pooled OLS		Random Effect		Fixed Effect	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Const	2.3888	6.14e-084***	0.9041	0.1642	0.2526	7.36e-152***
CCC	0.0329	0.7640	0.0901	0.0014***	0.1186	0.2474
WCTO	0.0017	0.0844*	0.0001	0.5723	0.0001	0.4293
FATO	-0.0029	0.1000	-0.0094	0.0346**	-0.0103	0.5486
TATO	-0.4082	0.0007***	-0.0332	0.5888	-0.0098	0.0046
S.E. of regression		1.6698		1.6969		0.3417
Adjusted R-squared		0.0262		-		0.0456
Observations		500		500		500

The results in Table 2 show that in the pooled OLS, the FATO and TATO have statistical significance in firms' NPM. It shows that the FATO and TATO harm the firms' NPM. This means that the NPM can decline if firms are not efficient in managing their fixed assets and total assets. Meanwhile, the fixed effect shows that the FATO positively affects the firms' NPM. This means that across firms, the FATO is a significant resource efficiency indicator that could allow firms to improve their performance. The random effect presents no signs of the resource efficiency ratios on the NPM.

In Table 3, the pooled OLS and the random effect show that TATO has statistical significance on the firms' EPS. The pooled OLS manifest that the TATO can diminish the firms' EPS if firms would not give attention to their resource efficiency activities. The random effect presents that the TATO has a varying negative effect across the firms. Thus, each firm would have to implement appropriate resource management activities. The fixed effect shows that resource efficiency does not affect the firms' EPS.

In Table 4, the results of the pooled OLS show that WCTO and TATO significantly affect the proportional change in MPPS. It presents that the WCTO has a positive effect on MPPS while the TATO has a negative effect. The random effect shows that the CCC positively

affects the MPPS while the FATO has a negative effect. The fixed effect shows that resource efficiency ratios do not significantly affect the proportional changes in MPPS.

As observed, the results of the static panel data provide mixed results. This would necessitate autocorrelation and heteroscedasticity testing to appropriately select the model. The testing process would also determine whether the results of static panel data are valid and pursue further tests to choose the appropriate regression model.

Autocorrelation and Heteroscedasticity Testing

Testing for autocorrelation and heteroscedasticity was done to validate the results of the static panel data. The Wooldridge test was used to determine autocorrelation, given the null hypothesis of "no first-order autocorrelation." White's test was employed for pooled OLS heteroscedasticity testing, with a null hypothesis of "heteroscedasticity not present." The Wald test for heteroscedasticity was employed for F.E., with the null hypothesis being that "the units have a common error variance."

Table 5

Results of Autocorrelation and Heteroscedasticity Testing

	Pooled OLS	Fixed Effect	Random Effect
Wooldridge Test			
Model: EPS	t(99)= 31.3845; p-value= 2.97e-053	F(1,99)= 15.6877 p-value= 0.00014	F(1,99)=15.6877; p-value= 0.00014
Model: NPM	t(99)= 18.6838; p-value= 3.15e-034	F(1,99)= 12.7079 p-value= 0.00056	F(1,99)=12.7079; p-value= 0.0006
Model: lnMPPS	t(99)= 118.33; p-value= 1.99e-108	F(1,99)= 114.16 p-value= 1.063e-240	F(1,99)=30.1214; p-value= 3.129e-007
Heteroskedasticity Test			
Model: EPS	White's Test: LM= 19.9189; p-value= 0.1327	Wald Test: Chi-square(100)= 3.24e009; p-value= 0	-
Model: ROE	White's Test: LM= 25.7098; p-value= 0.0.0282	Wald Test: Chi-square(100)= 3.23e007; p-value= 0	-
Model: lnMPPS	White's Test: LM= 22.0697;	Wald Test:	-

	p-value= 0.0772	Chi-square(100)= 1.21e006; p-value= 0

The autocorrelation tests reveal autocorrelation issues in pooled OLS, F.E., and RE results. The pooled OLS presents no heteroscedasticity issues for the EPS model in the heteroscedasticity tests; however, all models for F.E. present a problem in terms of heteroscedasticity. Because of autocorrelation and heteroscedasticity issues, the results of static panel data are deemed inaccurate (Habimana, 2016), and estimations are biased and inconsistent.

Analysis of the Dynamic Panel Data Estimations

Due to the issues from the results of static panel data, the study would focus on the results of the DPD estimations. It is probable that historical trends of EPS, NPM, and MPPS and along with the efficiency ratios, can both influence the firm's performance and value. The dynamic panel regression estimates are presented in this part using the 1-step and 2-step GMM-DIFF, where the 1-step is the initial regression that is still meaningful even in heteroscedasticity. In contrast, the 2-step has reduced asymptotic errors, improving efficiency. The GMM-DIFF values are validated by the results of A.R. (1&2) and the Sargan tests. The GMM-SYS will be utilized to increase the efficiency of the estimates.

Table 6

Dynamic Panel Data Estimate for the NPM Model

Var.	GMM-DIFF				GMM-SYS			
	1-Step		2-Step		1-Step		2-Step	
	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.
NPM (T-1)	0.3912	4.89e-05**	0.3928	0.015**	0.4126	3.57e-06***	0.4142	4.36e-06***
CCC	-0.0508	0.3811	-0.0318	5.27e-024***	0.0053	0.7159	0.0042	0.7555
WCTO	-1.86e-05	0.5718	-2.42e-05	0.0002***	-1.66e-05	0.5923	-2.19e-05	0.5783

FATO	0.0074	4.62e-09***	0.0075	0.2206	0.0073	1.15e-08***	0.0074	2.46e-06
TATO	-0.0324	0.4737	-0.0375	0.6867	-0.0140	0.744	-0.0183	0.7316
Const	0.0007	0.9154	6.22e-06	0.0601*	-0294	0.931	-0.0014	0.9965
S.E.		0.104		0.103		0.106		0.105
I.V.		43		43		46		46
Obs.		300		300		400		400
AR(1)	z= -1.40	0.1603	z= -1.59	0.111	z= -1.46	0.144	z= -1.60	0.109
AR(2)	z= -0.70	0.4850	z= -0.66	0.512	z= -0.64	0.523	z= -0.60	0.546
Sargan	Chi(37)= 116.37	0.000	Chi(37)= 35.22	0.5527	Chi(40)= 130.11	0.000	Chi(40)= 43.36	0.3299
Wald Test	Chi(5)= 141.71	0.000	Chi(5)= 134.79	0.000	Chi(5)= 441.51	0.000	Chi(5)= 404.74	0.000

Table 7

Dynamic Panel Data Estimate for the EPS Model

Var.	GMM-DIFF				GMM-SYS			
	1-Step		2-Step		1-Step		2-Step	
	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.
EPS (T-1)	-0.0296	0.8740	-0.0315	0.8727	0.815	3.35e-06***	0.9053	3.50e-06***
CCC	-4.5423	0.1601	-2.5859	0.2251	-3.0178	0.0905	-2.6037	0.097*
WCTO	-0.0008	0.6655	-0.0009	0.6242	0.0004	0.7224	0.0018	0.101
FATO	0.1452	0.0555*	0.0933	0.1441	0.1147	0.2690	0.0832	0.239
TATO	-5.1016	0.0236**	-3.6791	0.0084***	-5.6485	0.1044	-4.3025	0.028**
Const	0.1648	0.1460	0.4214	0.2212	71.576	0.079*	61.371	0.915
S.E.		5.2457		5.0675		12.43		10.885
I.V.		43		43		46		46
Obs.		300		300		400		400
AR(1)	z= -0.38	0.7017	z= -0.80	0.6690	z= -1.67	0.095	z= -1.79	0.074
AR(2)	z= -1.53	0.1260	z= -1.49	0.1545	z= -1.08	0.337	z= -0.95	0.3436
Sargan	Chi(37)= 153.77	0.000	Chi(37)= 39.62	0.3540	Chi(40)= 48.53	0.1669	Chi(40)= 45.22	0.2631
Wald Test	Chi(5)= 6.6161	0.251	Chi(5)= 8.08	0.1517	Chi(5)= 66.27	0.000	Chi(5)= 69.32	0.000

Table 8

Dynamic Panel Data Estimate for the lnMPPS model

Var.	GMM-DIFF				GMM-SYS			
	1-Step		2-Step		1-Step		2-Step	
	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.
lnMPPS (T-1)	0.1465	0.374	0.1284	0.413	0.6171	0.0001 ***	0.6171	0.0004***
CCC	0.3836	0.255	0.2860	0.319	8.62e-06	0.348	0.1829	0.399
WCTO	-8.34e-05	0.568	-6.43e-05	0.507	0.0003	0.994	9.86e-07	0.883
FATO	-0.0087	0.090*	-0.0074	0.175	-0.1026	0.621	0.0026	0.656
TATO	-0.0107	0.927	-0.0019	0.984	0.0362	0.347	-0.1536	0.404
Const	-0.0609	0.1434	-0.0563	0.124	0.3268	0.490	-2.8438	0.568
S.E.		0.4085		0.394		0.940		0.8799
I.V.		43		43		46		46
Obs.		300		300		400		400
AR(1)	z= -1.49	0.1365	z= -1.21	0.2269	z= -3.03	0.002	z= -2.17	0.0302
AR(2)	z= 0.80	0.4248	z= 0.49	0.6242	z= 0.662	0.508	z= 0.528	0.5975
Sargan	Chi(37)= 67.34	0.002	Chi(37)= 43.02	0.2292	Chi(40)= 20.62	0.995	Chi(40)= 56.17	0.046
Wald Test	Chi(5)= 13.57	0.0186	Chi(5)= 6.89	0.2289	Chi(5)= 60.77	0.000	Chi(5)= 60.38	0.000

The results of the dynamic panel data (DPD), as shown in Table 6, present that the historical NPM of the firm has a significant effect on its current NPM. The firm's previous years' profitability positively affects its present profitability. In addition to their historical profitability, some firms' resource efficiency ratios significantly affect their NPM. For instance, the FATO positively affects NPM as it was derived from the 1-step GMM-DIFF and 1-step GMM-SYS. The firm's ability to utilize its fixed assets can increase its profitability. The result affirms the findings of Chowdhury and Chowdhury (2010), who also found that FATO can affect the firms' performance which can increase the firms' profitability if efficiently managed. Meanwhile, the result shows that the WCTO harms the firms' NPM derived from the 2-step GMM-DIFF. This means that when firms have a slow WCTO or are not generating adequate revenue from their working capital, this could diminish their profitability.

Table 7 presents the DPD estimation for the EPS model. As observed in the 1-step and 2-step of GMM-SYS, the present EPS can be significantly influenced by the firms' historical EPS. This means that the firms' earnings concerning the shareholdings could allow them to increase their EPS continually. In addition, the FATO can positively affect the firm's EPS as derived from the 1-step GMM-DIFF. This means that if firms could efficiently utilize their fixed assets to generate revenue, they could improve their EPS.

On the other hand, the EPS can be diminished by CCC as observed in the 2-step GMM-SYS and by the TATO, which are consistently significant in the 1-step and 2-step GMM-DIFF and the 2-step GMM-SYS. Based on this, the firms' very slow CCC can diminish their EPS because it would take too long to revolve their cash and grab opportunities to earn for the shareholders. In the same way, the firms' inability to maximize the use of their assets in profitable undertakings limits the earnings capability.

In table 8, the proportional change in the MPPS can be influenced by its historical movements, as observed in the 1-step and 2-step of GMM-SYS. This means that the historical prices of their stocks can influence the firms' MPPS, wherein investors buy the shares of the firms when the shares have a favorable perceived market value. Investors, in general, would be willing to buy more shares of the firm when the movements in the MPPS can give them favorable returns. Regarding resource efficiency, the FATO was the only observed significant variable that could affect the proportional change in MPPS as observed in the 1-step GMM-DIFF. It can be observed that the FATO can diminish the firm's stock price. This means that when firms do not utilize their fixed assets to generate revenue, investors may not be willing to buy the firms' stock, resulting in a decline in the MPPS of firms. This result seems to be the same

as the findings of Junaid and Ali (2020), who also found that low FATO would decline the firm's profitability and consequently diminish the firm's MPPS.

Conclusion

This study evaluated the effect of firms' resource efficiency on their performance and value. Firm performance is represented by the firm's ability to profit from its operation and generate earnings per share for the shareholders. The market price per share indicates firm value, generally used to measure the firms' standing in the stock market. The study utilized efficiency ratios to represent the firms' decisions in terms of their resource efficiency. The study utilized both static and dynamic panel data. However, the dynamic panel data prevails after conducting several tests. The study concludes that the firms' resource efficiency has specific effects on the firm's performance and value. It was found that the firm's net profit margin (NPM) can be improved by the firm's fixed assets turnover (FATO) while it can be diminished by their cash conversion cycle (CCC) and working capital turnover (WCTO). In terms of the firm's earnings per share (EPS), this can be improved by the firm's fixed assets turnover (FATO), but it can be diminished by the CCC and the total asset turnover (TATO). Lastly, the firms' market price per share (MPPS) can be diminished by the FATO. Due to the specific effects of resource efficiency ratios, the study concludes that resource efficiency should still be a concern of financial managers in improving their financial performance and value. Inefficient resource management could diminish the firm's performance and value and vice versa. Resource efficiency is a relevant financial concept allowing firms to improve their operational performance and market value. This would bring a theoretical and practical implication that financial managers of the Philippines must consider the utilization and cycles of their resources (assets) since these could negatively or positively impact the firm's performance and value. If firms could improve their

resource utilization and cycles, they could benefit from their profitability and more excellent market value of their shares. Therefore, the study recommends continuously evaluating firms' resource efficiency because they are relevant to their performance and value.

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