



***Profitability(ROA) and
Productivity: Case of Philippine
Publicly Listed Electricity
Subsector Companies***

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Abstract:

Productivity is not significant to profitability. In this paper, we prove the point by looking at eight privately owned electric companies currently traded in the Phil Stock Market. Using panel data from 2007 to 2016, the research addresses the impact of firm-specific variables such as age, growth, productivity(net profit/revenue), size, and financial leverage with profitability (ROA). Results indicate that age, growth, financial leverage, and size have no significant effect on profitability. Productivity was found to

have a substantial and negative impact on the profitability of the power and energy subsector in the Philippines.

Key Words: *Profitability, Productivity, Power and Energy Subsector, Philippine Stock Market*

1. INTRODUCTION

Hattori and Miki (2004) reexamine the impact of the regulatory reforms on price in the electricity supply industry, using panel data for 19 OECD countries from 1987–1999. As cited in the paper, they compared the results with those found in an earlier study by Steiner (Regulation, industry structure, and performance in the electricity supply industry, OECD Economics Department Working Paper, ECO/WKP, 2000). They found that expanded retail access is likely to lower the industrial price and increase the price differential between industrial customers and household customers. The study further added that the unbundling of generation and the introduction of a wholesale spot market did not necessarily lower the price and may have resulted in a higher rate. This finding is crucial as it sets some light in many of the experiences of countries, including that of the Philippines.



The data from the Department of Energy (2016) indicated that the electricity rates in the Philippines remain as one of the highest in Southeast Asia at P5.84, P7.49, P8.90 kilowatt-hour for industrial, commercial, and household consumption respectively. Ranking 42 of 132 countries in electricity consumption based on estimates for the year 2009, the state of the country's power plants are alarming and in need of urgent repair and replacement. With a 14% increase in total installed capacity for the year 2016 and an accompanied 10% increase in consumption, the peak demand for 2016 is at 13,272 megawatts while the full available capacity is at 14,458 megawatts. Meanwhile, the National Tax Research Center (2011) estimated the consumption in the country by 2040 to more than triple from that of today's consumption.

In the study by Won and Jeong (2013) on Profitability and Productivity changes in the Korean electricity industry, the paper cited changes in the industry after the reform in 2001. The Korea Electric Power Corporation (KEPCO), a state-owned, vertically integrated company, was divided into

six power generation companies (GENCOs) to improve efficiency and introduce competition in the electricity industry. The said study used capital total factor productivity (KTFP) to analyze profit changes from fixed input capital, and an index number profit decomposition (INPD) to examine the sources of the profit changes. Although this is different as to how the paper proxied productivity, we saw similarities and differences of NAPOCOR and KEPCO and how NAPOCOR has remained state-owned at present.

In the '90s, the Philippines had a wealth of potential energy sources that ranked second to the United States (Dolan, 1991). However, events contributed to the electricity crisis during the '90s (U.S. Library of Congress). In an attempt to stabilize power supply, the Marcos government and the succeeding governments intervened. Thus, the first point as gov't regulation comes to play out, it explains. Measures of prices that are supposed to elevate revenue less cost of operations are tempered by volatile laws setting minimum cutoff for pricing and markups and dampening the field for innovation. Although this is not captured in the model, the



counterintuitive result implies that other things being equal, the truth is not similar in the power generation and distribution in and among undeveloped economies like the Phils. Their respective governments highly regulate electricity generation and distribution in the emerging markets. For instance, the then President Marcos earmarked to build power plants to cater to electricity demand at \$2.3 billion. The said plant which Pres. Aquino refused to operate as part of her anti-dictatorship movement incurred staggering losses and ill-maintained power plants. She further abolished the Department of Energy and other projects which were intended to move forward the said sector. President Ramos then succeeded and forged sovereign contracts allowing foreign companies to produce electricity at high prices with the government agreeing to pay first, then generate later. Governments exerting a significant impact on energy development had ramifications to profitability and productivity, and more so for chances for innovation. Although innovative growth within the power sector in the Philippines is substantial for the country's position, in this case, the role of the private sector is critical. The Electric Power

Industry Reform Act aimed to build a sustainable power supply to combat high electricity rates compelled conglomerates in the Philippines to dip its resources in the electricity subsector.

2. METHODOLOGY

The study examined the factors that affect the profitability of the power and energy subsector industry in the Philippines. The model used return on assets as a proxy for profitability, while productivity was measured by net profit over revenue. The proxy net profit over revenue for productivity is significant as the aging infrastructure in the said sector will have a considerable influence on the results later on.

2.1 Model: Using ROA or return on assets as the dependent variable, the independent variables include age, lagged profitability, productivity, growth, and financial leverage.

$$\text{Equation 1. } ROA_{it} = B_0 + B_1FS_{it} + B_2FA_{it} + B_3FG_{it} + B_4LROA_{it-1} + B_5P_{it} + B_6FL_{it} + u$$

ROA = book value of net profit after tax / total assets
i, t = age of firm i at time t



B_0 = constant

$B_1FS_{i,t}$ = firm's book value of sales

$B_2FA_{i,t}$ = # of years since firm inception as of the year of data collection

$B_3FG_{i,t}$ = current year's sales - last year's sales / last year's sales

$B_4LROA_{i,t-1}$ = profitability of the previous year

$B_5P_{i,t}$ = proxy of total factor productivity

$B_6FL_{i,t}$ = total debt / total assets

u = error term

2.2 Sample: Listed in alphabetical order, the sample examined the eight subsectors in the power and energy industry in Table 1.

First Philippine Holdings Corporation (FPH)	First Gen Corporation, Energy Development Corporation
Manila Electric Company (MER)	Meralco Energy Inc, Meralco Powergen Corp, General Electric Philippines Meter and Instrument Company Inc, Clark Electric Distribution Corp.
PHINMA Energy Corporation (PHEN)	PHINMA Power Generation Corporation, PHINMA Renewable Energy Corporation, CIP II Power Corporation, PHINMA Petroleum, and Geothermal, Inc
SPC Power Corporation (SPC)	Bohol Light Company Inc, SPC Island Power Corporation, SPC Malaya Power Corporation, SPC Electric Company, Mactan Electric Company

Source: Author's integration (2018).

Table 1:
Corporate subsidiaries and areas of coverage

Companies	Subsidiaries
Aboitiz Power Corporation (AP)	Visayan Electric Company Inc., Davao Light and Power Company, Cotabato Light and Power Company, Enerzone Group, San Fernando Electric Light and Power Co., Inc.
Alsons Consolidated Resources, Inc (ACR)	Western Mindanao Power Corporation, Southern Philippines Power Company, Mapalad Power Corporation, Sarangani Energy Corporation
Energy Development Corporation (EDC)	None
First Gen Corporation (FGEN)	First Gas Power Corporation, Prime Meridian Powergen Corporation, First NatGas Power Corp,

Among the eight power and energy subsector companies in Table 2, MERALCO is the oldest at 98 years with the most extensive infrastructure assets at 249billion. This mammoth of assets has greatly snail-paced its growth at 5.3%. Aboitiz Power and First Gen come as the youngest players in the industry. Both are aggressive in earning the right amount of profitability of 10.9% for Aboitiz Power with a 55% financial leverage. Aboitiz Power has managed debt efficiently, given the growth of 31% and 85% productivity. Another young player, First Gen, is fearless in borrowing at nearly 86% of its assets. The said ratio



implies that for every one peso of an asset, 86 centavos is borrowed money. With elevated productivity of 1.31, First Gen generated the lowest profitability at 4.6%. This number is consistent with the result of the study. The trend can also be seen from the First Phil. Holdings. First Gen is second to the oldest MERALCO and delivered the highest productivity at 1.428 and returned 6.3% from its 71billion assets.

Meanwhile, Energy Dev't Corp(EDC), which has existed for almost 36 years, played in the middle of the group with a reasonably low amount of assets at 26billion. Yet, the company has delivered the best return on assets of 14.6% with productivity of 1.134.

3. RESULTS AND DISCUSSION

To estimate the model, cross-section effects produced insignificant results when the original scale of the variables are used. So the natural logarithms of the variables were undertaken except for growth. Using the period random-effects model, the resulting model was significant with an F-statistic 3.247927 and p-value 0.001356. The cross-section fixed-effects model in Table 3 used growth, log(financial_leverage), log(lagged_profitability), log(productivity) and log(age).

Table 2: Company profile per variable.

Power Energy Substr Com.	Age in yrs.	Fin'l. Lev.	Grow th	Lagd Profit-*	Prody**	Profit-ability (ROA)	Size Billions in PHP
Aboitiz Power Corp	13.5	0.55	0.31	0.11	0.84	0.11	57b
Alsons Conso Res, Inc.	38	0.37	0.18	0.05	1.40	0.05	3.4b
First Phil Holding Corp.	50.5	0.57	0.06	0.07	1.42	0.06	72b
Manila Electric Com	93	0.69	0.04	0.05	0.58	0.06	249b
PHINMA Energy Corp	42.5	0.28	0.30	0.05	0.30	0.05	0.4b
Energy Devt. Corp.	35.5	0.62	0.24	0.15	1.13	0.15	27b
First Gen Corp	13.5	0.86	0.11	0.05	1.31	0.05	82b
Salcon Power Corp	17.3	0.18	0.16	0.13	0.37	0.13	1.9b

Source: Author's integration (2018).

Reference: * lagged profitability

** productivity = net profit/revenue

Table 3:



Dependent Variable: LOG(PROFITABILITY)
 Method: Panel Least Squares
 Date: 03/04/18 Time: 11:43
 Sample (adjusted): 2008 2016
 Periods included: 9
 Cross-sections included: 8
 Total panel (unbalanced) observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.005767	0.455627	-6.596997	0.0000
GROWTH	0.060821	0.161836	0.375822	0.7085
LOG(FINANCIAL_LEVERAGE)	-0.205117	0.199691	-1.027175	0.3088
LOG(LAGGED_PROFITABILITY)				
)	-0.059079	0.126416	-0.467333	0.6421
LOG(PRODUCTIVITY)	-0.277103	0.129417	-2.141168	0.0366
DLOG(AGE)	-5.111478	5.210974	-0.980906	0.3309

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.410372	Mean dependent var	-2.755600
Adjusted R-squared	0.284023	S.D. dependent var	0.752670
S.E. of regression	0.636875	Akaike info criterion	2.103570
Sum squared resid	22.71415	Schwarz criterion	2.524489
Log likelihood	-59.57317	Hannan-Quinn criter.	2.270563
F-statistic	3.247927	Durbin-Watson stat	2.043491
Prob(F-statistic)	0.001356		

The model has an R-squared of .410372, which implies that the variables can explain 41 % of the variability of log(profitability). Only log (productivity) has a p-value that is less than 0.05, indicating that the variability of log(profitability) can be significantly attributed to log(productivity). Specifically, holding

all other variables constant, an increase in a factor of production decreases profitability by approximately 27%. Industry experts posit that the negative relationship between productivity and profitability is consistent with the studies of Fareed, Ali, Shahzad, Nazir, Ullah (2016), and Kathuri (2014). The firms in the electricity sub-sector increase sales by expanding their markets by improving services to maintain current customers and by reducing unnecessary expenses and wastes. If we are to engage with the said power and energy subsector, strategies such as expanding the market, improving on services, and cutting on costs entail investments and drain net profits and revenues. And since productivity is proxied with net profit over revenue, Dimitropoulos and Yatchew(2014) reasoned that the negative relationship of productivity to profitability is strengthened by the aging of equipment and infrastructure which as the power plants age, the maintenance costs and facility replacement increases thereby, dampening higher return on assets or profitability.

4. CONCLUSIONS



In conclusion, the study has examined how firm-specific characteristics affected the profitability or return on assets of the power and energy sector in the Philippines from 2007-2016. The empirical results suggest that only productivity, as proxied by net profit over revenue, has a significant relationship with profitability. The reason why this relationship is happening can be attributed to aging infrastructure and machinery, which have led to substantial maintenance costs and lower profitability (Dimpitropoulos and Yatchew, 2017).

4.1 Recommendations and policy implications. Investors can use the study to help them when it comes to managing their investments towards the power and energy sub-sector industry. According to the study, the Philippine power sector's profitability as measured by return on assets is not responsive to changes in growth, leverage, and size. This means that those variables must not, as a suggestion, be used as criteria for decision making, whereas productivity can be useful as a factor for consideration. In the matter of investment choice, Energy Dev't Corp. seems to be a good buy.

Moreover, the results could also encourage the regulating body of the government, such as the Energy Regulatory Commission to take a closer look at more adaptive regulations in the national energy planning, especially on the effect of expenses and, on managing aging assets over revenue. Although the paper does not directly proxies the existence of innovation, it will also be useful to strengthen innovation in terms of better technology and the integration of renewable energy within the power and energy subsector platform.

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