DOES FIRM SIZE MATTER?

An Empirical Study of Firm Performance in Indonesia

A. Prasetyantoko
Atma Jaya Catholic University, Jakarta
a.prasetyantoko@atmajaya.ac.id

Rachmadi Parmono
Atma Jaya Catholic University, Jakarta
rachmadi.pm@atmajaya.ac.id

Abstract

This study seeks to understand the relationship between firm size and performance of listed companies in Indonesia during the boom and the bust period. The result shows that generally firm size gives a positive impact to firm profitability. There is significant relationship between firm size and performance during post-crisis period. Firm size is an important factor in recovering process. Nevertheless firm size does not affect the firm market value. By employing panel data analysis of 238 listed companies in Indonesia Stock Exchange (IDX) in the period of 1994–2004, the study shows that institutional factors matter on the firm performance, based on the fact that firm with majority foreign ownership have much higher performance in both measurements, namely, return on asset (ROA) and market capitalization growth.

Keywords: firm size, firm performance, crisis

JEL Classification: E32 (Prices, Business Fluctuations, and Cycles)

Several firms in Indonesia failed to survive, and others succeeded to pass the financial crisis in 1999. The question of why firms succeed and others failed in facing turbulence times becomes one of the most important issues in the studies of management and economics. In developing countries, there are challenges for companies to survive, since institutional factors are commonly unsettled.

Firm size could be one of the most important factors which affect firm performance. In common sense, big firms are supposed to be stronger than the small ones. By their large capacity, big companies have the better access to credit market or capital market to fulfil their financing needs. However, in the time of crisis, sometimes bigger companies would be much riskier than the small ones since bigger companies usually have more debts in their operation. Therefore, It is important to investigate the firm-level performance in Indonesia during the period of the boom and the bust in their business cycle, in order to gain better explanation on the heterogeneity of the firms behaviours and their responses in facing economic and business fluctuations.

The objective of this study is twofold. First, the study attempts to find how firm size matter on firm performance during the period of the boom and the bust in Indonesia. Secondly, the study attempts to understand how institutional factors affect firm performance regarding to the crisis. The study uses ownership structure variable as an important proxy of institutional factors. The study wants to answer whether firms with majority foreign ownership would be better in both, profitability and market capitalization growth, as measurements of the firm performance.

Firm Size and Firm Performance

The relationship between firm size and performance becomes a classical issue. Gibrat (1931) described that firm's growth rate is independent of its size. This finding is subsequently referred to as the "Law of Proportionate Effect" (Bhattacharyya, 2009). According to the law, growth is unrelated to firm size. Large and small firms therefore have equal probabilities of attaining a particular growth rate within any given period. Subsequently, some studies supported the Gibrat's Law and many other reject. Some studies concluded that there is a dependent relationship between firm size and performance, which can be both, negative and positive impact.

Punnore (2008) for instance, showed positive relationship between firm size and profitability, and Shepherd (1972) described similarly that the larger the firm, the higher is the profit rate. Meanwhile, others studies described inversely. For instance, based on data for U.S firms, Haines (1970), showed negative correlation between size and firm growth rate. The comparable results showed by Evans (1987) by describing an inverse relationship between size and firm growth rate. In this case, specific domestic factors might affect the relationship significantly.

Classical works are also concerned with such a relationship. Penrose (1959) theorized that firm size is basically a signal of resource capacity and capability. It means that larger firms usually have more organizational resources, permitting that they have better equipment to achieve their goals. Wu (2006) argued that larger firms have stronger competitive capability than the smaller ones as a result of their superior access to resources. Wincent (2005) highlighted a framework that firm size can foster in strategic Small Medium Enterprises (SME) network. Larger firms are suggested to have advantages for behavior and performance compared to the smaller ones. They improve performance simultaneously as they bind firms together in the SME networks.

Firm size can also be a proxy for probability of default and volatility of firm assets. It assumes that larger firms are more difficult to liquidate since they are commonly less volatile in many aspects,especially in assets. Fama and French (2001) stated that low volatility firm are less to default. Based upon the explanation of Majumdar (1997) whether larger firms are superior in performance to smaller firms, or vice-versa, and whether older firms are superior in performance to younger firms, or vice-versa, it has generated large amounts of theoretical and empirical research in economics, management and sociology. Majumdar (1997), based on previous studies, pointed out that larger firms generate superior performance relative to smaller firms (Penrose, 1959), and firm size is correlated with market power (Shepherd, 1986). The argument of Penrose is based upon the assumption that external constraints to growth arise from a combination of increasing market saturation and more intensive competitive pressure. In that situation, larger firms would be more suited with external environment, in a sense that they could be more easily adapt to the external pressures and shocks.

The relationship between firm performance and size is not just a theoretical issue, but also empirical one. By employing rich panel data for developed and developing countries, Forbes (2002) found that firms with greater foreign sales exposure have significantly better performance after depreciations and firms with higher debt ratios tend to have lower net income growth. Desai, Foley and Forbes (2004) found different responses between U.S. multinational affiliates and local firm when depreciation is present. U.S. multinational affiliates have higher sales, assets and investments than local firms during, and subsequent to, currency crisis.

Horst (1972) found in the study of US investment to Canada that firm size is the only important explanatory firm attribute with the positive coefficient in explaining the incidence of investment. The study of Lall (1986) found that firm size is one of the necessary firm attribute for Indian firms FDI. The larger firms have been the most dominant ones that doing FDI. In the other side, Kojima (1985) stated an adversary result in Japan by which he found that small size Japanese multinational companies are dominant player investing in Asia countries. The companies are becoming comparatively

disadvantages because of the production cost in Japan.

Several studies confirmed that firm size effects have been the most important factor influencing financial performance (Hill and Hoskisson, 1987). However, others found mixed effects or no effects. The mixed results are exhibited by some studies. Stekler (1963) and Osborn (1970) reported that size does not seem to be associated with higher profit. The conflicting conclusion reached by Hall and Weiss (1967) found association between size and profit among the Fortune 500 companies for the years 1956-1962.

Relating to financial crisis, Forbes (2002) differentiated several channels by which currency depreciations affect firm performance. First, depreciation could downgrade firm competitiveness since the cost of imported input raises relatively to foreign competitors. Secondly, depreciation may provide exporters with a relative cost advantage relative to foreign competitors. Thirdly, depreciation could generate higher borrowing costs and a contraction in lending. The impact of currency depreciation should be based on the heterogeneity of the firms. This description is quoted to show that macro variable could be very significant factor to the micro or firm-level.

Liu (2004) demonstrated the determinants of UK corporate failures by modelling the short-run and long-run behaviour of corporate failure rate in relation to macroeconomic phenomena over the period 1966-1999 and found that failure rates are associated with interest rates, credit, profits, price, and corporate birth rates both in the short run and in the long run. Furthermore, this study also found that among those macroeconomic variables, interest rate appears to be an important factor influencing failure rates and could be used as a feasible policy instrument to reduce the incidence of corporate failures. In empirical level, the study of firm performance usually considers a set of macro variable, such as inflation, interest rate and the development of capital market.

This study uses Return on Asset (ROA) and market capitalization growth as proxies of firm performance, and uses several variables such as leverage, liquidity and solvability as firm-level controlling variables. It includes several variables, such as interest rate, inflation and capital market development as controlling macro variables.

Leverage is considered as an important factor affecting profitability since that the composition of debt or equity as well as the time of maturity should influence the rate of return of the firm. In the seminal work Modigliani & Miller (1958) affirmed that in a perfect market, the composition of debt or equity does not have influence on the market value of the firm. In this case, the choice of debt or equity does not affect firm performance. However, this theory is a subject of criticism by several other theories.

Hypothesis

Based on the literature research, it is evident that factors influencing firm performance are merely complex. Firms' performance is determined by their size, leverage, liquidity, solvency, interest rate, inflation and capital market development. However, the firm size could be an important factor. And this study is basically intended to answer the question how does the firm size matter on firm performance. Therefore, the corresponding hypothesis is:

Hypothesis 1: Firms' performance is determined by their size, leverage, liquidity, solvency, interest rate, inflation and capital market development.

Method and Data Analysis

This main data of the study started with the analysis of listed company financial ratio in Indonesia by using the accounting data provided by the Indonesian Stock Exchange (IDX) and Indonesian Capital Market Directory published by ECFIN (Institute for Economic and Finance Research) in its various publications.

The accounting data covers the period of 1994-2004. The research included all non-financial sectors and excluded financial sector, since the debt structure of banks and investment institutions are not comparable to that of in other sectors. All variables of data are deflated by wholesale price index (WPI) in 2000 in order to gain the constant price. This study included 238 listed companies with at least 5 consecutives years.

For ownership structure the study accessed directly to the annual report of the firms documented by IDX between 1996-2003 The study made use of STATA version 8 package for data treatment.

Simple Model. In this following simple model, the research basically linked firm size to firm performance. However, the research included firm factors and macro factors, for controlling the main relation.

$$Y_{it} = \alpha_i + \beta X_{it}^{\ firm} + \varphi X_t^{\ macro} + \varepsilon_{it}$$

i is a subscript for each firm, and *t* for each year. Y_{it} represented firm performance measured by profitability or Return on Asset (earning before interest and tax deflated by total asset) and market capitalization growth. Market capitalization growth is calculated by equation as follows:

$$\frac{X_{(t)} - X_{(t-1)}}{X_{(t-1)}}$$

Result and Discussion

This study made use of the multivariate regression to understand the relationship between firm performance and firm size, and included the firm level as well as macro level controlling variables. Firm performance is measured by two proxies, namely Return-on-Asset (ROA) and market capitalization growth. ROA is considered as a variable for measuring the fundamental value of the firm, whereas market capitalization growth represents the market value of the firm.

The results of regression show that in

general there is no relationship between firm performance, in terms of market value, and firm size. Table 1 exhibit that the correlation between Delta-MC, representing the market capitalization growth, and firm size is not significant in total period (1994 – 2004), pre-crisis period (1994 – 1996) and post-crisis period (1999 – 2004). The results suggest that the market value of the firm should not be related to firm size.

Meanwhile, there is a positive significant correlation between ROA and firm size in total period and the significance correlation increases in the post-crisis period. It means that firm size increases with the fundamental value of the firm. The larger the firm, the higher is the profit rate. This evidence is consistent with the argument of positive correlation between firm performance and its size (Punnore, 2008; Shepherd, 1972). It is also important to note that the correlation is higher in post-crisis period than in pre-crisis. It indicates that firm size could be a pivotal factor in recovery period. The larger the firm, the faster is the rate of recovery.

Leverage is negatively related to firm performance which could mean that larger firms prefer to use their internal source to finance their operation. They prefer to employ equity rather than debt. It is also the case for liquidity, as the ratio of short-term debt to total debt. Thus, we can see that larger firm prefer to use debt in long-term maturity. The variable of solvability as the ratio of short-term asset to short term debt is positively related to firm size during pre-crisis period. Firm-level variables, such as leverage, liquidity and solvability affect diversely to the relationship between firm performance and its size.

Inflation is negatively and significantly related to firm performance in both sense, fundamental value (ROA) and market value (capital market value). High inflation will reduce firm performance and low inflation will increase with firm performance. Meanwhile, interest rate is positively related to firm performance. It could be confusing since in the common sense high interest rate will increase firm cost and then restrain profitability. However, it might be related to the business cycle issue, which means that in the booming period, the high interest rate has not negatively affected the firm performance.

Capital market development is related negatively to fundamental value of the firm but it has positive correlation with market value of the firm. Capital market development is the ratio of market capitalization to Gross Domestic Product. It is evident that the greater capital market, the higher is the market capitalization growth. However, the capital market development is negatively related to the fundamental value of the firm. It needs further inquiries to answer why capital market development decreases firm profitability. The possible answer is that the greater capital market could mean the greater volatility of the macro economy which be subsequently restraining to firm profitability.

This study is also concerned with the role of foreign ownership participation on the firm

Definition of Variables	
Dependent Variables	
1	Rate of Return on Asset (ROA): earnings before interest and taxes (EBIT) deflated by total asset.
2	Market Capitalization growth.
Independent Variables	
1	Firm Size = natural logarithm of total asset in Rupiah at the constant price
2	Leverage: total debt/equity
3	Liquidity: Short-term debt/ total debt (STD/TA)
4	Solvency : short-term asset/short-term debt (STA/STD)
5	Interest rate
6	Inflation
7	Capital market development

performance. Normatively, firm with foreign ownership has better access to international capital market or headquarter office to support their activities in the developing countries. It is therefore interesting to investigate empirically the institutional factors in determining firm performance.

The study categorized the sample into two categories, namely the firm with more than 50 percent foreign ownership and the domestic firm. Afterward, the test of significant difference applied between the two groups of sample in firm profitability and market capitalization growth. The research consistently found that domestic firms have much less firm performance. Furthermore, the different of firm profitability is more remarkable than the different of market capitalization growth.

Conclusion

This study shows several interesting results. First, the evidences reveal that firm size has a positive impact to firm performance. Even though during the pre-crisis period there is no significant correlation between firm size and performance, the high significant correlation is occur in post crisis period. The fact that there is a greater correlation during the recovery period could mean that firm size is a significant factor supporting the recovery. Greater firm is easier to recover than smaller one. Secondly, macro factors are more relevant in explaining firm performance in the context of Indonesia. It is likely typical for economy in developing countries. Thirdly, by nature, market value of the firms is more volatile than fundamental value of the firms, especially in developing market where informational and institutional factors do matter.

Table 1. Result of OLS Regression

Dependent variable are ROA (Return-on-Asset) as a proxy of profitability or fundamental value of the firm and Delta-MC (Market Capitalization Growth) as a proxy of market value of the firm. The main independent variable is Firm Size and for controlling variables, we have two sets of variables (firm-level and macro-level variables). The equation: $Y_{it} = \alpha_i + \beta X_{it}^{firm} + \varphi X_t^{macro} + \varepsilon_{it}$

We do not include the result of pre-crisis market capitalization growth since several estimations are dropped which may be due to the limit of observations.

	Total Period				Pre-Crisis		Post-Crisis			
Dep.var	ROA		Delta-MC		ROA		ROA		Delta-MC	
Ind.var										
Firm Size	0.0055	*	0.0046		0.0035		0.0078	**	0.0139	
	(0.0029)		(0.0330)	*	(0.0029)		(0.0040)		(0.0467)	
Leverage	-0.0002	**	0.0014		-0.0002		-0.0002	*	0.0015	
	(0.0001)		(0.0008)	*	(0.0002)		(0.0001)		(0.0010)	
Liquidity	-0.0149	*	-0.1588		0.0252	**	-0.0265	*	-0.6619	***
	(0.0081)		(0.0921)		(0.0106)		(0.0154)		(0.2418)	
Solvability	-0.0001		0.0013		0.0103	***	-0.0002		0.0006	
	(0.0002)		(0.0020)	***	(0.0023)		(0.0002)		(0.0023)	
Inflation	-0.2132	***	-1.9048		-0.1930		-0.6516	***	-7.2556	***
	(0.0213)		(0.2352))	***	(0.1651)		(0.1373)		(1.5643)	
Interest rate	0.0046	***	0.0723		0.0024		0.0075	***	0.1106	***
	(0.0012)		(0.0131)	***	(0.0038)		(0.0015)		(0.0173)	
Capital Market development	-0.1955	***	1.1523		-0.4624	**	-0.1642	***	0.8788	*
	(0.0291)		(0.3360)		(0.2140)		(0.0425)		(0.4925)	
Constant	-0.1144	*	-1.0238		-0.0182		-0.1867	**	-1.0219	
	(0.0683)		(0.7729)		(0.0956)		(0.0930)		(1.1158)	
Observation	2424		1911		594		1362		1327	
R^2-Adjusted	0.0643		0.0620		0.0467		0.0445		0.0665	

*, **, *** denote significance at the 10, 5 and 1 percent levels, respectively. Standard deviation is reported in parentheses for specifications

Table 2. Test of ANOVA

Test employed for examining the different of performance in both ROA and Market Cap growth for Multinational Corporation (MNC) and Domestic Firms (DC). We define MNC as firms with more than 50 percent foreign ownership participation, and DC is otherwise.
t-test for mean difference and z-test for median difference. For z-test, we use Wilcoxon rank-sums test.

		Total Period					Pre-Crisis		Post-Crisis		
		Mean	Median	STDev.	Max	Min	t-test		z-test		
ROA	MNC	0.0793	0.0777	0.2037	0.5755	-1.0542	-6.7547	***	-8.1980	***	
	DC	-0.0006	0.0301	0.2042	2.2396	-2.6181					
Delta-MC	MNC	0.7034	0.0037	2.5604	23.8428	-0.9533	-2.5173	***	-3.3980	***	
	DC	0.3697	-0.1067	2.0507	34.5756	-0.9515					

Profitability is relevant to valuate firm in fundamental value, whereas market capitalization growth reflects the market value or market perception for the firms. Since the capital market in Indonesia, like in other emerging countries, is relatively volatile, therefore it could be misleading in evaluating firm performance.

In this case, firm size is more relevant with fundamental value of the firm, rather than market value. It seems that investors in capital market do not consider firm size as an important variable for their valuation. It is also the case for firm leverage. Leverage is negatively related to fundamental value of the firm, but it increase with market value of the firms perceived by investors in capital market.

This study suggests that underdeveloped financial system has a serious impact to firms. These constraints diminished as financial development occurs. The firms that operate in institutionally underdeveloped financial environment are affected by the obstacles to a greater extent.

The study result shows how firm size can foster revival after the crisis. It extends the prior work that firm size have an important factor influencing its financial performance. ■

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