FIRM SIZE AND DIVERSIFICATION STRATEGIES: DOES LABOR INTENSITY MATTER?

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Abstract

This paper examines the impact of firm size on business and international diversification strategies. Using a novel dataset, we study 294 Indonesian publicly traded firms in a cross-section research. Controlling for past performance, firm age and industry dummies, we do find, as we expect, that large firms tend to diversify their business as well as their geographic segments. We also extend this study by looking at the moderating role of labor intensity in the impact of firm size on diversification strategies. Our results show that large firms could broaden their geographic area of sales more easily when they do not face labor constraint. Less labor intensive firms could be more flexible to bring their business into a wider coverage.

Keywords: Business Diversification, International Diversification, Firm Size, Labor Intensity, Indonesian Firms

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1. Introduction

Firm diversification strategy has been widely studied in finance, management, and strategic literature. Finance scholars majorly focus on the effect of such a strategy on accounting and market performance (e.g. Lang and Stulz, 1994; Servaes, 1996; Villalonga, 2004; Laeven and Levine, 2007), while, alongside examining the impacts of diversification strategy, those from management and strategic fields have investigated the determinants of this strategy (e.g. Chatterjee and Wernerfelt, 1991; Kim et al., 2004; Miller, 2004; George and Kabir, 2011). Two perspectives on the determinants of firm diversification activity are outlined in the literature. Those who work on the framework of resources-based view (RBV) argue that diversification strategy is majorly driven by possession of resources (e.g. Chatterjee and Wernerfelt, 1991; Nath et al., 2010). Firms having resources advantage are more likely to diversify their business. On the other side the proponents of industrial organization perspective contend that market structure where firms operate contribute to determine strategy of the firms. In a highly competitive market, firms tend to expand their business, seeking other sources of revenue to generate profits above the average (superior performance).

In this paper we focus to investigate the impact of a firm specific factor which is firm size on diversification strategy of Indonesian firms, an emerging market which supposedly firm diversification strategy is prevalently growing (Nachum, 1999). As argued in the RBV, tangible and intangible assets firms have, could determine their business strategy. Having large assets could enable firms to exploit the economies of scope by expanding their business segment and their geographic segment. Chatterjee and Wernerfelt (1991) find that firm size is an important resource to drive firms to be more diversified in their business. This present paper therefore examines the impact of firm size on business diversification and international diversification. We divide diversification strategy into two different kinds which are business diversification and international diversification.

Moreover, we deepen this study by looking at the role of labor intensity on the relation between firm size and diversification strategies. In the labor intensive firms, labor costs are more important than capital costs. More specifically, labor intensive means use of manpower in production process with little of technology (Shahidul, 2011). We argue that large firms could exploit their size advantage more so if they have less labor intensity as it could enable them

to be more flexible and it is quite less expensive to diversify their business.

The rest of this paper is structured as follows. We present our research method in section 2. Section 3 reports empirical results and discussions, while section 4 concludes the paper.

2. Method

2.1. Data and Sample

We collect data on firms' financial reports, business segments and geographic segments of Indonesian firms from OSIRIS database. In this cross-section study, we use 294 non-financial listed firms in the Indonesia Stock Exchange (IDX) as of December 2010 as our sample. Firms without complete information needed are excluded from the sample.

2.2. Variables

Business diversification

To measure the degree of business diversification (DIVER), we follow the work of Elsas et al. (2010) and Trinugroho et al. (2014) that perform their diversification index in banking firms. Therefore, we slightly adjust this index to capture the business difference between financial and non-financial firms. We measure business diversification as the square of proportion of each business segment. The index ranges from 0 (entirely undiversified firm) to 0.75 (firm with fully balanced revenue).

Diversification = 1 – [(REV1/REV)2 + (REV2/REV)2 + (REV3/REV)2 + (OTHER/REV)2]
where:
Diversification = Diversification index
REV = Total Revenue
REV1 = Revenue from business segment 1
REV2 = Revenue from business segment 2
REV3 = Revenue from business segment 3
OTHER = Revenue from other business segments

International diversification

Our proxy of international diversification (INTER) is the ratio of sales outside Indonesia to total sales which refers to the study of Brock dan Yaffe (2008) and Wang et al. (2011). It could be considered that the larger the overseas sales, the higher the degree of international diversification.

Firm Size

Following the study of Chatterjee and Wernerfelt (1991), we use the natural logarithm of total assets (LNTA) as a proxy of firm size.

Labor Intensity

We measure labor intensity as total assets deflated by number of employees. The higher value of this ratio indicates less labor intensity.

Interaction variable

To examine the moderating effect of labor intensity, we build an interaction variable between firm size and labor intensity (LNTA (-1)*Labor Intensity).

Control Variables

Past Performance

First, we control for past performance as argued by Untoro et al. (2014) that past performance contribute to influence the level of firm diversification strategy. We perform the ratio of return on total assets (ROA) as the measure of firm performance.

Firm age

We include firm age (AGE) in the empirical model to account behaviors differences between startup and mature firms.

Industry Dummies

To take into account the industry differences, we refer to the work of Prabowo et al. (2014) which use one digit Jakarta Stock Industrial Classification (JASICA). The one digit JASICA categorize firms into 9 industries: 1) agriculture; 2) mining; 3) basic industry & chemical; 4) miscellaneous, 5) consumer goods; 6) property, real estate & building construction; 7) infrastructure, utilities & transportation; 8) finance; and 9) trade, services & investment. We create dummy variables to identify such industries. However, financial firms are not included. We take miscellaneous firms as the benchmark.

2.3 Empirical Model

To test the impact of firm size on business and international diversifications, we run these two following equations using OLS regression technique:

$$Diveri,t=\alpha0+\alpha1LNTAi,t\text{-}1 + \alpha2LaborIntensityi,t +\alpha3Agei,t + \alpha4ROAi,t\text{-}1 + \alpha5LNTA*LaborIntensityi,t\text{-}1 + INDUSTRY + \varepsilon i,t$$

$$Interi,t=\alpha0+\alpha1LNTAi,t\text{-}1 + \alpha2LaborIntensityi,t +\alpha3Agei,t + \alpha4ROAi,t\text{-}1 + \alpha5LNTA*LaborIntensityi,t\text{-}1 + INDUSTRY + \varepsilon i,t$$

where:

INDUSTRY is a vector of dummy for industries and ε is the error term.

To avoid the possible endogeneity problem between diversification strategies, firm size and

performance, we use the lag value of natural log of assets (t-1) and the lag value of the ratio of return on assets (t-1).

3. Results and Discussion

Table 1 presents the descriptive statistics of full sample, while Table 2 exhibits the statistics across industry. Correlation matrix in the Table 3 shows that, as expected, our variable of interest which is firm size is positively correlated with business and international diversifications.

Table 1. Descriptive Statistics of Full Sample

This table presents the descriptive statistics of full sample. Diver is business diversification (measured as 1 – $[(REV1/REV)^2 + (REV2/REV)^2 + (REV3/REV)^2 + (OTHER/REV)^2]$). Inter is international diversification, calculated as the ratio of sales outside Indonesia to total sales. LNTA (-1) is the natural logarithm of total assets (t-1), while Age stands for firm age. ROA (-1) is the ratio of return on assets in the previous period. Labor Intensity is the ratio of total assets to number of employees.

	Diver	Inter	LNTA (-1)	Age	ROA (-1)	Labor Intensity
Mean	0.257	0.119	13.768	27.212	3.700	3.442
Median	0.205	0.000	13.865	26.000	3.135	0.806
Maximum	1.000	1.000	18.396	98.000	60.580	442.006
Minimum	0.000	0.000	6.864	1.000	-61.370	0.004
Std. Dev.	0.245	0.246	1.843	12.791	14.790	25.998
Observations	292	292	292	292	292	292

Table 2. Descriptive Statistics – Based on Industry

This table presents the descriptive statistics based on industry. Diver is business diversification (measured as 1 – $[(REV1/REV)^2 + (REV2/REV)^2 + (REV3/REV)^2 + (OTHER/REV)^2]$). Inter is international diversification, calculated as the ratio of sales outside Indonesia to total sales. LNTA (-1) is the natural logarithm of total assets (t-1), while Age stands for firm age. ROA (-1) is the ratio of return on assets in the previous period. Labor Intensity is the ratio of total assets to number of employees.

Industry	Firms	Statistics	Diver	Inter	LNTA (-1)	Age	ROA (-1)	Labor Intensity
Agriculture	11	Mean	0.170	0.234	14.176	30.818	14.307	1.731
		Std. Dev.	0.225	0.358	1.597	26.282	22.319	1.509
Basic	48	Mean	0.263	0.140	13.677	28.958	2.487	1.264
		Std. Dev.	0.258	0.206	1.778	9.640	14.682	0.989
Consumer	28	Mean	0.310	0.091	13.951	37.000	12.987	2.649
		Std. Dev.	0.286	0.189	1.625	14.079	16.032	2.936
Infrastructure	28	Mean	0.212	0.050	14.699	21.571	-0.096	0.699
		Std. Dev.	0.187	0.176	2.195	11.606	10.402	1.294
Mining	21	Mean	0.188	0.371	14.763	24.381	13.593	0.557
		Std. Dev.	0.224	0.395	1.977	11.859	15.512	1.057
Property	42	Mean	0.319	0.001	14.352	25.476	1.941	0.421
		Std. Dev.	0.256	0.005	1.157	9.078	5.678	0.407
Trade	77	Mean	0.267	0.018	12.951	24.351	3.315	8.710
		Std. Dev.	0.225	0.109	2.008	11.890	11.467	50.202
Miscellaneous	37	Mean	0.215	0.331	13.396	30.270	-4.849	3.556
		Std. Dev.	0.268	0.326	1.230	12.108	19.383	6.634

Table 3. Correlation Matrix

This table presents the correlation matrix of variables. Diver is business diversification (measured as 1 – $[(REV1/REV)^2 + (REV2/REV)^2 + (REV3/REV)^2 + (OTHER/REV)^2]$). Inter is international diversification, calculated as the ratio of sales outside Indonesia to total sales. LNTA (-1) is the natural logarithm of total assets (t-1), while Age stands for firm age. ROA (-1) is the ratio of return on assets in the previous period. Labor Intensity is the ratio of total assets to number of employees

	Diver	Inter	LNTA (-1)	Age	ROA (-1)	Labor Intensity
Diver	1					
Inter	-0.077	1				
LNTA (-1)	0.208	0.185	1			
Age	0.115	0.089	0.205	1		
ROA (-1)	0.079	-0.001	0.208	0.187	1	
Labor Intensity	-0.055	-0.016	-0.265	-0.002	-0.026	1

As presented in column 1 and column 2 of Table 4, we find positive and significant coefficients of firm size (LNTA) on business diversification. Similar results are found in the impact of firm size on international diversification as shown in column 3 and 4 of Table 4. These two results support our expectation that large firms tend to diversify their business and geographic segments.

Furthermore, result of our interaction variable on business diversification (column 2 of Table 4) does not confirm our expectation that labor intensity moderate the impact of assets on business diversification. However, interestingly, the regression result (column 4 of Table 4) shows a positive and significant sign of the coefficient of the interaction on international diversification. It could be interpreted that, as we could expect, the impact of firm size on international diversification is stronger for firms having less labor intensity.

Our findings reveal that past performance and firm age do not have significant effects on neither business nor international diversifications. International diversification is more different across industry than that of business diversification.

Table 4. Cross-section OLS Regressions

This table presents the results of OLS regression. Diver is business diversification (measured as 1 – $[(REV1/REV)^2 + (REV2/REV)^2 + (REV3/REV)^2 + (OTHER/REV)^2]$). Inter is international diversification, calculated as the ratio of sales outside Indonesia to total sales. LNTA (-1) is the natural logarithm of total assets (t-1), while Age stands for firm age. ROA (-1) is the ratio of return on assets in the previous period. Labor Intensity is the ratio of total assets to number of employees. LNTA (-1)*Labor Intensity is the interaction between LNTA (-1) and Labor Intensity.

	Business Diversification		**International Diversification**	
	1	2	3	4
LNTA (-1)	0.032***	0.033***	0.025***	0.028***
	(0.008)	(0.008)	(0.007)	(0.007)
Labor Intensity	-0.00003	-0.009	0.0004	-0.011**
	(0.0005)	(0.006)	(0.0005)	(0.005)
Age	0.001	0.001	0.00001	0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
ROA (-1)	0.0007	0.0007	-0.0008	-0.0007
	(0.001)	(0.001)	(0.0009)	(0.0009)
Agriculture	-0.091	-0.085	-0.101	-0.093
	(0.084)	(0.084)	(0.074)	(0.074)
Basic	0.028	0.043	-0.192***	-0.172***
	(0.052)	(0.053)	(0.046)	(0.047)
Consumer	0.048	0.051	-0.240***	-0.235***
	(0.062)	(0.062)	(0.055)	(0.055)
Infrastructure	-0.043	-0.025	-0.309***	-0.286***
	(0.061)	(0.062)	(0.054)	(0.055)
Mining	-0.083	-0.065	0.021	0.044
	(0.069)	(0.069)	(0.061)	(0.061)
Property	0.067	0.087	-0.348***	-0.322***
	(0.054)	(0.056)	(0.048)	(0.049)
Trade	0.061	0.067	-0.297***	-0.289***
	(0.049)	(0.049)	(0.043)	(0.043)
LNTA (-1)*Labor Intensity		0.001		0.0017**
		(0.0008)		(0.0007)
Constant	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS
Observations	294	294	292	292
F-statistic	2.764	2.742	10.749	10.415
Adjusted R-squared	0.062	0.066	0.269	0.279

Our main findings in this study basically confirm what was proposed in the resources-based view (RBV) in which firms having resources advantage could take benefits by diversifying their business. Firms having advantage in the form of assets exploit their advantage to expand their business and geographic segments to generate profits. Moreover, the results reveal that large firms could broaden their geographic area of sales more easily when they do not face labor constraint. Less labor intensive firms could be more flexible to bring their business into a wider coverage.

4. Conclusions and Limitations

We analyze the impact of firm size on business and international diversification in the context of Indonesian publicly traded firms. Controlling for past performance, age and industry, we do find, as we expect, that large firms tend to diversify their business as well as their geographic segments. We also extend this study by looking at the moderating role of labor intensity in the impact of firm size on diversification strategies. Our results show that large firms with less labor intensity are more likely to diversify their geographic segments.

Nevertheless, several caveats should be considered in interpreting our results. First, despite the lag value of firm size and accounting performance employed, possible endogeneity issue still arises. Second, as this study is a cross-section (individual varying), the skeptical may argue that this method neglects the matter of time effect. Therefore, a panel study using instrumental variables is suggested to overcome such econometrics problems. We also challenge future study to investigate whether the diversification strategies could lead superior performance.

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