



DOES INTERNATIONAL COMPETITION ENHANCE CAPACITY UTILISATION? EVIDENCE FROM INDONESIA, PHILIPPINE AND VIETNAM

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Abstract

This paper uses firm-level data of small and medium manufacturing firm in Indonesia, Philippine and Vietnam and studies the relationship between capacity utilisation and foreign market competition for the possibility of efficient firms self-selecting themselves instead of learning-by-exporting to enter the foreign markets. Estimating both linear and quadratic model on an unbalanced variance of exporting and non-exporting firms shows that the impact of foreign market competition on capacity utilisation is following a curvilinear relationship with a diminishing marginal point of as a constraint for further expansion. Capacity utilisation rate higher in non-exporting group is not only emphasizing a strong domestic market orientation of firms at large but also indicating the selection of learning-by-exporting entry mode by exporter SMEs in these countries. The paper further explores the impact of firm and industry physiognomies on a firm's capacity utilisation and finds that the effects of wage productivity, competition, firm size, and legal structure are linearly positive and capacity dependent. The results throughout maintain the importance of capacities, competitiveness, and institutional performance as priorities to promote SMEs growth.

1. INTRODUCTION

Small and medium-sized enterprises (SMEs) play a critical role as backbones of economic health and vitality in most developing and developed countries. Recent statistics indicated that SMEs make up 90 per cent of businesses worldwide and account 50 to 60 per cent of employment (Jenkins, 2004; Luetkenhorst, 2004). The 60 per cent of employment ratio particularly holds true in developing countries where large government enterprises are downsizing in response to the changing global economy. In addition to these strengths and opportunities, SMEs have established a successful track globally by building systemic productive capacities, nurturing entrepreneurs and innovation, and serving as attractive ventures for foreign investment (Pidani *et al.*, 2012; Raynard & Forstater, 2002). Given those facts, it is critical to create a conducive business environment and establish effective

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support systems that will help support small and medium businesses and, in turn, will help with the retention of skilled workers and eventually help boost their growth beyond the SME status.

In Southeast Asia, the importance of SMEs has been increasing as these economies have become more integrated to the global market. A paradigmatic shift from state interventionism and import substitution industrialisation (ISI) towards trade liberalization in 1990s as well as fast-moving dissemination of information and communication through technological advancements afterwards, have led to an increased propensity of SMEs to internationalize their business with export opportunities. Recent statistics from various official sources indicated that SMEs' average contribution to total exports in selected southeast Asian developing countries were ranged from 15 to 40 per cent to the country's total merchandise exports in the period 1990-2006 (Tambunan, 2011). Hence, although the value of ASEAN's exports increased three times between 1998 and 2008 (Thorbecke, 2010), SMEs' share of total exports still represent less than one third of the total export value of merchandised goods. Thus, there remains significant room for further improvement.

Research findings on export performance have established the important role that export activities could play in addressing the trade deficit problem (Dollar and Kraay, 2004; Noguez and Siscart, 2005). Consequently, this has attracted a growing number of researchers investigating the factors determining export success. Some of the relevant studies include the examination of firm efficiency by mainly analysing the progress of total factor productivity (TFP). While most of these studies conclude that exporter firms show higher productivity growth, a conflicting findings is that the learning effects of productivity in these firms are not permanent or long lasting (Greenaway & Kneller, 2004, 2007; Damijan and Kostevc, 2005). Capacity utilization has emerged as a rationale for these short-lived productivity improvements. Temporary increase in productivity may suggest that firms simply take advantage of their underutilized capacity in the new markets and it is not an actual change in TFP. Capacity underutilisation, therefore, can be used as an indicator of waste of scarce resources of capital and foreign exchange. While openness is largely supported by the idea of the beneficial effects of competitive forces, the question of whether a higher degree of openness leads in effect to an improvement in the use of resources remains under-explored. The question becomes even more relevant in the context of SMEs in developing countries, as despite the volume of research on this topic, there is still insufficient information concerning their process of internationalisation and factors determining their success (Parish & Freeman, 2011). The aim of this paper is to develop the research in this area by investigating whether foreign market competition can serve as a determinant of firm productivity in developing countries.

A lack of information pertaining to the determinants of capacity utilisation is an important constraint on our analysis. The difficulty in measuring capacity utilisation is indicated as a cause of this constraint (see Shaikh & Moudud, 2004; Saikia, 2012). Despite this difficulty, findings in this area showed that the existence of unused and/or underutilized capacity is the main incentive that stimulates many firms to begin exporting (see Ahmed *et al.*, 2006; Greenaway & Kneller, 2007; Julian & Ali, 2009), that is most firms across sectors and countries operate with a slack or spare capacity. Following the description of the firm heterogeneity phenomenon and participation in foreign market proposed by Melitz (2003) where firm's export entry and exit are determined by the interplay of two factors: firm level variation in productivity, and sunk cost, a shift in competitive market structure should bring in a decline in underutilization of capacity and yet capacity constraint for some smaller firms due to economies of scale and fixed costs associated with exporting activities. In this study's context, the maximisation of underutilized capacity is expected to occur from an increasing exposure in foreign markets. Firm level export intensity is expected to contribute significantly and positively to firm capacity utilisation which is demonstrated in less capacity underutilization.

This study contributes to the literature by identifying the influence of firm exposure to foreign market competition on efficiency of resource utilisation in Indonesia, Philippine, and Vietnam where such a determinant has not been widely investigated and where latest data are readily available for analysis. It examines the resource utilisation mechanism that has not been incorporated by previous studies as

the starting point of firm's productivity. Finally, this study is pertinent for there is a need to support government initiatives in this area, particularly after the Asian financial crisis, to enhance SMEs' opportunities for growth and development.

The rest of the paper is divided into four sections. The next section provides an overview of the literature on the determinants of capacity utilisation of firms. Following this, we describe the methodology employed in the analyses and then report on the empirical analysis of the impact of international competition of manufacturing SMEs on their capacity utilisation level. Finally, we discuss the findings for policy recommendations.

2. LITERATURE REVIEW

2.1. Definition of SME for this study

SMEs have been defined in various ways among ASEAN member countries, but the most commonly used criterion is the number of employees. In addition to measures of size, many member countries also use various other measures such as initial investment, including or excluding land and building, annual sales or turnover, or production capacity to distinguish SMEs from larger enterprises (APEC, UNESCAP, and Bailey in [Tambunan, 2009](#)). For the purpose of this study, number of employees is taken into account when defining an SME.

As indicated in Table 1, the number of employees is the most generic measure to distinguish small, medium and large enterprises. However, other monetary measures have also been adopted by many member countries for policy purposes which may vary according to different industry or policy programs. The size spectrum among economies is large which ranged between 99 and 199 workers.

Table 1: Various definition of MSME in ASEAN countries

Country/Economy	Employee ¹⁾	Capital	Fixed assets	Sales	Production capacity
Brunei Darussalam	99	-	-	-	-
Indonesia	100	-	+ ²⁾	+	-
Malaysia	150	-	-	+	-
Philippine	199	-	-	+	-
Singapore	199	-	+	-	-
Thailand	200	+	+	-	-
Viet Nam	200	+	-	-	-
Myanmar	<200 ⁴⁾	+	-	-	+ ³⁾
Cambodia	<200	-	-	-	-
Lao PDR	99	-	+	-	-

Note: 1) Table 1 indicates the maximum number of employees in a firm defined as a MSME; 2) "+" as an element of the definition; 3) production value; 4) depends on sector.

Source: APEC, UNESCAP and Bailey in [Tambunan \(2009\)](#)

An enterprise in this study is then an SME if it employs between 5 and 199 employees (APEC, UNESCAP, and Bailey in [Tambunan, 2009](#)). SMES could be further differentiated into small enterprises as firms with 5 to 19 workers and medium enterprises as those employ between 20 to 199 workers.

2.2. SME internationalisation and capacity utilisation

An increasing importance of SMEs in international markets as well as availability of longitudinal data at the firm level have led to substantial attention on the causality between firm characteristics of SMEs and their exporting status. The prominent work by [Bernard and Jensen \(1995\)](#) is one of the earliest attempts to investigate differences in productivity between exporters and non-exporters. Their work serves as a starting point for a productive expansion of the field. The outstanding performance characteristics of exporting plants and firms compared to non-exporters was subsequently confirmed by [Tybout and Westbrook \(1995\)](#) on Mexican data, [Chen and Tang \(1987\)](#) on Taiwanese data,

Clerides *et al.* (1996) on data for Colombia, Morocco and Mexico, Bigsten *et al.* (2000) on Cameroon, Ghana, Kenya and Zimbabwe, and Belke *et al.* (2013) on six Euro member countries.

The existing empirical literature, however, becomes rather sparse when probed with the direction of causality. On the one hand, there is sufficient evidence in support of the learning-by-exporting where exporting allow a firm to have an exposure to a larger market with higher competitive pressure thus allowing it to take advantage of technology transfer and any economies of scale in production and improve its productivity faster than firms that serve domestic market entirely (Blalock & Getler, 2004; Greenaway & Kneller, 2003; Wagner, 2007). On the other hand, evidence of the existence of sunk costs and hysteresis associated to selling abroad and fiercer competition in international markets has proven problematical for some firms (Bernard & Wagner, 2001; Girma *et al.*, 2005). Thus, above average firms may select themselves into foreign markets and are more likely to export than inefficient ones.

While there is a large evidences in favour of self-selection hypothesis (see for example Bernard & Jensen, 1999; Aw *et al.*, 2000; Delgado *et al.*, 2002; Girma *et al.*, 2005), the empirical evidence for positive post-entry effects of learning by exporting are mixed (see for example Greenaway & Kneller, 2007, and Wagner, 2007). Greenaway and Kneller's (2007), in particular, found some evidence of learning-by-exporting hypothesis on a large sample of UK manufacturing firms but only found to be significant in the initial couple of periods after entry and the fails to prove permanent in the long term. In comparison, studies by Van Biesbroeck (2003) and Blalock and Gertler (2004) on sub-Saharan Africa and Indonesia, respectively, indicated that the learning hypothesis has more explanatory power for countries facing significant technological gaps in respect of foreign markets. Thus, the scope for learning through exports is greater for firms from less developed countries than for firms from developed countries (Fernandes & Isgut, 2005). While the self-selection mechanism appears to be particularly prominent for firms from small and competitive domestic market where advanced technology is in place and thus, post-entry learning effect is irrelevant.

Since the prevailing evidence on whether exporting causes efficiency gains is less than conclusive, this study will be mainly targeting the effects of foreign market competition by specifically looking into the degree of efficiency in resources utilization in the aftermath of the increased trade exposure. A firm is assumed to operate on a precautionary slack or spare capacity to anticipate demand uncertainty in the long run. Hence, a firm, with a set of capacity in place, will maximize the quantity of the existing capacity ex-post receiving the information about their product's demand where the average costs is then minimized as due to a scale effect (Damijan & Kostecv, 2005).

Capacity utilisation in this study can be defined as the ratio of some base output (actual output) to capacity output (potential output) (Kirkley *et al.*, 2002). As to the potential output, we use the economic approach of the maximum amount of output that can be produced in the short run with the existent stock of capital (see Nelson, 1989). Based on this view, capital can be adjusted to achieve optimal level (cost minimising, profit maximising) in the long run. In the short run capital is fixed and only the variable inputs can be varied. This approach also implies that capacity utilisation may be a short-run concept as there exists in every sector of economy overcapacity and under-capacity, that evolving relative to growth and fall of its demand side or it is simply part of the business cycle fluctuations that is interpreted into firm's resource allocation strategy.

Some capacity utilisation measurements have been frequently cited in the business and economic literatures. However, the most direct and common means of obtaining numerical capacity utilisation ratios is by asking firms based on their own assessment the extent to which they are using available capacity in their various plants. This method has been used widely by industry and business survey institutions including the World Bank to provide information on capacity utilisation in both developed and developing countries. A self-assessment question that often request in manufacturing information survey is as follows:

“In fiscal year (insert last complete fiscal year), what was this establishment’s output produced as a proportion of the maximum output possible if using all resources available (capacity utilisation)?

This question is reviewing the previous fiscal operating period given the existing machinery and regular shifts. The responses of such a question provide not only the required ratio but also reliability of measurement as responses were consistent with the actual demand fluctuation (Christiano, 1981).

A review of empirical literature, in addition, indicates a number of variables that affect capacity utilization. Popular ones include wage rate, the price of capital, the size of the night shift wage premium, the capital intensity of the production process and the plant size. Capacity underutilization in developing countries has been under scrutiny by both Neo-Classical and Structuralist perspectives (Mensah, 2002). According to Neo-classical economists, capacity underutilisation is attributed to economic distortions in terms of relative prices of inputs and outputs, overvaluation of the exchange rate, lack of competition, quantitative restrictions and rent seeking which hinder productive use of capital assets by entrepreneurs. The Structuralist, alternatively, concerns the capacity underutilization with bottlenecks problems such as limited market size, limited supply of foreign exchange and inadequacies in the non-traded sector like poor power supply and transport. These variables have come under considerable scrutiny by a number of studies (see for example: Steel & Webster, 1991; and Mensah, 2002) that have them incorporated in their empirical analysis and models.

3. DATA, METHOD AND VARIABLES

For the purpose of this study, we employ data sets derived from Enterprise Surveys that were conducted by the World Bank in Indonesia and Vietnam in 2009. After separating manufacturing small and medium sized enterprises from non-manufacturing and large-sized ones, the sample size was reduced from 3,823 to 2,160 respondents.

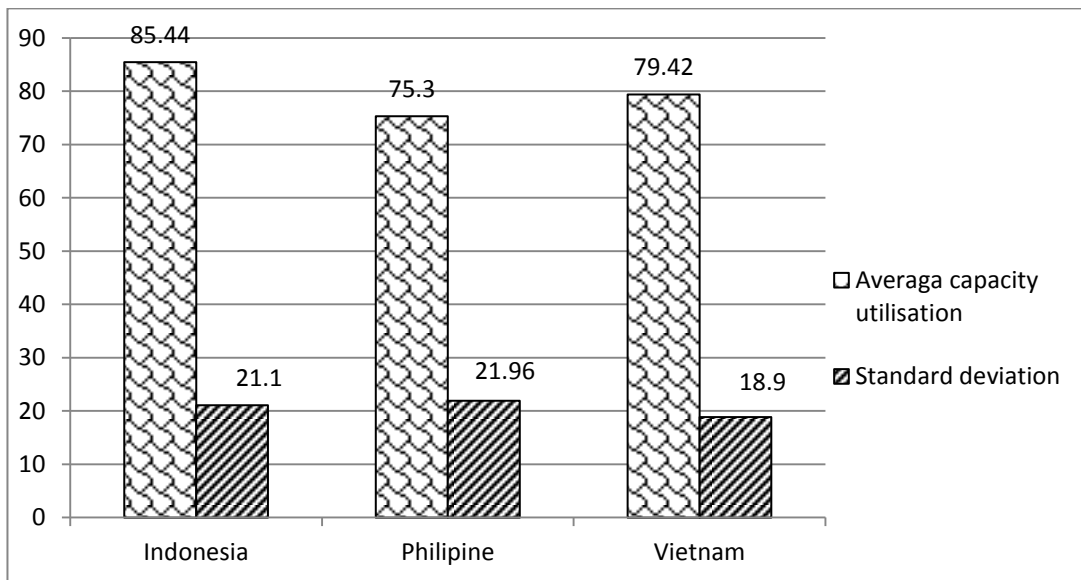


Figure 1: Differences in average capacity utilisation by countries (in per cent)

Based on respondents’ responses to the survey instrument, there are differences in average capacity utilisation among countries in the sample. The variation in the variable indicates that there might be specific qualities, constraints and opportunities affecting firms’ performance within each country’s environment. Figure 1 shows that average capacity utilisation is highest in Indonesia and lowest in Philippines. All countries, however, are in a relatively high capacity utilisation by running the production at more than 75 per cent of total capacity.

Average capacity utilisation also varies slightly by sector (see Figure 1). The highest average capacity is in the textiles sector (83.0%) which is also the sector with relatively lower share of exporters within (22.0%). Non-metallic and mineral products are the second highest sectors in their capacity utilisation (81.3 %), but followed by the lowest share of exporter firms (11.5%). The largest share of exporters (51.7%) with a reasonably high rate of capacity utilisation (75.6%) held by electronic sector. In general, these differences indicate that each industry has certain internal characteristics and external circumstances represented in the sector and country each firm belongs to, which might explain the variation in capacity utilisation and export intensity.

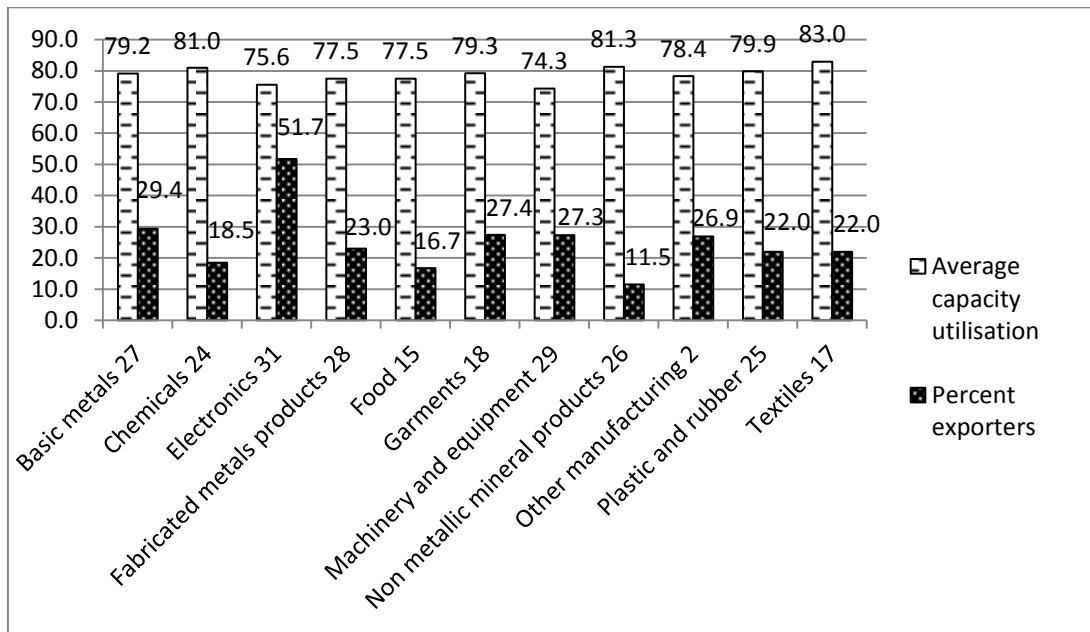


Figure 2: Average capacity utilisation by sector (in per cent)

In this paper, a method for measuring capacity utilisation is using firm’s own assessment as to which level the firm operates given its current level of variable input usage. The analysis has been applied by the World Bank to a number of small and medium-sized firms operating in many countries including three countries analysed. Low capacity utilisation scores for firms in a particular level of export intensity may suggest capacity underutilisation. This assumption, however, may not be fully answered unless testings are undertaken and if the assumption is valid, then exporting firms are expected to report more capacity utilisation than non-exporting firms. The degree of capacity utilisation is also expected to increase as the firms’ export intensity increases. In contrast, the degree of capacity utilization is expected to fall as the firm’s export intensity decreases.

The method was applied to the sample that contains a wide variety of capacity utilisation and export intensity levels. Firms were divided into two main groups of export intensity: (i) non-exporters or those with an export-to-total sales ratio equal to zero; (ii) exporters or those with export-to-total sales ratio equal or more than 10 per cent. Export intensity is a measure used to quantify the contribution made to a firm’s total business by exports (Das *et al.*, 2007; Estrin *et al.*, 2008). This ratio is repeatedly used in the export literature as an indicator of a firm’s export performance. It is concluded that the higher the export intensity, the greater the degree of internationalisation (Katsikeas *et al.*, 2000).

Based on the concept that some external and internal attributes have significant impact on unsolicited capacity utilization, other variables with particular reference to developing countries such perceived structural bottlenecks; electricity and transport barriers, are included and expected to have negative effects on undesirable capacity utilization. A solicited excess capacity, alternatively, is

mainly driven by price incentive. The sustained increase in demand and accordingly, an increase in price, should prompt the company to meet this demand either by building a new plant, or by intensifying the usage of their existing plant; running extra shifts or hiring seasonal workers. The gap between the costs of capital equipment and worker night-shift payment or employing seasonal workers will be a key factor in determining the lowest cost among these three alternatives. Wage cost for evening-shift differential is often exceedingly higher than those of desirable-shifts and can be too costly for firms to liquidate. Solicited excess capacities are also driven by the cost of capital that can vary due mostly to interest rate or exchange rate fluctuations. When capital is utilized considerably, average cost of capital becomes lower in any level of the rhythmic input(s) cost (Nikiforos, 2012). Table 2 provides a full description of the variables employed in the empirical analysis.

Table 2: Variable definitions

Variable	Definitions	Measurement
CAPACITY	The establishment average capacity utilisation or the amount of output actually produced relative to the amount that could have been produced using existing machinery, equipment and regular shifts).	Continuous
INTENSITY	Percentage of the establishment's sales that were indirect exports and direct exports.	Continuous
ELECTRICITY	Perceived infrastructure (electricity) barriers.	Ordinal: 1 = no obstacle; 2 = minor obstacle; 3 = moderate obstacle; 4 = major obstacle; 5 = very severe obstacle.
TRANSPORT	Perceived infrastructure (transport) barriers.	Ordinal: 1 = no obstacle; 2 = minor obstacle; 3 = moderate obstacle; 4 = major obstacle; 5 = very severe obstacle.
PROFITCAPITAL	The ratio of amount of profit to the amount spent on machines, raw materials and equipment for the year.	Continuous.
WAGE	The ratio of actual output to the wage bill for the year.	Continuous
LABOR	The ratio of total sale less raw material costs to total number of workers in the previous year.	Continuous
COMPETITION	Number of competitors faced by the firm in its main product market.	Continuous
SIZE	Permanent, full time employees the firm employs at the end of last fiscal year.	Continuous
LEGAL	Firm's current legal status.	Ordinal: 1 = sole proprietorship; 2 = partnership; 3 = limited partnership; 4 = shareholding company with non-traded shares or shares traded privately; 5 = shareholding company with shares traded in the stock market.

Source: Derived from survey data

Firm size and legal structure, as the most frequently cited organizational variable, are also included and expected to have an important influence on firm capacity utilisation. The business cycle process, which often requires an increasing demand in resources, has been strongly correlated with size. It is

assumed that the larger the real assets a firm have, the greater the firm's ability to expand resources (Burkart & Ellingsen, 2004) compared to smaller firms. Furthermore, firms with limited liability (diffused ownership) have more development attributes than those firms with unlimited liability (concentrated ownership) (Dietmar *et al.*, 1998). A number of advantages, such as high-level commitment of managers to the firm's goals due to the separation of ownership and administration have made diffused ownership possess stronger ability to access resources than concentrated ownership (Abor, 2008; Kira & He, 2012).

4. EMPIRICAL RESULTS

Table 3 provides the Pearson correlation test carried out to find out whether SMEs capacity utilisation level and other independent variables had relationships that could be used to further explain the distribution they have in the Figure 1 and Figure 2. Prior to performing the test throughout, the underlying assumptions of the test were investigated. The dataset generated fulfilled the following conditions of related pairs, scale of measurement, normality, linearity, and homoscedasticity (Coakes *et al.*, 2010). Following the test, Pearson correlation coefficient (see Table 3) indicates an expectedly significant positive correlation between SMEs capacity utilisation level and their level of export intensity, at 1 per cent significance level (r -squared = 0.111 and p -value = 0.000). This magnitude is supported by the standard t -test which indicates significant difference between exporting and non-exporting SMEs in terms of their capacity utilisation at 5 per cent significance level (t -value = -2.348 and p -value = 0.019). The two-tailed significance for export intensity suggests that non-exporting SMEs have a relatively higher mean of capacity utilisation (mean = 79.65, $s.d.$ = 22.79) than their exporting counterparts (mean = 76.81, $s.d.$ = 22.31). Hence, the proposed hypotheses (exporting firms are expected to report more capacity utilisation than non-exporting firms) is rejected as non-exporting firms is clearly utilising more production capacity than exporting firms.

Table 3: Correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
Capacity	79.15	22.71	.111***	.053***	.006 ^{ns}	-.054***	-.069***	-.002 ^{ns}	.032*	.246***	.146***
1. Intensity	8.84	25.74		.038**	.048**	-.003 ^{ns}	-.006 ^{ns}	.000 ^{ns}	-.031*	.207***	.125***
2. Electricity	1.96	1.51			.231***	-.028*	-.023 ^{ns}	.029*	.008 ^{ns}	.089***	.097***
3. Transport	1.66	1.75				.024 ^{ns}	-.036**	.014 ^{ns}	.026 ^{ns}	.070***	.133***
4. Profitcapital	-1.15.E+8	2.4.E+9					.845***	-.014 ^{ns}	.006 ^{ns}	-.102***	-.060***
5. Wage	-1.7.E+8	4.2.E+9						-.008 ^{ns}	.012 ^{ns}	-.114***	-.054***
6. Labor	1.7.E+8	9.4.E+9							.003 ^{ns}	.059***	.035*
7. Competition	3.38	1.84								-.046**	.027 ^{ns}
8. Size	53.65	71.78									.402***
9. Legal	2.52	1.44									

^{ns} not significant, *** $p < .01$, ** $p < .05$, * $p < .1$

Table 3 also reveals that the Pearson correlation analysis holds this foreseeable diminishing distribution patterns and show significant negative correlation coefficients both between SMEs capacity utilisation level and their profit to capital ratio (r -squared = -0.054 and p -values = 0.000) as well as between their capacity utilization level and wage productivity ratio (r -squared = -0.069 and p -values = 0.000) at 1 per cent significance level. The majority of respondents, considering their legal status, are in the shareholding company with shares traded in the stock market and followed secondly by partnership structure and then others. The proportion of partnership structure, however, is almost twice as many as shareholding firms with shares traded in the stock market in the highest capacity utilisation. The pattern is likely to distribute in the same array throughout the capacity utilisation categories is confirmed by the Pearson correlation test which shows a significant positive correlation between SMEs capacity utilisation level and their legal status at 1 per cent significance level. The calculated value of the test shows an r -squared = 0.146 and p -value of 0.000 which is less than the critical value of 0.01 (see Table 3).

The results on firm size show that both small and medium firms have a propensity to cluster progressively throughout the capacity levels with more medium size firms in the highest capacity utilisation. The pattern is supported by an estimated significant positive correlation coefficient (r-squared = 0.246 and p-value = 0.000).

Table 4 reports the regression results for the sample on both linear and u-shaped models. Under linear model, the analysis is undertaken to identify which among the predictors affect the level of capacity utilisation significantly. Under the linear regression, the estimated model is statistically significant because the p-value is less than the critical value of 0.01 (F-value = 18.585; Prob = 0.000). Independent variables were tested for multi-collinearity using variance inflation factor (VIF). These tests appeared satisfactory in that the range was between 1.006 and 3.557 which are less than 5 for any variable (Acock, 2014). The model, however, does not perform a good job in explaining the level of capacity utilisation as it only contributes 7.2 per cent of variation in capacity utilisation. Notwithstanding the model fit, five variables of export intensity, wage productivity, competition, firm size, and firm legal status generate the assumed significance.

It is clear from both linear and u-shaped models that the variable measuring firm export intensity is positively significant in explaining the capacity utilisation of a firm. Within the two models the export intensity coefficients are statistically significant at 1 per cent level. Holding all else constant, a one-percentage point increase in the percent of export is associated with a 0.062 to 0.662 percentage point increase in capacity utilisation. These results support the hypotheses specified in this study (the degree of capacity utilisation is expected to increase as the firms’ export intensity increases) and are corresponding to previous studies concluded that international engagement may increase demand and competition for a firm’s product that raise its capacity utilisation. Exporters, therefore, should demonstrate higher productivity and efficiency than non-exporters (Goldberg *et al.*, 2005). These result, however, are inconsistent with the initial finding (non-exporting SMEs have a relatively higher mean of capacity utilisation than their exporting counterparts), suggesting that the sample developing ASEAN SMEs have a strong orientation on large domestic markets and exporting SMEs might be simply shedding their underutilized capacity to marginal markets through learning-by-exporting approach. The u-shaped model, further, suggests that although SMEs should increase their export intensity as to allow for more capacity utilisation to take place, past a certain point, increased export intensity will increase capacity utilisation by only insignificant amount. More exactly, all things being equal, increased export intensity that passes the slope of 0.528 (0.661/(2*0.626) or approximately after 50 per cent of total sales will, in fact, decreases expected capacity utilisation. The stated hypotheses (the degree of capacity utilization is expected to falls as the firm’s export intensity decreases), therefore, is accepted at 1 per cent significance level as capacity utilisation is declining as the export intensity descends after reaching 50 per cent of total sales.

Table 4: Regressions

Independent variables	Linear-shaped relationship All countries		Inverted u-shaped relationship	
	Coefficient	Beta	Beta1	Beta2
Intercept	49.05 ^{***}			
Intensity	0.260 ^{***}	0.062	0.661 ^{***}	-0.626 ^{***}
Electricity	0.718 ^{ns}	0.034	0.043 ^{ns}	0.031 ^{ns}
Transport	-0.555 ^{ns}	-0.030	0.011 ^{ns}	-0.001 ^{ns}
Profitcapital	5.913E-10	0.028 ^{ns}	-0.046	0.033
Wage	-8.117E-10 [*]	-0.067	-0.138	-0.055
Labor	-5.232E-11 ^{ns}	-0.017	-0.086	0.073
Competition	0.797 ^{**}	0.044	0.026 ^{ns}	-0.010 ^{ns}
Size	0.098 ^{***}	0.209	0.207 ^{***}	0.044 ^{ns}
Legal	1.199 ^{**}	0.053	0.430 ^{***}	-0.284 ^{**}
Adjusted R ² (per cent)	7.2			

F-value	18.585 ^{***}
Number of observations	2157
Intercept	94.87 ^{***}

^{ns} not significant, ^{***} p < .01, ^{**} p < .05, ^{*} p < .1

The second factor determining capacity is the wage productivity, whereby the lower the output-wage bill ratio of the firm, the more likely it is to use all of its capacity. This finding, in particular, provides support for previous empirical research (see [Barbosa-Filho, 2004](#)) maintained that the wage a worker earns, measured in units of output, equal the amount the worker can produce. Otherwise, competitive firms would have an incentive to alter the number of workers they hire. If the wage bill increase below the output (value added), firms would find it profitable to hire more workers and use all of its capacity. The results from the u-shaped model, however, shows that the coefficient of the interaction term of wage productivity and capacity utilization are both negative (Beta1 = -0.138, Beta2 = -0.055) suggesting a curvilinear relationship may not exist between two variables.

The third factor found significant in explaining capacity utilisation is the competition. Manufacturing SMEs, as predicted, adjust to an expanding domestic or foreign market competition by increasing their capacity utilisation. In other words, increased competition induces firms to use their resources more efficiently ([Bocardo, 2004](#); [Stucke, 2013](#)). The coefficient term of competition appears positive but only significant in linear model at 5 per cent level (p-value = 0.036). The u-shaped model indicates a possible curvilinear relationship but emerges insignificant on capacity in both curve ends (p-values of both intersections = 0.343 and 0.716 respectively).

Firm size is the fourth factor found significant in determining firm's capacity utilisation. The coefficient appears to be positive and significant in linear model at 1 per cent level (p-value = 0.000). All other things being equal, a one-percentage point increase in the firm size is associated with a 0.098 to 0.207 percentage point increase in capacity utilisation. The u-shaped model also suggests that firms should increase their size as to increase the utilisation of production capacity, but after surpasses 2.35, increased firm size would be trivial in raising capacity utilisation or would in fact, decrease capacity utilisation. The diminishing slope, however, is not significantly affecting the capacity utilisation. In sum, the findings generally suggest that the advantages of firm size on the capacity utilisation remains crucial for growth as it is associated with the scale economies and cost differential arise from the ability of the larger firms to readily expand or run down their underutilized production capacity ([Bocardo, 2004](#)).

The coefficient of legal status is also positive and significant in linear model at 5 per cent level (p-value = 0.022). Assumed all else equal, a percentage point increase in legal status will raise capacity utilisation by 0.053 to 0.430 percentage point. The u-shaped model shows significant coefficients of the interaction terms which are partially positive but negative henceforth. The negative Beta2 suggests that there is a diminishing point where increased legal status or reduced company control and limited liability on the company legal structure would in fact, decrease capacity utilisation. More precisely, other things being equal, increased legal status that passes the slope of limited partnership structure will start diminishing capacity utilisation. Based on this, the proposition on firm legal status is, then, accepted at 5 per cent significance level as the variable has a significant positive effect on firm's capacity utilisation. This result provides support to previous studies that a firm legal structure is an important driver of its performance ([Kapopolous & Lazaretou, 2006](#); [Su & He, 2012](#)). In particular, [Su and He \(2012\)](#)'s study of publicly listed manufacturing firms in China for the period 1999 to 2006 found that the firm performance is negatively related to state ownership (concentrated/unlimited liability) but positively related to public and employee share-ownership (diffused/limited liability). Firms with more independent board, therefore, are more efficient compared to those with concentrated ownership.

5. CONCLUSION

This study investigates the relationship between firms' level of foreign market competition and capacity utilisation in three ASEAN countries. The findings of this study provide support for the hypothesis that firm capacity utilisation is significantly affected by its level of foreign market competition. Since exporters are marginally present within the three contexts, this would be an important issue to be considered by the government or public agencies in their pursuit to encourage SME's export and internationalisation. Further, the findings indicate that developing ASEAN SMEs have a strong orientation on large domestic markets and since capacity utilisation was higher in non-exporter group, exporting SMEs in these contexts might be just exploiting their underutilized capacity to marginal markets through learning-by-exporting approach. The results, in addition, suggest that increasing the level of exports also affects capacity but as an inverted u-shape test shows, the effect of more exports on capacity utilisation increases at a diminishing rate, indicating that if exporting passes 50 per cent of total sales, capacity utilization starts to decrease.

This study also includes other determinants of capacity utilisation. As projected, capacity utilisation is affected negatively by wage productivity. Firms that have lower wage productivity waste less of their resources, while those firms with a higher ratio of actual output to the wage bill for the year make the least of their productive resources. The results insinuate that a firm with lower wage bills has more flexibility or freedom to hire more workers in order to use the most of its capacity.

We also found competition to be significant factor in firms' disposition to utilize their production capacity. The positive result seems to suggest that the spiral effects of increased competition stimulate firms to thrive this externality by using their resources more efficiently. Positive causality between firm size and firm legal status and capacity utilization in our regression model provide some evidence in support of competition variable, in that SMEs which are making the most of their resources are characterized by having developed a particular firm size and legal status. The legal status, in particular, leads to inverted u-shape results suggesting the effect of increased legal status or reduced company control and limited liability on the company legal structure would in fact, decrease capacity utilisation. The implication from these findings is that SMEs need to be aware that by strengthening their institutional performance, they can expand their existing real capacity to achieve potential capacity. Promotion of foreign competition through export and other modes of entry, therefore, remains crucial for improving firms' efficacy and vital if the governments in each country desires to pursue high rates of economic growth.

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Reference

- Abor, J. (2008). Determinants of the capital structure of Ghanaian firms. *African Economic Research Consortium, Nairobi, AERC Research Paper*, 176, 1-29.
- Acock, A. A. (2014). *A gentle introduction to STATA*. Texas: Stata Corp.
- Ahmed, Z. U., Julian, C. C., Baalbaki, I., & Hadidian, T. V. (2006). Firm internationalisation and export incentives from a Middle Eastern perspective. *Journal of Small Business and Enterprise Development*, 13(4), 660-669.
- Aw, B. Y., Chung, S. & Roberts, M. J. (2000). Productivity and turnover in the export market: Micro-level evidence from the Republic of Korea and Taiwan (China). *The World Bank Economic Review*, 14(1), 65-90.

- Belke, A., Oeking, A., & Setzer, R. (2013). *Exports and capacity constraints – A smooth transition regression model for six Euro area countries*, ROME Working Papers number 201313, ROME Network.
- Bernard, A. B., & Jensen, J. B. (1995). *Exporters, jobs, and wages in U.S. manufacturing: 1976-87*. Brookings Papers on Economic Activity: Microeconomics, Vol.1995, pp. 67-112.
- Bernard, A. B., & Jensen, J. B. (1999). Exceptional exporter performance: Cause, effect, or both? *Journal of International Economics*, 47(1), 1-25.
- Bernard, A. B., & Wagner, J. (2001). Export entry and exit by German firms. *Review of World Economics*, 137(1), 105-123.
- Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J. W., Habarurema, J., Oduro, A., Oostendorp, R., Patillo, C., Söderbom, M., Teal, F., & Zeufack, A. (2000). *Exports and firm-level efficiency in African manufacturing*, Centre for the Study of African Economies Working Paper Series, 2000, number 16.
- Blalock, G., & Gertler, P. (2004). Learning from exporting revisited in a less developed setting. *Journal of Development Economics*, Vol.75, No.2, pp. 397-416.
- Bocardo, J. (2004). *A firm's capacity utilization and its relationship with foreign competition in selected countries*. Retrieved from https://repository.library.georgetown.edu/bitstream/handle/10822/555969/etd_jb427.pdf?sequence=4.
- Burkart, M. & Ellingsen, T. (2004). In-kind finance: A theory of trade credit. *American Economic Review*, Vol.94, No.3, pp. 569-590.
- Chen, T., & Tang, D. (1987). Comparing technical efficiency between import substitution-oriented and export-oriented foreign firms in a developing economy. *Journal of Development Economics*, 26(1), 277-289.
- Christiano, L. (1981). A survey of measures of capacity utilisation. *IMF Staff Papers*, 28(1), 144-198.
- Clerides, S., Lach, S., & Tybout, J. (1996). *Is "learning-by-exporting" important? Micro-dynamic evidence from Colombia, Mexico and Morocco*. NBER Working Paper number 5715.
- Coakes, S.J., Steed, L., & Ong, C. (2010). *SPSS: Analysis without Anguish: Version 17 for Windows*. Australia: John Wiley & Sons.
- Damijan, J. P., & Kostecv, C. (2005). *Performance on exports: Continuous productivity improvements or capacity utilization*. LICOS Discussion Paper number 163.
- Das, S., Roberts, M. J., & Tybout, J. R. (2007). Market entry cost, producer heterogeneity and export dynamics. *Econometrica*, 75(1), 837-873.
- Delgado, M. A., Farinas, J. C., & Ruano, S. (2002). Firm productivity and export markets: A non-parametric approach. *Journal of International Economics*, 57(1), 397-422.
- Dietmar, H., Konrad, S., & Woywode, M. (1998). Legal form, growth and exit of West German firms-empirical results for manufacturing, construction, trade and service industries. *The Journal of Industrial Economics*, 46(4), 453-488.
- Dollar, D., & Kraay, A. (2004). Trade, growth, and poverty. *The Economic Journal*, 114(493), F22-F49.
- Estrin, S., Meyer, K. E., Wright, M., & Foliano, F. (2008). Export propensity and intensity of subsidiaries in emerging economies. *International Business Review*, 17, 574-586.
- Fernandes, A. M., & Isgut, A. E. (2005). *Learning-by-doing, learning-by-exporting, and productivity: Evidence from Colombia*. World Bank, Washington, DC. .
- Girma, S., Kneller, R., & Pisu, M. (2005). Exports versus FDI: An empirical test. *Review of World Economics*, 141(2), 193-218.
- Goldberg, I., Radulovic, B. L. J., & Schaffer, M. E. (2005). *Productivity, ownership and the investment climate: International lessons for priorities in Serbia*. World Bank Policy Research Working Paper number 3681.
- Greenaway, D., & Kneller, R. (2004). Exporting and productivity in the United Kingdom. *Oxford Review of Economic Policy*, 20(3), 358-371.
- Greenaway, D., & Kneller, R. (2007). Firm heterogeneity, exporting and foreign direct investment. *The Economic Journal*, 117(517), F134-F161.

- Greenaway, D., & Kneller, R. (2003) *Exporting, productivity and agglomeration : A difference in difference analysis of matched firms*. GEP Research Paper number 03/45, University of Nottingham.
- Jenkins, H. (2004). A critique of conventional CSR theory: An SME perspective. *Journal of General Management*, 29(4), 55-75.
- Julian, C. C., & Ali, M. Y. (2009). *Incentives to export for Australian export market*. Retrieved from http://epubs.scu.edu.au/cgi/viewcontent.cgi?article=1307&context=comm_pubs.
- Kapopolous, P., & Lazaretou, S. (2006). *Corporate Ownership Structure and Firm Performance: Evidence from Greek Firms*. Bank of Greece Working Paper number 37.
- Kira, A. R., & He, Z. (2012). The impact of firm characteristics in access of financing by small and medium-sized enterprises in Tanzania. *International Journal of Business and Management*, 7, 108-119.
- Kirkley, J., Morrison Paul, C. J., & Squires, D. (2002). Capacity and capacity utilization in common-pool resource industries. *Environmental and Resource Economics*, 22(1-2), 71-97.
- Katsikeas, C. S., Leonidou, L. C., & Morgan N. A. (2000). Firm-level export performance assessment: Review, evaluation, and development. *Journal of Academy of Marketing Science*, 39(3), 157-168.
- Luetkenhorst, W. (2004). Corporate social responsibility and the development agenda. *Intereconomics*, 39(3), 157-166.
- Stucke, M. E. (2013). Is competition always good? *Journal of Antitrust Enforcement*, 1(1), 162-197.
- Melitz, M. (2003). The impact of trade and intra-industry trade reallocations and aggregate industry productivity. *Econometrica*, 71(6), 1695-1725.
- Mensah, J. V. (2002). Determinants of capacity utilisation of rural and urban small-scale industries n Ghana. *Oguaa Social Sciences Journal*, 3(3), 104-124.
- Barbosa-Filho, N. H. (2004). *Estimating potential output: A survey of the alternative methods and their applications to Brazil*. Economic Commission for Latin America and the Carribean. Retrieved from <http://www.cepal.org/publicaciones/xml/5/22275/lcbrsr152nelsonbarbosa.pdf>.
- Nelson, R. A. (1989). On the measurement of capacity utilisation. *Journal of Industrial Economics*. 37(1), 273-286.
- Nikiforos, M. (2012). *The (normal) rate of capacity utilization at the firms level*. Levy Economics Institute, Working paper number 737, November.
- Noguer, M., & Siscart, M. (2005). Trade raises income: A precise and robust results. *Journal of International Economics*, 65(1), 447-460.
- Parish, C., & Freeman, J. (2011). Factors contributing to the export propensity of Australian seafood firms. *Journal of New Business Ideas and Trends*, 9(1), 1-17.
- Pidani, R. R., Mahmood A., & Agbola, F. (2012). Do managerial characteristics promote export development? A case of Manufacturing small and medium enterprises in Indonesia. *Academy of Taiwan Business and Management Review*, 8(3), 6-15.
- Raynard, P., & Forstater, M. (2002). *Corporate social responsibility: Implications for small and medium enterprises in development countries*, UNIDO, Vienna.
- Saikia, H. (2012). Capacity utilization in small scale industries of India: Some empirical evidences from underdeveloped industrial structure. *Journal of Social and Economics Statistics*, 1(1), 35-54.
- Shaikh, A. M., & Moudud, J. K. (2004). Measuring capacity utilization in OECD countries: A cpintegration method, *The Levy Economics Institute, Working paper*. November.
- Steel, W. F., & Webster, L. M. (1991). *Small enterprises in Ghana: Responses to adjustment*. Industry Paper Series number 33, The World Bank Industry and Energy Department, Washington.
- Su, D., & He, X. (2012). Ownership structure, corporate governance and productive efficiency in China. *Journal of Productivity Analysis*, 38(3), 303-318.

- Tambunan, T. (2009). *Development of small and medium enterprises in ASEAN Countries*. India: Readworthy Publication Ltd.
- Tambunan, T. (2011). *The impacts of trade liberalization on Indonesian small and medium-sized enterprises*. TKN Policy Paper, International institute for sustainable development, Canada. Retrieved from http://www.iisd.org>impact_trade_lib_indonesia.
- Thorbecke, W. (2010). An empirical analysis of ASEAN's labor intensive exports. *Journal of Asian Economics*, 21(1), 505-513.
- Tybout, J. R., & Westbrook, M. D. (1995). Trade liberalization and dimensions of efficiency change in Mexican manufacturing industries. *Journal of International Economics*, 31(1), 53-78.
- Van Biesbroeck, J. (2003). Exporting raises productivity in Sub-Saharan African manufacturing firms. *Journal of International Economics*, 67(1), 373-391.
- Wagner, J. (2007). Exports and productivity; A survey of the evidence from firm level data. *The World Economy*, 30(1), 60-82.