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Importance of SMEs Development in Thailand

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Abstract

Although the issue of SMEs' development is not a new concept, increasing importance has been given to them recently following the Asian crisis. However, there are still considerable controversies over whether it is necessary to promote SMEs vis-à-vis LEs, and whether the support of SMEs is an enhancement of equity at the cost of efficiency. This paper provides an argument for and against the support of SMEs, taking Thailand as a case study where four hypotheses are investigated to reveal SMEs' advantages relative to LEs.

SMEs were found to possess many desirable characteristics, including the high usage of labor, the economic use of capital, and the high relation towards more equitable distribution of income and rural development. Still, the relatively lower productivity relative to LEs in nearly half of the industries may imply that overemphasis on the promotion of SMEs may come at the cost of efficiency. Thus, attention should be placed on balancing policies between industrial sizes and implementing more suitable policies and support for potential SMEs that enhance growth in Thailand's industrial sector.

I. Introduction

The issue of Small and Medium Size Enterprises (SMEs) is not a new concept in economic development. Though early academic works[1] emphasized the importance of development in small enterprises, not many resulted in policy enforcement as dynamic as that of large enterprises (LEs) in developing countries. Considering the large contribution of LEs in the economic prosperity of developed nations, this brought forth the question as to the significance of SMEs in development and why they should be emphasized, especially in planning and policy formulation of developing countries.

More recent researches[2] including those conducted by international organizations such as the World Bank, however, have started to vigorously investigate the role and impact of SMEs in developing countries. Such investigation started partly from the attempt to determine the factors which brought about the successful development of East Asian countries. Emergence of these countries during the 1980s has provided a new perspective on the desirable pattern of industrial development for other developing countries.

Globalization also played an essential role in generating a renewed attention to the role of SMEs in economic development. The concept of Global Paradox[3] introduced by Naisbitt (1994) provoked arguments as to how the openness of the world economy elicited increasing importance of small entity

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developments, given their flexibility, speed and innovativeness.

Upon entering the era of globalization, two opposing arguments are increasingly visible in both academic and policy circles. The first concerns the argument for the necessity of promoting and developing SMEs vis-à-vis LEs. The second concerns the manner in which SMEs contribute to economic development, or in other words, whether SMEs contribute to the enhancement of both equity and efficiency or enhancement of equity at the cost of efficiency. The 1997-98 Asian crises further sparked the argument for the encouragement of SMEs development. This is especially so in Thailand, where intensive support was set forth for revitalizing the industrial sector through the promotion of SMEs. Not only the Thai government but also international organizations, from then on, paid increasing attention to the promotion of SMEs both in Thailand and in other developing countries.

This paper introduces arguments for and against the promotion of SMEs taking Thailand as the base for analysis. The objective of this paper is threefold. First, it aims to discuss theoretical arguments for the importance of SMEs in the context of economic development. Second, it aims to assess the role and impact of Thai SMEs in development using establishment-level data from the Industrial Census 1997. Specifically, four hypotheses are tested to see whether SMEs perform more desirably vis-à-vis LEs. Third, it aims to conclude policy implications for SMEs in Thailand.

II. Importance of SMEs in Economic Development

The ideology behind the promotion of SMEs comes from the perceived failure of large enterprises in creating adequate productive jobs to absorb a significant share of the rapidly growing labor force in many developing countries (Snodgrass and Biggs 1996: 11). This perception inspired emphasis on the development of small industries by stressing benefits such as income generation, dispersal of economic activities to small towns and rural areas, and mobilization of entrepreneurial talents[4]. The following section provides a small briefing on the importance of SMEs in the field of economic development and brings forth four hypotheses to be tested in this paper.

II.1 Literature Survey

It is believed that goods consumed by poor people tend to be more labor-intensive than items consumed by those who are better off. Such goods tend to be better provided by SMEs. This is because SMEs are considered to utilize labor-intensive techniques of production, which in turn results in providing employment opportunities, especially to unskilled labor, and in enhancing their income growth and welfare. This is especially true in areas away from the cities, where industrial development other than SMEs is very limited. They provide a crucial foundation for rural development contributing to employment and income generation especially for poor people, resolving the problem of poverty and income disparities, thus built an intellectual base of public support since

the 1970s[5].

In the late 1980s, several studies made serious attempts to analyze the performance of small firms in developing countries[6] and considered the role of government in assisting firms to enhance growth potential. Among past studies, several countries showed rising factor productivity with plant size. However, Snodgrass and Biggs (1996: 24-29) found that in a few East Asian countries, upon disaggregating data by industry, the connection between productivity and plant size broke down. The total factor productivity was found to be highest in SMEs, especially among medium size firms. This finding provides an argument for SMEs not just as a source of improving social welfare, but also as a source of efficiency stimulating industrial development. Such productivity growth in SMEs was confirmed in studies such as Miwa (1996) and MOEA (1998) where the source of growth came from SMEs in Japan and Taiwan. In both countries, SMEs were found to be actively engaged in acquiring and upgrading new technologies and sustaining their competitiveness in the international market.

Apart from productivity enhancement, in the later stages of development, SMEs are found to also generate external economies through the formation of industrial clusters and positioning themselves near large enterprises. Such clustering behavior enables them to reduce cost and acquire better facilities as well as skilled human resources through the sharing of specialized suppliers, labor market pooling, and development through knowledge spillover (Perkins 2000), which would, as a result, help SMEs to capture productivity growth from the entire industry.

II.2 Argument for the Support of SMEs in Thailand

Although increasing attention started to be paid to SMEs elsewhere in the world in the 1990s, it is only in recent years that SMEs became a center of attention in Thailand and inspired more serious studies with respect to their true contribution to the economy[7]. Looking at the industrial structure of Thailand by size, SMEs occupy about 80% of the total industrial establishments. However, as seen in Table 1, their contribution to industrial employment is very small, and their share in output and value added is even smaller relative to LEs. This creates a doubt as to why SMEs need to be brought to the attention of the public and why they were strongly emphasized by the Thai government in 1998.

According to Regnier (2000), Thailand's intensive government support toward SMEs resulted from the economic crisis in 1997. Although the crisis was triggered mainly by the mismanagement of large firms, it was the SMEs that suffered most from the crisis, sparking criticism and concern for the sector. Both foreign and Thai researchers suggested that to bring back the economy, Thailand needed to emphasize on strengthening SMEs, especially those of the middle-sized and growth-oriented enterprises, as their base for recovery[8]. Furthermore, dominance of LEs in terms of employment and output may have been induced by preferential government policies. In the past, the Thai government has overemphasized the development of conglomerates and large enterprises, neglecting SMEs' role

Table 1 Overview of Thai Manufacturing Sector Classified by Industrial Size in 1997

Industrial Size	Industrial Establishment	Industrial Employment	Total Value-Added	Total Output
	No. of firms / %	Persons / %	Million Baht / %	Million Baht / %
Micro Enterprises (less than 10 employees)	3,031 (11.9)	15,410 (0.7)	6,619 (0.6)	17,408 (0.4)
Small Enterprises (10-49 employees)	15,366 (60.2)	268,949 (12.4)	80,672 (6.8)	226,703 (5.8)
Medium Enterprises (50-199 employees)	4,709 (18.4)	420,725 (19.4)	183,024 (15.4)	586,901 (15.1)
Large Enterprises (more than 200 employees)	2,423 (19.5)	1,465,398 (67.5)	917,965 (77.3)	3,044,942 (78.6)
Total	25,529 (100)	2,170,482 (100)	1,188,280 (100)	3,875,954 (100)

Note : (1) Numbers of industrial establishment include only firms which provide detail data for the analysis use in this paper. This is less than the total number of firms provided in the Industrial Census 1997 due to elimination of insufficient data sets provided by some establishments.

(2) See the definition of employment, value added and output in Appendix

Source : Author's calculation based on Industrial Census 1997, Thailand

especially in its strong government incentives and promotional policies toward attraction of foreign investors in the 1980s and 1990s. Major industrial research works are also concentrated on LEs, where data preparation and provision are much in favor of this sector. While for SMEs, research works are countable, and many have been published merely after the economic crisis in 1997.

II.3 Four Hypotheses

Although SMEs possess desirable development characteristics as summarized in the previous section, the policy shift of the Thai government towards SMEs needs to be justified. To investigate whether or not it is beneficial for Thailand to support and promote SMEs, this paper tests four hypotheses based on the widely claimed characteristics of SMEs relative to LEs[9] (Snodgrass and Biggs 1996: 11).

1. SMEs are more labor-intensive than LEs

First of all, the paper tests whether SMEs are more labor-intensive vis-à-vis LEs. As mentioned above, SMEs were found to be relatively more labor-intensive than LEs in the past studies. This paper tests whether the promotion of Thai SMEs has at least a certain potential in generating more jobs relative to LEs as long as SMEs utilize more labor-intensive production techniques and have an equal access to capital. In this paper, the labor-capital ratio is calculated for each industry to account for the labor usage per capital input among different size firms. By doing so, it is possible to measure how much labor is utilized by SMEs for one unit of capital relative to LEs.

2. SMEs are as efficient as LEs or more efficient than LEs

Past productivity studies (Snodgrass and Biggs 1996: 27-29) of SMEs in developed countries show relatively positive effects of SMEs' development. However, such results are relatively less prevalent in developing countries. So the second hypothesis intends to find out whether Thai SMEs are comparable or not to LEs in terms of productivity.

As part of this investigation, relative total factor productivity (TFP) is calculated for different industries by averaging TFP of each establishment in the industry. (Please see the Appendix for details of measuring relative TFP. From now on, relative TFP will be simply called TFP.) Although TFP is quite widely used in productivity studies, there are a number of limitations to its usage. As it is based on the standard production model, TFP is subject to the assumption of constant return to scale where the results of the estimation are usually interpreted as efficiency gains through adoption of new technology. However, according to Urata and Kawaii (2001), such efficiency gains are appropriate only when firms achieve maximum output given the level of inputs and technology in the long run. In the short run, firms are generally constrained by either immobility of inputs, inefficient management and inappropriate incentive system causing under-utilization, and possibility of true production technology being subject to increasing return to scale.

Therefore, two further measures are provided to examine the performance of SMEs - simply labor and capital productivity. In most developing countries, labor is abundant while capital is scarce. As a result, the existence of higher capital productivity especially in these economies may imply higher efficiency in the use of scarce resources.

3. SMEs are more equitable in distributing the income they generate than LEs

Since it is claimed that SMEs are a source of employment for unskilled labor in rural areas, promotion of SMEs is expected to contribute to employment and income generation especially for poor people and to resolve the problem of poverty and income disparities. This paper tests whether the higher concentration of SMEs is associated with more equitable income distribution in Thailand by relating the wage disparity in each province to the share of SMEs in provincial output. In this study, the wage disparity is represented by the coefficient of variation of wage paid by each firm in different provinces of Thailand. If the provinces with higher income equality have a higher share of SMEs, this may imply that promotion or development of SMEs could lead to more equitable income distribution in the future.

4. SMEs are more likely to play a higher role in rural development than LEs[10)]

SMEs are often said to provide employment opportunities and generate substantial income for unskilled and semi-skilled laborers especially in rural areas, thus working as a device in encouraging

rural development. To see whether this is true for Thai SMEs, the last hypothesis investigates the concentration of SMEs in rural areas by finding the relationship between the share of SMEs in provincial output and per capita income. Since the low level of income is associated with lower level of development[11], the concentration of SMEs in low-income areas shows that SMEs could be a major force of rural development as a result of rural dominance, despite the contribution from the agricultural sector in the early stage of development. This should be seen as a negative relationship between per capita income and the share of SMEs in provincial output.

III Assessment of the Contribution and Performance of Thai SMEs

III.1 Definition of SMEs and Data Source

The definition of SMEs varies significantly from research to research[12]. Particularly in Thailand, definitions of SMEs also differ among different organizations depending on their needs. Such non-uniformity of definition creates difficulties for the researcher to undertake in-depth analysis when data are combined from different sources. As a result, this paper defines SMEs as firms in the manufacturing sector consisting of 10-199 employees[13] and utilizes the single source of data provided by the National Statistics Office (NSO), which is the establishment level data of the Industrial Census 1997, in analyzing the performance of Thai SMEs[14].

III.2 Hypothesis Testing

Testing Hypothesis 1: *SMEs are relatively more labor intensive than LEs*

The first hypothesis tests whether SMEs are relatively more labor intensive than LEs whereby labor-capital ratio is calculated by industry and by size of firms. In doing so, it seeks to identify implications regarding SMEs' contribution to employment generation relative to LEs. T-test is also conducted to check the reliability of the results and examine the statistical significance of the difference in labor-capital ratios between different firm sizes.

Table 2 shows the results of the calculation of labor-capital ratio by industry and by firm size. Results found that labor intensity is exceptionally high in nearly all industries under SMEs, except for tobacco and basic metal industry. Besides, the t-test was found to be highly significant among small size firms[15]. For micro and medium size firms, results tend to be quite insignificant. Such high labor-capital ratios in small firms show that most tend to use higher proportion of labor relative to capital inputs. Considering Thailand as a country which lacks capital but has abundant labor resources, the high intensity of labor usage relative to capital implies a relatively more efficient usage of scarce resources in the country. It also implies that Thai SMEs tend to utilize more labor for a given amount of capital relative to LEs. These results affirm the hypothesis that SMEs are relatively more labor-intensive than LEs, and imply SMEs' potential in contributing to employment generation in Thai industries as long as they have an equal access to capital.

Table 2 Number of Firms and Labor - Capital Ratios by Size and by Industry

	Number of Firms				Index of Labor - Capital Ratio				T-test		
	Micro	Small	Medium	Large	Micro	Small	Medium	Large	Micro	Small	Medium
Food and Beverage	**413**	**2394**	**522**	**412**	**410**	**367**	**438**	**100**	**	*	*
Tobacco	**0**	**198**	**18**	**10**	**0**	**36**	**51**	**100**		*	
Textile	**127**	**807**	**362**	**227**	**152**	**298**	**118**	**100**		*	
Wearing Apparel	**159**	**1259**	**368**	**188**	**212**	**259**	**120**	**100**	*	*	
Leather Products	**58**	**543**	**146**	**93**	**152**	**306**	**82**	**100**		*	
Wood Products	**95**	**609**	**215**	**61**	**86**	**355**	**401**	**100**		**	
Paper Products	**104**	**353**	**124**	**51**	**192**	**668**	**131**	**100**		*	
Publishing and Printing	**359**	**732**	**122**	**36**	**212**	**176**	**263**	**100**	*	*	
Petroluem and Fuel	**3**	**22**	**13**	**7**	**37**	**4698**	**147**	**100**			
Chemical Product	**109**	**464**	**324**	**105**	**326**	**185**	**74**	**100**		*	
Rubber and Plastic	**237**	**1033**	**503**	**217**	**614**	**220**	**95**	**100**		*	
NonMetallic Mineral	**202**	**1896**	**385**	**137**	**513**	**564**	**256**	**100**		*	*
Basic Metal	**32**	**272**	**123**	**48**	**17**	**67**	**38**	**100**	**		
Fabricated Metal Product	**475**	**1679**	**367**	**118**	**257**	**254**	**229**	**100**	*	*	
Machine and Equipment	**188**	**633**	**213**	**88**	**263**	**179**	**121**	**100**		**	
Office Appliance	**1**	**9**	**8**	**33**	**62**	**120**	**49**	**100**			
Electrical Machinery	**50**	**184**	**134**	**97**	**260**	**129**	**174**	**100**			
Radio&TV Equipment	**14**	**72**	**62**	**109**	**1091**	**348**	**317**	**100**			
Precision Eq.,Watch and Clock	**14**	**74**	**29**	**26**	**131**	**436**	**317**	**100**		*	*
Motor Vehicle	**148**	**777**	**186**	**92**	**817**	**916**	**302**	**100**	*	*	*
Other Trasport Equipment	**19**	**116**	**62**	**30**	**85**	**459**	**180**	**100**		*	
Furniture and Other UCP	**218**	**1219**	**420**	**237**	**58**	**170**	**77**	**100**		**	
Recycling	**6**	**22**	**3**	**1**	**47**	**922**	**118**	**100**	*		
All Industry	**3031**	**15366**	**4709**	**2423**	**189**	**243**	**144**	**100**	*	*	**

Note : (1) For all industries, labor-capital ratio is defined as the number of laborers (L) divided by the total value of fixed assets (K). However, this table shows the index of the ratios for micro, small, and medium size enterprises relative to that of large enterprise with the base of 100.
However, this table shows the index of the ratios for micro, small, and medium size enterprises relative to that of large enterprise with the base of 100.

(2) " * " represents statistical significance at 5% confidence level under two-tailed t-tests.
" ** " represents statistical significance at 10% confidence level under two-tailed t-tests.
T-tests were conducted to see whether there is any statistical difference between LEs and SMEs (micro, small, and medium enterprises) at the 5% confidence level respectively.

(3) UCP represents unclassified products such as jewelry, musical instruments, sports goods, and etc.

Source : Author's calculation based on Industrial Census 1997, Thailand

Testing Hypothesis 2: *SMEs are as productive as LEs or more productive than LEs*

The second hypothesis tests whether or not Thai SMEs are productive relative to LEs using three measures of productivity: total factor productivity (TFP), labor productivity, and capital productivity. Table 3 shows the results of three productivity measures by industry and by firm size. The table also shows whether SMEs and LEs are statistically significantly different in terms of different productivity measures.

The results of the relative TFP index reveal that SMEs are as productive as LEs or in some industries more productive than LEs. In general, productivity levels of SMEs are higher than LEs such as in textile, paper products, petroleum and fuel, non-metallic mineral, fabricated metal, machine and equipment, electrical machinery, precision equipment and clocks, and furniture industries. The

Table 3 Total Factor Productivity, Labor Productivity, and Capital Productivity by Size and by Industries

	TFP Index				Labor Productivity				Capital Productivity				T-test relative to LEs: TFP			Labor Productivity			Capital Productivity		
	Micro	Small	Medium	Large	Micro	Small	Medium	Large	Micro	Small	Medium	Large	Micro	Small	Medium	Micro	Small	Medium	Micro	Small	Medium
Food and Beverage	-0.09	0.01	-0.03	0.09	80	74	90	100	394	184	231	100	*	*	*		*		**	*	
Tobacco	0.00	-0.07	0.54	0.50	0	3	8	100	0	1	8	100									
Textile	0.11	0.03	-0.02	-0.13	134	91	108	100	273	378	130	100	*	*	**					*	
Wearing Apparel	0.14	-0.06	0.14	0.04	110	69	106	100	223	162	152	100		*	*		*		*	*	*
Leather Products	0.08	0.02	-0.03	-0.14	133	68	117	100	268	278	142	100		*			*		**	*	
Wood Products	-0.16	-0.01	0.14	-0.17	99	107	138	100	220	332	572	100			*					*	**
Paper Products	0.08	0.05	-0.12	-0.19	40	23	25	100	127	168	80	100	**	*							
Publishing and Printing	0.02	-0.02	0.00	0.23	20	17	19	100	89	68	107	100				**	*		**		
Petroluem and Fuel	0.53	0.10	-0.10	-0.37	263	49	43	100	153	1815	134	100		**	**						
Chemical Product	0.05	0.00	-0.03	0.06	87	79	106	100	265	133	77	100									
Rubber and Plastic	-0.08	0.02	-0.01	0.01	88	81	115	100	211	118	125	100					**				
NonMetallic Mineral	0.03	0.01	-0.01	-0.17	130	79	88	100	574	424	311	100	*	*	*	**			*	*	*
Basic Metal	-0.31	0.00	0.07	0.05	50	65	138	100	50	158	166	100	*			*	*		**		**
Fabricated Metal Product	0.13	-0.03	0.02	-0.17	81	50	68	100	840	355	295	100	*	*	*		*	*	*	*	*
Machine and Equipment	-0.04	0.03	-0.01	-0.08	74	54	74	100	209	197	155	100		**		*	*	*	**	*	
Office Appliance	0.09	-0.06	0.09	-0.01	18	167	97	100	57	103	80	100									
Electrical Machinery	0.25	0.01	-0.01	-0.12	234	130	138	100	522	268	247	100	*						**	*	
Radio&TV Equipment	0.49	-0.03	0.06	-0.08	59	82	67	100	787	243	155	100									**
Precision Eq.,Watch and Clock	-0.21	0.08	0.15	-0.28	181	158	119	100	98	470	412	100									
Motor Vehicle	0.06	0.04	-0.18	-0.06	16	14	39	100	525	382	161	100			*	*	*	*	*	*	
Other Trasport Equipment	-0.08	0.00	-0.02	0.11	72	62	84	100	175	263	187	100		**	**		*			*	
Furniture and Other UCP	0.08	0.00	0.04	-0.12	117	78	128	100	129	160	117	100			*		**			**	
Recycling	-0.08	0.05	-0.13	-0.19	322	159	383	100	111	822	485	100				*		*			
All Industry	0.03	0.00	0.01	-0.05	80	59	82	100	236	165	140	100		*	*	*	*	*	*	*	**

Note : (1) Appendix A provides the methodology for the calculation of relative TFP Index and definition of Labor (L), Capital (K), Intermediate Inputs (M), and Output (Q)

(2) All industries are shown as an index with large enterprises as the base of 100 for comparison in labor and capital productivity.
Labor Productivity=Output/Labor
Capital Productivity=Output/Capital

(3) " * " represents statistical significance at 5% confidence level under two-tailed t-tests..
" ** " represents statistical significance at 10% confidence level under two-tailed t-tests.

(4) UCP represents unclassified products such as jewelry, musical instruments, sports goods, and etc.

Source : Author's calculation based on Industrial Census 1997, Thailand

productivity level is even higher for micro-size firms in some industries. However, the validity of the results is still quite uncertain as results show statistical significance in only half of the major industries. Further analysis is needed to identify SMEs' productivity relative to LEs.

It is important to note, however, that there are limitations to the calculation of short-term productivity measures. Since the NSO data are taken from a one-year survey, possible effects such as scale economies[16], increasing return to scale, and other effects could also arise, suppressing the real contribution from SMEs.

Due to such limitations of TFP index in interpreting the productivity measures, two other measures of productivity were used - simply labor and capital productivity. Results for labor and capital productivity are also shown in Table 3. Looking at labor productivity, SMEs showed relatively lower performance than LEs except for wood products, office appliance, electrical machinery, precision equipment and clocks, and the furniture industry. Labor productivity of SMEs tends to be significantly lower than LEs due to its high dependence on labor usage and lack of capital resources especially in small firms. However, capital productivity results are opposite. SMEs tend to incorporate higher capital productivity, especially in labor-intensive industries[17]. Since Thailand is still abundant in labor and scarce in capital, capital productivity could be a better indicator of efficient resource utilization. Since small firms have only limited access to capital relative to LEs, the only possibility for SMEs to grow faster is to utilize more low-cost labor resources[18].

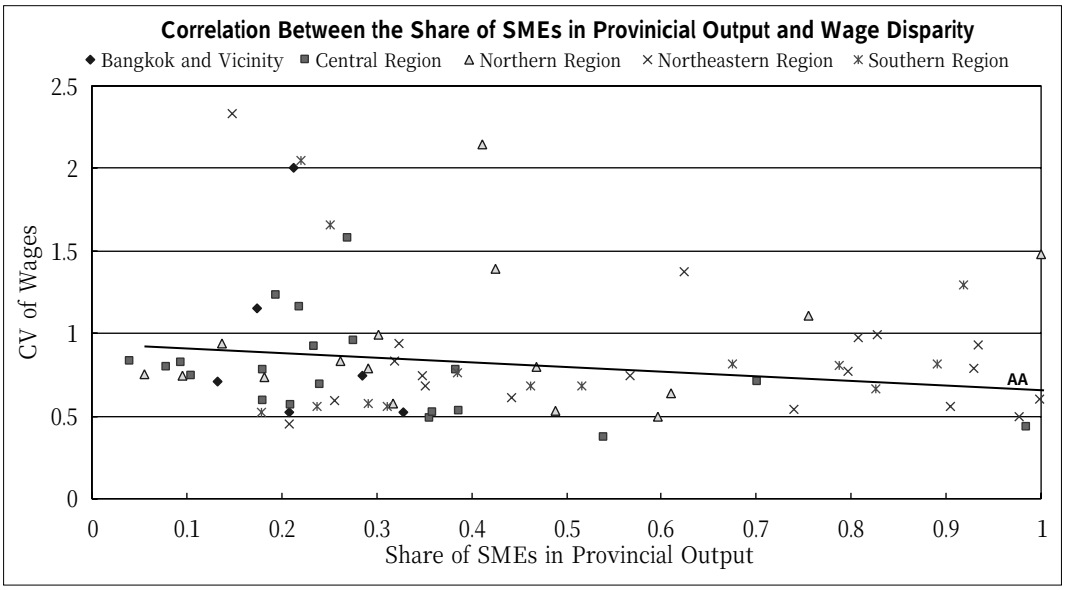
Overall, the results could imply that SMEs are as productive as LEs. Although the labor productivity in SMEs is relatively lower, its higher capital productivity implies that in terms of truly scarce resource efficiency, SMEs seem to be relatively more efficient than LEs.

Testing Hypothesis 3:
SMEs are more equitable in distributing the income they generate than LEs

The third hypothesis tests whether SMEs encourage more equity by generating and distributing income more equally than LEs. Figure 1 depicts the relationship between the share of SMEs in regional output and wage disparity.

According to Figure 1, there is a negative relationship between the share of SMEs in provincial output and wage disparity. This relationship is confirmed through their correlation coefficient of −0.19988[19] showing statistical significance at 5% confidence level. Moreover, line AA[20] in Figure 1, which is a regression of wage disparities and share of SMEs, shows the negative slope of −0.278149, a statistical significance at the 10% confidence level. Overall, these results confirm the test of hypothesis 3, implying that the promotion of SMEs could lead to the generation of more equitable income distribution in Thailand in the future.

Figure 1 Correlation between the Share of SMEs in Provincial Output and the Variation of Wage in Each Province



Note : (1) CV_i=Coefficient of variation of wage in i province

δ_i=Standard deviation of wage in i province

X_i=Mean of wage in i province

i=76 provinces in Thailand

$CV_i = \delta_i / X_i$

$Wage_i$=Salary/(Sum of Operative and Non-operative Workers × Number of Work days in a year)

(2) Share of SMEs=(Output of SMEs)/(Total Output of Each Province)

(3) _____ Line AA is the linear trend line for the relationship between SMEs Provincial Ouput and Wage Disparity drawn by calculating the least squares fit for the line represented by the following equation: y=mx+b

where for Line AA[20]: y=−0.278149x+0.94428

t-stat: (−1.71)* (11.7)* *Statistical significance at 10% confidence level

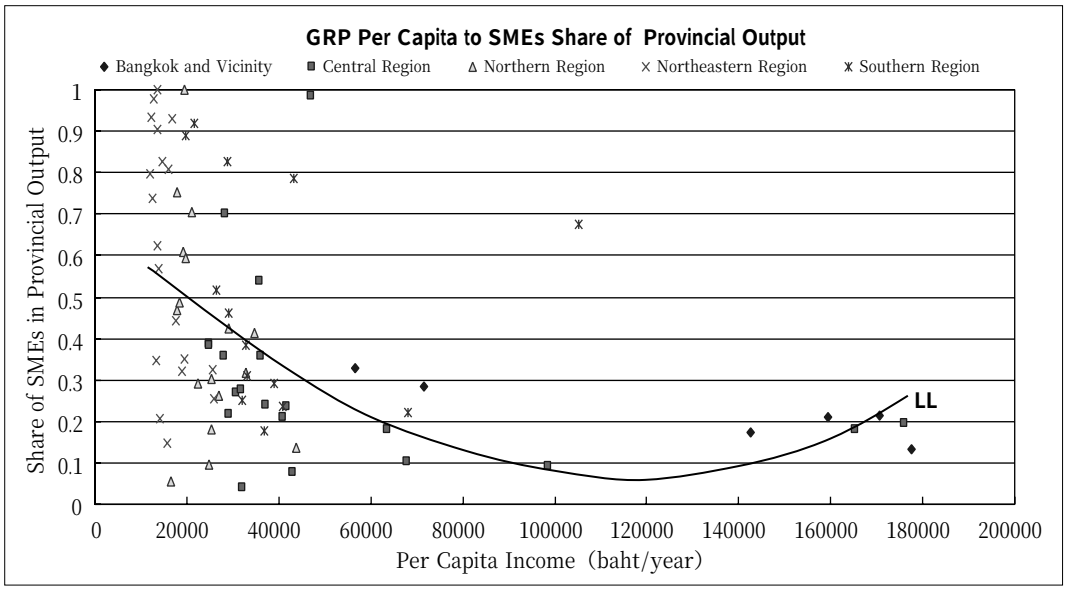
Source : Author's calculation based on Industrial Census 1997, Thailand

Testing Hypothesis 4:

SMEs are more likely to play a higher role in rural development than LEs

Finally, the fourth hypothesis tests whether SMEs are more likely to play a higher role in rural development than LEs. To do so, the share of SMEs in provincial output is related to per capita GRP (gross regional product). Figure 2 shows the result giving a negative relationship between per capita income and the share of SMEs in provincial output. Curve LL illustrates the relationship between the share of SMEs in regional output and GRP per capita. Since the low income regions are generally of rural areas in the sense that the agricultural sector is still more dominant, the findings of higher share of SMEs in low-income regions implies that SMEs may play an important role in rural development of Thailand relative to LEs especially in the early stage of development.

Figure 2 Role of SMEs in Rural Development



Note : (1) Line LL is the polynomial trend line for the relationship between per capita income and SMEs' share of output drawn by calculating the least squares fit through points by using the following equation:

$y=b + c_1x + c_2x^2$ where b is the constant, and c1 and c2 are coefficients.

Estimation results for Line LL: $y=0.73 - 1.1(0.1)^5x + 4.7(0.1)^{11}x^2$

t-stat: (9.4)* (−3.6)* (2.8)*

* Statistical significance at 1% confidence level

Source : Per Capita Income: Office of the National Economic and Social Development Board, Office of Prime Minister, 1996
Share of SMEs: Author's calculation based on Industrial Census 1997, Thailand

From figure 2, apart from the concentration of SMEs in rural areas of Thailand, the upper left hand side of curve LL showing the negative relationship between SMEs' output share and GRP per capita seems to imply that these provinces possess predominantly traditional type industries where income on average is low, and high technological production is not viable. However, on the lower right hand side, there exist six other provinces in which the share of SMEs starts to increase as the level of income rises. This may indicate the emergence of more modern type of SMEs in Thailand since the 1990s.

To investigate the validity of this finding, the productivity of SMEs between these two different areas were compared. Here, rural implies regions that are to the left of the curve LL, and urban includes the six provinces to the right of curve LL. Table 4 shows the results of productivity measures of SMEs in rural and urban areas. The urban SMEs show higher productivity than those of rural SMEs in all industries except for electrical machinery, Radio&TV equipment, and recycling industry. Not only TFP and labor productivities are higher, capital productivity is also higher in urban than rural SMEs for over half of the major industries. Aside from this, TFP and labor productivity differences between the two areas are statistically significant in most of the industries.

Table 4 Productivity Measures of SMEs in Rural and Urban Areas

	Urban Compared to Rural			T-Test		
	TFP	O/L	O/K	TFP	O/L	O/K
Food and Beverage	U > R	U > R	U < R	*		
Tobacco	U > R	U > R	U > R			
Textile	U > R	U > R	U > R	*	*	
Wearing Apparel	U > R	U > R	U > R	*	*	*
Leather Products	U > R	U > R	U > R	*	*	*
Wood Products	U > R	U > R	U > R	*		*
Paper Products	U > R	U > R	U < R	*		
Publishing and Printing	U > R	U > R	U > R	*	*	*
Petroluem and Fuel	U < R	U > R	U > R			
Chemical Product	U > R	U > R	U > R		*	**
Rubber and Plastic	U > R	U < R	U < R	*	*	*
NonMetallic Mineral	U > R	U > R	U < R	*		
Basic Metal	U > R	U > R	U > R	*		
Fabricated Metal Product	U > R	U > R	U > R	*		
Machine and Equipment	U > R	U > R	U > R		**	
Office Appliance	U < R	U > R	U < R		*	
Electrical Machinery	U < R	U < R	U < R			
Radio&TV Equipment	U > R	U < R	U < R			
Precision Eq.,Watch and Clock	U < R	U > R	U < R			
Motor Vehicle	U > R	U > R	U > R	*	*	
Other Trasport Equipment	U > R	U > R	U < R			
Furniture and Other UCP	U > R	U > R	U > R	*	*	*
Recycling	U < R	U < R	U < R			
All Industry	U > R	U > R	U < R	*		

Note : (1) Relative TFP Index for urban and rural industries has been calculated from relative TFP of each industry taking the average of firms categorized as urban and rural according to hypothesis 4.

(2) "U" represents Urban Areas and "R" represents Rural Areas.

(3) " * " represents statistical significance at the 5% confidence level under two-tailed t-tests.
" ** " representsstatistical significance at the 10% confidence level under two-tailed t-tests.

(4) UCP represents unclassified products such as jewelry, musical instruments, sports goods, and etc.

Source : Author's calculation based on Industrial Census 1997, Thailand

Perkins (2001) claimed that through time SMEs in rural areas and small towns, which are of traditional livelihood enterprises, would tend to lose out in the process of industrialization, and in their place, more modern SMEs, which cluster in large cities, would appear. These SMEs would depend upon the benefits generated from economies of agglomeration where the provision of access to intermediate material inputs and facilities in urban areas would provide adequate resources for them to sustain and become competitive in the market vis-à-vis LEs.

Such higher performance of urban SMEs could come about as a result of linkages to productive large enterprises in urban regions. Although further research is needed, this provides an area in which future government promotion needs to be considered.

IV. Conclusion

This study investigated the importance of SMEs in development taking Thailand as a case study.

Four hypotheses were tested to see whether Thai SMEs do incur the advantages and benefits claimed in previous studies. First, SMEs in Thailand were found to be relatively more labor-intensive than LEs, implying more efficient usage of abundant resources for production. Second, SMEs were found to be as or more productive than LEs from the results of the TFP. Although labor productivity is relatively lower in many industries, SMEs performed better in their utilization of capital, where capital productivity was significantly higher than LEs. Third, SMEs were found to possess the potential of contributing to more equal income distribution relative to LEs, especially in the areas in which SMEs are concentrated, the wage disparity tends to be lower. Finally, SMEs were found to play a higher role in rural development than LEs in the early stage of development. However, as the industry develops and moves along the quality ladder, the role of SMEs seems to move away from the promotion of regional to urban development.

Overall, the development of SMEs plays a crucial role in the development of Thailand's industrial sector. The productivity found in SMEs relative to LEs confirmed the importance of SME as a source of growth for the Thai economy in the future. Moreover, as SMEs are found to possess many desirable characteristics, including the high usage of abundant labor, the economic use of capital, and the more equitable distribution of income they generate, the relatively lower productivity of SMEs in some industries imply that overemphasis on the promotion of SMEs may, however, come at the cost of efficiency. Thailand might run the risk of lowering the overall efficiency of the manufacturing sector if policy makers are not cautious and overemphasize promotion of non-efficiency-oriented SMEs. To secure Thailand's industrial development, more attention should be placed on balancing the policies between industrial sizes and implementing more suitable policies for the support of SMEs which provide greater benefit to the economy as a whole. Although supports for rural SMEs are important, through time these traditional types of SMEs are likely to diminish and be replaced by modern SMEs. To enforce the better provision of support, as well as recognizing the important role of rural SMEs, the Thai government should recognize that urban SMEs could be potential forces in driving Thailand's economy in the near future. Towards this, further study into the development of urban SMEs is needed to investigate the potential, strengths, and weaknesses of these industries so that effective policies can be implemented accordingly.

Notes

1) See Bruch and Hiemenz (1984), Karlsson et al. (1993), Kunasirin (1984), and Liedholm et al. (1999).

2) See Itoh and Urata (1994), Levy (1994), and Kim and Nugent (1994).

3) "Global paradox" is a new trend in global economics, politics, and social life that implies a growing importance of individual parts in the overall economic system as the latter is growing in size due to globalization (Naisbitt 1994).

4) See Perkins et al. (2001), Bruch et al. (1984), Liedholm et al. (1999), and Acs and Audretsch (1990).

5) Snodgrass et al. (1996) cited several studies in the early 1970s like ILO in 1974 and Lipton in 1977 which mentioned that the promotion of SMEs was an advocate for low income agricultural countries as an alternative to more traditional approach emphasizing industrialization. While much later, Jamornmarn (1999) finds that the activeness of SMEs in the late 1970s enabled new establishments to be possible under lower entry restrictions and procedures.

6) See Little et al. (1987), Snodgrass et al. (1995), Chenery et.al. (1986), Karlsson (1993), and Leidholm (1999).

7) In the past, not many studies analyzed the performance of Thai SMEs. Among the major studies are Kunasirin (1984) and Sanguanrang (1978). It is only recently after the economic crisis in 1997 that an increasing number of works emerged, such as CA International (1999), Chirathivat (2000), Sevilla (2000), Simachokdi (1999) and Wiboonchutikula (2000).

8) See Regnier (2000), Chirathivat (2001), Wiboonchutikula (2001).

9) Snodgrass and Biggs (1996: 11-12) identified that relative to large firms, SMEs are more labor-intensive, more efficient, more equitable in distributing the income that they generate, more widely dispersed geographically and more nurturing of entrepreneurs. The last characteristic of nurturing entrepreneurs is not tested in this paper due to insufficiency of data to provide analysis.

10) According to Snodgrass and Biggs (1996), SMEs tend to be more widely dispersed geographically than LEs. However, implication of SMEs' geographical dispersion has a high implication towards the role of SMEs in rural development. Therefore, the last hypothesis was changed into testing the possibility of SMEs' contribution to rural development.

11) In the early stage of development, share of agricultural sector in output and employment is usually large. However, as a country grows, the share of the agricultural sector declines and is replaced by the rise in the manufacturing sector. Such rise in the share of industry could be explained by the increase in population moving to the cities as income rises (Perkins 1996: 84). So the high share of agriculture is usually associated with the dominance of rural areas and low level of income and development.

12) See the difference in the definition of Thai SMEs in Sevilla et al. (2000); Department of Internal Trade (1999); and Regnier (2000).

13) Small enterprises are defined as firms with 10-49 employees and medium enterprise are firms with 50-199 employees. Such categorization of industrial firms are made in accordance with the definition of SMEs used in the past studies of Thai SMEs (Kunasirin 1984) in order to be a base of comparison for future studies.

14) Since the published data of the Industrial Census do not provide data detailed enough to undertake hypothesis testing statistically, in this paper, the author approached the NSO for the establishment level data of the Industrial Census which provided in-depth statistics on output, labor, capital and material inputs of different industries categorized into nine industrial sizes.

15) In the case of "petroleum and fuel" industry, the labor-capital ratios for small firms are exceptionally high. This is due to a few data being extremely low in capital inputs and relatively insignificant. The significance

of the data could be observed from the t-test table provided.

16) Scale economies add to the reduction in cost, which could create misleading effects if different scale industries are compared (Perkins et al. 2001). Due to the comparatively higher cost incurred in smaller firms than larger firms, this might cause the overall effect on the TFP index to be much less than that of LEs.

17) The capital productivity in the "non-metallic mineral" is quite high among the SMEs. This is due to the high dependence of small industries on labor force, especially in the production of ceramics, glass, clay, plaster, and stone products in the "non-metallic mineral" industry. In the case of "petroleum and fuel" and "recycling" industry, capital productivity is highly affected by the low capital inputs, and results are relatively insignificant.

18) Further analysis was made over labor and capital productivity using value added. Though overall results were quite similar to those in Table 3, labor productivity in leather products, wood products, petroleum and fuel, non-metallic mineral and fabricated metal product industry improved quite significantly for SMEs relatively LEs.

19) Correlation coefficient is calculated by the following formula:

$$p_{x,y} = \frac{Cov(X,Y)}{\sigma_x, \sigma_y} \quad \text{where-1<px, y<1; and } \quad Cov(X,Y) = \frac{1}{n}\sum_{n=1}^{i}(X_i - \mu_x)(Y_i - \mu_y)$$

X and Y represent share of SMEs in provincial output and wage disparity respectively.

20) Line AA was drawn by estimating the linear trend line between SMEs provincial output and wage disparity by calculating the least squares fit for the line represented by the following equation: y=mx+b. In the estimation of line AA, three out lying provinces were discarded to provide better estimation for the result of y= -0.278149x+0.94428 with statistical significance at 10% confidence level.

21) In the calculation of factor cost share, the method utilized by Lieberman et al. (1990) and Bartelsman and Gray (1996) is utilized in finding the capital cost share which is the residual of the other input shares

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APPENDIX

Measurement of Total Factor Productivity (TFP)

This paper follows the methodology used by Bailey et al. (1992), Jorgenson (1995) and Okamoto (1999) for the calculation of the relative TFP index. The relative TFP index of each establishment was calculated for each industry. Then averages of the TFP index were calculated for each firm size (micro, small, medium and large) in each industry. The index is calculated for each industry separately in order to avoid effects of pricing and tariffs of different industrial products. So in this paper, TFP index in different scale sizes are calculated for 18 different industries.

Calculation of TFP is based on the Neoclassical production function:

$$Q_{ij}=F(L_{ij}, K_{ij}, M_{ij}) \qquad \text{where}$$

Q_{ij} is the output of firm i in industry j (j=1,....,18)

L_{ij} is the labor input, K_{ij} is the capital input, and M_{ij} is the intermediate input.

Under constant return to scale, relative TFP could be interpreted as:

$$\ln TFP_{ij}=\ln Q_{ij}-\underline{\ln Q_j}-((\alpha_{ij}))\ (\ln L_{ij}-\underline{\ln L_j})-((\beta_{ij}))\ (\ln K_{ij}-\underline{\ln K_j})-((\gamma_{ij}))\ (\ln M_{ij}-\underline{\ln M_j})$$

Relative TFP is calculated by relating deviations of firm output from the industry mean to the deviations of the factor inputs from the industry means. Here, the underlined variable indicates the average of output and factor inputs of all firms in each industry and $((\alpha_{ij}))$, $((\beta_{ij}))$, and $((\gamma_{ij}))$ are the factor elasticities for each factor input taken as the average of the firm's factor cost shares and the industry shares. Factor cost shares are taken from the output share where labor cost share are taken as total labor compensation divided by total output; material cost share are taken as total cost of material divided by the total output; capital cost share are computed as residual of the other share[21], $1-\alpha_{ijL}-\gamma_{ijm}$.

$$\underline{\ln Q}=(1/n)\Sigma \ln Q_{ij}, \quad \underline{\ln L}=(1/n)\Sigma \ln L_{ij}, \quad \underline{\ln K}=(1/n)\Sigma \ln K_{ij}, \quad \underline{\ln M}=(1/n)\Sigma \ln M_{ij},$$

$$((\alpha_{ijL}))=(1/2)[\alpha_{ijL}+(1/n)\Sigma\alpha_{ijL}],$$
$$((\beta_{ijK}))=(1/2)[\beta_{ijK}+(1/n)\Sigma\beta_{ijK}],$$
$$((\gamma_{ijm}))=(1/2)[\gamma_{ijm}+(1/n)\Sigma\gamma_{ijm}]$$

TFP index is adjusted to have mean zero for each industry.

OUTPUT (Q_i)- *Value of Gross Output.* All receipts of the establishment including sales of goods produced, receipts of goods for resale, receipts from contract and commission work, receivable rents, other receipts, net value-added, and change in value of stock of work-in-progress, finished goods, and goods for resale.

LABOR INPUT (L_i)- *Number of hours work in a year.* Number of hours' work in a year multiplied by the sum of operative and other employee.

CAPITAL (K_i)- *Total Book Value.* Excluding land and vehicle.

MATCOST (M_i)- *Cost of Materials.* All expenses on productive process of goods or services in the establishment covering total cost of raw materials and components use in production, cost of industrial services (such as machinery maintenance cost, purchase of electricity energy and fuels consumed for heat and power, and contract and commission work of other companies), purchase of goods for resale, cost of sales expenses, administrative expenses, and the change in stock of material and components.

LSHARE (α_{ij})- *Labor cost share.* Total labor remuneration of both operative and other employees divided by the total output.

KSHARE (β_{ij})- *Capital cost share.* Taken as residual of labor cost and material cost share.

MSHARE (γ_{ij})- *Material cost share.* Total material cost divided by the total output.

Industrial Employment - The sum of operative and other employee. Other employee refers to all employees other than operatives include administrative, technical and clerical personnel such as salaried managers and directors, laboratory and research workers and the like.

Total Value Added - The difference between total output and total cost.