

Chapter

Development Policies for Small and Medium Enterprises in APEC ---In the case of the Philippines---

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1. Introduction

This paper shows the importance of further promotion in SMEs development policies, with a special emphasis on APEC, by analyzing the role of SMEs in the Philippines and their TFP growth structure. The results indicate that SMEs have strong potential for increasing Philippines' entire manufacturing productivity and thereby contribute to further economic development. However, labor productivity in SMEs didn't show strong improvement between 1983 and 1994 even though the government offered various programs to assist SMEs.

Recently, APEC started a new program called the APEC Center for Technology Exchange and Training for Small and Medium Enterprises (ACTETSME). ACTETSME is one of the action programs in Economic and Technical Cooperation (ECOTECH), and it contributes to the SMEs' development through its wide range of activities which are based on a global network under APEC. To attain productivity growth among SMEs, ACTETSME is expected to play an important role in promoting SMEs development.

The rest of this paper is organized as follows: Section 2 shows a brief review of the Philippine economy, and the author considers it important to mention some economic transition periods in the Philippines; Section 3 explains the performance and features of SMEs; Section 4 estimates total factor productivity in the manufacturing sector and analyzes the overall performance in small and medium enterprises concentrated sectors; Section 5 conducts a regression analysis to determine factors

affecting productivity growth. In this section, the importance of SMEs will be pointed out; Section 6 explains domestic policies for SMEs in the Philippines. Then, the role of ACTETSME in promoting SMEs will be analyzed; and the last section provides a conclusion.

2. Review of the Philippine Economy

The Philippines became independent in 1946. At that time, the economy structure depended heavily on primary commodities, which was the legacy of the colonial rule under the US. To promote industrialization in the 1950s, the government adopted an import-substitution policy by imposing direct import restrictions, mainly on consumption goods. This contributed to increased domestic production and decreased imports of consumption goods. However, there was an increasing need to change policy from import-substitution to export-orientation because of the limited domestic market. Although the government tried to promote liberalization by abolishing import restrictions and devaluating the exchange rate, it only resulted in increased primary goods. Tariffs replaced import restrictions, and it showed the persistence and protectionist nature of the policy at that time.

The Ferdinand Marcos administration began in 1965 and advocated policies to achieve industrialization by expanding manufactured goods exports. While government-led policies increased foreign direct investment and exports, the expansion of exports was mainly led by consignment manufactured goods, which increased the imports of intermediate goods and raw materials as well. Along with increased imports, oil shocks in the 1970s and the plunge in primary commodity prices combined to deteriorate the current account and sharply increase foreign debt.

Around the start of the 1980s, the Philippine economy suffered from continuous stagnation in growth and exports, increasing foreign debt, expanding fiscal deficits, and rising inflation. Moreover, financial crisis occurred in 1981. In addition to these economic difficulties, Benigno Aquino, Jr. was assassinated in 1983. A huge capital outflow and a consequent decrease in foreign exchange reserves damaged the economy.

The IMF and World Bank placed harsh conditions on the Philippine government. The harshest condition required the government to follow the economic plan(memorandum) proposed by IMF. With the election of the Aquino government in 1986, liberalization of trade and investment started to proceed.

Table 1 shows some basic indicators of the Philippine economy. According to the table, negative growth rates occurred in 1984, 1985, and 1991. As explained above, the main causes of decelerating economic growth rates in 1984 and 1985 were political uncertainty and unstable macroeconomic fundamentals. The economy recovered during the first several years of the Aquino government, but recovery was not sustained later on. Political uncertainty and poor macroeconomic fundamentals again caused a negative GDP growth rate in 1991. GDP growth rates showed modest recovery in 1992 and 1993. Then, GDP growth rates rapidly improved from 1994 to 1997 with the expansion of exports.

It is interesting to note that in the late 1980s and mid 1990s the Philippine economy followed different growth paths. **Table 1** shows index numbers (1983=100) for gross domestic product, total imports and total exports. It took until 1989 for the

Table 1. Basic Indicators of the Philippines

YEAR	1982	1983	1984	1985	1986	1987	1988	1989
Gross Domestic Product(1983=100)	98	100	93	86	89	93	99	105
Total import(1983=100)	103	100	83	71	78	100	120	138
Total export(1983=100)	97	100	105	88	103	110	126	137
Real GDP Growth rate	3.6	2.0	-7.4	-7.2	3.5	4.3	6.6	6.2
Inflation rate	8.7	5.1	46.8	25.1	-0.4	3.0	8.9	12.2
National Government Surplus(Deficit) as percent of GNP	-4.3	-4.6	-2.1	-2.0	-2.0	-5.3	-2.5	-3.0
Average Exchange Rate	7.9	8.5	11.1	16.7	18.6	20.4	20.6	21.1
Current Account Balance(Percent of GNP)	-5.8	-8.7	-8.4	-3.7	-0.3	3.3	-1.4	-1.0
Trade Account Balance(Percent of GNP)	-7.1	-10.0	-9.8	-4.9	-1.6	1.8	-3.1	-3.1
YEAR	1990	1991	1992	1993	1994	1995	1996	1997
Gross Domestic Product(1983=100)	108	108	108	110	115	121	128	134
Total import(1983=100)	152	150	164	182	209	242	283	324
Total export(1983=100)	139	148	154	164	196	220	254	298
Real GDP Growth rate	3.2	-0.6	0.4	2.1	4.4	4.8	5.7	5.1
Inflation rate	14.2	18.7	8.9	7.6	9.1	8.1	8.5	5.1
National Government Surplus(Deficit) as percent of GNP	-2.2	-3.5	-2.1	-1.2	-1.5	0.9	0.6	0.3
Average Exchange Rate	21.7	24.3	27.5	25.5	27.1	26.4	25.7	26.2
Current Account Balance(Percent of GNP)	-3.5	-5.8	-1.9	-1.6	-5.5	-4.5	-4.3	-4.9
Trade Account Balance(Percent of GNP)	-5.4	-7.4	-3.7	-3.1	-6.7	-5.9	-4.5	-6.2

Source: Philippine Statistical Yearbook, 1997, NSCB., Annual Report, various years, Bangko Sentral ng Pilipinas.

GDP level to recover to the same level as in 1983. Looking at exports, they began recovering in 1986 along with the imports.¹ With these data, it is inferred that the Philippines' economic growth in the late 1980s was led by the recovery of production for domestic market and the expansion of exports after the recession in the early 1980s. Both factors contributed to the growth. On the other hand, the expansion of exports provided the main source of economic growth after 1994. However, the trade balance didn't show a clear improvement in spite of the rapid expansion of exports, which reflected little linkage to the domestic economy.

Since the late 1980s, the Philippine government has started making policy adjustments such as trade liberalization, financial reforms, and tax reforms. The Ramos government has stressed promoting further liberalization, privatization and the introduction of foreign capital while policies for SMEs were not carried out vigorously. However, sustainable economic growth would be difficult without appropriate

development of backward-forward linkages based on small scale industries, which are expected to play an important role in augmenting the domestic supply of intermediate inputs.

In the early 1970s, the government recognized the importance of SMEs, and it has offered various programs to SMEs since then. However, it is difficult to instantly evaluate the effects of these programs on the actual development of SMEs. In later sections, the author tries to explain how the performance of SMEs improved through some data based on 'productivity'.

3. Overview of Small and Medium Enterprises in the Philippines

3.1. Definitions, Performance and The Role of SMEs

According to the definition of Bureau of Small and Medium Business Development(BSMBD), Department of Trade and Industry(DTI), SMEs are classified by either employment numbers or total assets. **Table 2** shows the official definition of the BSMBD. In this chapter, the author explains the development of SMEs based on the

¹ Export index in 1984 shows positive growth due to appreciation of the exchange rate.

Table 2 SME Definitions

	By Asset Size	By Employment
Micro	Less than P150,000	1-4
Cottage	P150, 001- P1,500,000	1-9
Small	P1,500,001- P15,000,000	10-99
Medium	P15,000,001- 60,000,000	100-199
Large	More than P60,000,001	More than 200

(1)All enterprises with total assets of P15,000,000 and below shall be called small enterprises.

Source: BSMBD.

employment number classification, which is the most commonly used classification.

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(1) Cottage Industries²

Cottage industries are broadly characterized as household-based enterprises which largely depend on household labor. **Table 3** shows SME statistics classified by employment size. As a whole, the Philippines have a high concentration of cottage

industries with employment size less than 10. In 1994, cottage industries were estimated to comprise about 90% of the total number of establishment. They also employed about 24% of the total labor force, but the share of census value added³ to the total remained very low. As seen from these indicators, cottage industries are characterized as highly labor intensive, small in production size, and low in labor productivity compared to large establishments. According to data obtained from Census of Establishment in 1994, the sector distribution of cottage industries to the total manufacturing establishment was 47.54% in food, 16.24% in wearing apparel, and 10.50% in fabricated metal products. The share of these three industries comprised about 74% of the cottage industries manufacturing total. Contrarily, the share of other industries was small, 6.45% for furniture and fixtures, 3.17% for non-metallic mineral products, 2.05% for machinery, and 2.50% for wood and wood products.

The author conducted field research in Marikina, Metro Manila, where more than 70% of the nation's total footwear supply is produced. The footwear industry in the Philippines is generally considered to be a highly micro, cottage, and small firms

² In the regression analysis in section 4, not cottage industries are reviewed due to insufficient data availability.

³ The definition of Census value added is the difference between the value of output and total costs of materials and supplies consumed, fuels purchased, industrial services done by others and the value of goods purchased and resold.

Table 3 Some Statistics of SMEs in Manufacturing

	Year	Establishment	Share(%)	Employment	Share(%)	Census value added	Share(%)	Labor Productivity
Cottage	1983	50,313	89.8	186,735	21.0	2,681,412	2.4	14.4
	1988	69,446	88.3	247,173	22.7	4,249,213	3.7	17.2
	1994	81,544	88.4	287,630	24.3	7,213,339	4.4	25.1
Small	1983	4,512	8.1	127,450	14.3	11,441,178	10.4	89.8
	1988	7,678	9.8	201,553	18.5	12,362,820	10.8	61.3
	1994	9,061	9.8	213,979	18.1	17,634,513	10.7	82.4
Medium	1983	505	0.9	70,884	8.0	9,102,189	8.3	128.4
	1988	683	0.9	95,994	8.8	11,417,223	10.0	118.9
	1994	752	0.8	105,464	8.9	19,077,196	11.6	180.9
Large	1983	717	1.3	503,498	56.7	87,003,314	78.9	172.8
	1988	828	1.1	545,389	50.0	86,096,651	75.4	157.9
	1994	913	1.0	575,809	48.7	120,438,868	73.3	209.2
MSMEs	1983	55,330	98.7	385,069	43.3	23,224,779	21.1	60.3
	1988	77,807	98.9	544,720	50.0	28,029,256	24.6	51.5
	1994	91,357	99.0	607,073	51.3	43,925,048	26.7	72.4

(1)Labor Productivity= Census Value Added/Total Employment

(2)Census Value Added are deflated using GDP deflator.

(3)MSMEs=Total value of Micro, Small and Medium establishment.

Source: BSMBD.

concentrated industry. The interviews and factory tours reconfirmed that footwear SMEs suffer from low productivity, which is the main reason for the low competitiveness in the global market. Other observed characteristics include a lack of skilled workers, a shortage of capital equipment, and falling behind mechanization. Almost all of the production processes such as design making, insole and outsole preparation, and cutting, are done by hand. Very old machines usually carry out the processes requiring machine operations. Previous studies point out that the Philippine footwear industry is considered to be 30 years behind that of comparable shoe manufacturers in Italy (Roxas[1996]).

(2)Small and Medium Enterprises

Small and medium enterprises have a greater impact on employment along with better labor productivity compared to cottage industries. Many foreign firms and joint ventures might be included in this category, but it isn't possible to separate these firms from domestic firms because of insufficient data availability. The share of employment in small and medium enterprises was 27%, and the SMEs share of census value added was 22% of the total. The performance of small and medium enterprises is considered better than the performance of cottage industries.

It is interesting to note that small and medium enterprises experienced a decrease in labor productivity in 1988 while labor productivity improved slightly for cottage industries. It is inferred that as the size of production in small enterprises expanded during the economic boom in the late 1980s, they faced difficulty financing new investments which would have raised labor productivity through economies of scale and enhanced efficiency by obtaining new capital equipment. According to the data of labor productivity, SMEs, as a whole, are still highly labor intensive and low in productivity. Nevertheless, labor productivity improves as the size of an establishment grows.

In sum, the following points characterize SMEs in the Philippines, and they are similar to the general features of SMEs in developing countries:

- (1) Small scale production and sales
- (2) Low labor productivity
- (3) Slow mechanization
- (4) Lack of skilled labor and strong dependency on unpaid family workers
- (5) High labor intensity
- (6) Inadequate financial resources

3.2. Small and Medium Enterprises High (SMEH) ⁴Sectors in Manufacturing

Section 2.1 illustrated an overview of SMEs. The data shown in the previous section was not classified by sub-industries. Therefore, it is interesting to clarify which particular manufacturing industries have a high share of SMEs.

According to Fabella[1988], SMEH sectors can be defined in two ways: 1) 40% or higher SME share of the sector's total employment; 2) 20% or higher SME share in total manufacturing employment. SMEs are defined as all establishments with an employment size of 10-99. **Table 4** shows SME shares of individual sectors' employment and shares in total SME employment in 1994. The first criteria can be applied to 7 industries, and only food manufacturing falls in the second criteria. From the table, food manufacturing, footwear, furniture and fixtures, printing and publishing, non-metallic mineral products, fabricated metal products, and machinery, qualify as SME concentrated sectors⁵.

⁴The concept of SMEH was first introduced by Fabella[1988].

Table 4. Employment Share in SMEs

PSIC Code	Industry	SME Share in Sector Employment	SME Share in Total Manufacturing Employment
311+312	Food Manufacturing	27.1	20.6
313	Bevarage	4.3	0.5
321	Textiles	18.5	5.5
322	Wearing Apparel	21.2	14.5
323	Leather and Leather Products	31.2	0.9
324	Leather Footwear	43.4	3.2
331	Wood and Wood Products	32.6	3.7
332	Furniture and Fixtures	41.2	4.7
341	Paper and Paper Products	27.2	2.3
342	Printing and Publishing	62.1	6.5
351	Industrial Chemicals	34.0	1.8
352	Other Chemicals	22.3	3.2
355	Rubber Products	18.4	2.1
356	Plastic Products	34.7	4.2
361	Pottery, China & Earthenware	11.6	0.6
362	Glass and Glass Products	20.7	0.5
369	Non-metallic Mineral Products	43.2	2.8
371	Iron and Steel	19.8	2.0
372	Non- Ferrous Metal	23.1	0.4
381	Fabricated Metal Products	43.2	5.9
382	Machinery	46.0	4.7
383	Electrical Machinery	5.3	2.7
384	Transport Equipment	23.7	2.7
385	Professional, Scientific, Measuring Equipment	7.9	0.2
386	Furniture , Metal	36.4	0.3
390	Other Manufacturing Indutries	26.7	3.4

Source: Census of Establishment, 1994, NSO.

Table 5 shows performance indicators for SMEH manufacturing industries. The table reveals some important characteristics.⁶ Value added per employee in cottage industries recorded the lowest performance level followed by small, medium, and large establishments. Fabricated metal products and food performed better than other SMEH some important sectors. Looking at compensation, cottage industries achieved the lowest level of wages because workers were mainly family-workers and likely to be unpaid. Footwear paid the least in the SMEH sectors, and none of the SMEH sectors did

⁵It is interesting to note that the previous research conducted by Fabella[1989] showed 9 industries classified as SMEH sectors in 1983. However, wearing apparel, leather products and pottery, china and earthenware are not qualified as SMEH in this study. The main reason is that the employment share of large industries to the total becomes large. For instance, the share of employment in large establishments is 68% in Wearing Apparel, 58% in Leather Products and 73% in Pottery, China and earthenware.

⁶ Similar analysis was conducted by Fabella[1989] indicating mostly the same result as in this paper.

Table 5. Performance Indicators for SMEH Manufacturing Industries by Firm Size, 1994

		10-99			
		Per Employee(in thousand pesos)			
PSIC code	Industry	Value Added	Total Sales	Wage	New Investment
311/312	Food	176.3	567.1	38.5	11.9
	324 Footwear	40.6	101.5	24.7	0.5
	332 Furniture	94.1	245.2	42.2	3.4
	342 Printing	135.6	305.4	54.1	14.8
	369 Nonmetallic-Mineral Products	141.0	302.8	46.5	10.1
	381 Fabricated Metal products	194.0	376.3	48.9	20.2
	382 Machinery	111.3	224.4	52.1	7.9
All industries(1-9)		75.2	170.9	21.1	8.7
All industries(10-99)		168.1	460.6	51.0	20.9
All industries(100+)		613.6	1816.8	91.4	143.1
All Industries(all firms)		363.3	1053.1	63.2	77.8

Source: Census of Establishment, 1994, NSO.

better than the average for all firms. The last column, new investment per employee, represents the overall tendency of capital-intensity or labor-intensity by establishment sizes. According to data, micro and small enterprises indicated the lowest level of new investment, and they are considered highly labor-intensive. Among the SMEH sectors, per capita investment was largest in fabricated metal products and smallest in footwear. Establishments with 100 or more employees are characterized as capital-intensive. From viewing these results, general features of SMEs, referred to in section 2.1, are reaffirmed. SMEs are characterized by high labor intensity, low productivity, and low wages.

In this section, analysis was conducted mainly based on data about employment, value added, compensation, and investment to reveal some basic characteristics of SMEs development. As shown above, SMEs gradually improve their performance over time, and there are several methods to estimate the source of improvement, such as labor productivity(output per employee or value added per employee). However, the improvement in labor productivity proceeded so slow that the overall level of the labor productivity still remains low. Hence, the author will introduce estimation method to show a comprehensive improvement of efficiency, total factor productivity(TFP). The next section will estimate TFP in the manufacturing sector and discuss some important features of TFP in SMEH sectors.

4. Measurement of Total Factor Productivity

This section analyzes the pattern of total factor productivity in manufacturing industries in the period 1984-1995. As a source of economic growth, total factor productivity is one of the most crucial factors. TFP represents overall efficiency, and it is defined as the difference between the growth rate of real product and the real factor inputs.

Theoretically speaking, there are many different ways to increase productivity, such as technological progress, efficient use of resources, introduction of streamlined production processes and management, improvement of overall educational levels, or training of employees. On the other hand, Foreign Direct Investment(FDI) also plays an important role in improving productivity by bringing in new technologies, management know-how, and imports of new capital equipment to the host countries. Furthermore, the increasing number of foreign firms leads to greater competitive pressure on domestic firms, and domestic firms have to improve their productivity to compete with a more competitive market. Exports also enhance productivity through economies of scale induced by expanding production, and increased exports make it possible to import more capital equipment through foreign exchange earnings. The provision of new capital equipment will contribute to improved productivity⁷. However, in formulating strategies for increasing and improving efficiency and competitiveness of SMEs, the author considered it particularly important to take into account their specific nature, i.e., the relative ease with which division of labor can be achieved among firms. In this regard, SMEs have great potential for increasing productivity by realizing economies of scale through division of production processes among firms.

As explained above, several possible channels can affect productivity growth. In general, it can be inferred that industries with high ratios of exports and foreign firms might have positive TFP growth. Industries with a well-developed division of labor among firms are also considered to show positive TFP growth.

⁷See Urata[1994] for further explanations.

4.1 Previous Studies

The Philippine economy experienced declining productivity over the years, confirmed by various estimations at the macro level. For example, Kawai[1994] estimated declining productivity from 0.8% in the period 1970-80 to -2.2% in 1980-90. Bosworth[1995] estimated 0.2% in the period 1960-70 to 0.8% in 1970-80, indicating a moderate improvement, and to -4.6% in 1980-86. Sanchez[1983] concluded from his results that the TFP level of the Philippines compared to Korea was only 27% of the Korean level. On the other hand, Hooley[1985], Kajiwara[1994], and Cororaton[1995] conducted sectoral estimates. Hooley and Kajiwara estimated TFP by using the growth accounting method. Hooley estimated TFP growth in the period 1956-80 for 25 manufacturing industries, and it covered establishments which employ 20 or more workers. From his results, TFP decreased by 0.15% annually over the period of 1956-80 as a whole, and the average rates were uniformly lower for the entire period after some additional adjustments for labor quality improvements. Kajiwara estimated TFP in the period 1974-79 and 1984-88 for 20 manufacturing industries. For manufacturing industries as a whole, TFP performance improved 0.72% from -3.50% for the first period to -2.78% for the second period. This improvement, according to the author, resulted from promoting liberalization and increasing rates in capital utilization.

Cororaton and his associates estimated TFP over the period 1956-92 for 23 manufacturing industries by applying both the growth accounting approach and the stochastic frontier method. Since the neo-classical growth accounting approach tends to give biased estimates of TFP, the stochastic frontier method is more preferable to avoid possibly biased estimates. In his study, he attempted to separate TFP into technical progress and technical efficiency. As a result, in comparison with estimates using the growth accounting approach, the TFP by stochastic frontier gave less biased estimates.

4.2 Estimation Method and TFP Growth Rates in the Manufacturing Sector

The estimation method used in this paper is based on the growth accounting approach, and TFP for each industry was estimated by using the following equation:

$$\ln TFP_t - \ln TFP_{t-1} = [\ln(Q_t) - \ln(Q_{t-1})] - S_k[\ln(K_t) - \ln(K_{t-1})] - S_l[\ln(L_t) - \ln(L_{t-1})] - S_n[\ln(N_t) - \ln(N_{t-1})], \quad (1)$$

where t is time, Q stands for sectoral output as a translog function of labor input(L), capital input(K), and intermediate input(N) and S_k for capital input share, S_l for labor input share, and S_n for intermediate input share calculated by using data from the value of production, the value of labor input, the value of capital input, and the value of intermediate inputs of each industry. Share weights are obtained as follows:

$$S_k = 0.5*(S_{k_t} + S_{k_{t-1}})$$

$$S_l = 0.5*(S_{l_t} + S_{l_{t-1}})$$

$$S_n = 0.5*(S_{n_t} + S_{n_{t-1}})$$

Because of data coverage, TFP estimates were only calculated for large establishments, which are establishments with 10 or more workers. Hooley pointed out two main reasons why productivity estimations could exclude small establishments. First, large establishments may serve as better approximations of firm production functions than smaller ones. Second, large establishments provide more qualified and detailed data. Hooley also concluded that these inferences agreed with the results of the study conducted by the National Census and Statistical Office(NCSO).

Data comes from various years of Annual Survey of Establishment(ASE) and Census of Establishment. Gross output was deflated using GDP deflators of each manufacturing industry obtained from Philippine Statistical Yearbook. Capital stock for the period 1983-95 was estimated using the perpetual inventory method. Investment expenditure was deflated by using the investment price index, calculated based on the study of Medalla[1979], to obtain annual investment expenditures in 1985 constant prices. Annual Depreciation rates in each industry were obtained from the data based on Hooley[1985]. Labor input was estimated by using the number of employment, and data of intermediate inputs were obtained from total cost⁸ that appeared in the Census and ASE. Total cost was deflated using the same GDP deflators as gross output.

Table 6 shows TFP growth rates⁹ for three periods: 1984-1989, 1990-1995 and 1984-1995. It also shows the difference between the periods of 1984-1989 and 1990-1995. Over the entire period, TFP decreased by -1.23% annually. TFP increased at

⁸It is defined as the total cost of all materials used as supplies and fuels in production, including the cost of goods for resale, as well as the cost of services supplied by others, including electricity.

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Table 6. Annual Growth Rates of Total Factor Productivity

PSIC code	Industry	84-89	90-95	84-95	Period difference 90-95 - 84-89
All		0.61	-3.06	-1.23	-3.66
311+312	Food Manufacturing	0.61	0.58	0.60	-0.03
	313 Beverage	6.40	-6.05	0.18	-12.46
	314 Tobacco	3.78	2.35	3.06	-1.43
	321 Textiles	1.35	1.21	1.28	-0.14
	322 Wearing Apparel	3.29	-0.62	1.34	-3.91
	323 Leather and Leather Products	2.23	1.29	1.76	-0.95
	324 Leather Footwear	-3.62	-0.64	-2.13	2.98
	331 Wood and Wood Products	0.31	-2.14	-0.92	-2.46
	332 Furniture and Fixtures	0.37	-2.14	-0.89	-2.51
	341 Paper and Paper Products	3.90	-1.12	1.39	-5.01
	342 Printing and Publishing	0.55	0.01	0.28	-0.54
	351 Industrial Chemicals	-1.45	1.04	-0.21	2.49
	352 Other Chemicals	0.43	-1.02	-0.30	-1.45
	353 Petroleum Refineries	-2.86	2.48	-0.19	5.34
	354 Misc.prod of Petroleum & Coal	2.04	4.86	3.45	2.82
	355 Rubber Products	-0.38	-0.94	-0.66	-0.56
	356 Plastic Products	-1.77	0.57	-0.60	2.34
	361 Pottery, China & Earthenware	1.85	-2.02	-0.08	-3.87
	362 Glass and Glass Products	7.49	-2.22	2.64	-9.71
	363 Cement	4.51	-4.03	0.24	-8.53
	369 Non-Metallic Mineral Products	3.81	-2.67	0.57	-6.48
	371 Iron and Steel	-6.73	0.23	-3.25	6.96
	372 Non- Ferrous Metal	0.53	3.91	2.22	3.39
	381 Fabricated Metal Products	-0.83	0.24	-0.29	1.07
	382 Machinery	0.41	2.50	1.46	2.09
	383 Electrical Machinery	0.62	-1.08	-0.23	-1.70
	384 Transport Equipment	1.93	0.49	1.21	-1.44
	385 Professional, Scientific, Measuring eqp.	1.05	-0.43	0.31	-1.48
	386 Furniture , Metal	2.81	0.92	1.86	-1.89
	390 Other Manufacturing Industries	-1.04	-0.87	-0.96	0.17

Source: Estimated by the author.

⁹ The results shown in table 5 might include some errors of measurement causing seriously biased estimates of TFP. According

some errors of measurement causing seriously biased estimates of TFP. According to Jorgenson[1995], as a result of these errors, TFP estimates tend to be upwardly biased. Capital input and labor input should be calculated based on the concept of 'services' representing quality change, however, in this study, data were not available to conduct detailed breakdowns of labor and capital inputs. Jorgenson showed that initial estimates of TFP in the U.S. for the period of 1945-65 accounted for 47.6% of the output growth, but TFP only accounted for 3.3% after appropriate corrections were made. Cororaron[1995] also estimated sectoral TFP growth rates by using the stochastic frontier approach to estimate errors mainly caused by the assumption that firms operate along with their production function. He concluded that a big bias was observed when the economy was highly unstable, especially in the 1980s and early 1990. Consequently, TFP growth rates shown in table 5 may possibly include upward biases.

Table 7 Annual Growth Rates of Capital Utilization Rate

PSIC code		1984-89	1990-95
All	all	7.98	-9.78
311+312	Food Manufacturing	8.94	-5.81
	313 Beverage	8.28	-11.21
	314 Tobacco	17.84	-0.15
	321 Textiles	31.09	-7.17
	322 Wearing Apparel	13.36	-2.93
	323 Leather and leather products	15.17	6.51
	324 Leather footwear	6.12	1.70
	331 Wood and wood products	12.86	-7.11
	332 Furniture and fixtures	22.60	-5.36
	341 Paper and paper products	8.31	1.12
	342 Printing and publishing	12.37	6.13
	351 Industrial chemicals	2.95	-0.40
	352 Other chemicals	3.36	-9.31
	353 Petroleum refineries	28.71	25.11
	354 Misc.prod of petroleum & coal	19.73	32.45
	355 Rubber products	9.10	-14.55
	356 Plastic products	16.58	-12.04
	361 Pottery, china & earthenware	15.61	10.46
	362 Glass and glass products	12.68	-12.38
	363 Cement	19.31	-14.87
	369 Non-metallic mineral products	18.77	-11.30
	371 iron and steel	9.99	2.09
	372 Non-ferrous metal	27.56	-1.82
	381 Fabricated metal products	11.90	-2.47
	382 Machinery	13.37	-5.79
	383 Electrical machinery	2.63	-6.61
	384 Transport equipment	5.85	-1.91
	385 Professional, scientific, measuring eqp.	18.24	-2.51
	386 Furniture, metal	11.25	23.49
	390 Other Manufacturing industries	8.31	-5.73

Source: Estimated by the author.

annual rate of 0.61% for the period of 1984-89 while it drastically

4-89 while it drastically decreased at an annual rate of -3.06% for the subsequent period.

During the economic expansion in the

late 1980s, the manufacturing sector, as a whole, improved its productivity.

For the 1984-89 period, most industries indicate positive TFP growth except for leather footwear, industrial chemicals, petroleum refineries, rubber and plastic products,

iron and steel, fabricated metal products and other manufacturing industries. Several factors can be pointed out for both positive and negative TFP growth. Improvement in productivity could be explained by: (1) increasing rates of capacity utilization.¹⁰ As

Table 8. DRC/SER ratio of the Philippine Manufacturing Industries

PSIC code	Industry	1983	1988
All		1.7	1.5
311+312	Food Manufacturing	1.5	1.1
313	Bevarage	1.9	1.2
314	Tabacco	1.7	1.2
321	Textiles	4.9	3.5
322	Wearing Apparel	0.9	1.0
323	Leather and Leather Products	1.6	1.6
324	Leather Footwear	0.9	1.1
331	Wood and Wood Products	1.1	1.4
332	Furniture and Fixtures	0.9	0.9
341	Paper and Paper Products	2.8	1.9
342	Printing and Publishing	2.7	1.9
351	Industrial Chemicals	2.2	3.1
352	Other Chemicals	1.7	1.2
353	Petroleum Refineries	1.5	1.8
354	Misc.prod of Petroleum & Coal	2.0	0.6
355	Rubber Products	2.1	0.9
356	Plastic Products	2.6	1.2
361	Pottery, China & Earthenware	6.6	1.3
362	Glass and Glass Products	2.6	1.6
363	Cement	3.4	3.1
369	Non-Metallic Mineral Products	6.6	1.8
371	Iron and Steel	1.7	2.3
372	Non- Ferrous Metal	1.3	1.7
381	Fabricated Metal Products	2.6	1.8
382	Machinery	2.8	1.4
383	Electrical Machinery	2.9	3.9
384	Transport Equipment	2.4	1.4
385	Professional, Scientific, Measuring eqp.	1.1	2.7
386	Furniture , Metal	4.1	2.7
390	Other Manufacturing Indutries	1.3	1.2

Source: Tecson[1996].

Note: 0.0 < DRC/SER < 1.2 = efficient

1.21 < DRC/SER < 1.5 = mildly inefficient

¹⁰Capital utilization DRC/SER < 1.0 = efficient (1985=100). The estimation method is based on Hooley[1985]. DRC/DER > 2.0 = highly inefficient

shown in table 7, capacity utilization rates drastically improved through the

improved through the period. (2) increased exports. (3) further promotion of trade liberalization. Regarding the trade policy, it affects productivity both positively and negatively. A study conducted by Tecson[1996] helps explain both positive and negative TFP growth rates.

Tecson calculated the ratio of domestic resource cost(DRC) and shadow price of foreign exchange(SER) to evaluate the allocative efficiency of manufacturing industries before and after the reform. A decline/rise in the DRC-SER ratio implies an improvement/decline in comparative advantage. In the 1980s, the Philippines adapted trade liberalization by reducing tariffs and import liberalization; therefore, TFP might be affected by the policy adjustment. **Table 8** shows the DRC-SER ratios for 1983 and 1988. According to the table, coal and rubber products became highly efficient. 12 industries were classified as efficient in 1988 in contrast to only 5 industries in 1983. On the other hand, wood products and professional equipment became inefficient in 1988 while industrial chemicals, petroleum refineries, iron and steel, non-ferrous metal, and electrical machinery became more inefficient during the period. Tecson's estimates might explain the negative TFP growth rates in industrial chemicals and iron and steel. However, some other industries with positive TFP growth rates even are classified even less efficient. Although it doesn't suggest any strong relationship between productivity growth and high comparative advantages, trade liberalization is considered another possible factor that effects TFP growth rates.¹¹

As for the period of 1990-95, the number of industries that registered positive TFP growth rates decreased. Although TFP performance differs across industrial sectors, the following explanations could generally be made for the negative productivity growth. (1) Stagnation of exports in export-oriented industries. (2) The energy crisis in the early 1990s. It was mainly caused by slow construction of new power plants and decreasing efficiency in old plants. (3) Pregnancy period of new investment. During 1993-95, the amount of foreign direct investment (FDI) expanded. Since new investment benefits come after the pregnancy period, rapid inflow of foreign direct investment resulted in negative productivity growth. FDI in industrial chemicals, petroleum products and electrical machinery drastically increased .

During the period of 1984-89, TFP in all SEMH sectors, except footwear and fabricated metal products, improved due to the expansion of production scale through

increasing capital utilization rates. However, industries other than food, fabricated metal products, and machinery showed declining TFP growth for the next 5 years. It is interesting to note that SMEH sectors didn't succeed in increasing efficiency between 1990 and 1995 after achieving of economies of scale.

¹¹Cororaton[1995] attempted a regression analysis to examine whether the increase of comparative advantage, or international competitiveness explains TFP growth. The result shows very low coefficients ranging in between 0.13 to 0.10 for both 1983 and 1988. He also estimated the relation between ERP and TFP with a low coefficient as well.

In the next section, the author conducts a regression analysis to show what specific factors affect TFP growth rates. The author also points out the relative importance of SMEs.

5. TFP Determinants and Their Implications on the Role of SMEs

In this section, the author used regression analysis¹² to determine what specific factors affect TFP growth. By relating productivity indices to some explanatory variables considered to represent SMEs, this paper will show the importance of SMEs in the process of productivity improvement. Considering the previous studies, selected explanatory variables¹³ are as follows.

- (1) KL : Growth rates in capital equipment ratio per employee. This variable represents whether relatively capital-intensive sectors or labor-intensive sectors have a positive effect on TFP improvement. Expected sign is negative or positive.
- (2) Q : Growth rates in output per establishment. This variable represents the influence of economies of scale on productivity growth. Expected sign is positive.
- (3) LA: Growth rates of the average number of employees per establishment. This variable represents the scale of establishment. It is considered that an increase in the average number of employees indicates growth of establishment scale from small to medium, and large firms. As the firm size grows, productivity will improve. Therefore, the expected sign is positive.

- (4) EX/MA: Growth rates in the percentage of managers and executives to total employment. This represents the development of organization and internal management sophistication. In some previous studies, this variable was found to have a negative impact on productivity improvement. Since management style is often viewed as ‘top heavy’ resulted in negative correlation with production workers,

¹² The method used to conduct regression analysis is a cross-sector analysis in which regressions were done using a pool of observations for various industries and years.

¹³ FDI is also considered one of the factors affecting productivity, however, in this study, FDI isn’t analyzed because of limited data availability. The role of FDI and its impact on productivity will be analyzed in another report.

the expected sign is negative.

- (5) EXPROD: Percentage of an industry’s output which is exported. Firms with a high share of exports are considered more competitive and highly efficient. The expected sign is positive(nominal figures for both output and exports).

The equation adopted in this study is formalized as follows.

$$\ln TFP_{t,j} = F(\text{constant}, \ln KL_{t,j}, \ln Q_{t,j}, \ln LA_{t,j}, \ln EX/MA_{t,j}, \text{EXPROD}_{t,j}, \ln KL_{n-t,j}, \ln EX/MA_{n-t,j}, \text{EXPROD}_{n-t,j}), \quad (2)$$

where Δ indicates growth rate of each variable, subscript t denote time and subscript j denote sub-sectors. In this study, the author incorporates slope dummies for $\ln KL$, $\ln EX/MA$, and EXPROD to isolate the possible shift in respective variables. These slope dummies appear in the regression equation as $\ln KL_{n-t,j}$, $\ln EX/MA_{n-t,j}$, $\text{EXPROD}_{n-t,j}$. The estimation period for both $\ln KL_{n-t,j}$ and $\ln EX/MA_{n-t,j}$ are 1990-95 and 1988-1990 for $\text{EXPROD}_{n-t,j}$.

Table 9 shows empirical results with industry TFP growth as a dependent variable. Q showed its expected positive sign, and it was highly significant. The result indicates that the expansion of production size is a major source of TFP growth. It also implies that the economic expansion during this period moved together with productivity improvement. LABOR was expected to show a positive sign, but its coefficient was negative and statistically significant at the 1 percent level. This negative

coefficient emphasizes the role of SMEs on the process of productivity improvement. Generally speaking, as the scale of an establishment grows, its overall efficiency is expected to rise due to achieving economies of scale. However, the results show that productivity performance tends to improve as the scale of the establishment becomes smaller, which indicates SMEs have a high rate of marginal productivity compared to that of large establishments. Moreover, the coefficient of the KL ratio showed a negative sign and it was highly significant. This indicates that industries with small scales of capital have more potential for productivity improvement, which also emphasizes the role of SMEs

The impact of the export ratio on productivity showed a negative sign at a statistically insignificant level¹⁴. This negative coefficient indicates that a rise in the export ratio didn't result in productivity growth. The author regressed using the annual growth rates of exports and export ratio instead of the level of export ratio, however, the result showed an insignificant level with negative coefficients as well. As explained in

Table 9 **Determinants of TFP**

Const	-0.002 (-0.39)
ln Q	0.261 (11.96)**
ln LA	-0.221 (-7.70)**
ln KL	-0.219 (-7.55)**
EXPROD	-0.007 (-0.41)
ln EX/MA	-0.041 (-0.99)
EXPROD 1988-1990	0.047 (1.44)
ln EX/MA 1990-1995	0.112 (1.97)*
lnKL 1990-1995	0.106 (2.39)*
R-Square	0.390
Adjusted R-Square	0.376
Sample Size	348

Notes: The t value in parentheses; ** 1 percent significant, * 5 percent significant.

Source: Estimated by the author.

¹⁴Previous studies also observed a negative coefficient for exports. s also observed a negative coefficient for exports. Kajiwara[1994] conducted a regression analysis of exports and TFP growth rates during 1984-88 and obtained a negative coefficient significant at the 1 percent level. According to his explanation, domestic industry didn't have enough capacity to expand exports while consignment manufactures whose production activity had little linkage to domestic firms increased their exports.

section 1, this is mainly based upon a mixture of observations for the economic recovery period of 1984-1989 and the economic expansion period of 1990-95. Therefore, it hinders the identification of exports throughout the sample period, but it doesn't indicate that exports had no effect on productivity improvement. Exports in export-oriented industries, such as wearing apparel, furniture and electrical machinery are assumed to play an important role in increasing productivity in the sample period. To some extent, productivity improvement might be associated with exports when looking at individual industries.

As for the slope dummies, the export ratio was marginally significant with a positive effect. A positive coefficient indicates that exports played an important role in increasing productivity along with expansion of production scale during 1988-90. This result also supports the trade liberalization policy under APEC. In the Philippines, it is considered that implementing trade and investment liberalization in the 1980s had a positive effect on actual productivity improvement through building exports-productivity virtuous cycle.

The impact of EX/MA showed a positive sign statistically significant at the 5 percent level. The result indicates that the increasing number of managers and executives contributed to productivity growth during 1990-95. In other words, organization sophistication increases productivity. Organization development in this period was mainly achieved by introducing more efficient management through FDI. In general, foreign firms bring efficient management into the domestic economy; therefore, this might contribute to increased productivity. According to census data, the number of managers and executives is very small in SMEH sectors while the number of managers and executives is high for relatively large firms.

It is worth noting that the coefficient of KL in 1990-95 was positive, and it indicates that raising the capital-labor ratio would have a positive impact on productivity. This result shows opposite implication compared with the negative coefficient of the KL ratio estimated for the entire period. Taking the negative coefficient of LA into consideration, expanding the size of the firm would rather decrease productivity. Therefore, it is important to increase the number of firms with high productivity by promoting capital intensification among SMEs. Consequently, a strategy to improve productivity needs to increase the number of SMEs with high productivity, and we can

conclude that ACTETSME plays a significant role in promoting the development of SMEs, particularly in improving their productivity.

Empirical results strongly support the view that SMEs should play an important role in increasing productivity in manufacturing sectors. Historically, the relative importance of large firms was stressed, however, results now indicate the significant contribution of SMEs to productivity growth. Considering all these results, further productivity improvement will be led by the development of small and medium scale establishments. Programs and assistance for SMEs need to be implemented to achieve the productivity improvement.

6. Domestic Policies for SMEs and Activities of ACTETSME

As a result of regression analysis, results show that the Philippines needs to further develop SMEs to improve the country's overall productivity. The government recognized the importance of SMEs in the early 1970s and various programs have been offered to assist SMEs since then. Recently, APEC started a new framework that targets SMEs. It is called the APEC Center for Technology Exchange and Training for Small and Medium Enterprises (ACTETSME), and it is one of the action programs under Economic and Technical Cooperation (ECOTECH). This new movement gives the government an alternative source of information, finance and technology exchange for the SMEs development.

The ACTETSME role stresses improving SMEs' technological capabilities to enhance their international competitiveness by offering various programs such as information networking and technology training. Domestic programs for SMEs are mainly consist of financial assistance and training programs only for entrepreneurs, but these training programs are less related to productivity improvement. Therefore, assistance would be more effective in achieving productivity increases if the government succeeds in connecting activities of ACTETSME with domestic policies. This section gives a brief overview of domestic policies. It also delineates features of domestic programs, and the role of ACTETSME will be pointed out later.

6.1 Domestic Policy Profiles for SMEs in the Philippines

In the Philippines, SMEs have been recognized as important and as an engine of growth and dynamism. The government and other institutions provide various programs to strengthen their international competitiveness.

SMEs in the Philippines mostly suffer from lack of skilled labor, limited market access, financial and human resource constraints, lack of information on market opportunities, insufficient technical training, and limited financial access at low interest rates. These factors force SMEs to maintain a low level of productivity. Among these factors, the SMEs' major constraint is a lack of adequate financial sources because banks and other financial institutions are more likely to lend to large firms due to risk factors. Financial constraints make it impossible to introduce more new technologies; therefore, the government has mainly helped SMEs by providing financial sources.

Many programs offer assistance to further develop SMEs by reducing constraints. More than thirty financial programs have been set up for micro, cottage, small, and medium enterprises. The Small Business Guarantee and Finance Corporation (SBGFC) created by the Magna Carta for Small Enterprises, in particular, expects to play an important role by guaranteeing loans obtained by qualified small enterprises, local/or regional associations' small enterprises, and industries. In the field of human resource development, DTI (Department of Trade and Industry), UPISSI (University of the Philippines-Institute for Small-Scale Industries)-SERDEF (the Small Enterprises Research and Development Foundation), and other organizations have started various training programs for SMEs, such as training for skills and technology upgrading, management, and advisory training. To promote information and market access, CITEM (Center for International Trade and Exposition), BDTP (Bureau of Domestic Trade Promotion) and PTTC (Philippine Trade and Training Center) conduct trade fairs and business encounters. DTI and DOST (Department of Science and Technology) have offered mainly technology related programs.

To some extent, these programs contributed to the eliminating constraints, however, insufficient financial sources and the lack of appropriate trainers limits the range of programs. In addition, technology related programs, the most important programs for increasing productivity, aren't organized to target improvements based on

productivity. With respect to technology improvements, the government has the alternative of adopting activities developed by ACTETSME. Under APEC framework, technology transfers and sharing technological capabilities have been proposed. The proposals emphasize building information networks and training for further development among SMEs. ACTETSME has a lot of potential for increasing the productivity of SMEs through its activities as well as domestic policies.

6.2 The Role of ACTETSME in Promoting SMEs Development

On November 2, 1993, at the APEC Leaders Pledge in Seattle, USA, President Fidel V. Ramos took the initiative to establish a center to take full advantage of APEC member economies' resources to support the sustainable development and growth of small and medium enterprises in the APEC region. On September 7, 1996, ACTETSME began, and the physical site of the center was set up at the Science and Technology Park of the University of the Philippines in Los Banos, Laguna, Philippines.

ACTETSME functions mainly as a resource provider with capabilities in information networking, technical training, and organizing special activities for syndicating technology transfer projects. Its strategy focuses particularly on information networking, which will initially entail establishing networks with SME data bases in the APEC region and outside APEC in the future. ACTETSME expects to provide (1) a list of sources for commercial technologies (2) a directory of training institutions (3) a compendium of policies, legislation, and programs affecting SMEs development (4) a list of information service providers and brokers (5) an operations manual for economy coordinators (6) a standards and procedures manual for information networking.

ACTETSME was established to increase SMEs' international competitiveness by using the APEC framework. Its activities are based on three action programs: (1) Develop a comprehensive SME database. (2) Deliver technology and conduct training programs. (3) Operate a Network of Networks on SMEs in APEC. The program for delivering technology and conducting training programs includes an information service program, business promotion program, and technical training assistance program. Three programs--- business promotion program, technical training assistance program, and operation of a Network of Networks on SMEs in APEC--- have been implemented.

The business promotion program manages projects and activities that promote business development and productivity improvement by providing opportunities for SMEs to exchange and share technology. This program is designed to develop the capacity of SMEs' technology by using business matching activities, such as technology matching (request/offer), licensing, subcontracting and joint ventures. Through the ACTETSME Home Page, firms are free to access other individual firms which register technology request/offer corresponding to their needs. This program plays an important role in providing SMEs access to new technologies and the consequent improvement in productivity. Moreover, expanding business opportunities through licensing, subcontracting, and joint ventures will result in broadening markets for SMEs and globalizing SMEs' activities. However, since ACTETSME doesn't conduct follow up research of activities mainly due to a lack of staff, it is difficult to evaluate the results of these activities. In particular, the number of firms successfully matched should be reported to ACTETSME for further implementation of programs. As for firms without appropriate computer systems, information should be disseminated through regional offices of domestic SME-related organizations and institutions, such as the Philippine Chamber of Commerce and Industry(PCCI). The business promotion program urgently needs to build a strong linkage between ACTETSME and domestic SME-related organizations and institutions.

Technology training, one of the purposes of ACTETSME, also stresses human resource development. As explained in previous sections, SMEs in the Philippines are characterized with small scale production, slow mechanization, lack of skilled labor, and low productivity. The government and other organizations offer various programs, mainly financial assistance, for SMEs to alleviate these constraints. As mentioned above, training programs offered by other institutions don't necessarily result in increasing SMEs' productivity; therefore, ACTETSME needs to assist with technical training programs to help SMEs develop.

In 1998, two training programs were held. Due to a lack of trainers, staffs from the University of the Philippines were invited; therefore, the curriculum was highly technical, and participants included mostly professors and researchers. The training programs related only slightly to the training in assisting the human resource development in SMEs because of a lack of trainers and appropriate equipment, such as

computers and infrastructures needed to conduct appropriate training. However, considering the recent economic situation, the Philippine government faces providing limited financing for ACTETSME. Other financial sources, such as an APEC fund, should be introduced.

Operating a Network of Networks on SMES in APEC has progressed by providing information about various SMEs related sites in APEC member economies through ACTETSME's home page. A network of collaborating centers of excellence and chambers of commerce in each of the APEC economies is being operationalized, and the internet links each to a network. This ensures the flow of information to SMEs. This international network links to national focal points in the APEC economies. The ultimate goal will provide a network of SMEs-to SMEs communicating with each other in the Asia pacific region. To make this possible, further inter-regional cooperation based on information exchange needs to occur.

As explained above, ACTETSME encounters some constraints¹⁵. However, ACTETSME has great potential if the appropriate improvements are made. The following points are considered key factors for its success:

- (1) Increasing staffs to follow up on the results of business matching and technology offer/request.
- (2) Promoting interchange of staffs from APEC regions.
- (3) Financial assistance from APEC funds.
- (4) Inviting technical advisors and engineers from APEC regions for training programs.
- (5) Expanding accommodation facilities to make it possible for longer periods of training and to attract participants from overseas.
- (6) Building a strong linkage with domestic SME-related organizations and institutions to successfully transfer information.

7. Conclusion

In this paper, TFP estimates and regression analysis show how important SMEs are for achieving sustainable economic growth. The results indicate that SMEs have great potential to achieve further development, and they play an important role in economic growth. However, several factors constrain the development of SMEs, such as the lack of appropriate technical and financial resources, and so on. In order for SMEs to improve their capabilities, specific assistance is needed. The Philippine government

¹⁵According to a field research conducted in October 1998, activities of ACTETSME are financially supported by the Philippine government and its budget is 6 million pesos per year. It will decrease to 5 million pesos per year due to budget deficit. There are two full-time staffs maintaining the ACTETSME website and additional part-time staffs of three. More financial supports and staffs are needed. has provided assistance, mainly financial assistance, to SMEs since the 1970s, but its main purpose wasn't to increase SMEs' productivity. Although the government provides other necessary programs for SMEs in technical training and access to information and markets, those programs have little effect on increasing overall efficiency and productivity among SMEs.

In this regard, ACTETSME should be recognized for its wide range of activities, particularly, activities based on technology improvement. The regression results show SMEs are a key component for improving productivity, however, there is a large gap between the actual development of SMEs and the estimated results shown in section 4. Consequently, ACTETSME should make it a policy to fill the existing gap. On the other hand, ACTETSME faces very limited financial resources, and it hinders ACTETSME activities. To make it fully successful, ACTETSME requests further international cooperation and financial assistance from an APEC fund and other countries, mainly from the Japanese government.

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