

## THE TEXTILE INDUSTRY IN THE PHILIPPINES AND THAILAND: A COMPARISON

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### INTRODUCTION

The past decade has seen a tremendous rise in the share of developing countries in the world trade of textiles and clothing. Production of textile and clothing has found a welcome home in developing countries. The reasons for the exodus are manifold and include both push and pull factors.

One of the push factors has been the widening wage disparity resulting from labor shortages in developed countries which has brought about a shift in comparative advantage in textile and clothing production away from developed towards developing countries. The dominance of labor cost in the cost structure of textile and clothing production has given low-wage countries a competitive edge over their high-wage counterparts.

The textile industry is footloose, and its operations are easily transferable from one location or nation to another which explains why the textile industry has been one of the first to move out of high-wage countries to relocate to low-wage regions.

In a number of today's industrialized nations, the textile industry had been at the forefront of industrial development. For instance, it was the expansion of the textile industry that fueled the industrial revolution in England. The historical fact of the textile industry's key position in the industrial process of some of today's more advanced nations makes it especially attractive to developing countries embarking on an industrialization program.

Many of today's developing countries are beset by an employment problem that strikes at the very heart of the social system's viability. Governments pinning their hopes on the expansion of the industrial sector to solve the nagging employment problem see in the textile industry an answer to their prayers, for not only is the industry labor intensive, its technology is simple, requiring relatively fewer skilled workers that are in short supply in developing countries.

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In addition, the textile industry's output satisfies a basic human need, the fulfillment of which is a desirable goal both socially as well as politically.

Governments in developing countries, therefore, have looked upon the textile industry with kind eyes, and, in recognition of its importance, have conferred it with various incentives to encourage its expansion.

This study is a comparison of the performance of the textile industry in the Philippines and Thailand, two ASEAN countries at similar levels of economic development whose industrial structures reflect the prominent place which the textile industry occupies in their industrialization efforts. In the Philippines, the industry is fifth in terms of share in total manufacturing value added; in Thailand, it ranks second to the food industry. The textile industry is a major employer, contributing close to 15 percent of total manufacturing employment in the Philippines and 25 percent in Thailand.

The Philippines pioneered in textile production in the ASEAN region. Large-scale textile manufacturing began as early as 1906 and by the 1950s and early 1960s, the Philippines had attained a spindle-leage equivalent to that of the Far East in the 1960s. Thailand was a latecomer; its modern textile factory started operations only in the 1950s but a heavy buildup of productive capacity occurred in the late 1960s. A comparison between the Philippines and Thailand, therefore, brings into focus the contrast between a pioneer and a latecomer in textile manufacturing.

The study is divided as follows. Section 1 defines the textile industry's coverage. Section 2 looks at integration and concentration in the textile industry. Section 3 examines the industry's performance in terms of output, export and productivity with focus on the latter. A productivity comparison is undertaken between the Philippines and Thailand, and an attempt is made to explain the productivity differences between them. Greater stress is laid on total factor productivity (TFP) measures as against partial productivities to compare the two countries productivity performance.

## TEXTILE INDUSTRY COVERAGE

The whole range of textile activities covers (1) fiber production, both natural and man-made; and (2) yarn, fabric, garment and made-up textile manufacture. As usually defined, the textile industry comprises (1) the primary processing sector — spinning, twisting, weaving, knitting, dyeing and finishing; and (2) the secondary processing sector — garment and made-up textile goods manufactu-

ring. The exclusion of natural and man-made fiber production is borne out by the consideration of the former as an agricultural activity and of the latter as part of the basic industrial chemicals industry. In this study, the textile industry is defined to include those establishments engaged in the manufacture of man-made fiber, yarn and fabrics. Man-made fiber production has been included because of the special relationship between this and the textile industry's primary processing sector, while garment production has been excluded since it deserves separate treatment. The Philippines industrial classification system considers garment manufacturing as an industry separate from textile production while Thailand treats it as a part of the textile industry. To achieve data comparability adjustments were made to Thailand's textile statistics.

## INTEGRATION AND CONCENTRATION IN THE TEXTILE INDUSTRY

### *Integration*

Basic to textile production are the stages of spinning, weaving, knitting and finishing. Spinning involves the conversion of natural and man-made fibres into yarns and threads. The weaving process turns out woven fabrics; the knitting process, knitted fabrics. The finishing stage improves the appearance, texture and quality of fabrics through bleaching, dyeing, printing and treatment.

Firms in the textile industry can be classified broadly into two main categories depending on the number of processing stages they undertake. There are the integrated firms which perform all three stages of textile manufacture and the nonintegrated firms which perform one or two of the basic stages.

In the Philippines, the textile industry is dominated by integrated firms which account for over 30 percent of total textile employment, about 48 percent of textile value added, and 37 percent of total book value of fixed assets held by the industry. They have the highest spindle and loom capacities with shares of 58 percent and 82 percent (average for 1967 to 1984) in the total number of spindles and looms, respectively. The prominence of integrated firms has been the outcome of the interplay of government policies and decisions made by private investors. Government fiscal incentives and financial assistance to the industry in the 1950s encouraged vertical integration, on the one hand; on the other, textile producers showed a preference for vertical integration because of the greater control it afforded them over their operations. Vertical integration practiced in the Philippines, rather than conferring advantages by way of cost

reductions, has led to overcapacity and inefficiencies. A World Bank study, for instance, has reported a per-spindle productivity of integrated spinners that is lower than that of nonintegrated ones. And, while the share of integrated firms in total book value of and total expenditure in fixed assets is the highest in the industry, their capital productivity is one of the lowest.

In Thailand, the vertically-integrated firms are mostly those in joint venture with foreign capital. Vertical integration holds a special attraction for foreign partners because of the needed flexibility to compete internationally that it provides. In addition, vertical integration lessens the dependence on the internal distribution system which, because of differences in language and business practices, tends to hinder rather than enhance efficient production.

Vertical integration has been more prevalent in the synthetic rather than pure cotton sector of Thailand's textile industry. This is because of the lack of development in the weaving sector for synthetic fiber and the more developed weaving sector for pure cotton.

In 1977, 63.6 percent of spinning in Thailand was vertically integrated. Most large integrated firms were joint ventures with Japanese investment. Synthetic production, in particular, is heavily dominated by the Japanese. Studies (those by Ikeda (1982) and Buddhikarant (1973) in particular) show that Japanese companies are more efficient in generating value added than Thai firms.

### *Concentration*

Competition is a spur to productivity inasmuch as in a competitive environment, firms must produce efficiently in order to survive. Inefficiency spells death. The extent of competition within an industry is indicated by the level of concentration.

The textile industry in the Philippines is highly concentrated, with 61 percent of assets, 49 percent of sales and 44 percent of employment controlled by the largest four establishments. Concentration, measured in terms of the share of the largest three and largest five establishments in total spindle capacity, shows a decline from 26.1 and 39.5 percent in 1975 to 16.7 and 25.1 percent in 1984, respectively.

In Thailand, the spinning and fiber production sectors of the industry are marked by high concentration levels. But the highly concentrated market structure is slowly being eroded by greater competition presented by new entrants. Thailand's synthetic fiber production began as the monopoly of two Japanese companies. Their share in total fiber production was 100 percent in 1970 and fell to 53 percent in 1978. The trend towards reduced concentration

is evident also in spinning. In 1975 the ten largest spinning firms accounted for 62.7 percent of total spinning capacity; this dropped to 51.4 percent in 1978.

## TEXTILE INDUSTRY PERFORMANCE

### *Output Performance*

Thailand's textile industry outdistances its counterpart in the Philippines in output performance. Over the 1975-84 period, textile output grew at an average rate of 9.8 percent in Thailand compared to 0.6 percent in the Philippines (see Table 1). Thailand's rapid output growth, however, slackened from an average 14 percent growth between 1975 and 1979 to 5 percent between 1980 and 1984. A similar pattern occurred in the Philippines — textile output growth slowed down from 3.8 percent in 1975-79 to -2.7 percent in 1980-84. The downturn has been at a rate faster than Thailand's.

### *Export Performance*

Based on the product cycle model, the development stages which an industry is likely to follow are: (1) the preproduction stage when all of domestic demand is met by imports; (2) the import substitution stage when local production begins and imports decrease but are not totally eliminated since local production would still be insufficient to meet domestic demand; (3) the export starting stage

Table 1  
PHILIPPINES AND THAILAND: TEXTILE OUTPUT GROWTH RATES,  
PERIOD AVERAGES, 1975 - 84  
(In percent)

Period	Philippines	Thailand
1975 - 84	0.56	9.78
1975 - 79	3.85	14.24
1980 - 84	-2.73	5.33

Sources of basic data: *Statistical Bulletin*, Central Bank of the Philippines; Textile Mills Association of the Philippines; Research Division, The Thai Textiles Manufacturing Association.

when local production exceeds imports and products begin to be exported; (4) the export expansion stage when exports rise rapidly; (5) the maturing stage when exports hit a maximum and imports reappear gradually; and (6) the re-import stage when production stagnates and imports once again surpass exports. The Philippines and Thailand's textile industries have developed according to this pattern.

Import substitution as a development strategy in the Philippines began in 1949 when import and foreign exchange controls were imposed to remedy the crisis in foreign exchange triggered by a huge trade deficit and a decline in the flow of dollars for war damage and rehabilitation. The textile industry, one of the leading sectors identified for promotion, was given access to dollar allocations for machinery and raw material imports as well as easy access to loans from government financial institutions for capacity buildup and expansion. Helped by a protective wall erected by import controls and government incentives to new and pioneer industries, the textile industry in the Philippines grew rapidly during the initial stages of import substitution. But by the mid-1960s, expansion of the industry petered out as overcapacity developed.

A few years following the de facto devaluation of the peso in February 1970, the Philippine government switched from an inward looking to an outward looking development strategy. Exports which before were penalized by policies directed towards promoting import substituting industries became the focus of government attention. To stimulate industrial exports, the government introduced various export incentives — the Export incentives Act of 1978; the credit on duties paid on imported materials and supplies; double deduction of shipping costs and promotional expenses for exports; and establishment of an export processing zone, which, together with the 1970 de facto devaluation, made exporting a profitable activity.

Under this favorable export environment, textile exports grew from an average rate of 6.4 percent in 1963-69 to 30.9 percent in 1970-78. Textile fiber, yarn and fabric exports, in real terms, generated foreign exchange earnings that jumped from an average of US\$25.9 million in 1971-1977 to US\$37.2 million in 1978-84. The industry's export growth kept in close step with the growth of total exports. Between 1971 and 1984, textile fiber, yarn and fabric exports registered an annual growth rate of 6 percent, just slightly lower than the 6.3 percent annual growth rate of total exports.

Thailand's import substitution stage extends from 1959 to early 1970s. To encourage the textile industry's expansion, the Thai government accorded it tariff protection, imposing tariff rates of 22-35 percent on textile fabric imports and 20-25 percent on cotton

and synthetic yarn imports; in addition, it conferred it with non-tariff promotional measures such as a five-year exemption from corporate income tax, unrestricted importation of machinery and equipment, and a two-year exemption from raw material duties.

A rapid expansion of the industry occurred during the period of import substitution. Expansion was in three phases — 1950-62 was the first expansion phase; 1963-66 the second expansion phase; and 1967-72 the third expansion phase. The first expansion phase was characterized by the concentration of production in cotton-based products (cotton yarn and fabrics) and by investments by local entrepreneurs in highly mechanized textile mills with mainly European technology. Expansion in the second phase was the result of Japanese investment in local companies, in particular, in synthetic spinning and weaving. Synthetic fiber production started in the third expansion phase.

Thailand's experience was an example of successful import substitution in textile production. Thailand obtained an overall self-sufficiency ratio of 1.00 in 1975 and 1.09 in 1980. It was this excess supply of textile products that was one of the driving forces behind Thailand's move towards exports.

In the late 1960s, Thailand switched from an import substitution to an export promotion strategy. In 1972, the government officially promoted textile exports, giving firms with promotional status incentives which included among others the exemption of raw materials from import duties and business taxes; and the reduction, on the basis of export sales increase, of assessable income for purposes of taxation. Firms gained promotional status by exporting no less than 65 percent of their output.

The response of textile exports to the shift in strategy was favorable as seen from the rapid growth of textile exports — 28 percent between 1975 and 1984 — and the rise in the proportion of exports to imports from 0.64 in 1974-79 to 0.81 in 1980-84.

Thailand's export performance has been more remarkable than that of the Philippines. The fact that in 1977 Thailand had already reached the export expansion stage in cotton and man-made yarn and fabric production, while the Philippines, supposedly the pioneer, was still in the export starting stage attests to this. The more advanced stage of development of the Thai textile industry may be discerned from Tables 2 and 3 where textile export-import ratios for the Philippines and Thailand for the years 1974 to 1984 are shown.

Textile exports as a proportion of imports are higher in Thailand than in the Philippines — 1.35 for Thailand between 1974 and 1984 as against 0.32 for the Philippines (see Tables 2 and 3). Not

Table 2  
**PHILIPPINES: EXPORT-IMPORT RATIO, BY TEXTILE PRODUCT,  
 PERIOD AVERAGES, 1974-84**

Period	All	Man-made fiber	Other man-made fiber	Text yarn	Cotton fabric	Other fabric	Tulle, lace etc.	Spec text
1974-84	.27	.00	.01	.19	2.79	.79	1.22	1.12
1974-79	.30	.00	.01	.22	3.11	.69	1.07	1.14
1980-84	.31	.03	.02	.77	.02	.41	.37	1.25

Source of basic data: *Foreign Trade Statistics*, National Census and Statistics Office.

Table 3  
**THAILAND: EXPORT-IMPORT RATIO, BY TEXTILE PRODUCT,  
 PERIOD AVERAGES, 1974-84**

Period	All	Man-made fiber	Cotton yarn	Man-made yarn	Cotton fabric	Man-made fabric	Knitted fabric
1974-84	1.35	0.20	8.18	1.50	2.70	1.69	0.01
1974-79	1.37	0.23	13.98	1.39	2.99	1.67	0.01
1980-84	1.32	0.18	2.37	1.62	2.36	1.72	0.00

Source of basic data: Research Division, The Thai Textiles Manufacturing Association.

only has the export-import ratio been higher for Thailand; its rate of increase has also been faster. Between 1974 and 1984 Thailand's export-import ratio increased at an average rate of 18 percent while that of the Philippines increased by a mere 0.2 percent over the same period (see Table 4). The heightened exports relative to imports of man-made yarn and fabrics explain much of the observed rise in Thailand's export-import ratio. In these commodities, Thailand has become a net exporter just as it has become a net exporter in cotton yarn and fabrics; in man-made fiber and knitted fabric, however, it remains a net importer. The Philippines, whether in fiber or fabric,



**Table 4**  
**PHILIPPINES AND THAILAND: GROWTH RATE OF**  
**EXPORT-IMPORT RATIO,**  
**PERIOD AVERAGES, 1975-84**  
**(In percent)**

Period	Philippines	Thailand
1975-84	8	18
1975-79	20	44
1980-84	-5	-8

Sources of basic data: Same as for Tables 2 and 3.

has been a net importer. Imports of fiber and fabrics far exceed their exports as the low export-import ratio indicates.

To assess the international competitiveness of Philippine and Thai textile products, an international competing power index (ICPI) given by

$$\text{ICPI} = (X_i - M_i) / (X_i + M_i)$$

where

$X_i$  = export values of product  $i$

$M_i$  = import values of product  $i$

has been computed, the results of which are shown in Table 5. A positive figure indicates a trade surplus and implies a strong international competitiveness of a country's exports while a negative figure suggests either that the country has no exports of the product or that its product lacks international competitiveness.

The index for Thailand shows increasing competitiveness — its ICPI improved from 0.08 in 1974-79 to 0.13 in 1980-84, attributable mainly to the improved competitiveness of man-made yarn and fabric exports. The Philippine ICPI averaged -0.60 over the 1974 to 1984 period. Between the subperiods 1974-79 and 1980-84, the ICPI declined from -0.50 in 1974-79 to -0.54 in 1980-84.

The Thai textile industry's greater export orientation relative to that of the Philippines can be attributed, in part, to the nature of ownership of textile enterprises.

**Table 5**  
**PHILIPPINES AND THAILAND: INTERNATIONAL COMPETING POWER**  
**INDEX (ICPI) \*, PERIOD AVERAGES, 1975-84**  
**(In percent)**

Period	Philippines	Thailand
1975-84	- 0.58	0.08
1975-79	- 0.55	0.13
1980-84	- 0.54	0.10

\*Computed from  $ICPI = (X - M) / (X + M)$  where X and M are textile export and import values.

Sources of basic data: *Foreign Trade Statistics*, National Census and Statistic Office; Research Division, The Thai Textiles Manufacturing Association.

In the Philippines, foreign ownerships of textile firms has not been prevalent. Control has largely been in the hands of the Filipino-Chinese who first started out as importers and later moved into production in response to import controls that, by restricting the entry of textile imports, threatened their livelihood. Out of a total of 34 firms that Yoshihara sampled in his 1985 Philippine industrialization study, 17 were owned by Filipino Chinese, 12 by Filipinos and only 5 by foreigners.

The Philippines has relied very little on Japanese investment to develop its textile industry. Japanese investment played no role in cotton textile manufacture but was confined largely to synthetic fiber production. This contrasts sharply with the Thailand case where textile industry expansion has been linked closely to direct Japanese investment. Japanese investment, mainly in joint venture with local investment, was responsible for the expansion of Thailand's cotton textile industry in the early 1960s and of synthetic fiber production in the 1970s. Although Japanese investors held less than a 50 percent equity share in most joint ventures, control of management was largely in their hands.

Not only has Japan been Thailand's major supplier of capital, technology and entrepreneurship; it has also been a major market for Thailand's textile exports. Japanese textile enterprises, although initially set up to cater to domestic demands, have turned to export markets as outlets for their textile products. Exports of Japanese textile companies as a proportion of total exports of Thai industrial

products have risen sharply, and their success can be traced, in part, to the advantage which Japanese joint ventures enjoy in exports by way of Japanese trading companies and their international marketing and information network.

Textile companies in the Philippines, in contrast, are oriented towards supplying the domestic market. A large proportion of their output is sold domestically and only a small proportion is exported. The lack of an international marketing and information network has been a deterrent, but the real reason has been the low quality of textile output that renders locally produced textile products internationally uncompetitive.

### *Productivity Performance*

Productivity denotes a relationship between output and input; it indicates the efficiency with which resources (inputs) are combined to produce output. A rise in productivity occurs if output increases proportionately more than the increase in inputs.

A rise in productivity is beneficial to society, for, given limited resources, it enables output to expand without undue strain on available input supplies, thereby allowing society to enjoy higher living standards free of inflation.

The productivity estimates used to compare the productivity performance of the Philippines and Thailand are total factor productivity (TFP) measures which relate output to all factor inputs combined. The choice of TFP over partial productivity measures is borne out by the superiority of the former as an indicator of overall productive efficiency — partial measures are sensitive to changes in input composition while with total factor measures factor substitution effects cancel each other out.

### *Methodology*

The methodology employed to measure TFP in Philippine and Thai textile industries is based on that employed by Christensen, Cummings and Jorgenson (CCJ) in their international comparison of the patterns of economic growth of eight industrialized and one industrializing economics. This approach has been employed by Sanchez (1983) in the estimation of TFP growth rates in the Philippines in the postwar period. Underlying the approach is a multiple input and multiple output translog production model, which is a less restrictive formulation compared to the conventional two-input, single-output production model which expresses TFP growth as the difference between the simple growth rates of aggregate real output

and aggregate factor inputs. The translog production model specifies aggregate output as a translog function of aggregate inputs which is specified in turn as a translog function of their components.

### *Estimation Results*

The estimation results based on the CCJ approach are shown in Table 6. Based on these results, TFP in the Philippines grew by 1.7 percent between 1975 and 1984, while that in Thailand increased by 3 percent over the same period. In relative terms, Thailand's TFP growth rate exceeded that of the Philippines by 42 percent. This higher growth was accompanied by higher growth rates of all inputs – labor, capital and intermediate.

Why has Thailand's TFP performance been better than the Philippines despite the latter's long experience in textile manufacturing? The following discussions give an insight into some of the possible answers.

**Table 6**  
**PHILIPPINES AND THAILAND: GROWTH RATES OF TOTAL FACTOR PRODUCTIVITY, OUTPUT, CAPITAL, LABOR AND INTERMEDIATE INPUTS, 1975-84**  
(In percent)

	Philippines	Thailand
Total factor productivity	1.70	2.93
Output	0.56	9.78
Capital input	1.49	5.65
Labour input	1.87	3.26
Intermediate input	-2.63	9.10

Sources of basic data: *Factbook on Labour, Employment, Salaries and Wages 1985*, National Economic and Social Development Board; *Foreign Trade Statistics of the Philippines*, National Census and Statistics Office, 1971-85; Research Division, The Thai Textiles Manufacturing Association; *Statistical Bulletin*, Central Bank of the Philippines, various issues; Textile Mills Association of the Philippines; and *Yearbook of Industrial Statistics*, United Nations, 1977 and 1984.

## EXPLAINING THE DIFFERENTIAL

### *Capital Input*

The estimates show a 94 percent difference in textile output growth rates between the Philippines and Thailand. This difference is in large part due to differences in the growth rates of capital inputs.

Observance of the movement of partial productivities underscores the importance of capital (and its productivity) in explaining productivity differences between the Philippines and Thailand.

The interrelationship between capital and partial labor productivities is given by

$$\dot{Q}/L = \dot{Q}/K + \dot{K}/L$$

where

$\dot{Q}/L$  = rate of growth of output ( $Q$ ) per unit of labor ( $L$ ) or labor productivity growth rate

$\dot{Q}/K$  = rate of growth of output ( $Q$ ) per unit of capital ( $K$ ) or capital productivity growth rate

$\dot{K}/L$  = rate of growth of the capital-labor ratio.

Changes in labor productivity, according to the equation, are the sum of changes in capital productivity and the capital-labor ratio.

Table 7 shows the rates of growth of labor and capital productivities and of the capital-labor ratio of the Philippines and Thailand for the years 1975 to 1984.

Labor productivity in Thailand's textile industry rose by 6.8 percent between 1975 and 1984. Decomposition shows the rise to be attributable largely to the increase in capital productivity. Capital productivity grew by 4.1 percent as against a 2.7 percent increase in the capital-labor ratio. In the Philippines, labor productivity in the textile industry declined by 1.3 percent between 1975 and 1984. The decline was accounted for mainly by the fall in capital productivity by 0.9 percent — the capital-labor ratio fell by only 0.4 percent over this period.

The subperiod movement of labor productivity in Thailand and the Philippines showed dissimilar trends. Between 1975-79 and 1980-84, labor productivity in Thailand declined while that in the Philippines rose. The fall in Thailand's labor productivity was the result of the drop in capital productivity while the rise in the Philippines' labor productivity was due to the increase in the capital-labor ratio.

**Table 7**  
**PHILIPPINES AND THAILAND: DECOMPOSITION OF**  
**TEXTILE INDUSTRY**  
**LABOUR PRODUCTIVITY, PERIOD AVERAGES, 1975-84**  
**(In percent)**

	Labor productivity	Growth rates of capital productivity	Capital – labor ratio
Philippines			
1975-84	- 1.31	- 0.93	- 0.38
1975-79	- 6.66	3.73	- 10.39
1980-84	4.04	- 5.59	9.63
Thailand			
1975-84	6.81	4.13	2.68
1975-79	10.03	7.86	2.17
1980-84	3.60	0.42	3.18

Sources of basic data: Same as for Table 1.

The Philippines experienced the most rapid growth in textile productive capacity in the 1950s and early 1960s during the heyday of import substitution. Between 1957 and 1962 its spindles and looms registered average growth rates of 48 and 38 percent, respectively, the highest ever recorded for the entire period from 1957 to 1984. After the 1960s the growth of productive capacity slowed down – average growth in the number of spindles dropped to 3 percent in 1963-74 and to 2 percent in 1975-84, while the growth of looms declined to 3 and 0 percent in the same periods.

The large buildup in productive capacity in the 1950s and the subsequent slowdown in the 1960s affected the age distribution of Philippine textile machinery; they led to an ageing of the machine population. The 1980 age structure of spindles and looms shown in Table 8 suggests this to be so. Sixty-five percent of spindles and 74 percent of looms were over 20 years of age, and a large proportion of them were of 1960 and pre-1960 vintage.

The data for Thailand reveal a rapid growth of productive capacity between 1963 and 1975 but a slowdown between 1975 and

**Table 8**  
**AGE DISTRIBUTION OF SPINNING AND WEAVING EQUIPMENT**  
**(In percent)**

	Spindles	Looms
Pre-1945	11	—
Pre-1950	—	4
1946-55	6	—
1951-60	—	58
1956-60	28	—
1961-65	20	12
1966-70	12	7
1971-80	23	19
Total	100	100

Sources: Philippine Textile Sector; Reconnaissance Mission, International Bank for Reconstruction and Development.

1984. Growth in the number of spindles and looms averaged 20 and 19 percent, respectively, between 1963 and 1975; this average fell to 9 and 5 percent, respectively, between 1975 and 1984 (see Table 9).

While the Philippines and Thailand shared similar trends in the growth of productive capacity, the levels of growth have been widely dissimilar. Compared to the Philippines, Thailand registered a higher growth of productive capacity in the 1963-84 period, with growth in the number of spindles and looms averaging 15 and 13 percent, respectively, compared to the Philippines low growth of 3 and 2 percent, respectively.

Thailand's more rapid productive capacity growth suggests that its machinery was of a younger vintage relative to that of the Philippines. What bearing does this have on productivity performance?

There has been a surge in technological improvements in the postwar period. This has had major influences on the textile industry. Among the technological advances affecting textile production have been: (1) the advances in synthetic fiber technology; (2) the increases in the speed of textile machines; (3) the elimination of steps/combination of steps in the production process; and (4) the automation of various stages of production.

**Table 9**  
**PHILIPPINES AND THAILAND: GROWTH RATE OF**  
**NUMBER OF SPINDLES AND LOOMS**  
**PERIOD AVERAGES, 1963-84**  
**(In percent)**

Period	Philippines		Thailand	
	Spindles	Loom	Spindles	Loom
1963-84	3	2	15	13
1963-75	3	3	20	19
1976-84	2	- 1	9	5

Sources of basic data: Textile Mills Association of the Philippines; Research Division, The Thai Textiles Manufacturing Association.

The increases in machine speeds have been impressive. Loom speeds have increased sharply from 190 picks per minute in the 1940s to 220 in the 1950s, and, with the introduction of the shuttleless loom, to 440 picks per minute in the 1980s. Speed of warping machines have risen from 500 metres per minute in 1950 to 650-900 metres per minute in 1965; currently, it exceeds 1,000 meters per minute. Rotors, used in open-end spinning in place of spindles, have speeds ranging from 23,000 to 100,000 rpm, or three to six times the speed of ring spinning.

The introduction of open-end spinning as an alternative to ring spinning, besides allowing for increases in machine speed, has eliminated certain basic steps in yarn processing — roving and winding. The use of synthetic fibers that come in continuous filament ready for the loom has made cleaning, ginning and combing, processes which natural fibers undergo before they are spun into yarn, unnecessary.

The technological advances embodied in machines have raised machine productivity. A comparison of 1950 and 1966 models of spinning machines reveals that, in all six stages of spinning (blowing, carding/combining, drawing, roving, ring spinning and winding), the 1966 model yields a higher output/unit time relative to the 1950 model — 1.5 times more in spinning output and eleven times more in drawing output (see Table 10).



**Table 10**  
**OPERATING SPEEDS OF SPINNING MACHINES**

Technical operation	1950	1966
Lap forming (kg/hr)	150 - 180	180 - 220
Carding (kg/hr)	4 - 8	15 - 32
Drawing (m/min)	28 - 36	250 - 450
Combing (kg/hr)	6 - 8	25 - 55
Roving (rev/min)	500 - 850	1200 - 1800
Spinning (rev/min)	8000 - 12000	12000 - 18000

Source: Mingsarn Kaosa-ard (1984), Table 2.

An index of the technological advances in spinning from 1813 to 1970 is shown in Table 11. The index, in terms of pounds per spindle hour, shows a tremendous leap in machine productivity between 1965 and 1970 — a near doubling (97 percent increase) of output per spindle hour between 1965 and 1970 compared to a 27 percent increase between 1960 and 1965 and a 13 percent increase between 1950 and 1960.

The leap in machine productivity brought about by technological discoveries implies a greater built-in efficiency in newer as opposed to older vintage machines.

In addition to the greater efficiency of newer models, modern machines save on space because they tend to be less bulky and reduce expenses for air conditioning which constitutes an expensive cost item. In the case of open-end spinning machines, for instance, the reduction in space requirements may be as high as 40 percent.

The greater efficiency built-in in newer as compared to older machines and the younger age structure of Thailand's textile machinery imply quality differences in the capital inputs of the Philippines and Thailand in favor of the latter. It is therefore not surprising to find the Thai textile industry excelling the Philippines in productivity performance.

### *Technical and Organizational Knowledge*

The above observation, however, does not suggest that mere introduction of newer vintage machines will ensure productivity

**Table 11**  
**TECHNOLOGICAL ADVANCES IN SPINNING, 1900-70**

Year	Pounds per spindle hour	Index
1900	0.017	100
1920	0.018	106
1940	0.019	112
1950	0.023	135
1960	0.026	153
1965	0.033	194
1970	0.065	382

Source of basic data: Ajanant (1986).

improvement. The productivity embodied in newer textile machinery is a potential, realizable only if accompanying factors — labor and, more importantly, technical and organizational knowledge — do not pose obstacles to its attainment.

The importance of technical and organizational knowledge in explaining interfirm as well as intercountry productivity differentials has been stressed by Pack (1987). In the comparison of Kenyan and Philippine textile firms using similar vintage spinning and weaving equipment, Pack found higher total factor productivity, in both spinning and weaving, in the Kenyan firms. He attributes the Kenyan success to the "presence of international managers of high quality who have been able to implant the procedures followed by some of the better firms of India, Japan and Western Europe." The Philippines, as he points out, "has not benefited from a similar infusion of international expertise. Although a few firms have employed two or three expatriate managers (on fixed-term contracts) from other countries on an ad hoc basis, most plants have relied on domestic managers whose training has rarely included sustained exposure to international best practice" (Pack 1987).

The Thai experience has provided a contrast in that textile production, particularly in foreign-affiliated companies, has been influenced by the international best practice of international managers who have been exposed to the standards in Japan (which has for a long time been at the forefront of textile production) whose textile producers, because of industrial restructuring at home,

were forced to relocate elsewhere in Southeast Asia, particularly Thailand where wages were lower compared at home.

Japanese investment in the Thai textile industry has been conspicuous. Synthetic fiber production was a virtual monopoly of the Japanese when this activity first started in 1970. Japanese presence in cotton and polyester cotton spinning, as well as in polyester rayon spinning and weaving, has been dominant. Out of the 23 companies performing cotton and polyester cotton spinning in 1975, 13 were Japanese affiliated; and of the total nine polyester rayon spinning companies and eight polyester rayon weaving companies, 10 were Japanese. As a consequence of the high rate of Japanese investment in textile production (56 percent in 1971 and 50 percent in 1977), Thailand has reached about the same level of essential technology as has Japan (Ikeda 1982). Where Japanese investment has been active, Japanese managers and Japanese technical support have not been far behind (in 1978 there were 134 Japanese executives in the 27 Japanese-affiliated textile companies). The infusion of organizational and technical knowledge by Japanese expatriates has benefited Thailand, so much so that Thailand has been able to achieve high product quality standards and to penetrate the export market. (Among Southeast Asian countries, Thailand has been the biggest textile exporter to Japan.) In productivity terms, Japanese-affiliated textile companies have been found to be better performers than Thai companies as reflected in the higher rates of return of Japanese affiliated relative to Thai companies (Ikeda 1982).

### *Aggregate Demand*

It is not difficult to envision a relationship between aggregate demand and TFP growth given that technology is embodied in machines and that investors behave as profit maximizers. Profit maximizing investors will invest in new machinery if the rate of return would exceed the cost of investing. The rate of return from an investment (say, a product) is a function of demand in a positive way, i.e., the rate of return would very likely be higher if the demand for such product rises. Exports are a component of aggregate demand, and, together with domestic demand, it constitutes a force spurring investment and, in turn, productivity.

The evidence for Thailand suggests a close association between export growth and TFP performance. A rank correlation analysis of TFP and export growth rates yields a highly significant rank correlation coefficient. This result has not been true for the Philippines. Its rank correlation coefficient is significantly lower. In other words, export growth bears little association with the growth of TFP in the

case of the Philippines. Furthermore, domestic demand for textile products in the Philippines has been weak brought about primarily by the poor quality and high price of textile output which has led to the poor linkage between the textile industry and garment manufacturing (which rely on imported fabrics for their inputs) and to the industry's failure to profit from the boom in garment exports.

## CONCLUDING REMARKS

This study has been a comparison of textile industry performance in the Philippines and Thailand. The comparison has been in terms of output, export and TFP growth. The focus of discussion has been on the latter in view of the importance of TFP as a component of growth. TFP is indicative of how much more output can grow beyond the mere addition of inputs.

By far, Thailand's textile industry has performed better than its counterpart in the Philippines in terms of output, of export and TFP growth. It is the technological differences that are a contributory factor to the differential in productivity performance between the two countries. The Philippines was the early bird in textile production in Southeast Asia, and the bulk of its textile machinery was accumulated in the 1950s and early 1960s. The problem of obsolete machines has led observers to point to the need to scrap about half of industry machinery if efficiency is to be improved and the quality of local fabrics is to be upgraded. In contrast, Thailand's productive capacity was built up at a later period and consists of relatively younger vintage textile machinery.

But more important than technology has been the technical knowledge which Thailand was able to acquire through joint ventures with foreign investors who engaged actively in textile production in their own countries. The Philippine textile industry, on the other hand, benefited little from the infusion of international expertise.

The evidence for Thailand suggests a close association between the growth of TFP and the growth of exports. Successful exporting requires high standards of performance to be able to compete internationally, and Thailand was able to meet this with the assistance of outsiders who possessed the technical knowledge, capital and network to get the activity going profitably.

A policy of protection on infant industry grounds gains little support from the evidence presented. The Philippine textile industry that has been under heavy protection for many years remains to this day an infant. A newcomer, Thailand, has learned to do better than an "old hand" in the field.

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