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ECONOMIC INCENTIVES AND COMPARATIVE ADVANTAGE
IN THE PHILIPPINE COTTON INDUSTRY

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INTRODUCTION

In support of the government's agricultural development objective
to develop import substitutes, the national cotton development prog-
ram, which paved the way for the commercial-scale reintroduction of
cotton in Philippine agriculture[2], was formally launched in the early
1970s. Rationale given to the program were (1) the country has
been importing its cotton lint requirement which, over a ten-year
period (1966-75), involved an average annual outflow of $30 million;
and (2) research studies have shown that cotton can be grown in suit-
able areas of the country with a profitable rate of return.

More than 530,000 hectares have been delineated as potential
areas technically suitable for cotton cultivation and about 150,000
hectares of this fall into the existing cropping systems. The latter
represents more than the required hectarage of 115,000 in order for
the country to be self-sufficient in its raw cotton consumption. As

of crop year 1980-81, about 17,000 hectares of these have been planted to cotton, a quantum jump from a modest 194-hectare beginning in crop year 1974-75.

As expected, the promotion of cotton raises two crucial economic issues. First, how economically competitive is the domestically produced cotton with respect to imported cotton, i.e., does the economy have a comparative advantage in domestic cotton production? And second, has the matrix of government policies encouraged domestic cotton production?

This paper attempts to answer these two questions. The first section describes the historical development, trends in production and imports, and policies affecting the cotton industry. In the next section, the effects of government policies on the structure of economic incentives in the cotton industry is analyzed. Lastly, in the third section, the issue of the relative economic efficiency of domestic cotton production is comprehensively explored.

I. INDUSTRY BACKGROUND

Historical Profile

The Philippine cotton industry dates as far back as the pre-Hispanic era. Throughout the land, household weaving flourished, and "lompotes", a native fabric made of cotton, was a renowned export product of Filipino ancestors to China and other parts of the globe. The fibers were extracted from perennial-type cotton plants known now today as wild-growing native cotton plants.

With the transfer of the center of trade from Cebu to Manila during the Spanish regime, the local industry began to crumble. The cheaper and higher-quality imported fabrics manufacturing by English mills competed with the locally woven fabrics. This proved to be a sharp blow to the local weaving industry. In a short time, "lompotes" ceased to be a major barter commodity for Chinese goods, the locally grown varieties became mere backyard crops, and the local cotton industry dwindled.

The establishment of the National Land Settlement Administration in 1939 led to the revival of cotton cultivation. NLSA, the first agency in the country to attempt to grow cotton on a commercial scale, started a modest 100-hectare cotton cultivation in that year. The undertaking, however, was cut short by the Japanese occupation of the country during the Second World War.

A post-war era in the Philippine cotton industry began with the organization of the National Development Company in 1953 and the Philippine Cotton Agricultural Corporation in 1955, the latter renamed as the General Agricultural Corporation in 1956. Concentrating operations in Mindanao where prospects of cotton cultivation looked good, both agencies established a modern mechanized all-cotton

having hundreds of laborers and planting an annual average of nearly 1,000 hectares.

Results of the undertaking, unfortunately, were rather discouraging. Overall average seedcotton[3] yield, after eight cropping

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[3]The product consisting of fibers and seeds, picked from cotton plants.

years, was only 326kg/ha, with the lowest registered at 85kg/ha.
Technical inadequately, complicated by acute financial difficulty
and organizational and operational conflicts within the company
led to the discontinuation of operations.

A turning point in the Philippine cotton industry came in
the late sixties and early seventies. At this time, cotton lint
prices in the world market began to soar after a long declining
trend from the fifties to the early sixties. As a result, the
country's textile millers who bore the brunt of the increasing
cost of cotton imports agitatated for the development of the local
cotton industry. In response, the government enacted a series of
legislations, the first of which was the passage of Republic Act
4986 creating the Philippine Textile Research Institute PTRI, a
joint venture with the private sector, was mandated to promote the
development of the country's textile industry.

In 1969, the Bureau of Plant Industry, through a research
grant from PTRI, took special interest in the launching of a cotton
research project which gave special attention to the development of
a cotton variety that best fits the climatic and topographical con-
ditions of the country. Results of its studies showed Deltapinee
16, an American upland medium-staple variety, to be the best in
terms of yield and adapatibility.

Almost in the same year, Central Luzon State University, through
a similar grant from PTRI, assumed the important role of undertaking
a vigorous technical research program on cotton cultivation. Its

research efforts turned out to be successful and the encouraging
results led to the launching of a pioneering project called "Opera-
tion Bulak", an on-farm production program with operations concen-
trated in Central Pangasiann, in 1972. This project sought to
reintroduce cotton growing into farmers' cropping systems.

The outstanding performance of "Operation Bulak" immediately
drew national attention. Thus, in 1973, the project culminated
with the signing of Presidential Decree 350, later amended by
PD 1063, creating the Philippine Cotton Corporation (PCC) as the
central authority to undertake, implement, and supervise commercial
scale-cotton production in the country. A semi-government controlled
corporation attached to the Ministry of Agriculture, PCC is a joint
venture between the government and the private sector.

To support the national cotton development program formally
launched in crop year 1977-78 after three years of pilot operations,
the Philippine government, by virtue of PD 1432, created the Cotton
Research and Development Institute in June 1978. The Institute is
assigned the task of strenthening and accelerating current efforts
in the specialized areas of cotton research and development in order
to support the national objectives of attaining self-sufficiency in
cotton in the shortest time possible.

The Domestic Raw Cotton Scenario

Importation. There are over 20 cotton textile millers presently
operating in the country. Over the past year, the magnitude of their

demand is reflected in the country's important of cotton lint
(equivalently referred to as raw cotton) which represented the
total supply before 1975.

Raw cotton imports over the last two decades, though marked
by inter-year fluctuations, generally showed a declining trend
(Figure 1). The annual average quantity of imports dropped by
15 percent in the ensuing decade despite the country's significant
increase in per capital income and population. Partly, this pheno-
menon was due to the intense competition that developed between
cotton and man-made or synthesis fibers. In terms of import value
however, raw cotton importation in the seventies rose signinficantly
reaching $47 million in 1978. This resulted largely from
a more than twofold jump im world cotton prices between the two
decades.

The observed inter-year fluctuations in the volume of raw
cotton imports in the late sixties and early seventies can be
related to the textiles industry's principal problem during this
period, The textile firms were then suffering from low capacity
utilization (60 percent) primarily because of low domestic and
world demands for their products (Morales, 1974). Presumably, this
was the reason why the Fiscal Policy Committee of the Board of
Investment placed the textile industry in the category of over-
crowded industries in 1970. The sudden increase in importation
in 1973 could be attributed to the deletion of the industry from

the same list of congested industries by the BOI in 1972. This

in effect, lifted the restrictions on expansion of facilities and

other disincentives (e.g., imports of machineries and equipments)

imposed on the firms prior to 1972.

For the past decades, raw cotton imports originated mainly

from the United States (Table 1). This was especially so during

the 1971-75 period when practically all cotton imports were pro-

vided to the Philippine textile industry via the agreement between

the US through its Public Law 480 and the Philippine government.[4]

Domestic production. Though commercial-scale cotton product-

ion in the country was pursued in the fifties and early sixties as

mentioned earlier, the efforts and scale were not intensive as in

the second half of the seventies and early eighties when the nation-

al cotton development program was pursued with full support from

both the government and the private sectors. During this latter

period, domestically produced raw cotton began to fill a signifi-

cant fraction of the domestic supply. From a modest 0.3. percent

share of production to supply in 1975, the proportion jumped to

13.6 percent at the beginning of the eighties (Table 2). With

imports remaining almost at the same level during the late seven-

ties and early eighties, this increase in proportion is attributed

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[4]The law's primary purpose was to support American agriculture,
while at the same time assisting the economic development of friendly
nations through the utilization of America's surplus of agricultural
commodities via provision of long-term credit for the purchase of
such surplus crops. USDA's Commodity Credit Corporation financed
the sale and exportation of these commodities.

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almost entirely to domestic production which, during the same

period, registered an annual growth rate of about 100 percent.

Interfiber competition. The introduction and development of

man-made or synthetic fibers in the fifties ushered in a new era

in the cotton industry. With the market for man-made fibers

largely concentrated in apparel and elastomer industries, a stern

competition developed between natural and synthetic fibers.

The competitiveness of cotton vis-a vis man-made fibers can

be gleaned from the relative world price trends and local fiber

consumption. As shown in Figure 2, the price index of non-cell

ulosics, represented by US polyester staple, decreased rapidly from

the fifties down to the early seventies. Cotton prices, however,

began to increase markedly in the late sixties, so that by the

early seventies, the polyester- cotton price ratio had declined

by about 75 percent, compared to 1960-65. This may be part of

the reason that local cotton consumption, as reflected in the

level of imports shown earlier, did not consistently increase

during the same period. Local textile mills preferred the rela-

tively cheaper man-made fibers which correspondingly absorbed a

greater proportion of the country's imports of textile fibers

during the sixties and seventies. Also, this phenomenon was con-

sistent with a steadily declining cotton content on locally pro-

duced fabrics-ranging from 76 percent in 1963 to 27 percent in

1972 (Table 3).

The trend in relative world prices of competing fibers,
however, changed after 1973. Prices of man-made fibers began to
increase as the price of oil, upon which synthetics depend
for their raw materials rose sharply during this period. Al-
though cotton prices seem to have risen about as fast, the
cotton content of locally produced fabrics increased especially
between 1973 and 1975.

Policies, Laws and Related Measures Affecting the Cotton Industry

The producing sector. As mentioned earlier, the Philippine
Cotton Corporation, created in 1973 by virtue of PD 350, later
amended by PD 1063, is the central authority to undertake,
implement,and supervise commercial=scale cotton cultivation in
the country. Since its inception, PCC has undertaken a broad
ranged of activities, the most critical of which are: the select-
ion of general areas for cotton growing the provision of neces-
sary financial and agricultural extension services; and the
puchasing, storing, ginning, baling, and marketing of all cotton
produced under its program.

Seedcotton price is set by PCC at the beginning of the crop-
ping season and farmers are assured of the market for their pro-
duce by the PCC which is the sole buyer and processor of seed-
cotton. PCC, through its lending-arm participating rural and
commercial banks, gents production credit to farmers. Like

other supervised credit programs, cotton production loans carry

an interest rate of 10 percent plus 2 percent service charge.

For the past seven cropping season, the average actual product-

ion loan ranged from ₱535 to ₱2,001 per farmer, or from ₱1,270

to ₱2,581 per hectare (Table 4). Translated into terms of raw

cotton (lint) production, the average loan ranged from ₱3,773

per metric ton in 1975 to ₱9,553 per metric ton in 1981.

Payment for farmers' seedcotton produce is channeled by

PCC to the lending banks which in turn deduct the production

loan obtained by farmers before remitting the balance to the

latter. This practice enables the lending banks to have a high

repayment rate for their production loans. During the 1975-80

period, the repayment averaged 85 percent, which is one od the

highest in agricultural production loans of a similar nature.

The textile sector. In the past, domestic cotton suplly,

as stated earlier, mainly originated from imports, the bulk of

which came from United States through the provision of the agree-

ment between the US (through)its Public Law 480) and the Philip-

pines government. This agreement ceased its effect in 1975, the

same year domestic production started to supply a modest fraction

of total supply. Quantitative regulation by the government through

a licensing system, however, was in effect - and is still presently

imposed - on imported raw cotton. Under the system, the Development

Bank of the Philippines allows imports of cotton by textile mills only

after the domestically produced

cotton has been allocated among these mills. If the textile

mills' request to import is granted, DBP enters their request

and endorses the application of qualified importers to Central

Bank, which are then authorized to open a letter of credit.

In addition to quantitative regulations, cotton imports

are subjected to customs duties - 10 percent ad valorem and a

10 percent sales tax over 25 percent mark-up. These rates

represent an almost 24 percent implicit tariff on imported

cotton. Since there are no sales taxes imposed on domestically

produced raw cotton (lint), this rate can be also interpreted as

a measure of nominal protection on cotton lint production. As

will be shown in the next section, however, this rate under-

estimates the incnetive to domestic cotton seed production.

Recently, the expansion and modernization of the textile in-

dustry was given a considerable boost. The government, in push-

ing its export-orientation program for the generation of foreign

exchange , is encouraging the country's millers to retire old

equipment in response to tachnology development and to meet

the mbdern finishes désired for exports. To give effect to

this program, the BOI, through the provision of Incnentive Act

6135 implemented since 1979, gives incentives to new textile

mills by allowing them to import equipment and machinery free

of duty and taxes for a period of 7 years from the date of re-

gistration. Starting 1981, however, this incnetive is tied with

another government policy - a rational program which

requires textile mills to export at least 30 percent of their

produce.

II.   STRUCTURE OF INCENTIVES IN THE COTTON INDUSTRY

Nominal and Effective Protection

Since the tradable commodity is raw cotton (lint) and not

seedcotton, the estimation of nominal protection on cotton farm-

ers' output starts with the determination of overall (total)

nominal protection to the cotton industry, i.e., to seedcotton

production and to processing which is a monopoly of the Philip-

pine Cotton Corporation. This total protection can be best

measured by direct price comparison between domestic and border

prices evaluated a t a comparable in the marketing chain.

However, because of the marked quality difference between cotton

imports and domestic production the border price of raw cotton

was correspondingly adjusted in an attemp to make domestic and

border prices directly comparable. The adjustment procedure is

discussed in Appendix A.

The impact of government policies, notably trade and fiscal

policies, measured by these price comparisons, was, as expected,

favorably to the cotton industry as a whole (Table 5). Total

nominal protection rate averaged 28 percent during the 1975-81

period. This figure was somewhat close to an independent estimate
(24 percent) based on tariff and indirect taxes. Given the quan-
titative import restrictions (quota allocation) on raw cotton, how-
ever, the first estimate (by price comparison) is preferred and is
used for futher analysis since the latter (by legislated rates)
fails to capture the effect of this form of trade restriction.

From the total nominal protection conferred by policy on the
cotton industry, the nominal protection to cotton farmers for the
production of seedcotton was estimated indirectly. Briefly, the
estimation method consists of two stages. First, the implicit pro-
tection to processing was eliminated by replacing PCC's processing
cost with the average processing cost of eleven major cotton pro-
ducing countries. The implicit assumption was that this average
is a close approxiation of the cost of efficient and protection-
free processing. Second, this processing cost was added to the
lint price equivalent of seedcotton price actually received by farm-
ers and the total, termed farm price in lint equivalent, was com-
pared with the border price as in the estimation of total nominal
protection rate. Details ofthe estimation procedure are also dis-
cussed in Appendix A.

These estimates revealed that the nominal protection rate on
seedcotton production was negative averaging- 7 percent during
the 1975-81 period. What this tends to show is that the producer's out-
put was, generally, not protected, i.e., not conferred with incentives,

by price policy set by PCC, but rather penalized. Domestic producer prices were pegged, on the average, 7 percent below comparable world prices.

The nominal protection rate measure, however, does not completely capture the impact of all price policies on the incentive structure in seedcotton production. In addition to price policy on output, farmers' .incentives also depend on the price of inputs which are likewise affected by various policy measures. Thus, the effective protection rate is a more relevant measure than the nominal rate.

Because the implicit tariffs on tradable inputs used in cotton production were substantially higher than ∴ the nominal protection rate on farmers' output, the effective protection rate was generally lower than the nominal protection rate (Table 6). Over the seven-year period considered, EPR averaged - 12 percent, i.e., returns to domestic primary factors (domestic value added) were lower by 12 percent as a result of the implicit tariffs on outputs and inputs. In other words, returns to these factors were penalized by the protection system.

So far, no mention has been made of the incentive impact of the government's agricultural credit policy and its funding of agricultural extension, research and development, and other services. As mentioned earlier, the national cotton development program has

had an accompnying supervised crédit package and a pool of research

and extension support. Only the average impact of intervention on

production credit, however, has been estimated here to determin e

the extent to which the penalty by price policy on cotton

has been offset by the interest rate subsidy on agricultural credit.

The interest rate differential between agricultural loans and

the rest of the economy had tended to be about 6 percentage points

during bhe seventies (David, 1981). Consequently, the cost of

capital in agriculture was about 6 percent lower than in the non-

agricultural sector. In the present paper, this subsidy, when ex-

pressed as a proportion of free-trade value added, ranged from 2 to

5 percent during the 1975-81.

The incentive impact of credit subsidy on the overall protect-

ion to farm cotton production did not fully offset the penalty

imposed. by price policy on tradable inputs and output, the average

effective protection rate during the period under consideration

being raised only from -12 percent to -9 percent as a result of

the credit subsidy.

The protection rate would be still lower when the disincentive

effect of the overvalued domestic currency relative to foreign ex-

change is accounted for in the measure. AS mentioned elsewhere,

the protection system itself makes domestic currency overvalued

relative to foreign exchange. Medalla (1979) estimated a 32 percent

undervaluation of foreign exchange. Thus, the net EPR is less than

that indicated in the foregoing measure,i.e., an average of -25

percent during the 1975-81 period. It should be noted, however, that the correction for overvaluation of domestic currency has a neutral effect on all traded goods industries in the agricultural sector and the general economy. Thus, the relative ranking of cotton production would not change before and after the correction for currency overvaluation.

Synthesis on Incentive Structure

The foregoing analysis has shown that despite a clear positive nominal protection conferred by price policy on raw cotton, the protection on cotton farmers' output and value added tended to be negative indicating that cotton farmers have been penalized by the governmet's price policy. This does not necessary mean, howeve, that the protection to the cotton industry accrued totally to the processing sector, i.e., to PCC. A considered proportion of PCC's profit was apparently to supplement the budget for agricultural extension and research and development. Thus, a part of the overall protection to the industry was ultimately channeled down to cotton farmers in the form of government services. If the impact of these servcies to domestic value added could be reasonably quantified and incorporated in the effective protection measure, the picture of overall protection recieved by cotton farmers might have to be modified. It is not expected, however, that the position of the cotton crop in the protection-penalty scale of agricultural

crops will be markedly altered. Other agricultural crops are also receiving similar government services which may likewise increase the protection on these crops.

The estimated protection rates on seedcotton were generally lower than those conferred by price policy on food crops, but higher than those on export crops (Table 7).[5] During the seventies, nominal protection rates on food and export crops were, on the average, -3 and -15 percent, respectively. Considering that export crops, notably sugar and tobacco, are the predominant alternatives of farmers in the choice for second crops in most cotton-growing areas, it may be less disheartening to observe a nominal penalty on cotton farmers' output since the penalty imposed by price policy on export crops is more severe. However, considering that cotton is a relatively new agricultural crop in farmers cropping systems, the slight output protection advantage of this crop relative to export crops may be easily outweighed by greater risk and uncertainly perceived in shifting to a new crop. Moreover, there is an income distribution questions that should not be ignored. Why should these farmers' incomes be reduced substantially below what a free market would offer? Also, in the longer-run as the national cotton development program expands to other targeted areas where food crops are mostly grown as second crops, a more favorable price policy on

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This refers to nominal rates of protection, but as tradable inputs represent only a small proportion of production costs and value of output in crop production, it is likely that the ranking of agricultural crops would be roughly similar with the use of either nominal or EPR as the measure of protection.

cotton may be necessary to induce farmers to plant cotton.

Relative to the manufacturing sector which received an effect-
ive protection from government policies of about 44 percent during
the seventies, the protection conferred on the cotton industry was
very low. Thus, government pricing policies seem not to be de-
signed to attract resources to the cotton industry in competition
with manufacturing industries. If this discrepancy continues in
the long-run, it may be that the government would increasingly
have to bear the burden of financing the cotton program.

III. STRUCTURE OF COMPARATIVE ADVANTAGE IN THE COTTON INDUSTRY

As raised earlier, one principal issue in the national move
to commercialize cotton production in the country is the relative
competitiveness of domestically produced as compared to imported
cotton. Put in its proper perspective, the issue is, would the
economy benefit from substitutigng domestic for imported cotton
i.e., would the benefits outweigh domestic cost of production?
The analysis is centered on the "ex post" domestic resource cost
(DRC) concept which measures the value of domestic resources
evaluated at social opportunity cost, used in saving a unit of
foreigh exchange via local cotton production.

For input-output coefficient at the farmers' fields, the
present paper made use of comparative input, output and financial
farm survey data for cotton and major alternative crops, available

at the Special Studies Division, Ministry of Agriculture. Some

description features of these surveys are shown in Table 8. These

data were supplemented by production statistics from the Cotton

Research and Development Institute, Philippine Cotton Corporation

and the Bureau of Agricultural Economics, Ministry of Agriculture.

The Industry DRC

Exluding land rent, the average seedcotton production costs

(evaluated at market prices) for the period considered are shown in

Table 9. On a per-hectare basis production costs ranged ₱2, 131

in 1976 to ₱5,044 in 1981. Labor and operating capital costs in 1981

reanched unprecedentedlevels, the increases in the former mainly re-

sulting from increased physical labor inputs rather than increased

market wages.

The allocation of the above costs to domestic and foreign

sources is presented in Table 10 [6]. Together with labor,cost, land

rental, which was taken to be 25 percent of the value of production

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[6]
The genral methodology followed on the allocation of costs
to domestic, foreign and tax sources was that outlined in the IEPAD
Project. Briefly, the allocation process took into account the
historical origin (source) of tradable inputs, whether they were
fully or partially imported.

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in tobacco , the best alternative of cotton in present cotton-

growing areas,was allocated fully to domestic cost.

As mentioned earlier, processing (ginning) of seedcotton into

cotton lint and marketing operating are monopolies of the Philip-

pine Cotton Corporation. In the past, its yearly average net ginning

costs, calculated, as shown in Table 11, by deducting the value of

ginning by products (agricultural and industrial seeds) from total

ginning costs, fluctuated drastically. This resulted mainly from

large excess capacity in some years. During the seventies, for

example actual use ranged from only 8 to 35 percent of rated capa-

cities in contrast to an average utilization rate of 67 percent

in the early eighties. The same explanation can be made about

the observed annual fluctuation in average marketing cost.

The country's relative comparative advantage in cotton lint

production did not show a progressive trend. Instead of an expected

decline in domestic resource cost from 1975 onward, the study gave

surprisingresults with industry DRC generally escalating from

₱8,74/US$ in 1975 to ₱15,90/US$ in 1978 (Table 22). What gave

rise to these results was the general marked decline in average

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A large proportion of the farm respondents used in the present
study were share-tenants and /or part-owners. From crop year 1975-76
to 1977-78, it was about 59 percent: crop year 1978-79 to 1980-81, 52
percent. For these farms, the most common practice was the 75-25
sharing system (i.e., seven-five percent of the farm produce going
to the farmer cultivator and 25 percent to the landowner, the latter
not sharing production costs). From this observation it was deemed;
appropriate to measure the opportunity cost of land through the pre-
vailing share rent.

raw cotton yield in the survey data from 0.37/ha in 1975, when

the cotton program was first introduced, to 0.24 mt/ha in '.?78 (or

equivalently, from 1.0 mt/ha to 0.66 mt/ha of seedcotton, respect-

ively).[8] This alone had largely contributed to spiralling product-

ion cost per unit of raw cotton produced in the country from 1975

to 1978.[9] Compared with the shadow price of foreign exchange,

however, the DRCs, except for 1978, were still relatively lower,

though only slightly, indicating that the value of domestic re-

sources so used in cotton production was less than the average

amount of domestic resources required to earn one dollar (the

domestic cost of foreign exchange).

However, an apparently better picture of the relative effi-

ciency of the industry in saving a unit of foreign exchange appeared

during the last two years considered. At this time, the study

showed industry DRCs falling substantially below the shadow ex-

change rate, clearly indicating a strong comparative advantage

position for the country in raw cotton production. As in the

above case, the relatively low DRCs during this period were

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[8]Coincidentally or not, this was also the general trend in
the actual national performance of the cotton development program.
From a seedcotton yield of 1.24 mt/ha in 1975, the average dropped
to 0.54 mt/ha in 1978. From hereon to 1980, average yield showed
a reversal trend reaching 0.97 mt/ha in 1980 but subsequently dec-
lined to 0.72 mt/ha the following year.

[9]It should be apparent that the drastic increase in DRC in
1978 was also partly contributed by an almost twofold jump in
ginning and marketing costs incurred by PCC relative to that in
the previous year.

largely explained by comparatively high average raw cotton yield

estimated from the survey data. Though production costs on a per-

hectare basis increased significantly from previous years as shown

earlier, the remarkable increase in average raw cotton yield in

1980 and 1981 was enough to push production cost per metric ton

of lint to comparable levels from previous years. This low per-

unit production cost was strongly reinforced by more favorable

world market price (CIF) of raw cotton during the last two years

The Seedcotton DRC

The industry DRC does not give a clear picture of comparative

advantage in seedcotton production. Though it has been stated that

fluctuations in seedcotton yield largely contributed to the change

in the industry DRCs over time, it should be apparent that the state

of efficiency or inefficiency in processing and marketing did like-

wise exert a considerable influence on overall comparative advan-

tage. What is needed therefore is a measure of actual comparative

advantage in seedcotton production that is free from the influence

of changing cost parameters in processing and marketing.

However, because seedcotton is not tradable, and thus, does

not have an actual (observed) world market value, the DRC in

seedcotton production was estimated indirectly. First, the implicit

border value of seedcotton was estimated by deflating the seed-

cotton price actually received by cotton farmers with the nominal

protection rate as estimated in the preceeeding section. Then
the DRC in seedcotton production was calculated as in the indus-
try case. The results, shown in Table 13, indicated that seed-
cotton DRCs were generally lower than industry DRCs, implying
that the generally higher DRCs in the industry compared to those
in seedcotton production were due to relatively less efficient
processing. Since the inudstry was in effect a weighted average
of implicit DRCs in processing and seedcotton production, it
would be expected that the DRCs in processing would be higher
than the industry DRCs.

To evaluate the sensitivity of seedcotton DRCs to the assumpt-
ions implicit in the calculation and to changes in the price
structure cf inputs and output, an attempt was made to calculate
elasticities for the different parameters. As commonly defined,
an elasticity represents a percent change in DRC with respect to
a given percent change in a specified parameter, all other factors
held constant. The results of the exercise are summarized in
Table 14. DRCs were relatively insensitive to the opportunity
costs of land, labor, capital, fertilizer, and insecticide but
were highly sensitive to yield and implicit border price of
output. Since the seedcotton yield influences the DRC in exactly
the same magnitude as that of the implicit border price, only
yield is given a further examination.

Except for some years, average seedcotton yields used in

the base estimates were much above the national average yield.

This was apparently true in 1980 and 1981 when the survey data

gave more than 1.5 mt/ha of seedcotton, or 88 percent higher than

the national average yield of 0.8 mt/ha during the same period.

However, these yield levels are easily attainable in areas ade-

quate irrigation. Moreover, if the recommended technology is

properly follwed, seedcotton yield ranging from 1.5 to over 5 mt/

ha are not all farfetched, as demonstrated by model cotton grow-

ers selected annually in each province and to more recent data

from Mindanao.[10]

To show the range of seedcotton yield levels within which

the country could have a comparative advantage, critical mini-

mum seedcotton yields were estimated.[11] In this exercise, average

seedcotton production cost per hectare was assumed constant as

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[10]For crop year 1981-82, Mindanao farmers accounting for 5
percent of national production obtained an average yield of 1.5
mt/ha compared to Luzon (38% of production) and Visayas (11% pro-
duction) farmers with 0.8 and 0.9 mt/ha yields, respectively.

[11]Critical minimum seedcotton yield is defined as that yield
level at which the ratio of DRC to shadow exchange rate (SER)
equals to unity, i.e., the country nether losses nor gains in
domestic cotton production. Seedcotton yield below the critical
minimum would mean a loss to the society, local production being
more costly than importation, or vice versa.

given in the farm survey and as used in the base estimates. The results, presented in Figure 3, showed that while estimates from 1975 to 1979 were generally close to critical minimum yields, seed-cotton yileds estimated in 1980 and 1981 would have to decrease more than 45 and 40 percent, respectively, for the country to lose its comparative advantage in cotton production. Incidentally, estimated critical minimum seedcotton yields for the last two years were about 20 percent lower than the average levels targeted by the national cotton development program at the self-sufficiency stage of the industry's development.

CONCLUDING REMARKS

The paper has explicitly shown that despite the favorable protection conferred by government policies on the cotton indus-try, the farmers were penalized even by those policies set by the Philippine Cotton Corporation, the nations' implementing arm of the national cotton development program. It also dis-closed that the country exhibited a comparative advantage in local cotton production, underscoring the industry's relative efficiency in saving foreign exchange for the economy.

Since its inception, PCC has been giving a considerable focus on cotton research and development and agricultural exten-sion as a way of enhancing the cotton industry's performance. Part of the protection conferred by government policies on PCC's

processing and marketing operations is used to supplement the budget for these activities. While it can be viewed that these activities are ultimately for the benefit of farmers, it should be also noted that the incidence of this incentive is necessarily a long run one. In the short run, for the national cotton program to hold its modest growth pace of recent years, it is imperative that a larger proportion, if not all, of the total protection the industry is receiving from government policies should be shifted to farmers by instituting price policies that are more favorable to farmers. In this way, the country can better fully exploit its comparative advantage in domestic cotton production. As the relative competititveness of the crop with respect to traditional alternative crops stabilizes in the longer-run, this protection may need to be gradually withdrawn and allow the crop to compete in the market.

One qualifying points needs to be stressed here. While it was explicitly stated that there is an economic ground for cotton expansion in Philippine agriculture, the study does not suggest that economic efficiency is the only consideration of policy in the choice of crop for agricultural promotion or penalization. Other factors like employment, income distribution, concentration of economic power and the socio-political implications of the choice to the agricultural and non-agricultural sectors of the society, are obviously considered in policy decisions.

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Table 1. Sources of raw cotton (lint) imports, 1963-80.

Country of Origin	1963-65	1966-70	1971-75	1976-80
	Percent of total quantity			
United States	73.6	75.3	99.0	79.0
Mexico	15.1	15.6	0.4	3.4
Brazil	5.5	0.7	0.3	0.1
Nicaragua	2.3	1.91	a	2.5
Guatemala	0.5	1.5	-	1.7
United Arab Republic	0.2	0.4	0.3	a
Sudan	0.1	0.9	-	0.2
Pakistan	-	-	-	3.5
Israel	-	-	-	2.5
USSR	-	-	-	1.6
India	0.3	a	-	1.1
Others	2.4	3.7	-	4.4
Total	100.0	100.0	100.0	100.0

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

[a]Less than 0.1 percent.

Table 2. Domestic production of raw cotton (lint) and share to total supply 1975-81

Year	Production (mt)	Proportion to Total Supply[a]
1975	97	0.3
1976	176	0.6
1977	437	2.1
1978	619	1.7
1979	802	3.1
1980	2,603	8.2
1981	4,594[b]	13.6[b]

Source: Production data from Philippine Cotton Corporation.

[a]Total supply is defined as import plus production.

[b]Estimate.

Table 3. Cotton content in locally produced fabrics, 1963-81.

Year	Cotton Content (%)
1963	76
1964	65
1965	62
1966	65
1967	51
1968	50
1969	40
1970	43
1971	32
1972	27
1973	53
1974	44
1975	51
1976	35
1977	41
1978	39
1979	38
1980	39
1981	36

Source: Philippine Cotton Corporation.

Table 4. Loans granted for the cotton supervised credit financing
program, 1975-81

Year	Total Loan (₱1000)	Average Loan Per			Repayment Rate (%)
		Farmer (₱)	Hectare (₱)	Metric ton of raw cotton (₱)	
1975	366	851	1,887	3,773	98
1976	1,336	928	1,641	7,591	75
1977	3,565	635	1,270	8,158	73
1978	4,675	535	1,478	7,552	77
1979	5,979	995	1,946	7,455	80
1980	15,988	1,161	2,132	5,796	91
1981	43,887	2,001	2,581	9,553	n.a.

Source: Philippine Cotton Corporation.

Table 5. Trends in farm price, ex-warehouse price.,border price,
and nominal protection rates on the cotton industry, 1975-81

| Year | Farm Price | | Domestic Ex-Warehouse Price [c] (P/mt) | Border Price [d] (P/mt) | Nominal Protection Rate [e] (%) | Total Nominal Protection Rate [f] (%) |
	In seed-cotton [a] (P/mt)	In lint equivalent [b] (P/mt)				
1975	3,500	10,549	13,000	11,431	-8	14
1976	3,850	11,315	13,000	11,297	0	15
1977	4,000	11,771	15,000	13,641	-14	10
1978	4,000	11,811	15,000	11,166	6	34
1979	4,000	11,851	16,500	11,854	0	39
1980	4,400	12,982	19,000	13,313	-2	43
1981	4,450	13,167	18,150	15,121	13	20
Weighted average, 1975-81 [g]					-7	28
Legislated rate [h]						24

[a] Price actually received by farmers.

[b] Lint price equivalent of seedcotton price plus efficient cost of
converting seedcotton to cotton lint and marketing the product computed
as shown in Appendix A.

[c] Selling price of cotton lint to textile millers by the Philippine
Cotton Corporation.

d
Average CIF Value for imported raw cotton (lint), adjusted for
quality differential domestically produced and imported raw
cotton.

e
Percentage difference of farm price (in lint equivalent) to border
price,

f
Percentage difference of domestic ex-warehouse price to border
price.

g
Weighted by total raw cotton production in each year.

h
Based on existing tariff rates for imported raw cotton: 10% ad
valorem and a 10% sales tax over 25% mark-up.

32

Table 6. Estimates of effective protection rates on cotton
production, 1975-81.

Year	Effective Protection Rate (%)	Ratio of Credit Subsidy to Free-TRade Value Added	Effective Protection Rate with Credit Subsidy (%)
1975	-14	.02	-12
1976	- 4	.05	1
1977	-21	.04	-17
1978	1	.05	6
1979	-4	.04	0
1980	-6	.03	-3
1981	-19	.04	-5

Weighted average,

1975-81[a]   -12   -9

a
Weighted by total raw cotton production in each year.

Table 7. Comparison of protection rates on cotton vis-a-vis
other crops and between the cotton industry and the
manufacturing sector, 1970s and early 1980s.

Item	Protection Measure	Percent
Cotton industry[a]	Total nominal protection rate	28
Seedcotton	Nominal protection rate	-7
	Effective protection rate	-12
	Effective protection rate with credit subsidy	-9
Food Crops[b]	Nominal protection rate	
Rice		3
Corn		3
Other food crops		0
Export crops[b]	Nominal protection rate	
Sugar		-21
Copra		-24
Other export crops		-4
Manufacturing sector[c]	Effective protection rate	44

a Includes seed cotton production and processing.

[b]Based on price comparison between domestic and border prices as
estimated in David, C.C. " Impact of Price Intervention Policies on
Agricultural Incentives in the Philippines," paper presented at the
Second Western Pacific Food Trade Workshop Kartika Chandia Hotel,
Jakarta, August 22-23,1982.

[c]Based on legislated rates as shown in Tan, N. "The Structure
of Protection and Resource Flows in the Philippines", in Bautista, R.
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Philippines., Philippine Institute for Development Studies, 1979.

Table 8. Some descriptive features of the SSD-Ma* farm surveys on cotton and alternative crops.

Title	Crop Year Covered	Area Covered	Total Number of Farm Respondent	
			For all crops	For cotton
1. Comparative Input, Output, and Finannial Data for Virginia Tobacco, Palay, Mongo, Corn and Cotton	1974-75	Ilocos Reg on[a]	300	60
2. Comparative Input, Output and Financial Data for Palay, Corn, Mongo, Virginia Tobacco and Cotton	1975-76	Ilocos Region	515	100
3. Comparative Input, Output and Financial Data for Mongo, Cotton palay, Virginia Tobacco and Corn	1976-77	Ilocos Region	500	180
4. Comparative Input, Output and Financial Data for Cotton, Corn Palay, Mongo, Virginai Tobacco, and Burley Tobacco	1977-78	Ilocos Region	554	91
5. Comparative Input, Output and Financial Data for Cotton, Palay Burley Tabacco, Virginia Tobacco, ans Native Tobacco	1978-79	Ilocos Region, Tarlac, Nueva Ecija	515	304
6. Comparative Input, Output and Financial Data for Cotton, Palay, Burely Tobacco, Virginia Tobacco, and Native Tobacco	1979-80	Ilocos Region Tarlac, Nueva Ecija, and Cagayan	426	183
7. Cost Involved in the Domestic Production of Agri-based Import Substitutes : Cotton	1980-81	Ilocos Region	–	201

*a Special Studies Division, Ministry of Agriculture.

a Includes the provinces of Ilocos Norte, Ilocos Sur, La Union, and Pangasinan.

Table 9. Average costs of seedcotton production, Ilocos Region*, 1975-81

Year	Labor Cost[a]	Capital Service Cost[b]	Operating Capital Cost[c]	Interest on Pre-harvest Cost[d]	Other Costs[e]	Total
			Pesos per Hectare			
1975	1,013	240	1,178	139	41	2,611
1976	789	308	892	109	33	2,131
1977	1,207	609	876	135	44	2,871
1978	934	518	729	115	36	2,332
1979	1,274	614	724	125	61	2,798
1980	1,253	683	1,239	212	75	3,462
1981	1,987	949	1,628	304	176	5,044

* Except for 1979 and 1980 which also include Nueva Ecija, Tarlac and Cagayan.

[a] Includes hired labor costs and imputed values of operator, family and exchange labor.

[b] Includes depreciation and interest cost of fixed capital assets other than land.

[c] Includes fertilizer, insecticides and seeds.

[d] At 15% per annum, apportioned as original cost;7.5% for 6 months.

[e] Unclides containers, food for hired and exchange labor, and transportation costs.

Table 10. Domestic and foreign cost in seedcotton production, Ilocos Region*, 1975-81.

Source of Cost	1975	1976	1977	1978	1979	1980	1981
Domestic							
Land rent	1,415	735	1,169	1,446	988	1,695	1,241
Labor cost	1.013	789	1,207	934	1,274	1,253	1,987
Capital service cost	211	274	446	342	419	442	544
Operating capital cost	350	287	247	247	247	369	462
Interest on preharvest cost	139	109	135	115	125	212	304
Other costs	41	33	44	36	61	75	176
Sub-total	3,169	2,227	3,248	3,120	3,114	4,046	4,714
Foreign							
Capital service cost	22	25	120	130	146	179	300
Operating capital cost	661	485	499	387	387	701	938
Sub-total	683	510	619	517	533	880	1,238
Total Domestic and Foreign costs	3,852	2,737	3,867	3,637	3,647	4,926	5,952

*Except for 1979 and 1980 which also include Nueva Ecija, Tarlac and Cagayan.

Table 11. Estimates of ginning and :erketing costs in cotton production, Philippines. 1975-81.

Item	1975	1976	1977	1978	1979	1980	1981
Ginn:ng Cost							
Total ginning cost[a]	$4,480^d$	5,442	4,511	5,298	4,993	2,159	$3,570^d$
Less: Value of ginning by-products[b]	$2,280^d$	3,182	2,745	1,643	2,271	1,255	$1,760^d$
Net ginning cost	$2,200^d$	1,630	1,766	3,655	2,722	904	$1,810^d$
Allccated to:							
Domestic	1,936	1,434	1,554	3,216	2,395	795	1,592
Foreign	220	163	177	365	272	90	181
Tax	44	33	35	73	54	18	36
Marketing Cost[c]	790^d	883	1,670	2,345	440	486	460^d

Source of basic data: PCC Financial Statements.

[a] Approximated cost of converting seedcotton to cotton lint. Includes expenses for direct labor, manufacturing overhaed, and administrative charges.

[b] Includes value of industrial seeds exported to Japan and agricultural seeds for planting materials.

[c] Includes picking up seedcotton from the farm to ginnery and transportation cotton lint to textilemillers.

[d] Estimate.

Table 12. Summary of domestic resource cost components in cotton lint production, Ilocos Region*, 1975-81.

Year	Average Yield Lint[a] (mt/ha)	Domestic Cost			Foreign Cost		Average CIF Value[c] (US$/mt)	Domestic Resource Cost (P/US$)	Comparative Advantage
		Production (P/ha)	Ginning[b] (P/mt)	Marketing (P/mt)	Production (P/ha)	Ginning[b] (P/ha)			
1975	0.37	3,169	1,936	790	683	220	1,577	8.74	0.90
1976	0.26	2,227	1,434	883	510	163	1,518	8.83	0.89
1977	0.28	3,248	1,554	1,670	619	177	1,843	9.73	0.98
1978	0.24	3,120	3,216	2,435	517	365	1,515	15.90	1.61
1979	0.31	3,114	2,395	440	533	272	1,606	9.64	0.97
1980	0.58	4,046	795	486	880	90	1,773	5.30	0.53
1981	0.57	4,714	1,592	460	1,238	181	1,914	6.39	0.60
Weighted Average, 1975-81[d]								7.22	0.71

*Except for 1979 and 1980 which also include Nueva Ecija, Tarlac and Cagayan.

[a]Based on a recavery rate of 37% of seedcotton.

[b]Net of value of ginning by-products (industrial and agricultural seeds).

[c]Adjusted for quality differential between domestically produced and imported cotton lint.

[d]Weighted by total raw cotton production in each year.

[e]Ratio of domestic resource cost to shadow exchange rate.

Table 13. Summary of domestic resource cost com ponents in seedcotton production, Ilocos Region*, 1975-81.

Year	Seedcotton Yield (mt/ha)	Production Cost		Implicit Border Value[a] (US$/mt)	Domestic Resource Cost (₱/US $)	Comparative Advantage[b]
		Domestic (₱/ha)	Foreign (₱/ha)			
1975	1.00	3,169	683	525	7.36	0.76
1976	0.71	2,227	510	517	7.46	0.75
1977	0.75	3,248	619	628	8.38	0.84
1978	0.66	3,120	517	512	11.65	1.18
1979	0.85	3,114	533	542	8.02	0.81
1980	1.57	4,046	880	598	4.92	0.49
1981	1.55	4,714	1,238	647	5.57	0.53
Weighted average, 1975-81[c]					6.19	0.61

*Except for 1979 and 1980 which also include Nueva Ecija, Tarlac and Cagayan.

[a]Seedcotton price deflated by nominal protection rate on seedcotton, converted at official exchange rate.

[b]The ratio of domestic resource cost to shadow exchange rate.

[c]Weighted by total seedcotton production in each year.

Table 14. Elasticity of DRC coefficient in seedcotton production with respect to stated parameter, IlocosRegion* 1975-81.

year	Land rent	Labor cost	Capital service cost	Fertilizer cost	Insecticide cost	Implicit border price	Year
1975	0.395	0.268	0.022	0.058	0.129	-1.255	-1.255
1976	0.331	0.356	0.136	0.135	0.177	-1.213	-1.213
1977	0.422	0.433	0.240	0.128	0.220	-1.141	-1.141
1978	0.479	0.314	0.444	0.107	0.169	-1.231	-1.231
1979	0.266	0.358	0.133	0. 47	0.045	-1.222	-1.222
1980	0.501	0.392	0.219	0.176	0.178	-1.048	-1.048
1981	0.284	0.443	0.179	0.128	0.139	-1.150	-1.150

*Except for 1979 and 1980 which also include Nueva Ecija, Tarlac and Cagayan.
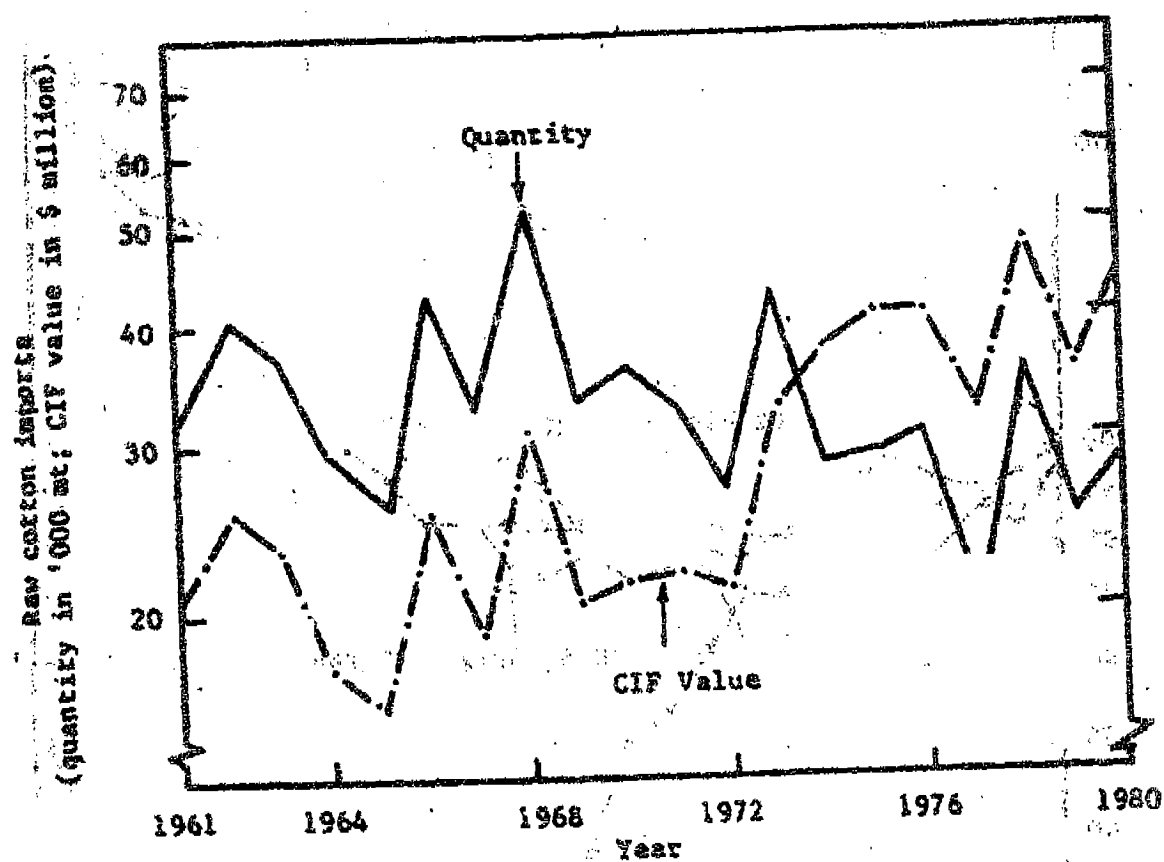
Figure 1. Quantity and value of raw cotton imports, Philippines, 1961-80, semi-logarithmic scale.
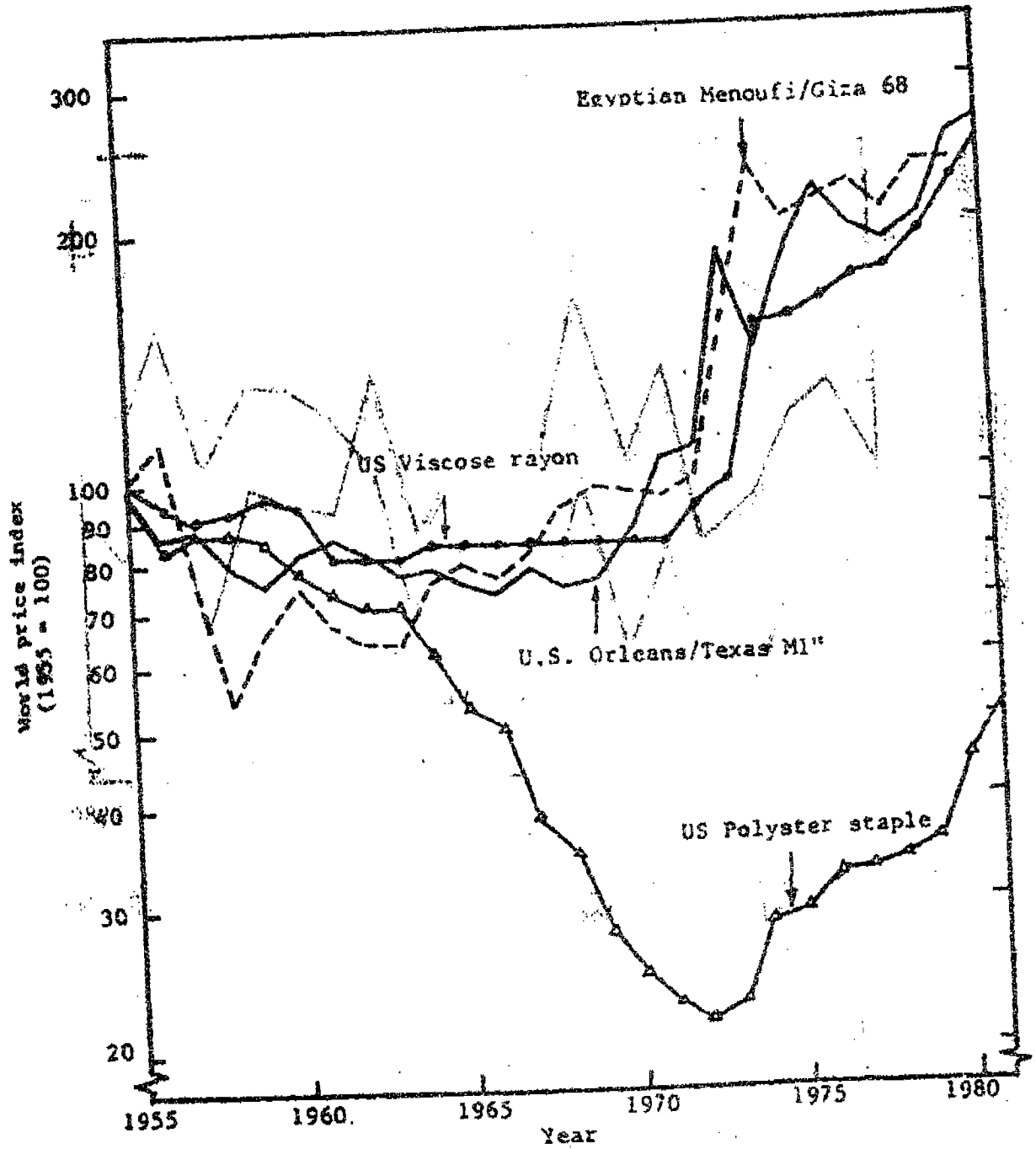
Figure 2. World price trends of raw cotton and man-made fibers, 1955-81, semi-logarithmic scale.
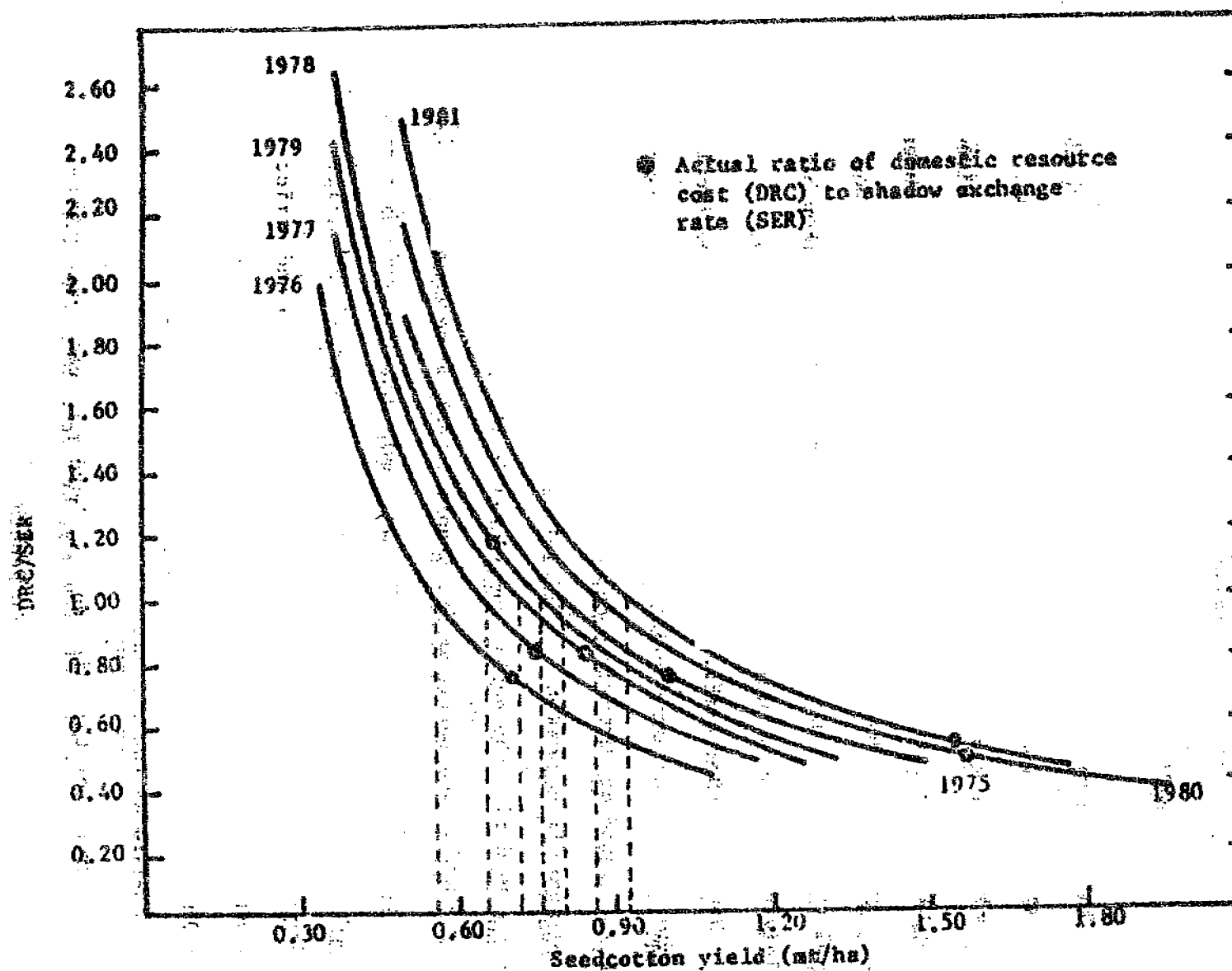
Figure 3. Critical minimum seedcotton yield for a comparative advantage position in cotton production, Ilocos Region, 1975-81.

APPENDIX A

ESTIMATION OF BORDER AND FARM PRICE OF FARM COTTON

This note presents the details of the adjustment done in the estimation of appropriation border and domestic producer prices. Clearly, this adjustments was done to make domestic and border prices directly comparable, i.e., to net out the price differential between domestic and border prices due to quality difference between imports and local production. Any wedge between the two prices can then be solely attricbuted to price-distorting govermemt policies.

Without matked quality difference between imports and local production, the domestic price of raw cotton sold by PCC to textile millers should be directly comparable toborder price, represented by average CIF converted at official exchange rate. However, this was not so during the period considered in the study. While domestic production was mostly medium staple (about 86 percent), imports were mostly short staple (60 percent). This was also tru in terms of lint grades: local production were mostly middling and strict middling in contract to imports whish were mostly low and strict low middling. Thus, a noticeable higher price on domestic production relative toborder price of import was presumably due to the higher quality of the former.

To correct for this discrepancy, border prices were correspondingly adjusted upward. The general adjustm ent factor)1,14) was taken as the average price ratio (1976-81) of two American

lint grades, Memhis Terr. SM 1-1/16" and Orleans/Texas M 1".

The former was more or less comparable to the quality of local

production; the latter, to that of imports.

Price comparison between farm and border prices involved more

complication than that above. Since farmers' output is not tradable,

its price is not directly comparable to that of tradable lint. In

this paper, for both prices to be comparable, seedcotton price was

translated in terms of its lint price equivalent and added to it

processing (ginning) cost. Any wedge between domestic producer and

border prices measured at a comparable point in the marketing chain

was then attributed, as in above, to price-distorting government

policies. The problem, however, was that of processing cost to

quote. Since the net protection conferred by government policies

to cotton farmers was the concern of the study, PCC's processing

cost could not be used since this cost apparently included the

effects of whatever protection conferred to and inefficiency

that existed in processing. The alternative was to replace

PCC's processing cost with the average processing cost of eleven

major cotton-producing countries. The implicit assumption was

that this average was a close approximation of the cost of effi-

cient and protection-free processing. The estimates are summarized

in Appendix Table 1.

Appendix Table 1. Estimates of farm price of raw cotton (lin), 1975-81.

Item	1975	1976	1977	1978	1979	1980	1981
			₱/kg.				
Price received by farmers for seed-cotton	3.50	3.85	4.00	4.00	4.00	4.40	4.45
Price equivalent in cotton lint[a]	9.46	10.40	10.81	10.81	10.81	11.89	12.03
Plus: Processing and marketing costs[b]	1.09	0.91	0.96	1.00	1.04	1.09	1.14
Farm price of raw cotton	10.55	11.31	11.77	11.81	11.85	12.98	13.17

Source of basic data: Philippine Cotton Corporation
World Cotton Statistics

[a]Based on a recovery rate of 37%.

[b]Average of eleven major cotton-producing countries. This represents the approximated cost of protection-free and efficient processing (ginning) and marketing.