LAND-ABUNDANT AGRICULTURAL GROWTH AND SOME OF ITS CONSEQUENCES: THE CASE OF THAILAND

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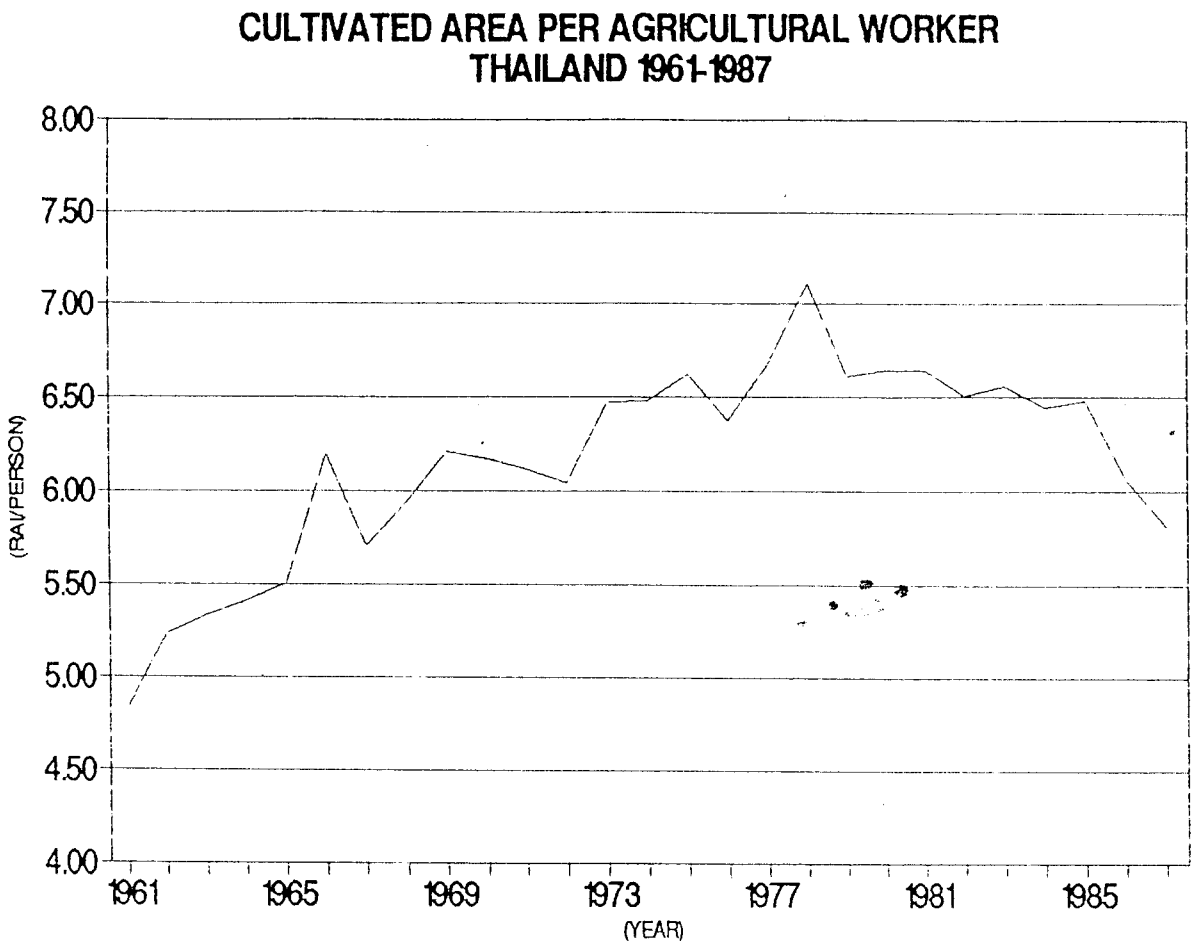
I. INTRODUCTION

Thai agricultural growth since the Second World War until about 1980 was dominated by massive expansion in the land area under cultivation. During this period, Thailand was probably the only country in Asia that saw the amount of cultivated land per agricultural worker actually increasing (Figure 1). Even though the labor force in agriculture did not grow as fast as the amount of land that was cleared, the availability of land allowed agriculture to continue to absorb large amounts of labor, with the consequence that Thailand still has a larger proportion of its labor force in agriculture than other Asian countries at similar income levels (Figure 2).[1]

The plentiful availability of new land allowed Thailand to have a strong comparative advantage in agriculture. During the period of expansion in the 1960s and the 1970s, the foreign exchange earnings that agricultural exports brought in allowed the Thai government to follow a relatively liberal trade and foreign-exchange regime. The consequence is that the strong hand of the government (which is usually associated with credit and foreign-exchange rationing) never made itself felt. To be sure, the Thai economy was never run on strictly laissez-faire principles: the Board of Investment has actively encouraged new investments in

[1] We shall see later that there are certain problems with the data in Figure 2, but as a crude indicator of the concentration of the labor force in agricultural activities, it will do for now.

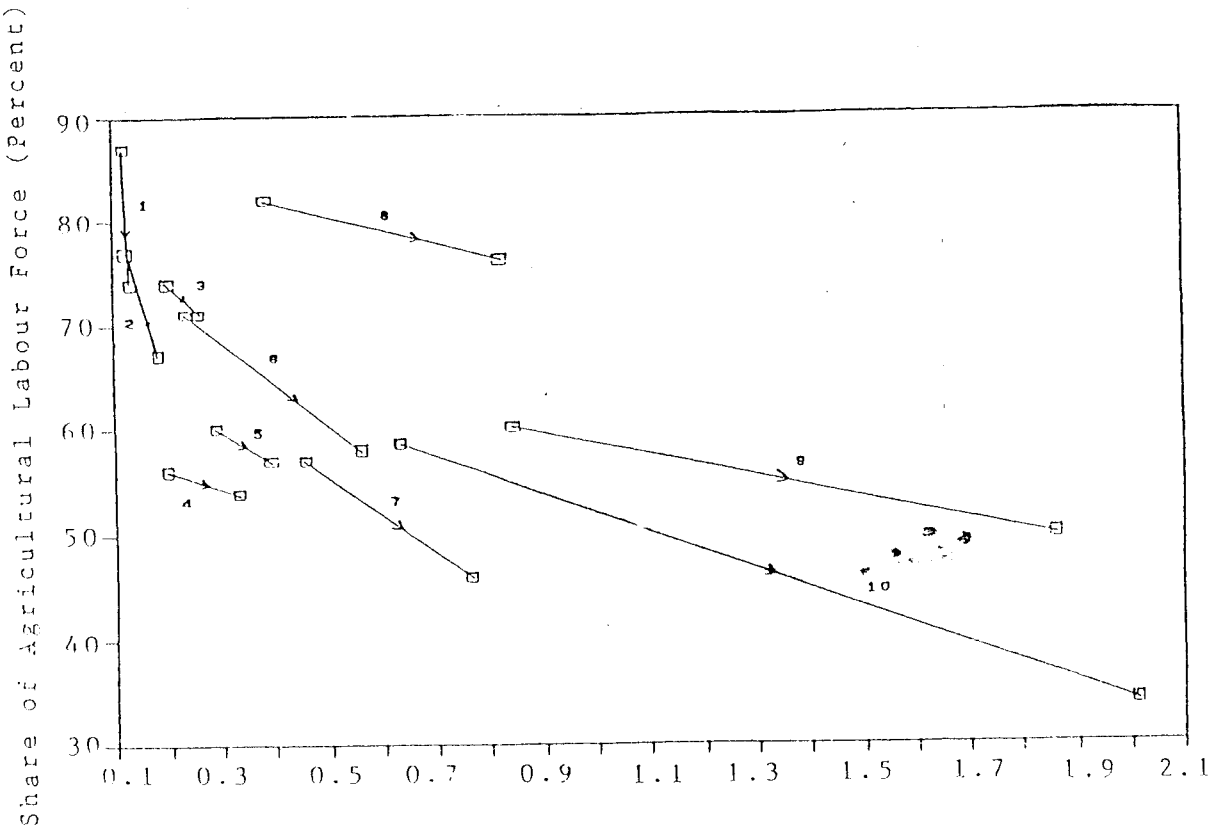
FIG. 1



Source: Cultivated Area figures from Office of Agricultural Economics for 22 most important crops compiled by Thailand Development Research Institute (TDRI); Agricultural Workers Population Census figures and interpolatal.

FIGURE 2

Relationship Between Share of Agricultural Labour Force and GDP per capita, Selected Asian Countries 1965-1983



1. Bangladesh
2. Burma
3. India
4. Sri Lanka
5. Pakistan
6. Indonesia
7. Philippines
8. Thailand
9. Malaysia
10. Republic of Korea

Initial Point 1965 End Point 1983

Source : World Development Report 1985.

what it deems to be sunrise industries; and the tariff rates were also quite high, ranging from 30 to 90%. Except for the implicit restraint caused by the expansion of promoted industries and the occasional ban on new entry that ensued, the government seldom imposed direct restraint on the growth of any industry through licensings and bans.

This growth pattern has shifted since about 1980. Land was no longer in plentiful supply. The land area per agricultural worker since about 1980 has been declining at the rate of about 1% per annum (see Figure 1 again). Agricultural output, which grew at 4.2 per cent per annum between 1970 and 1980 (Table 1) has since been growing at 3.4 per cent. Compounding the problem has been the worldwide agricultural depression of the early 1980s, leading to falls in domestic prices. The consequence of these developments for the standard of living of the rural population was immediate and palpable. The poverty level--and Thai poverty is almost entirely a rural phenomenon--increased between 1981 and 1986 for the first time since income and expenditure statistics were kept, although between 1986 and 1988, the farm price recovery has led again to a decline in the poverty rate, back to what it was in the early 1980s. The net result was an unchanging absolute poverty level in the last decade after two decades of continuous and substantial decline.

As the comparative advantage of agriculture has declined with the closing of the land frontier, manufactured exports began to play an increased role as a source of foreign exchange. Its share in the exports of goods jumped from 32% to 65% between 1980 and 1988. Another nonagricultural source of foreign exchange earning is income from tourism, which contributed an additional 19.8 per cent to the earnings from goods exports in 1988, up from 13.5 per cent in 1980. This restructuring of the country's export revenues has not been entirely painless, and is paid for by a sharp slackening of the growth rates in the period 1982-1986.

Table 1
Growth Rates of Real GNP and Sectors,
Thailand, 1970-1988

(Per Cent)

	1970-80	1980-86	1986-88
Agriculture	4.2	3.7	1.9
Mining	6.0	4.9	7.9
Manufacturing	9.7	4.1	13.7
Others	7.1	6.4	8.7
GNP	6.9	5.3	8.5

Note: Growth rates are obtained by regression analysis

Source: National Accounts Division, National Economic and Social Development Board. (New Series).

This sketch of the Thai growth experience sets a broad framework for the analysis that follows. There are essentially two tradable sectors in the economy, agriculture and manufacturing. The large and amorphous remainder of the economy (which contributes about half of the total GDP) produces largely nontradable goods, although income from tourism does contribute a significant amount to the value added in this sector.

A description in terms of comparative advantage would make the relative growths of agriculture and manufacturing competitive rather than complementary. Expansion of the one can take place only if it takes away resources away from the other. This of course presupposes a fully employed economy. But if the economy is less than fully employed, then the expansion of one may induce expansion in the other through demand linkages, and the familiar multiplier process. But regardless of whether the economy is fully employed, the expansion of either tradable sector or both would raise the demand for the nontradable sector, and perhaps its prices relative to the tradable sectors.

The main task of the paper is therefore to check whether this description is indeed borne out by the data at hand, both at the aggregative and at the microeconomic levels.

II. A BRIEF MACROECONMIC HISTORY OF THAILAND 1970-1988

As the main question of this paper is the role of comparative advantage in explaining the growths of the agricultural and the manufacturing sectors, the first task is to examine whether policies allow comparative advantage to play its proper role. Recent literature has stressed the importance of macroeconomic policies in influencing the degree to which international relative prices are allowed to be

reflected in domestic relative prices (Krueger, Valdes and Schiff 1988). It is therefore important to start the discussion with Thai macroeconomic history.

Thai monetary and fiscal policies have been traditionally disciplined by two over-riding objectives: the reluctance to change the nominal exchange rate, and a very strong central-bank desire to avoid quantitative foreign-exchange controls. For twenty-six years (1955 to 1981), the baht/dollar exchange rate remained between 20 and 21 baht. This need (and ability) to maintain the nominal rate without extensive foreign exchange control requires conservative monetary and fiscal policies. This has been, with one exception, the normal policy stance of the Thai government.

This particular combination of fixed exchange rates coupled with conservative monetary and fiscal policies appeared to have been very successful during the 1960s, when the world as a whole was under a fixed exchange rate system. With increasing international exchange rate instability during the 1970s and the 1980s, using a fixed nominal exchange rate target as a guide to macroeconomic management began to land Thai policy-makers in serious problems, inasmuch as they conceive their task, not as the maintenance of the value of the baht in some general sense, but narrowly as the maintenance of the baht/dollar exchange rate. As the dollar began to soar against other currencies, particularly the yen, in the world exchanges between 1979 and 1985, the policy of maintaining the baht/dollar parity caused the baht to become seriously overvalued, with an adverse impact on export performance, as well as inducing larger imports.

In the face of these pressures on the balance of payments, the nominal exchange rate could be maintained partly because of the Thai government's willingness (perceived as necessity) to borrow overseas as the current account deficits began to widen. This borrowing, in conflict with the traditional reluctance

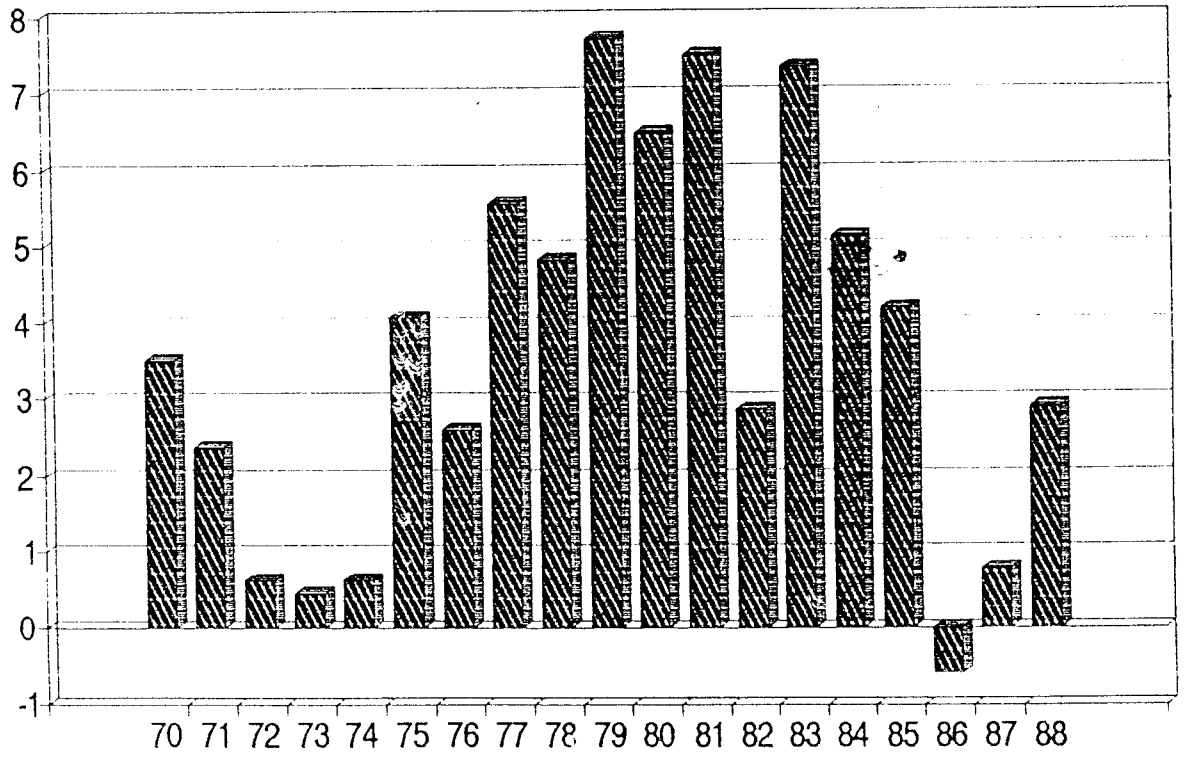
of the Thais to borrow excessively overseas, began in 1977, at first independently of the problems with the baht--the borrowing was to finance burgeoning fiscal deficits, caused by heavy military expenditures. The borrowing gathered momentum after the second oil shock and the accompanying upward movement of the baht in 1979 (Figure 3). It was accompanied by continually large fiscal deficits, amounting at times to about 10 per cent of the GNP. The late 1970s and the early 1980s thus saw an uncharacteristically loose macroeconomic policy stance.

Eventually in 1983, after discussions with the International Monetary Fund, there began a long and painful reversal of these loose policies. The fiscal deficits were gradually tightened, by introducing a zero-growth (in real terms) budget; by terminating open-ended subsidies to various public enterprises; and by placing a cap on the aggregate foreign borrowing by the public sector; all these in addition to the 15 per cent devaluation in November 1984. This devaluation was actually the second one in the 1980s. It had already been once devalued by 10 per cent against the dollar in July 1981, as a consequence of a speculative run on the baht.

At the time of the second devaluation, the baht was to be pegged to a basket of currencies. But as the dollar began to drift downwards in the second quarter of 1985, the share of the dollar in the basket was apparently lifted from about a half to close to 90 per cent, marking the first time since 1955 when Thai policy-makers begin to make deliberate, if cautious, use of the nominal exchange rate as a policy instrument.

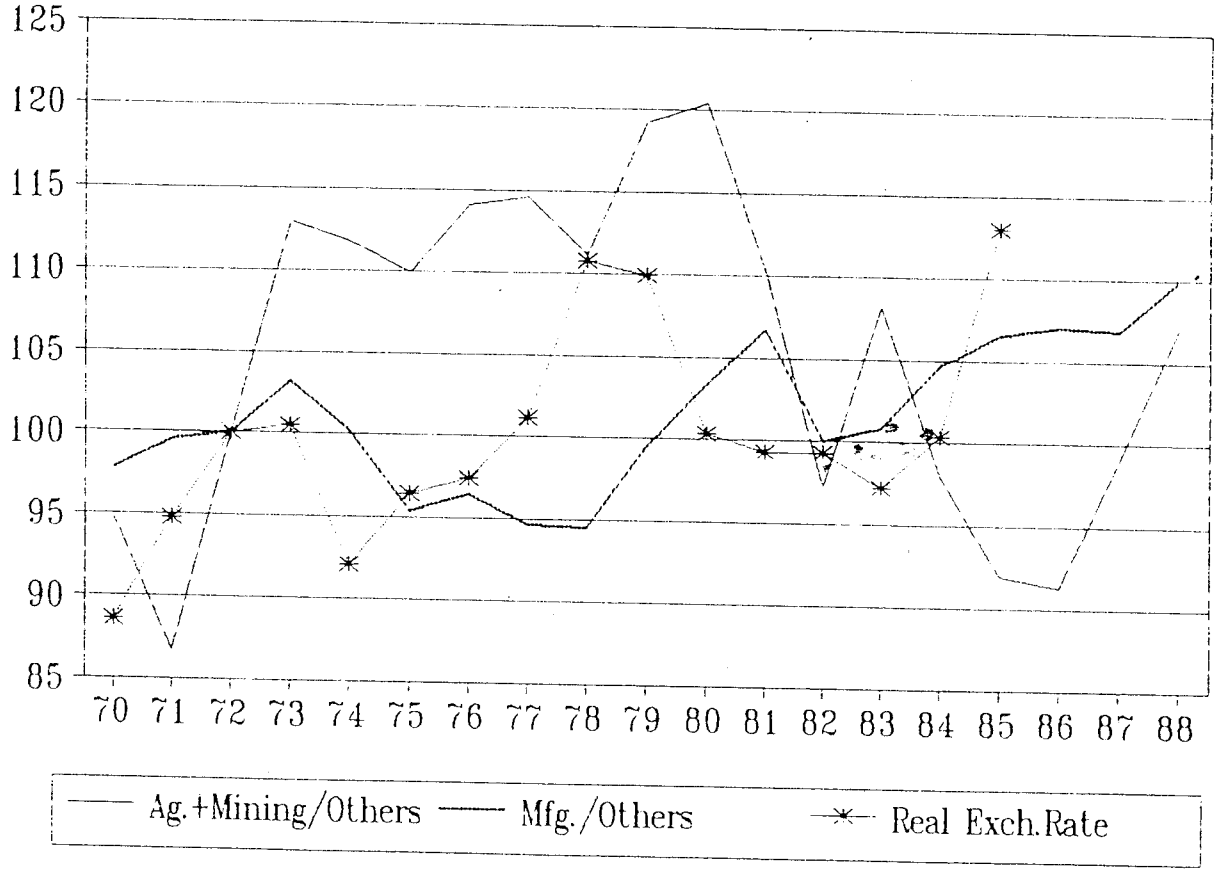
There were therefore three devaluations of the baht in the 1980s, two apparent ones in the baht/dollar rate in 1981 and 1984 which merely corrected the earlier involuntary revaluation, and a deliberate one beginning in mid-1985 which really lowered the effective exchange rates against the traded-weighted basket of

Fig.3: Current Account Deficit as % of GNP, 1970-1988



Sources: Current Account Deficit from Bank of Thailand; GNP from National Accounts Division, National Economic and Social Development Board.

Fig.4: Relative Price of Tradables to Nontradables 1970-1988



Sources: Sectoral Value Added Deflators (which provide the prices for agricultural and mining, for manufacturing and for the other sectors) from National Accounts Division, National Economic and Social Development Board; real exchange rates from Siamwalla and Setboonsarng 1989.

other currencies and which therefore increased the competitiveness of Thai manufactured goods exports.

These manipulations of the exchange rates, and the concomitant discipline in macroeconomic policies, meant that the exchange rate was overvalued relatively to a free-trade exchange rate by about 10 per cent in 1986, a low degree of overvaluation by historical standards (Siamwalla and Setboonsarng 1989). The economy was therefore poised for a strong performance which came in the ensuing three years.

III. SECTORAL LINKAGES: THE MACRO PICTURE

Figure 4 shows the movements in the relative prices of agriculture and mining on the one hand, and manufacturing on the other, as against the "other" (i.e. nontradable) sectors. The price indices used here are the sectoral GDP deflators. Although the paper intends to examine the impact of agriculture on the rest of the economy, we have decided for now to aggregate mining to agriculture, for reasons which will presently become apparent.

The movements of relative agricultural and mining prices are especially striking, with most of the 1970s showing generally high prices, relative to the early 1970s, and a sharp fall during the 1980s. These movements reflect worldwide trends of commodity prices more or less faithfully. The only deviation from the worldwide trends would arise from domestic policy changes, particularly policies at the border. Here, I would note that Thai agricultural export policies were completely liberalized during the 1980s after three decades during which agriculture (particularly rice) was heavily taxed (Siamwalla and Setboonsarng 1989). The process of liberalization would tend to raise or slow down the fall in agricultural prices. Figure 4 indicates that the liberalization was insufficient to offset the worldwide trend of prices

downward. As we shall discuss in the following section, this downward trend in prices has a clear impact on the level of poverty in the country.

Figure 4 also shows the movement in the relative prices of manufacturing. The logic that drives this relative price is completely different from that which drives the relative price of agriculture and mining. Movements in the relative price of manufacturing lag behind the movements of the real exchange rates by about two years.[2] I would suggest that the nominal price for manufactured goods tends to be partially sticky, while that for nontradables may be somewhat more flexible, and this is the reason for the lag.

The price formation in agriculture differs from that in manufacturing. Essentially, Thai agriculture (and mining) is in a flexprice world, with its nominal price level moving quite freely over a wide range, mostly in response to world market conditions and to government border measures. Manufacturing is in a fixprice world, hence its price relative to nontradables is a better indicator of the domestic macroeconomic environments than are agricultural prices.

On the quantity side, agricultural output is mostly supply determined, subject both to long-range changes in the overall comparative advantage within the Thai economy and, in the short-run, to weather conditions. Agriculture does respond to price (through which demand makes itself felt), but the response in the short to medium run is quite small in magnitude. In any case, the price to which agriculture does respond is essentially exogenous to the economy. Manufacturing output on the other hand can be very strongly influenced in the short run by shifts in the demand

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[2] The real exchange rate displayed in Figure 3 is defined as the nominal exchange rate divided by the ratio of the weighted average of the inflation rates of Thailand's trading partners and the domestic inflation rate.

side, both domestic and foreign. Its lack of price flexibility is made up for by output flexibility.

With this discussion of price flexibility in mind, we did a very simple regression test of the hypothesis of the linkage between agriculture and manufacturing. We shall estimate the following equation:

$$(1 - cL).\ln(\text{Real Manufacturing Output}) = \text{Constant} + a.\ln(\text{Real Agricultural Income}) + b.\ln(\text{Industrial Countries' GNP})$$

where L is the lag operator, and a and b measure the responsiveness of the manufacturing output to the two autonomous demand shifters, while c is the lag coefficient.

The dependent variable we take to be the real output of the manufacturing sector (i.e. the output from the manufacturing sector at constant prices). The first independent variable, real agricultural income, is defined as the nominal value of agricultural and mining output deflated by the price deflator for the nontradables (i.e. sectors other than agriculture, mining and manufacturing). Another way of expressing this variable is as the product of real agricultural and mining **output** and the real price of agriculture and mining (deflated by the nontradable goods prices), which is our measure of the real agricultural and mining **income**.

The problem in estimating this equation is that the variables are subject to very strong time trends, so that although apparently good results can be obtained (with high R^2 and good t-statistics) as indicated in the first column of Table 2, one cannot be sure that the correlation is not spurious. The results reported there are obtained by experimenting with different value of c, the lag coefficient and choosing

Table 2
Estimates of Regression Explaining
the Logarithm of Real Manufacturing Output,
1971-1988

Variables Used	Actual	Detrended
Lag Coefficient	0.46	0
Constant	-1.790	0
Logarithm of Real Agri-cultural and Mining Income		
Coefficient	0.236	0.633
t-statistic	2.884	9.591
Implied Long-Run Coefficient	0.438	0.633
Logarithm of Industrial Countries' GNP		
Coefficient	1.148	-
t-statistic	9.033	-
Implied Long-Run Coefficient	2.125	-
Durbin-Watson Statistic	1.539	1.863
Adjusted R-Squared	0.980	0.836

All logarithms are to the base e

that value which yield the best fit, subject to the constraint that the Durbin-Watson statistic does not indicate a significant serial correlation in the error term. Table 3 indicates the results of our experiments. We have chosen the value of the lag coefficient of 0.46 as giving the best result, which has been reported in Table 2. The results of Table 3 indicates that the long-run values of the responsiveness of manufacturing output to the two autonomous demand shifters (i.e. the values of a/(1-c) and b/(1-c)) are robust and do not vary much whatever value of c we choose, so that while it is unsafe to draw any conclusion concerning the short-run responsiveness of manufacturing output to the two independent variables, we can have more confidence as far as the long-run response is concerned.

To be sure that our results are not entirely the outcome of a spurious correlation between strongly trended variables, we have detrended all the three variables by taking the residuals from their log-linear regression trend lines, and then regressing them. Real agricultural income remains significant as a determinant of manufacturing output (Table 2, second column), while the industrial countries' GNP is no longer significant. These results indicate that the correlation between real manufacturing output and real agricultural income is most certainly not spurious. We would have liked to report only this result as being the most robust. Unfortunately, correlation between detrended variables does not indicate the long-term relationship between them, as we have taken away the very part of a variable that indicates its long-term characteristic, namely its trend.

While we may be confident that agricultural and mining income does appear to have clearly significant impact on manufacturing output, one should not draw too strong a policy conclusion from this finding, as far as long-term growth is concerned. It is well known that for most Asian countries, real expansion of agricultural output in the long run cannot stray much from the range 1-5 per cent. An effort to boost

Table 3
Robustness of Estimated Parameters
in Table 2

Assumed Value of Lag Coeff.	Estimate of a (ShortRun)	Estimate of a/(1-c) (LongRun)	Estimate of b (ShortRun)	Estimate of b/(1-c) (LongRun)	D-W Statistic	Adjusted R-Sq.
0.00	0.477	0.477	2.131	2.131	1.184	0.98795
0.20	0.372	0.465	1.704	2.130	1.298	0.98756
0.40	0.268	0.446	1.276	2.127	1.484	0.98355
0.46	0.236	0.438	1.148	2.125	1.539	0.98038
0.60	0.163	0.408	0.848	2.121	1.621	0.96235
0.80	0.059	0.294	0.421	2.103	1.597	0.79977

agricultural growth in Thailand permanently by, say 2 percentage points, in itself a striking performance, would accelerate the growth of manufacturing output by about 1 percentage point only. Such acceleration should be set against the normal long-run growth rate in manufacturing that varies between 8 to 12 per cent.

IV. DEMAND LINKAGES: AN EXAMINATION OF MICROECONOMIC DATA

A more direct approach to estimate the size of demand linkages than that attempted in of Section III, is to look at the behavior of consumers in the different sectors and examine how they respond to an increase in income.

Using data from the Socioeconomic Surveys of 1975 and 1988, I estimate the Engel curves for different groups of the population in Thailand. The population is divided into three geographical groups: rural, urban outside Bangkok, and Bangkok. It turns out that the difference between the two sets of urban areas is small (there is a slight tendency for urban people outside Bangkok to consume more food), and even though we have provided separate tables for these two sets of urban areas, the discussion below will refer collectively to all urban areas.

The population is also divided into three income classes: the bottom 3 deciles (labeled "poor"), the top 3 deciles (labeled "rich") and the middle 4 deciles (labeled "medium"). The division lines are based on ranking in the national population and not regional ones, so that the poor in Bangkok, would roughly have the same nominal incomes as the poor in rural areas.

The approach and the specification follow closely Hazell and Roell (1983). The appendix gives details of the specification and results of the regression estimates.

Tables 4 to 6 show the absolute and marginal budget shares for the various categories of goods and services. The data of course have used consumption categories to describe the various goods and services. I have grouped them according to their production characteristics without the benefit of an input-output table. Some arbitrariness have thus unavoidably crept in. "Meals taken away from home" includes both a service component and a goods component. "Shelter" includes embodied manufactured goods in the form of brick and mortar. Similarly, transportation includes expenditures on vehicles of all sorts. Nevertheless, the grouping provides a convenient peg to hang the discussion which follows.

The rural consumption pattern (in comparison with the urban counterpart) exhibits a great deal of surprising features: the distinctly smaller share of the marginal budget going to food, compensated by the larger (and increasing) share going to what we have lumped together as services.

Among food items, we may note the values of both the average and the marginal shares of cereals and what may be called the second tier of food (the category termed "Meats, Poultry, etc."). Cereals and grain products in Thailand are now in effect inferior goods, and the income elasticity (measured by the ratio of the average and the marginal budget shares) of the second tier is also rapidly dwindling. The rural population in particular spends relatively little extra money on this group of commodities. Indeed, if one compares the figures in Tables 4 to 6 against similar data in Hazell and Roell, we find the marginal budget share for food, beverages and tobacco in both rural and urban areas to be uniformly below that in the Muda scheme in Malaysia in 1972/73 (Hazell and Roell 1983:45). Because linkages through food consumption, both in the rural and urban areas are relatively small, the impact on agricultural production of these items is not large. Table 7 shows the growth of agricultural production by crops, both for the entire period, and for the

Table 4
Average and Marginal Budget Shares of Rural Households

(Per Cent)

Commodity Group	Year	Poor		Medium		Rich	
		Average	Marginal	Average	Marginal	Average	Marginal
FOOD, BEVERAGES AND TOBACCO							
Grains and Cereal Products	1975	29.5	-3.9	24.1	-9.3	14.2	-15.8
	1981	23.9	-0.3	18.3	-3.1	10.7	-6.7
	1988	20.1	-0.5	14.4	-3.4	7.6	-7.6
Meat, Poultry, Fish, Seafood, Dairy Products, Oils, Fats, Fruits and Vegetables	1975	29.0	12.8	29.7	7.3	24.4	0.4
	1981	27.7	12.0	26.0	7.2	21.0	0.9
	1988	23.0	9.1	21.8	4.1	16.8	-2.6
Sugar, Spices, Coffee, etc.	1975	2.6	1.6	3.1	1.1	2.6	0.5
	1981	2.1	1.6	2.3	1.2	1.9	0.7
	1988	3.1	1.9	2.9	1.3	2.6	0.6
Meal and Beverages away from Home	1975	0.8	5.9	1.7	7.4	3.3	9.2
	1981	3.6	9.4	5.5	10.2	8.8	11.4
	1988	5.0	10.1	6.3	10.8	9.7	11.8
Beverages, alcoholic and nonalcoholic	1975	0.9	2.9	1.3	3.3	1.8	3.8
	1981	1.1	2.6	1.4	2.9	1.7	3.2
	1988	1.3	2.2	1.4	2.1	1.9	2.0
Tobacco Products	1975	3.1	1.4	3.1	1.0	2.7	0.6
	1981	2.6	1.5	2.5	1.4	2.5	1.2
	1988	2.0	1.4	1.9	1.4	2.0	1.3
SUBTOTAL	1975	65.9	20.7	63.0	10.9	49.0	-1.3
	1981	60.9	26.8	55.9	19.8	46.5	10.7
	1988	54.5	24.2	48.8	16.3	40.6	5.5

Source: National Statistical Office, Socioeconomic Surveys, data tapes

Note: Poor households refer to the lowest 3 deciles, using the national population as the basis to mark the deciles; rich households refer to the top 3 deciles; and medium households the remaining 4 deciles.

Table 4 (Cont'd)

(Per Cent)

Commodity Group	Year	Poor		Medium		Rich	
		Average	Marginal	Average	Marginal	Average	Marginal
MANUFACTURED GOODS							
Clothing and Footwear	1975	10.4	21.0	12.8	21.7	14.0	22.7
	1981	8.6	9.5	9.1	8.7	8.1	7.6
	1988	7.5	8.0	6.9	7.1	7.1	5.7
Fuel and Light	1975	4.2	2.2	4.1	2.2	3.7	2.2
	1981	4.8	2.6	4.5	2.3	3.9	1.8
	1988	5.1	2.4	4.7	1.7	4.1	0.7
Consumer Durables	1975	4.7	9.4	5.6	9.8	6.7	10.3
	1981	4.7	7.4	5.3	7.5	6.1	7.6
	1988	5.2	5.0	5.2	4.6	5.3	4.0
Medicines and	1975	4.3	8.6	4.7	9.3	4.8	10.0
Medical Services	1981	4.2	5.3	3.8	5.5	3.4	5.7
	1988	4.2	6.2	3.7	6.5	4.2	7.1
SUBTOTAL	1975	23.6	41.2	27.2	43.0	29.3	45.3
	1981	22.4	24.8	22.6	23.9	21.5	22.7
	1988	21.9	21.6	20.5	19.9	20.8	17.6
SERVICES							
Personal Services,	1975	2.9	11.3	4.0	13.2	7.1	15.6
Recreation and	1981	2.9	11.4	4.3	13.5	6.5	16.1
Education	1988	3.9	9.5	5.0	10.8	6.5	12.3
Transportation	1975	7.3	23.2	5.0	28.4	12.9	34.8
	1981	4.3	15.2	5.6	17.4	9.6	20.4
	1988	4.8	21.6	7.2	25.5	14.3	30.9
Shelter	1975	0.3	3.6	0.8	4.5	1.7	5.6
	1981	9.5	21.7	11.5	25.3	15.9	30.2
	1988	15.0	23.1	18.5	27.5	17.8	33.6
SUBTOTAL	1975	10.4	38.1	9.8	46.1	21.7	56.0
	1981	16.7	48.3	21.4	56.3	32.0	66.7
	1988	23.6	54.2	30.7	63.8	38.6	76.9

Source: National Statistical Office, Socioeconomic Surveys, data tapes

Note: Poor households refer to the lowest 3 deciles, using the national population as the basis to mark the deciles; rich households refer to the top 3 deciles; and medium households the remaining 4 deciles.

Table 5
Average and Marginal Budget Shares of Urban Households outside Bangkok

(Per Cent)

Commodity Group	Year	Poor		Medium		Rich	
		Average	Marginal	Average	Marginal	Average	Marginal
FOOD, BEVERAGES AND TOBACCO							
Grains and Cereal Products	1975	24.6	1.3	18.1	0.2	9.3	-2.2
	1981	17.9	0.6	11.4	-0.6	5.2	-2.5
	1988	15.9	0.0	10.9	-0.7	4.7	-2.3
Meat, Poultry, Fish, Seafood, Dairy Products, Oils, Fats, Fruits and Vegetables	1975	32.3	15.2	30.9	11.3	23.4	3.1
	1981	27.2	12.3	23.4	8.1	15.9	1.9
	1988	22.2	10.9	20.1	8.0	13.8	1.7
Sugar, Spices, Coffee, etc.	1975	3.1	1.1	3.0	0.6	2.0	-0.3
	1981	2.3	1.0	2.0	0.6	1.4	0.1
	1988	3.3	1.9	3.1	1.4	2.4	0.3
Meal and Beverages away from Home	1975	3.0	6.6	4.5	7.0	8.6	8.2
	1981	8.1	12.9	16.1	11.4	20.1	8.9
	1988	8.8	11.5	13.1	10.3	14.9	8.9
Beverages, alcoholic and nonalcoholic	1975	1.3	2.8	1.8	2.8	2.2	2.9
	1981	1.0	1.5	1.5	1.3	1.7	1.0
	1988	1.6	2.5	1.8	2.4	2.1	2.2
Tobacco Products	1975	3.5	1.3	3.6	0.7	3.0	-0.4
	1981	2.6	0.9	2.8	0.2	2.3	-0.9
	1988	2.6	1.0	2.8	0.4	1.9	-0.7
SUBTOTAL	1975	67.7	28.1	62.0	22.6	48.5	11.3
	1981	59.1	29.3	57.3	21.0	46.6	8.5
	1988	54.4	27.9	51.8	21.7	39.8	10.2

Source: National Statistical Office, Socioeconomic Surveys, data tapes

Note: Poor households refer to the lowest 3 deciles, using the national population as the basis to mark the deciles; rich households refer to the top 3 deciles; and medium households the remaining 4 deciles.

Table 5 (Cont'd)

(Per Cent)

Commodity Group	Year	Poor		Medium		Rich	
		Average	Marginal	Average	Marginal	Average	Marginal
MANUFACTURED GOODS							
Clothing and Footwear	1975	8.0	11.4	8.8	11.2	10.4	10.8
	1981	6.3	8.1	5.6	9.1	6.7	10.4
	1988	5.2	7.5	5.4	7.7	6.3	8.4
Fuel and Light	1975	4.4	3.2	4.3	3.0	4.3	2.4
	1981	4.8	5.0	5.2	4.8	4.9	4.6
	1988	5.8	3.5	5.8	3.0	4.5	1.9
Consumer Durables	1975	5.9	8.0	6.3	8.0	6.8	8.0
	1981	4.6	5.9	4.8	6.1	5.2	6.4
	1988	5.2	4.1	5.2	3.7	4.7	2.9
Medicines and	1975	3.9	6.3	4.6	6.3	4.0	6.5
Medical Services	1981	3.9	4.7	3.4	5.4	3.0	6.4
	1988	4.7	6.0	3.4	6.8	3.8	8.1
SUBTOTAL	1975	22.2	28.9	24.1	28.5	25.6	27.7
	1981	19.6	23.6	19.0	25.5	19.9	27.8
	1988	20.9	21.2	19.8	21.2	19.3	21.3
SERVICES							
Personal Services,	1975	4.2	16.1	5.7	17.8	10.0	21.3
Recreation and	1981	4.6	12.0	6.1	13.8	7.9	16.1
Education	1988	4.1	9.8	5.4	10.3	6.9	11.3
Transportation	1975	4.0	23.0	5.7	26.5	11.3	34.0
	1981	6.0	18.7	6.2	23.0	10.3	29.0
	1988	6.3	22.5	6.9	26.8	14.0	34.5
Shelter	1975	1.9	3.9	2.6	4.6	4.6	5.7
	1981	10.7	16.4	11.5	16.8	15.2	18.7
	1988	14.3	18.7	16.1	19.9	19.9	22.7
SUBTOTAL	1975	10.4	38.1	9.8	46.1	21.7	56.0
	1981	16.7	48.3	21.4	56.3	32.0	66.7
	1988	23.6	54.2	30.7	63.8	38.6	76.9

Source: National Statistical Office, Socioeconomic Surveys, data tapes

Note: Poor households refer to the lowest 3 deciles, using the national population as the basis to mark the deciles; rich households refer to the top 3 deciles; and medium households the remaining 4 deciles.

Table 6
Average and Marginal Budget Shares of Bangkok Households

(Per Cent)

Commodity Group	Year	Poor		Medium		Rich	
		Average	Marginal	Average	Marginal	Average	Marginal
FOOD, BEVERAGES AND TOBACCO							
Grains and Cereal Products	1975	11.2	2.3	9.2	1.4	5.8	-0.1
	1981	15.2	2.4	8.5	3.2	5.8	4.0
	1988	9.6	-0.5	6.0	-0.5	2.5	-0.9
Meat, Poultry, Fish, Seafood, Dairy Products, Oils, Fats, Fruits and Vegetables	1975	32.6	15.9	25.4	11.1	21.9	3.6
	1981	26.3	12.0	23.0	11.4	19.1	7.5
	1988	18.1	11.1	16.5	8.9	10.8	4.7
Sugar, Spices, Coffee, etc.	1975	1.6	1.6	1.8	1.1	1.8	0.5
	1981	2.8	0.5	1.9	-0.2	1.8	-1.1
	1988	3.1	1.2	2.8	0.9	1.9	0.0
Meal and Beverages away from Home	1975	7.5	7.2	9.6	4.1	12.0	3.1
	1981	13.5	28.1	21.4	18.2	22.0	8.7
	1988	16.8	11.8	24.1	8.9	20.0	0.8
Beverages, alcoholic and nonalcoholic	1975	2.5	2.9	1.6	2.7	2.3	2.6
	1981	1.3	3.5	2.8	5.2	2.4	6.3
	1988	0.8	2.0	2.5	1.5	2.1	0.4
Tobacco Products	1975	1.1	1.5	3.2	0.5	3.0	-0.8
	1981	2.0	2.0	2.3	0.8	1.9	1.5
	1988	2.9	0.9	2.6	0.4	1.7	-0.8
SUBTOTAL	1975	56.5	31.4	50.8	20.9	46.7	8.9
	1981	61.1	48.5	59.9	38.6	52.9	27.0
	1988	51.3	26.4	54.4	20.1	38.9	4.2

Source: National Statistical Office, Socioeconomic Surveys, data tapes

Note: Poor households refer to the lowest 3 deciles, using the national population as the basis to mark the deciles; rich households refer to the top 3 deciles; and medium households the remaining 4 deciles.

Table 6 (Cont'd)

(Per Cent)

Commodity Group	Year	Poor		Medium		Rich	
		Average	Marginal	Average	Marginal	Average	Marginal
MANUFACTURED GOODS							
Clothing and Footwear	1975	2.0	11.0	6.4	11.7	8.6	12.2
	1981	2.5	11.0	2.2	10.7	5.0	12.6
	1988	3.8	7.6	2.6	8.4	5.7	10.1
Fuel and Light	1975	8.3	7.2	18.2	8.4	6.7	10.0
	1981	6.3	-0.7	5.0	0.3	4.1	-1.3
	1988	5.9	4.9	6.5	4.1	5.1	2.7
Consumer Durables	1975	4.4	6.1	4.6	7.1	6.2	8.0
	1981	3.3	4.6	3.8	6.4	4.6	7.8
	1988	5.1	5.3	4.7	5.2	4.3	5.2
Medicines and	1975	3.0	5.9	2.8	7.5	3.7	8.9
Medical Services	1981	3.3	0.7	2.7	-0.2	1.3	-0.6
	1988	4.1	4.0	2.2	4.4	2.9	5.5
SUBTOTAL	1975	17.8	30.2	32.0	34.8	25.2	39.1
	1981	15.4	15.5	13.8	17.2	15.1	18.4
	1988	18.9	21.8	16.0	22.1	18.1	23.5
SERVICES							
Personal Services,	1975	3.2	12.2	6.2	12.7	9.4	13.1
Recreation and	1981	3.3	10.8	5.9	13.3	5.9	15.9
Education	1988	5.8	10.6	6.2	10.9	7.1	11.8
Transportation	1975	13.1	22.3	4.9	29.0	12.1	37.0
	1981	7.3	6.6	6.9	6.4	5.8	5.9
	1988	7.1	28.4	5.8	31.9	15.1	42.3
Shelter	1975	9.4	4.0	6.0	2.6	6.7	1.9
	1981	12.9	18.6	13.5	24.5	20.4	32.7
	1988	16.9	12.7	17.5	15.0	20.7	18.2
SUBTOTAL	1975	25.7	38.5	17.2	44.3	28.1	52.0
	1981	23.5	36.0	26.3	44.1	32.1	54.6
	1988	29.8	51.7	29.5	57.8	43.0	72.3

Source: National Statistical Office, Socioeconomic Surveys, data tapes

Note: Poor households refer to the lowest 3 deciles, using the national population as the basis to mark the deciles; rich households refer to the top 3 deciles; and medium households the remaining 4 deciles.

Table 7
Growth Rates and Shares of Various Agricultural Subsectors

(Per Cent)

	Growth Rate 1970-88	Growth Rate 1981-88	Share in 1988
Paddy	2.1	0.9	27.8
Upland Field Crops	5.3	1.9	14.9
Rubber	6.2	9.5	9.0
Fruits	5.5	5.4	4.4
Vegetables	4.3	2.3	3.6
Garlic, Shallots, Pepper, Chillies	0.3	-1.8	2.4
Coconuts and Oil Palm	7.1	10.0	1.6
Pineapples and Watermelons	9.1	7.2	0.8
Cocoa, Coffee and Tea	17.3	13.0	0.5
Orchids and Flowers	17.6	2.3	0.2
Others	2.5	-0.7	0.7
All Crops	3.9	2.7	66.0
Livestock	6.1	7.0	10.0
Fisheries	1.6	1.9	6.1
Forestry	-1.9	-0.9	3.8
Agricultural services	2.7	-0.4	3.2
Simple agricultural processing	5.5	6.3	10.9
All agriculture	3.9	3.4	100.0

Note: Growth rates are estimated by logarithmic trend regression, and are based on value-added at constant (1972) prices. Shares are based on current prices in 1988.

Source: National Accounts Division, National Economic and Social Development Board. New Series.

more depressed early 1980s. The major explanatory factors for the relatively rapid expansion of some of the commodities during this decade remain export market environments (i.e. the prices were particularly good), such as for rubber, or for which the government had a highly protective policies (oil crops).

Among the nonfood items, the main surprise is the relatively small share of the manufactured goods and the large and increasing share of services in both the average and the marginal budgets. Attention may be drawn to three specific categories, namely clothing and footwear, shelter and transport. The figures for housing in 1975 do appear incredibly low. As these figures are mostly imputed, there is a strong possibility of error in the figures, particularly for 1975.[3] But in any case, while there is little doubt the figures for 1975 were probably grossly underestimated, there is a strong presumption that both the average and marginal budget shares for shelter were significantly lower in the 1970s than in the 1980s, at least in the rural areas. This is because the deforestation associated with the expansion of land under cultivation peaked in the mid 1970s. Poor households in rural areas and in urban areas outside Bangkok benefited from having access to cheap (almost free) timber for their housing. In the 1980s, the almost free timber was no longer available. Increasingly, rural households began to use non-wood materials, such as cement blocks, and the richer among them began to embellish the houses with glass. The roofing used shifted from corrugated iron to fiber cement. Indeed by the 1980s, rural households spend a larger share of their marginal incomes on shelter than their urban counterparts.

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[3] Mrs. Varai Woramontree, Acting Chief of the Socioeconomic Surveys Division of the National Statistics Office indicates that 1975 was the first time the survey attempted to impute the rent on owner-occupied dwellings. The enumerators were therefore quite inexperienced in the methods to be used. Most of these mistakes were corrected by the 1981 surveys. (Personal communication, February 5, 1991)

An independent confirmation of the importance of the expenditures on shelter comes from a study of migrants from Northeastern Thailand to work overseas (mostly the Middle East). It finds that migrating households spend about one third of the inflow, net of the costs of migration and the interest payments (Sangthanapurk 1988:96-97,103). This is of course cash outflow on investments in housing, unlike the figures from the Socioeconomic Surveys presented in Tables 4 to 6, but the importance of expenditures on housing is clearly visible.

This heavy expenditure on shelter (even if much of it is imputed rather than "real") is of interest in itself as a pointer to the linkages that one would expect to occur. Indeed most villages in Thailand can now boast a gang of construction workers whose job it is to build houses for their fellow villages. Villagers in the North, with more experience in woodworking, are beginning to specialize in furniture production, not only for their home villages, but they have become itinerant producers for other villages all over Thailand as well.

Ironically, the heavy expenditure on shelter seems to reflect the commitment of most rural households to staying put, at a time when the rapid industrialization of the economy would lead one to predict large emigration out of rural areas.

Expenditures on transport service are another major claimant on the marginal income. The rural labor market in Thailand, as we shall be discussing in Section V below, is a highly active one, and involves considerable commuting or (seasonally) migrating distances. Thus, about 200,000 sugarcane harvesters come down yearly from the Northeast to the sugarcane growing areas in the Central Region. Within the Central Region itself, considerable labor movements take place across districts and sometimes across provinces during the peak demand periods of transplanting and harvesting. These workers would be transported sometimes by

the employers, and sometimes by labor contractors whose main asset is his pick-up truck or van.

The importance of rural housing and transportation is in striking contrast to Hazell and Roell's finding in two rural areas in Malaysia, where the marginal budget shares for housing of the top decile is below that of the poor in Thailand (in 1981 and 1988). The contrast in the expenditure on transportation is even stronger. Let it be quickly added that the distribution of the income level in the rural areas of Muda (even in 1972/73, the date of the Hazell-Roell data set) is unlikely to be to the left of that for rural Thailand in 1988.

Another feature that may be noted is the relatively small share (about a fifth) spent by all households on manufactured goods (other than those embodied in "shelter" and "transportation") as a group. This share is remarkably constant both across urban and rural areas and across income classes.

Within the manufactured goods category, the expenditures on clothing and footwear used to claim a relatively large share of the income in the 1970s, but has since declined sharply. Partly, of course the large average and marginal figures in 1975 may be an overestimate which is a counterpart to the corresponding underestimation in the figures for shelter (remember that all average and marginal budget shares have to sum up to one), but one would not expect this category to pick up the entire error. There appears to have been a real shift in the expenditures for clothing and footwear between the 1970s and the 1980s.

It is also interesting to find out how much of the demand linkages arising from an increase in rural incomes accrue to suppliers in the local area. Of the major items, that is, those items for which the marginal budget shares are high, transport services are of course provided within the local areas. Admittedly, a large

proportion of the cost would accrue to the producers of the vehicles that are used for the service. Nevertheless, transport services are employing increasing numbers of rural people, albeit people with the capital to invest in the necessary equipment, and therefore not necessarily the poorest among them.

Last but not least, the overwhelming proportion of villages in all regions of Thailand boasts at least a village retail shop, and in some villages three or more shops vie for custom. This is a considerable change from the situation as recently as two decades ago, when such a statement would be true only for the Central Plains.

We close this section with the observation that when Thailand's agricultural growth was rapid in the 1970s and in the latter half of the 1980s, there is no doubt a linkage effect, but this linkage effect is mostly on the nontradable sectors. Much of it remains within the rural areas. Little of the increased purchasing power spilt over to the manufacturing sector, except perhaps the construction materials and the vehicle assembly sectors in the 1980s and the textile and garment sectors in the 1970s.

On the other hand, the success of Thai manufacturing industries in the 1980s is not at all based on rural income increases. The star performers in the industrial sector in Thailand during the 1980s are textiles and garments, gems and jewellery, canned tuna fish and toys. None of these owe their success to the domestic market, least of all to the rural market, perhaps with the exception of textile and garments for whom the boom in the demand came in the 1970s. Of course, when rural incomes again rose substantially in the late 1980s after a long hiatus, rural demand did add somewhat to the boom in the industrial sector. And it is noteworthy that the sectors that feel the supply constraint the strongest during the boom are the two sectors which feature importantly in the discussion above, namely vehicles and

construction materials. It so happens that these two sectors are closest within the manufacturing sector to being nontraded--by policy in the case of transport equipment, and by bulkiness in the case of construction materials.

V. INTER-INDUSTRIAL LINKAGES

An outstanding characteristic of the Thai economy is the overwhelming concentration of much of the nonagricultural actities in the Bangkok Metropolitan Area, where 78 per cent of the manufacturing value added takes place (Chintayarangsan 1990:1). The overwhelming advantage of Bangkok arises for a number of reasons. As the main port of the country, it draws all the industries that depend on imported raw materials. As the capital city, it has a great deal of activities connected to the government. As a cultural center, it attracts the business managers to avoid moving to outlying provinces. Having attracted many industries to itself for these reasons, they then contribute to raising the income levels in the capital, so that with only 15.8 per cent of the population, its regional product is 49.0 per cent of Thailand's (Chintayarangsan 1990:22).

A shift-share analysis covering the period 1981-87 indicates that in most of Thailand, the growth of the manufacturing sector essentially follows the growth of the overall economy, while in the South, the growth of manufacturing substantially lags behind (Tamboonlertchai 1990:12-15, 30).

Intensive studies of the tiny proportion of the manufacturing sector outside Bangkok indicates that they concentrate largely on processing of the raw materials originating in the local areas (Chintayarangsan 1990; Tamboonlertchai 1990:31). Apart from the obvious reasons that most of these industries are weight-losing, there is an additional reason for the location of many of these processing industries. Because of the seasonality of their production, their labor demand dovetails nicely

with that in the agricultural sector. As we shall argue below, the rapid growth of the agricultural sector in the 1970s has tended to lead to greater seasonality in employment. Outside Bangkok, where agriculture is overwhelmingly important, manufacturing industry has to accommodate itself to this characteristic of the labor market.

Given this peculiarity of the Thai industry, agriculture and manufacturing are thus trivially linked. Much of the processing industries do not generate a great deal of value added per worker, because seasonality in production and labor availability precludes a high degree of capital intensity. High value added per baht of agricultural output is also precluded by the crops that were chosen to be grown by the Thai farmers, concentrating as they have done on basic carbohydrate crops such as rice, maize, cassava and sugar-cane all of which needs little processing to become tradable. Once it has become tradable (i.e. the weight-loss advantage no longer rules), then the canons of comparative advantage (plus cascading tariff protection) would apply as to the location of further processing. Thus, Thailand certainly does not process comparative advantage in corn-milling, or in feeding the cassava to its livestock. In the case of the tire industry, which prima facie would have appeared attractive given the country's large natural rubber production, the main raw material used actually is carbon black which has to be imported. More significantly, the local tire industries find it more profitable to use imported synthetic rubber than the locally available natural rubber--this despite the implicit protection given to the tire industry by a high tax on natural rubber exports.

Because the market forces in favor of a Bangkok location have been so powerful, industrialists have resisted government efforts to encourage the location of factories in the provinces. It is only in the last three years, when Bangkok has become severely congested and when the government has pushed forward with the

development of a new deep-water seaport on the Eastern Seaboard, that new industrial centers are being developed outside Bangkok and its immediate environment.

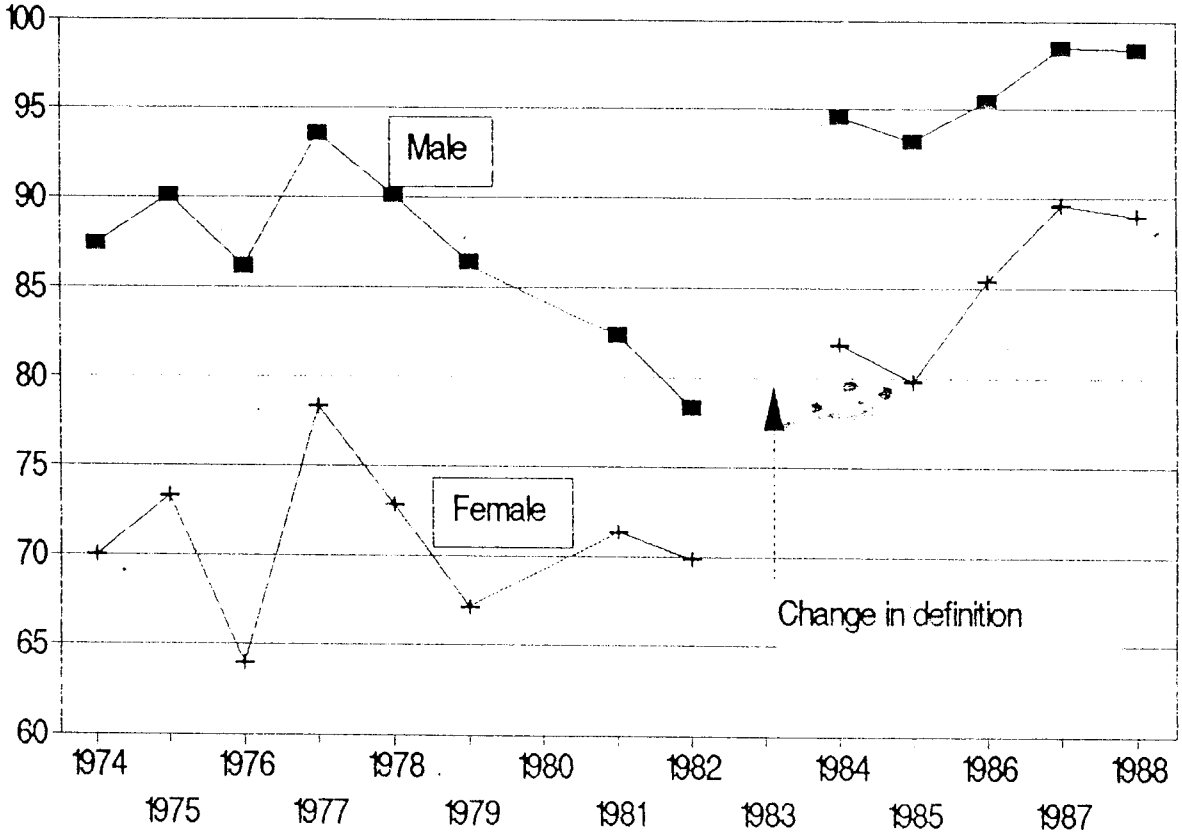
This failure of industry to develop in the provinces (particularly in the 1970s) thus indicates that the inter-industrial linkages has not led to the location of the industries (other than agro-processing) in the provinces in response to the rapidly growing agricultural sector.

VI. SUPPLY LINKAGES: THE LABOR MARKET

We now examine what impact changes in the agricultural and manufacturing sectors have had on the labor markets. Data originating from the Census, for example those displayed in Figure 2 above, tend to exaggerate the share of the labor force in agriculture. This is because enumerators would ask respondents their primary occupation in the previous year, and farmers would tend to identify themselves as such, even though a substantial portion of their income may have originated outside agriculture. Data from the Labor Force Surveys, which the National Statistical Office has been conducting twice (since 1985, thrice) a year give a more detailed and truer picture of the industrial distribution of the labor force, as respondents are asked what they were doing in the previous week. Unfortunately, use of the survey results is plagued by constant definitional changes. The figures reported below represent periods during which they are consistently defined.

Figure 5 shows the seasonality of the employed labor force very well, a point that has been already argued at length by Bertrand and Squire (1980). We have indicated the point at which there was a definitional change, and comparison across that point should not be made. In any case, the female labor force is the one that

Figure 5: Dry Season Employment as
Percent of Prev. Wet Season Employment



adjusts to the varying demand in the agricultural cycle. This should be borne in mind in interpreting the industrial distribution of the labor force below.

Table 8 shows changes in the industrial distribution of the labor force for the period 1974 to 1979 during which time agricultural prices were high, and land was still available. Remarkably, agriculture was taking up almost the entire increment of the labor force during the wet season. Indeed, the share of labor in agriculture during the wet season actually increased. Equally striking is the fact that the share of the labor force going into agriculture during the dry season was proportionately less, despite the rapid increase in dry season cropping following on the completion of the Chao Phraya irrigation system and the introduction of the new photoperiod-insensitive varieties of rice. The rapid expansion of area under cultivation during the 1970s was actually making Thai agriculture more seasonal than before, because much of the expansion was into rainfed areas. The graph for the male labor force in Figure 5 seems to be bearing this out.

That almost the entire increment of the labor force was going into agriculture during the wet season, implies that growth in other sectors would at best be constrained by the need to accommodate to the rhythm of the agricultural cycle. Clearly, such a labor market would make it difficult for Thailand to have a comparative advantage in capital-intensive activities (such as manufacturing) which also require large numbers of year-round workers.

Within a decade, all this has changed. Agriculture was no longer taking up most of the incremental increase in the labor force (Table 9). Indeed, the number of women working in agriculture during the wet season declined absolutely. A phenomenon of the labor market during the 1980s was that the nonagricultural sectors were absorbing more women than men. We have argued above that during

Table 8
Structure and Changes in the Thai Labor Force, 1974-1979

	Wet Season						Dry Season					
	Level 1974		Increments 1974-79		Level 1979		Level 1974		Increments 1974-79		Level 1979	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Employment by Industry												
Agriculture	6015.3	5210.9	1821.0	1971.5	7836.3	7182.4	4411.8	2643.8	1345.1	1282.0	5756.9	3925.8
Mining	41.6	8.0	-9.8	-1.2	31.8	6.8	34.0	15.4	30.3	6.2	64.3	21.6
Manufacturing	939.4	754.2	24.5	6.7	963.9	760.9	1157.1	968.3	104.2	-52.4	1261.3	915.9
Construction	243.6	33.2	109.6	23.4	353.2	56.6	291.8	33.5	204.1	49.4	495.9	82.9
Utilities	49.2	12.4	-2.4	-5.4	46.8	7.0	50.6	10.7	-6.3	-3.7	44.3	7.0
Commerce	748.2	880.4	43.2	69.8	791.4	950.2	780.4	898.0	81.4	117.5	861.8	1015.5
Transport	437.7	27.4	-43.2	3.4	394.5	30.8	493.2	31.8	-48.0	-0.4	445.2	31.4
Services	1016.5	740.2	-45.6	104.1	970.9	844.3	1032.2	791.0	-19.4	78.3	1012.8	869.3
Others	0.8	0.1	-0.8	-0.1	0.0	0.0	0.1	0.1	-0.1	-0.1	0.0	0.0
Total	9492.3	7666.8	1896.5	2172.2	11388.8	9839.0	8251.3	5392.5	1691.2	1476.9	9942.5	6869.4
Employment by Location												
Rural	8249.2	6863.2	1493.1	1751.4	9742.3	8614.6	7037.1	4598.1	1286.2	1090.6	8323.3	5688.7
Urban	1243.1	803.7	403.4	420.7	1646.5	1224.4	1214.2	794.5	405.0	386.2	1619.2	1180.7
Percentages of Total Employment												
Agriculture	63.4	68.0	96.0	90.8	68.8	73.0	53.5	49.0	79.5	86.8	57.9	57.1
Mining	0.4	0.1	-0.5	-0.1	0.3	0.1	0.4	0.3	1.8	0.4	0.6	0.3
Manufacturing	9.9	9.8	1.3	0.3	8.5	7.7	14.0	18.0	6.2	-3.5	12.7	13.3
Construction	2.6	0.4	5.8	1.1	3.1	0.6	3.5	0.6	12.1	3.3	5.0	1.2
Utilities	0.5	0.2	-0.1	-0.2	0.4	0.1	0.6	0.2	-0.4	-0.3	0.4	0.1
Commerce	7.9	11.5	2.3	3.2	6.9	9.7	9.5	16.7	4.8	8.0	8.7	14.8
Transport	4.6	0.4	-2.3	0.2	3.5	0.3	6.0	0.6	-2.8	-0.0	4.5	0.5
Services	10.7	9.7	-2.4	4.8	8.5	8.6	12.5	14.7	-1.1	5.3	10.2	12.7
Others	0.0	0.0	-0.0	-0.0	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Rural	86.9	89.5	78.7	80.6	85.5	87.6	85.3	85.3	76.1	73.8	83.7	82.8
Urban	13.1	10.5	21.3	19.4	14.5	12.4	14.7	14.7	23.9	26.2	16.3	17.2

Source: Labor Force Surveys, data tapes.

Table 9
Structure and Changes in the Thai Labor Force, 1983-1988

	Wet Season						Dry Season					
	Level 1983		Increments 1983-87		Level 1987		Level 1983		Increments 1983-87		Level 1987	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Numbers (in thousands)												
Agriculture	9055.4	8345.9	483.8	-96.0	9539.2	8249.9	6730.7	4797.8	1890.8	1762.5	8621.5	6560.3
Mining	44.4	6.2	-2.3	6.7	42.1	12.9	48.3	17.7	27.9	-10.6	76.2	7.1
Manufacturing	1013.2	829.2	259.3	336.1	1272.5	1165.3	1402.7	1133.8	47.0	177.8	1449.7	1311.6
Construction	426.9	84.6	116.2	10.8	543.1	95.4	639.7	105.7	169.4	-0.2	809.1	105.5
Utilities	90.0	16.3	7.7	5.1	97.7	21.4	89.7	16.9	7.1	3.5	96.8	20.4
Commerce	990.1	1203.7	383.1	418.9	1373.2	1622.6	1109.6	1303.8	411.9	338.8	1521.5	1642.6
Transport	488.6	46.1	82.6	15.5	571.2	61.6	568.2	51.0	62.2	5.0	630.4	56.0
Services	1329.9	1206.5	115.3	294.9	1445.2	1501.4	1403.2	1214.0	47.7	405.9	1450.9	1619.9
Others	2.4	2.3	17.4	0.8	19.8	3.1	2.3	0.4	2.1	3.1	4.4	3.5
Total Employment	13440.9	11740.8	1463.1	992.8	14904.0	12733.6	11994.4	8641.1	2666.1	2685.8	14660.5	11326.9
Employment by Location												
Rural	11615	10324.7	870.6	399.2	12485.6	10723.9	10205.4	7267.3	1983.9	2009.9	12189.3	9277.2
Urban	1825.9	1416.1	592.5	593.6	2418.4	2009.7	1789.0	1373.8	682.2	675.9	2471.2	2049.7
Percentages of Total Employment												
Agriculture	67.4	71.1	33.1	-9.7	64.0	64.8	56.1	55.5	70.9	65.6	58.8	57.9
Mining	0.3	0.1	-0.2	0.7	0.3	0.1	0.4	0.2	1.0	-0.4	0.5	0.1
Manufacturing	7.5	7.1	17.7	33.9	8.5	9.2	11.7	13.1	1.8	6.6	9.9	11.6
Construction	3.2	0.7	7.9	1.1	3.6	0.7	5.3	1.2	6.4	-0.0	5.5	0.9
Utilities	0.7	0.1	0.5	0.5	0.7	0.2	0.7	0.2	0.3	0.1	0.7	0.2
Commerce	7.4	10.3	26.2	42.2	9.2	12.7	9.3	15.1	15.4	12.6	10.4	14.5
Transport	3.6	0.4	5.6	1.6	3.8	0.5	4.7	0.6	2.3	0.2	4.3	0.5
Services	9.9	10.3	7.9	29.7	9.7	11.8	11.7	14.0	1.8	15.1	9.9	14.3
Others	0.0	0.0	1.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Total Emmployment	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Employment by Location												
Rural	86.4	87.9	59.5	40.2	83.8	84.2	85.1	84.1	74.4	74.8	83.1	81.9
Urban	13.6	12.1	40.5	59.8	16.2	15.8	14.9	15.9	25.6	25.2	16.9	18.1

Source: Labor Force Surveys, data tapes.

the 1970s, proportionately more females were shed from the labor force during the slack dry season than the males, i.e. the female labor force was more "in surplus". Consequently, it was not surprising that those manufacturing industries which could employ these females had a natural comparative advantage in the 1980s, and these sectors therefore grew rapidly during the last decade.

While the increment in the wet-season labor force went mostly out of agriculture, the dry-season increment still were going into agriculture. This suggests that the labor force in both agriculture and nonagriculture was becoming more specialized and both activities are now beginning to be year round.

VII. RURAL INCOMES AND POVERTY

The discussion on the labor market and its seasonal changes indicate that the occupational classification of Thai workers is quite difficult. We need to look at some income data.

Table 10 indicates changes in real rural incomes in the period since 1975, based on Socio-Economic Survey data. Aggregate incomes increase sharply in the latter half of the 1970s, but then wobble during the 1980s, the year 1986 with poor agricultural prices being a particularly bad year. Also to be noted are the changes in the structure of rural incomes. If one looks only at the figures for all groups (last column), then the share of farm income has clearly declined, the share of wage incomes (some of which may be earned from the agricultural sector) has continued to increase, as did the share of all other incomes.

Within each occupational group, the picture is repeated, although not as dramatically. Thus while for all rural population, the share of farm income declined from 52.5 per cent in 1975 to 39.6 per cent of all income in 1988, for the "other

Table 10

Average Per Capita Monthly Real Income of Rural Population by Sources of Income and Distribution of Rural Population by Occupation Groups

(1988 Baht/month/capita)

Sources of Income	Year	Small Farmers	Other Farmers	Farm Workers	General Workers	Others	All Groups
Farm Income	1976	237.8	388.2	89.3	120.0	132.3	299.0
	1981	271.1	473.1	99.4	82.0	118.7	357.4
	1986	247.0	362.3	71.6	69.0	95.2	256.3
	1988	269.2	452.9	75.7	70.0	103.5	294.1
Income from Enterprises	1976	25.5	27.1	18.8	21.7	283.5	72.8
	1981	33.9	36.2	25.4	35.5	243.1	78.8
	1986	40.3	29.9	20.3	25.8	221.6	78.3
	1988	29.1	33.9	22.4	18.4	253.6	95.9
Wage Income	1976	38.9	32.7	339.0	547.6	231.6	122.0
	1981	55.0	35.3	278.4	333.8	406.8	135.6
	1986	50.5	32.9	227.1	289.3	421.2	158.2
	1988	42.4	40.6	274.1	286.0	446.1	188.8
Income from Property	1976	46.4	42.2	40.4	64.6	74.2	49.7
	1981	62.4	50.3	36.9	44.8	121.9	65.0
	1986	79.3	63.7	47.7	57.1	128.7	79.3
	1988	76.7	72.1	51.0	48.5	140.7	89.4
Transfer Payments	1976	20.0	14.5	20.4	27.2	72.5	26.5
	1981	51.9	34.3	52.7	68.8	161.2	63.6
	1986	48.6	25.7	25.8	44.3	123.1	52.0
	1988	35.5	31.2	36.9	43.4	176.7	74.7
Total	1976	368.4	504.7	507.9	781.2	794.1	570.1
	1981	474.3	629.3	492.8	564.8	1051.7	700.3
	1986	465.8	514.6	392.5	485.6	989.9	624.0
	1988	452.8	630.6	460.2	466.3	1120.7	743.0
Proportion of Population in Classification (Per Cent)	1975	5.0	64.3	5.4	4.9	20.3	100.0
	1981	4.8	65.8	7.0	1.4	21.0	100.0
	1986	2.8	59.8	7.7	4.1	25.6	100.0
	1988	4.8	53.4	8.4	4.4	29.1	100.0

Note: The income data from the tapes were deflated by the Urban Consumer Price Indices, but adjusted to take account of the different consumption baskets of rural households

Source: National Statistical Office, Socioeconomic Surveys, Data Tapes

farmers" category, the decline was from 76.9 per cent to 71.8 per cent. The decline for the small farmers' category is of roughly the same order of magnitude, and the two "farmer" categories constitute the bulk of farm income. This suggests that there has also been concurrently a shift among the occupational groups, away from those who are primarily farmers to non-farmer categories, as is evident from the figures in the bottom panel of Table 10.

Poverty in Thailand is almost entirely a rural phenomenon, and is continuing increasingly so (Table 11). In the following we shall therefore focus exclusively on the problem of the rural poor in Thailand, and how agricultural growth with its linkages has contributed to or detracted from the improvements in the condition of the poor. The definition of "poverty" and the "poor" in this section, is based on a long-standing official absolute poverty line, based on calorific adequacy (plus some adjustments for nonfood expenses). This definition will thus differ from that in Section IV.

Ever since statistics on incomes have been collected in 1962/63, the incidence of poverty has steadily declined, with the exception of the period from 1980/81 to 1986, about which more below. The most recent figures are shown in Table 12.[4]

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[4] Until 1986, the years during which socioeconomic surveys were conducted happen to fall on favorable years, particularly from the point of view of agricultural prices. 1986 was the one year when prices were bad, indeed in that year they were at a record low in real terms.

Table 11
Characteristics of the Poor
(Per Cent of all poor having characteristic)

	1975/76	1980/81	1985/86	1988/89
OCCUPATION OF HEAD				
Professional & Technician	7.08	0.10	0.05	0.2
Executives	0.34	1.01	0.01	0.0
Clerical Workers	0.21	0.09	0.04	0.2
Sales Workers	2.45	2.07	1.80	2.2
Services Workers	0.44	0.80	0.49	0.5
Farmers	81.56	80.44	78.02	73.7
Labourers	5.13	7.45	8.35	9.9
Inactive	2.80	8.04	11.25	13.3
SECTOR OF PRODUCTION				
Inactive	1.85	2.82	3.53	4.9
Agriculture	82.96	82.52	80.95	74.9
Nonagriculture	15.19	14.66	15.52	20.2
COMMUNITY TYPE				
Village	87.63	89.53	91.24	84.3
Sanitary District	6.50	5.62	5.60	10.7
Municipal Area	5.87	4.86	3.16	5.0
SEX OF HEAD				
Male	89.01	88.00	86.40	83.9
Female	10.99	12.00	13.60	16.1
AGE OF HEAD				
Less than 20	0.04	0.30	0.24	0.1
20-29	7.35	11.06	9.50	9.4
30-39	26.84	28.32	27.36	27.6
40-49	33.67	31.64	24.78	24.9
50-59	17.90	16.13	20.81	18.1
60 and over	14.21	12.55	17.31	19.9
EDUCATION OF HEAD				
No Formal Education		18.97	16.76	15.3
Elementary		79.82	80.82	81.9
Secondary		0.97	1.40	1.9
Vocational & Technical		0.05	0.09	0.0
Bachelor		0.00	0.19	0.2
Higher than bachelor		0.00	0.00	0.0
Unknown		0.20	0.74	0.6

Sources: 1975/1976 to 1985/1986 from Hutaserani and Jitsuchon(1988);
1988/89 from Socio Economic Survey 1988, data tape.

Table 12

Incidence of Poverty in Per Cent

Year	Rural	National
1975	36.5	30.0
1981	27.3	23.0
1986	35.7	29.5
1988	26.8	23.5

Sources: 1975, 1981 and 1986 (National) from Hutaserani and Jitsuchon (1988), the remainder from Socioeconomic Survey data tapes

The overall decline has been made possible largely as a result of agricultural growth. Table 11 again tells us that the poor are not only largely rural, but that they are mostly farmers. Even though the share of the poor who are farmers has been steadily declining, they still are more than three-quarters of all the poor, more than their share in the total population. Clearly, when new land was continuously being brought into cultivation, and if farmers had access to this land, this in itself would help to reduce the incidence of poverty, and this has been the story of the decades prior to 1980. With land becoming more of a constraint, poverty can no longer be as easily reduced. Of course, Thai farmers--and the poor among them included many who supplied surpluses to the market--were subject to additional pressures from the falling prices in the 1980s as well. This was a key factor explaining the rise in poverty in 1986. With the rise in agricultural prices, it is now estimated that the incidence of poverty has fallen to roughly the same level as in 1980/81. In short, progress on poverty reduction has ground to a halt in the 1980s, and as the favorable agricultural price situation in 1988 is temporary, there are grounds for believing that the poverty situation has retrogressed.

Has the locus of poverty shifted? How has the land availability and the agricultural growth that accompanied it affected the poverty levels in the different

regions of the country? Answers to these questions will provide clues to the contribution of agriculture to the growth of the rest of the economy.

In general, the rural poor may be classified into two categories: those who have land in poorly endowed areas, for example in the Northeast, and those who have no land or very little land and therefore have to rely almost exclusively on selling their labor time. Because of past land abundance, Thailand has predominantly the first category of poor, although the landless has appeared in increasing numbers. The percentage of the landless (officially classified as farm workers and general workers) nationwide has increased from 10.4 in 1975 to 12.8 in 1988 (see Table 10 above), while that among the poor has increased from 8.4 to 18.7. From being somewhat an unusual and indeed relatively wealthier (from their oddity?) group in the countryside in 1975, landless laborers in Thailand have since then joined their brethren in the rest of Asia in the poorer stratum.

Despite this large increase in the proportion of the landless among the poor, the proportion of farmers among the poor remains about 2/3 in 1988. Among these the proportion of small farmers (defined as holders of less than 4 rais or 0.64 hectares if owner-cultivator and 5 rais or 0.8 hectares if tenant--average farm-size in Thailand is about 3 hectares) remains small at between 10-15 per cent of all farmers. Most of the poor farmers have land that places them above the category of small farmers.

If poverty is to be associated with landlessness, and if we assume that landlessness increases the individuals' mobility, then we would expect the poverty to be distributed more or less uniformly across the country. If anything, there may be a concentration of landless laborers in the more prosperous regions, because that is

where the jobs are. For the same reasons, one would expect also a considerable degree of urban poverty.

If on the other hand, poverty is associated with holdings of poor land, then it would be distributed according to the resource endowment of the particular locality. We can get already an inkling of this idea already in the figures of Table 13, if we think of the Northeast collectively as a resource poor area. From 1975 to 1988, the proportion of the poor in the Northeast has fluctuated between 55 and 62 per cent, much larger than the one-third share of the overall population that the Northeast has. Another way of expressing the same idea is that the incidence of poverty (the probability that a person will be poor) in the Northeast in 1988 is about 36 per cent while the overall incidence in the country is 27 per cent.

A more detailed picture is provided by Table 14. We have taken the sample villages in the Socio-economic Surveys, and assume that the overall economic environment of a village is captured by the per-capita income of the sampled individuals in the village. The national median is then used to divide all the villages in the sample into rich (above median) and poor (below median) villages.

A by-product of this definition of rich and poor villages is that movements in relative regional incomes can be shown from the data (see the first two columns in Table 7). Thus, the Upper North has been doing relatively well, probably because the Upper North has always practised a more intensive form of agriculture than the rest of the country--average farm size there is only about 1 hectare, and as such has benefited more from modern technology than the rest of the country. The deterioration in the West may also be observed. This may be because the West is the last frontier left in Thailand, where the prevailing form of agriculture is highly extensive. With a large number of new settlers, the observed level of income is

Table 13
Distribution of the Rural Poor, by Region and by Occupation, 1975 to 1988
(Per cent of total population)

(Per Cent)

Region	Year	Small Farmers	Other Farmers	Farm Workers	General Workers	Others	All Groups
Upper North	1975	3.5	6.3	0.7	1.1	1.5	13.1
	1981	2.7	6.3	0.7	0.2	1.5	11.5
	1986	1.2	4.4	0.8	0.8	0.8	8.0
	1988	3.4	3.4	0.4	0.9	0.8	8.9
Lower North	1975	1.1	7.7	1.1	0.2	1.0	11.0
	1981	0.5	5.2	1.1	0.1	0.5	7.4
	1986	0.3	5.2	0.8	1.2	1.0	8.4
	1988	0.5	4.6	1.5	1.3	0.7	8.6
Upper Northeast	1975	0.7	23.7	0.4	0.2	1.4	26.4
	1981	1.4	24.9	1.6	0.5	3.0	31.3
	1986	1.1	24.0	3.2	0.3	1.5	30.1
	1988	2.8	21.2	1.5	1.2	3.4	30.2
Lower Northeast	1975	0.8	24.2	1.4	0.6	2.2	29.1
	1981	1.8	21.6	2.9	0.0	2.3	28.7
	1986	0.5	23.1	3.5	0.8	3.8	31.8
	1988	1.3	18.8	2.7	0.9	3.8	27.5
Western	1975	0.1	1.0	0.1	0.2	0.1	1.5
	1981	0.0	1.3	0.2	0.0	0.6	2.0
	1986	0.1	1.4	0.6	0.2	0.6	2.9
	1988	0.1	2.4	1.1	0.5	0.8	4.9
Central	1975	0.0	2.0	0.3	0.1	0.3	2.7
	1981	0.1	2.2	1.0	0.4	0.6	4.2
	1986	0.1	1.8	0.7	0.2	0.6	3.3
	1988	0.2	2.2	1.3	0.2	0.8	4.7
Eastern	1975	0.1	2.2	0.3	0.7	0.1	3.5
	1981	0.0	2.3	0.7	0.1	0.2	3.3
	1986	0.1	1.5	0.3	0.2	0.7	2.8
	1988	0.0	1.5	0.4	0.2	0.4	2.4
Upper South	1975	1.1	4.5	0.4	0.2	1.6	7.9
	1981	1.1	5.0	0.8	0.0	2.0	8.9
	1986	0.2	4.3	0.5	0.2	1.4	6.6
	1988	0.7	4.3	1.9	0.7	1.0	8.6
Lower South	1975	0.8	2.3	0.2	0.1	1.0	4.3
	1981	0.3	1.0	0.6	0.0	0.3	2.1
	1986	0.5	3.0	1.2	0.2	0.7	5.6
	1988	0.6	0.5	1.7	0.1	1.0	3.9
Suburban Bangkok	1975	0.1	0.3	0.0	0.1	0.1	0.6
	1981	0.0	0.1	0.2	0.0	0.3	0.6
	1986	0.1	0.2	0.1	0.0	0.1	0.4
	1988	0.0	0.1	0.1	0.0	0.1	0.3
Whole Kingdom	1975	8.2	74.2	4.9	3.5	9.2	100.0
	1981	7.9	69.8	9.7	1.2	11.4	100.0
	1986	4.1	68.8	11.6	4.2	11.3	100.0
	1988	9.5	58.9	12.7	6.0	12.9	100.0

Source: National Statistical Office, Socio-Economic Surveys, data tapes.

Table 14
Distribution of the Rural Poor, by Region
and by Residence in Rich or Poor Villages
1975 to 1988

(Per Cent)

Region	Year	% of Regional Population in		% of Regional Poor in	
		Rich Villages	Poor Villages	Rich Villages	Poor Villages
Upper North	1975	32.1	67.9	16.3	83.7
	1981	39.7	60.3	17.1	82.9
	1986	63.0	37.0	27.0	73.0
	1988	60.5	39.5	31.0	69.0
Lower North	1975	62.0	38.0	36.8	63.2
	1981	73.3	26.7	34.5	65.5
	1986	66.4	33.6	45.2	54.8
	1988	63.6	36.4	40.0	60.0
Upper Northeast	1975	28.2	71.8	9.3	90.7
	1981	25.1	74.9	11.8	88.2
	1986	29.1	70.9	11.4	88.6
	1988	27.2	72.8	7.7	92.3
Lower Northeast	1975	24.0	76.0	8.3	91.7
	1981	32.7	67.3	16.1	83.9
	1986	22.1	77.9	10.7	89.3
	1988	30.5	69.5	15.4	84.6
Western	1975	95.0	5.0	88.2	11.8
	1981	86.2	13.8	68.7	31.3
	1986	84.8	15.2	61.5	38.5
	1988	63.7	36.3	40.4	59.6
Central	1975	92.0	8.0	81.2	18.8
	1981	78.5	21.5	43.8	56.2
	1986	78.3	21.7	58.8	41.2
	1988	82.9	17.1	61.2	38.8
Eastern	1975	87.4	12.6	68.7	31.3
	1981	69.8	30.2	46.5	53.5
	1986	69.2	30.8	30.9	69.1
	1988	68.5	31.5	34.9	65.1
Upper South	1975	74.8	25.2	58.2	41.8
	1981	62.6	37.4	30.9	69.1
	1986	71.3	28.7	46.8	53.2
	1988	62.1	37.9	32.0	68.0
Lower South	1975	18.3	81.7	7.1	92.9
	1981	48.1	51.9	27.6	72.4
	1986	41.3	58.7	25.2	74.8
	1988	29.9	70.1	14.1	85.9
Suburban Bangkok	1975	96.4	3.6	82.0	18.0
	1981	92.6	7.4	64.4	35.6
	1986	98.6	1.4	93.3	6.7
	1988	100.0	0.0	100.0	0.0
Whole Kingdom	1975	50.2	49.8	22.3	77.7
	1981	50.1	49.9	21.4	78.6
	1986	50.1	49.9	22.3	77.7
	1988	50.1	49.9	22.1	77.9

Note: "Rich villages" are those whose per-capita incomes are higher than the median for all villages. "Poor villages" are those with incomes below the median. Consequently, for the whole kingdom (last four rows) half of the people will live in rich villages and half will live in poor villages.

Source: National Statistical Office, Socio-Economic Surveys, data tapes.

therefore likely to be low. Furthermore, both the Eastern and Western regions were major producers of sugar cane, a highly subsidized and therefore profitable crop, but their relative position has declined as the center of gravity of the sugar industry has shifted more to the Northeast.

The last two columns of Table 14 show the location of the poor among the villages. In line with our earlier observations, significantly more poor people are located in poor villages than in rich villages in all regions with one exception. The only exception, suburban Bangkok, neatly proves our rule that only landless laborers migrate to where the jobs are--which is in the richer areas.

Because of the complex cross-currents of changes among regions and of the secular increase in the number of landless laborers, we can observe from the figures for the Whole Kingdom at the bottom of Table 14 that the share of poor people living in poor villages is well over a half, whereas the null hypothesis would predict a share of exactly a half. More importantly, there has been relatively little change in this share throughout more than a decade when the constraints facing the rural people have undergone tremendous changes, and the number of landless households has increased significantly.

To summarise, the agricultural growth during the 1970s has contributed to the decline in poverty. The slowdown in the rate of land expansion in the 1980s meant that the easy route to agricultural growth and rural poverty reduction was no longer possible. On top of this, the agricultural sector also experienced the sharp fall in worldwide agricultural prices upto the mid-1980s. This aggravated the situation and indeed led to an increased level of poverty.

VII. THE PATH OF THAI ECONOMIC GROWTH

The above analysis indicates that the path of Thai economic growth is devoid of major surprises, once one starts with the fact of land abundance in the 1960s and the early 1970s, and its disappearance in the 1980s.

The earlier growth with land abundance carries with it certain consequences, namely:

(1) Agricultural growth can be easily achieved: the land abundance gives Thai agriculture a natural comparative advantage.

(2) For the comparative advantage to be turned to good account, a liberal trade and exchange rate regime is essential. This has been generally followed. Admittedly, Thai agricultural export policies have at times been highly restrictive. However, it is significant that the most restrictive policies were applied to rice and to some extent rubber (Siamwalla and Setboonsarng 1989). The upland crops which are grown on most of the new lands have gotten off relatively lightly.

(3) Another essential factor for comparative advantage to be turned to account is a good infrastructural basis, particularly for transport. It must be remembered that where there are new lands, there are by definition relatively few people. There must be the willingness to invest ahead of the traffic. Motivated mostly by security considerations, the Thai government invested heavily in roads throughout the 1960s and the 1970s.

(4) Because increasing land is an easy way to increase labor productivity, the seed-fertilizer technology that has been such a major factor in the agricultural growth in the rest of Asia plays a much smaller role in Thailand. Yields in Thailand, particularly for rice at 1.9 tons (paddy basis) per hectare, are among the lowest in

Asia. The public research system has not had the intense pressure to perform, as was the case with most Asian food-importing countries. New crops were brought in by market forces, largely by the middlemen, and it is only after cultivation of that crop has expanded that the research system would initiate a research program.

(5) Mechanization, on the other hand, has been an essential part of the story. Not only does land abundance lead to a larger farm size which would itself require mechanization, but the tractor emboldens farmers to claim much larger land than they would otherwise have, had they relied on animal power. To be noted is the farmers' preference to grow crops with relatively low labor intensity on much of the new land, notably maize and cassava. The only exception to this rule is sugarcane, but then sugarcane is a heavily protected crop.

(6) The income increases that the new lands gave to Thai farmers appeared to have been mostly expended in things other than manufactured goods. The major beneficiary of the Thai agricultural growth seems to have been the services sector rather than manufacturing industry, much of which is located in the rural areas. Among manufactured goods on which Thai farmers appear to expend much of their income increments, construction materials and vehicles could be singled out. The construction materials industry produces mostly nontradable products, and therefore no judgement needs be made as to Thailand's comparative advantage in it. The vehicle industry, particularly cars and trucks, is uniquely inefficient, despite or perhaps because of two decades of protection.

(7) Extensification of agriculture is, almost by definition not conducive to the growth of towns, unlike intensification, as it means greater dispersal of the population. It is important to stress that the problem does not lie with the low use of purchased inputs, as would be the case if the seed-fertilizer technology was more

widely applied. If Thailand has lagged behind in this respect (see (4) above), it has made up by using more machineries. This tends to generate its own support industry, but this support industry has to follow its clientele into the countryside.

(8) The obverse side of agricultural comparative advantage that Thailand had before 1980 was its comparative disadvantage in manufacturing industry. Growth in manufacturing industry was limited, import-intensive and therefore concentrated in Bangkok, and it was highly protected, part of the protection being the low price of rice made possible by export taxation. Even more limited was the growth in manufactured goods exports. Related to this phenomenon was the limited urbanization in Thailand.

It is only in the 1980s, when the comparative advantage in agriculture began to disappear, partly hastened by the fall in world commodity prices, that Thailand switched to exporting manufactured goods. This in turn has a number of consequences:

(a) The range of products for which Thailand has found a niche in the world market has nothing to do with what the agricultural sector has been demanding in the previous period of strong agricultural growth. Most of the products take full advantage however of the cheap labor that the agricultural depression of the 1980s has made available to Thailand.

(b) The agriculture-based economy has meant that most of the population did not see much need for extensive schooling, despite the fact that increased primary schooling has had a demonstrable impact on labor productivity in agriculture. Rural households do not see any need for education at a higher level, and Thailand has one of the lowest secondary enrolment ratios in Asia. The problem seems to be a lack of demand by the parents rather than a shortage of

space; although rural parents may still be quite rational as the quality of rural schools is quite poor. The schooling problem implies that Thailand will face constraints in moving up the industrial ladder, in competition with other Asian countries.

(c) A shift to a manufacturing base will ease the pressure on the forest cover after four decades of continual land expansion. It is expected that the absolute size of the (permanent) agricultural labor force will shrink sometime during the 1990s. This will lower the demand for land.

(d) With continued land expansion becoming unprofitable, and assuming agricultural prices to resume their downward trend after the boom of the late 1980s has worn itself out, automatic reduction of rural poverty through agricultural growth that characterized the 1960s and the 1970s can no longer be assumed. The only way to see further decline in rural poverty is to bring in new technology or to provide agricultural protection.

(e) New technology will be available mostly in the better irrigated areas. As we have shown, much poverty in Thailand occurs in areas with unfavorable production environment. Therefore, as far as the poor are concerned, new technology is not the solution--unless by some miracle, the new technology turns out to be suitable for rainfed areas.

(f) Agricultural protection has been increasing, although currently the political economy of the protectionist policies has little to do with the poverty problem.

REFERENCES

Akarasenee, Narongchai, *et al.* (1983). **Rural Off-farm Employment in Thailand.** Bangkok, Thailand, Industrial Management Consultants.

Bertrand, Trent J. and Lyn Squire (1980). "The Relevance of the Dual Economy Model: A Case Study of Thailand", Oxford Economic Papers, Vol.32(3) (November), 480-511.

Chintayarangsan, Rachain (1990). "Industrial Structures and Inter-Industry Linkages", Rural Industries and Employment Project, Thailand Development Research Institute.

Hazell, Peter B.R. and Ailsa Roell. (1983). **Rural Growth Linkages: Household Expenditure Patterns in Malaysia and Nigeria.** Research Report 41. Washington DC. International Food Policy Research Institute.

Hutaserani, Suganya and Somchai Jitsuchon (1988). "Thailand's Income Distribution and Poverty Profile and their Current Situations." 1988 TDRI Year-end Conference on Income Distribution and Long-term Development. Bangkok, Thailand, Thailand Development Research Institute.

Krueger, Anne O., Maurice Schiff Maurice Schiff and Alberto Valdes (1988). "Agricultural Incentives in Developing Countries: Measuring the Effect of Sectoral and Economywide Policies", **World Bank Economic Review,** Vol.2(3), (September), 255-271.

Sangthanapurk, Hongpha (1988). **The Consequences of Overseas Migration on Rural Labour Market: Udonthani.** M.Econ. Dissertation, Faculty of Economics, Thammasat University.

Siamwalla, Ammar and Suthad Setboonsarng. (1989). **Trade, Exchange Rate, and Agricultural Pricing Policies in Thailand.** World Bank Comparative Studies on the Political Economy of Agricultural Pricing Policy. Washington DC. The World Bank.

Tamboonlertchai, Somsak (1990). "A Profile of Provincial Industries", Rural Industries and Employment Project, Thailand Development Research Institute.

World Bank. (1983). **Growth and Employment in Thailand.** Washington, DC. The World Bank.

Appendix:

Estimation of the Average and Marginal Budget Shares

This appendix described how the average and marginal budget shares reported in Tables 4 to 6 were estimated.

The first step is of course to estimate the Engel functions for each of the groups of the commodities. Total consumption expenditure was used as a proxy for income. Some socioeconomic characteristics were included in the model. Specifically, the function was specified as follows:

$$E_{ij} = a_i + b_i.E_j + g_i.E_j.\log E_j + \Sigma_j(m_{ij}.Z_j + l_{ij}.E_j.Z_j);$$

where E_i is expenditure on good i, E_j is the jth household's total consumption expenditure, Z_j is its characteristics, and a_i, b_i, g_i, m_{ij}, l_{ij} are constants. The following expenditure share form of the above Engel function was estimated:

$$S_{ij} = b_i + a_i/E_j + g_i.\log E_j + \Sigma_j(m_{ij}.Z_j/E_j + l_{ij}.Z_j);$$

where $S_i = E_i/E$ is the share of good i in total expenditure. For each year, forty five functions were estimated, for the fifteen commodity groups to be listed below and for three regions (Bangkok, urban areas outside Bangkok and rural areas).

The average and marginal budget shares for the i^{th} good (ABS_i and MBS_i, respectively) were then obtained as follows:

$$ABS_i = S_i;$$

$$MBS_i = dE_i/E = b_i + g_i.(1 + \log E) + \Sigma_j l_{ij}.Z_j.$$

For each household group, these terms were evaluated at the sample mean values for E_j and Z_j.

In this analysis, commodities are classified into 15 groups as follows:

1. Grains and cereal products.
2. Meat and poultry; Fish and seafood; Milk, cheese, and eggs; Oils and fats; Fruits and nuts; Vegetables.
3. Sugar and sweets; Spices, coffee, etc.
4. Prepared meals taken home; Alcoholic beverages taken away from home; Meals eaten away from home; Students' lunch.
5. Beverages.
6. Tobacco products.
7. Cloth and clothing; Footwear.
8. Shelter.
9. Fuel and light.
10. Consumer durables including textile house furnishings, Minor equipment, Cleaning supplies, Personal supplies.
11. Servants; Personal services; Miscellaneous services.
12. Medicines and supplies; Medical services.
13. Local transportation; Travel out of area; Vehicle operation; Vehicle purchase; Communications.
14. Admissions; Recreation equipment; Musical equipment; Reading materials; Religious activities; Ceremonies.
15. Education.

In the interest of saving space, we have aggregated items 11, 14 and 15 together when reporting the results of the calculations in Tables 4 to 6, although we have estimated separate equations for each of the expenditure categories.

There are five variables representing household characteristics Z_j:

1. Family size;
2. Age of household head;