

A Dynamic Analysis of Thai Agricultural Growth: Some Lessons from the Past

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This research examines the factors behind the growth of production in Thailand's crop sector during the period of 1961 to 1985. It utilizes province-level data from various sources to estimate the supply functions for agricultural output as a whole and for the groups of crops (i.e., paddy, field crops, tree crops and vegetables). Investment by the public sector for promoting agriculture through irrigation, agricultural research activities, and extension works are also examined. They are assumed to raise agricultural productivity.

ANALYSIS

The analysis addresses the following topics:

- Labor productivity and the supply of crops
- Supply of crops by group
- Speed of the planted land expansion
- Labor migration

A pool of cross-section and time-series data is used to test the hypotheses based on economic theory.

Supply of Crops

The model covers 20 crops whose total value added share is about 75 percent of the total crop sector. This supply measure increased by 69 percent in the period 1961-1985, equivalent to an increase of 2.4 percent per year ([Table 1](#)). This research examines the underlying factors contributing to this growth. Some of the findings indicate that:

- Increases in crop supply were due to an increased application of factor inputs (land, capital, and labor—particularly, land).
- Farmers were motivated by price incentives (i.e., they increased the crop supply in response to better prices).
- Schooling is by far the most important factor in raising agricultural productivity, but irrigation and agricultural research also have a measurable impact.

Supply of Crops by Groups

The 20 crops covered in this study are grouped into four categories: paddy (wet- and dry-season); field crops; tree crops; and vegetables. The analysis examines the supply response of crops by estimating the revenue shares of crops by region. Own- and cross-supply elasticities are estimated for each region. Some of our findings confirm that:

- For most regions, farmers were motivated by price incentives (i.e., a higher price for a particular crop

would motivate farmers to produce more and to draw resources from the competing crops).

- Research activities tended to strengthen crop diversification away from rice.
- Conversely, irrigation prevented diversification away from rice.

Expansion of the Cultivated Land

Expansion of the planted land was included as part of the model. The model assumes that farmers opened the land frontier in response to opening opportunities and to price incentives. The findings confirm that:

- The combination of land availability and crop yield per area was the most important factor contributing to land expansion.
- Irrigation tends to slow down land expansion.
- Education motivated farmers to do intensive farming, as they could attain higher productivity from the same piece of land.

Labor Migration

Labor migration across provinces is also examined. The net flow of interprovincial migration is used as a measure of permanent migration. Results from this study confirm that:

- Wage differential was an important factor motivating migration across provinces.
- New road building stimulated more net migration to the region.

APPLICATIONS

Growth Accounting

This exercise also estimates the sources of growth in Thailand's crop sector during the study period (1961-1985). Some of our findings indicate that:

- The importance of technological progress—measured in terms of human capital, irrigation, and the agricultural research budget—was substantial. Its contribution was about 50 percent.
- Although land was confirmed an important input, its contribution to the growth of supply was only about one-third (much less than commonly expected). While land played an important role in the period prior to 1977, the decrease in per capita available land has diminished its importance.
- Higher crop prices contributed about 15 percent to the growth of crop production, particularly in the first subperiod (1961-1977). The fall in crop prices in the period 1982-86 adversely affected poor performance and farmers' income.
- Fertilizer prices were made cheaper—most notably after 1975—by the government's policy of allowing more competition in this market. This had some impact on raising farm productivity.

Long-run Supply Response

This simulation exercise assumes a 10 percent price increase for all crops from 1970 onward, and it estimates the amount of supply response. Our results suggest that:

- While crop production would be raised by 8-9 percent for the whole Kingdom, the magnitude of response varies from region to region.
- Supply responses tended to be higher in the Lower North, the Northeast, and the South, due to the availability of resource endowment.

Policy Liberalization

This simulation exercise raised the question of what would have happened to output and farmers' income had the government abolished the restrictions that were applied against the rice trade (particularly, the rice

premium and the rice quota) at the beginning of the study. Our counter-factual analysis suggests that:

- The domestic rice price would have been raised by 40 percent despite a marginal fall in the world rice price.
- The better rice price would have stimulated the supply of rice and would have drawn resources away from other activities.

As a result, the aggregate supply for crops was estimated to be 5 percent higher. This implies that farmers' income could have been raised by approximately 45 percent by government policy liberalization in the study period. The welfare implication is not given in this exercise, as it is beyond the scope of this research project.

FORECAST TO THE YEAR 1995

The same model is used for forecasting purposes. Analyzing the status of Thailand's crop sector in the future (up to the year 1995) is mainly based on two sets of assumptions: resource endowments and crop price expectations. The crop supply is projected to grow by 2.3 percent per year in the early 1990s. This will be a slowdown in terms of the growth of our crop sector compared to its past performance. The underlying factors are:

- Limited future land expansion as well as limited irrigation development due to an inadequate water supply.
- Lower crop prices as a group (measured in real terms).

It should be mentioned that these are merely a projections and are subject to change by assumptions.

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