

Resilience and Dynamism of Thai Agriculture

Bhanupong
Thai Economy
Lecture 11

Trend of agricultural exports
The rise and fall of commodities
Diversification and dynamism

| <u>Industry</u> | <u>Exports as a share of total exports (%)</u> | <u>Exports as a share of world exports (%)</u> | <u>Share of top 3 export markets (%)</u> | <u>Specialisation (Balassa Index / RCA Index)</u> |
|--|--|--|--|--|
| 04 Dairy products, eggs, honey, edible animal products nes | 0.1 | 0.27 | 53.1 | 0.2 |
| 06 Live trees, plants, bulbs, roots, cut flowers etc | 0.05 | 0.54 | 52.1 | 0.4 |
| 08 Edible fruit, nuts, peel of citrus fruit, melons | 0.44 | 1.14 | 71.5 | 0.9 |
| 07 Edible vegetables and certain roots and tubers | 0.56 | 2.06 | 87 | 1.6 |
| 03 Fish, crustaceans, molluscs, aquatic invertebrates nes | 1.33 | 3.16 | 62.1 | 2.5 |
| 20 Vegetable, fruit, nut, etc food preparations | 0.92 | 3.73 | 43.7 | 3 |
| 40 Rubber and articles thereof | 9.64 | 9.56 | 54.5 | 7.7 |

Main themes

- Agricultural exports
- Baumal-Bowen Hypothesis
- Comparative advantage of Thai agriculture
- Learning curve effect
- Export diversification

Dynamism of the Thai Agriculture

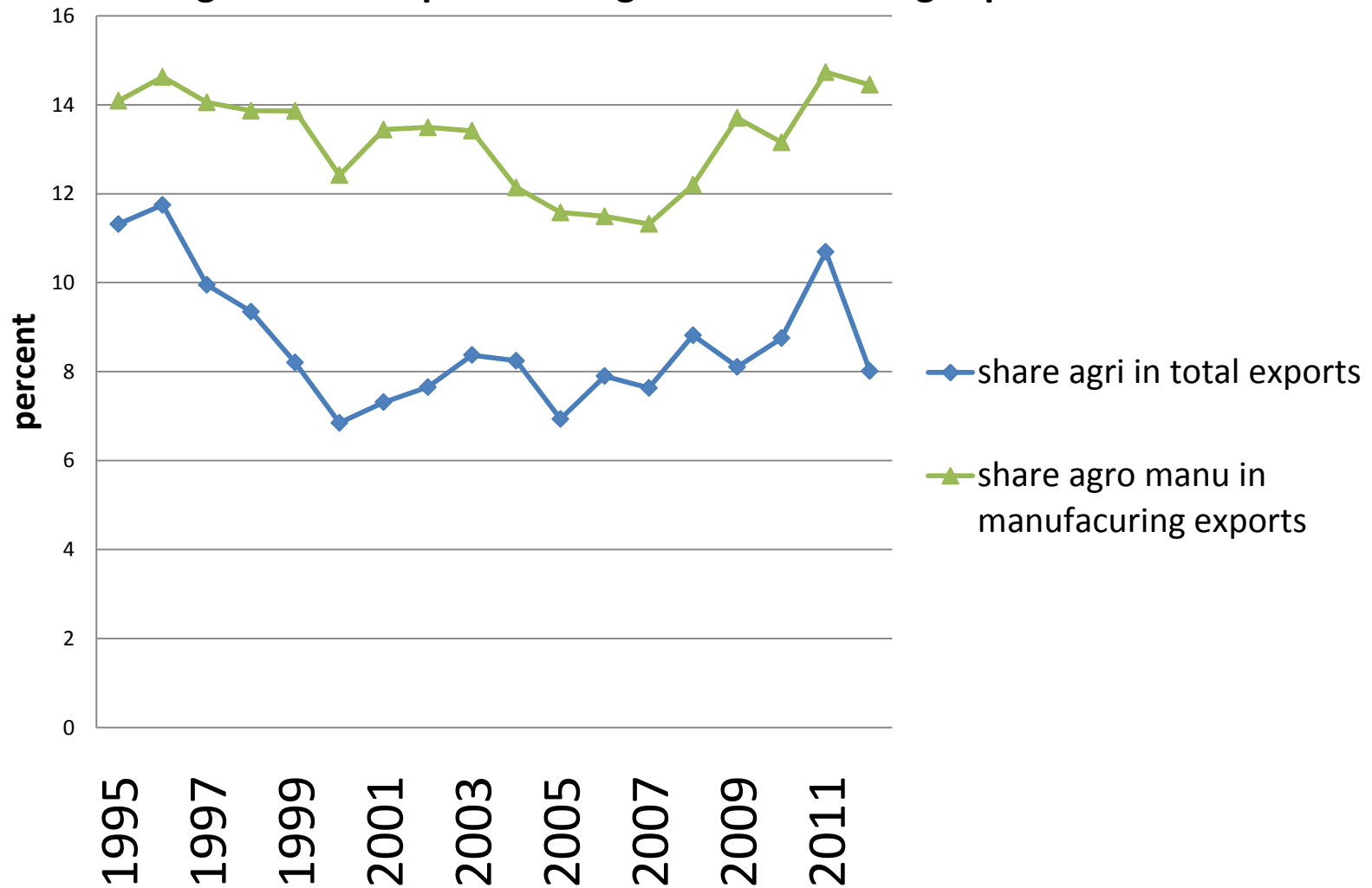
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Abstract

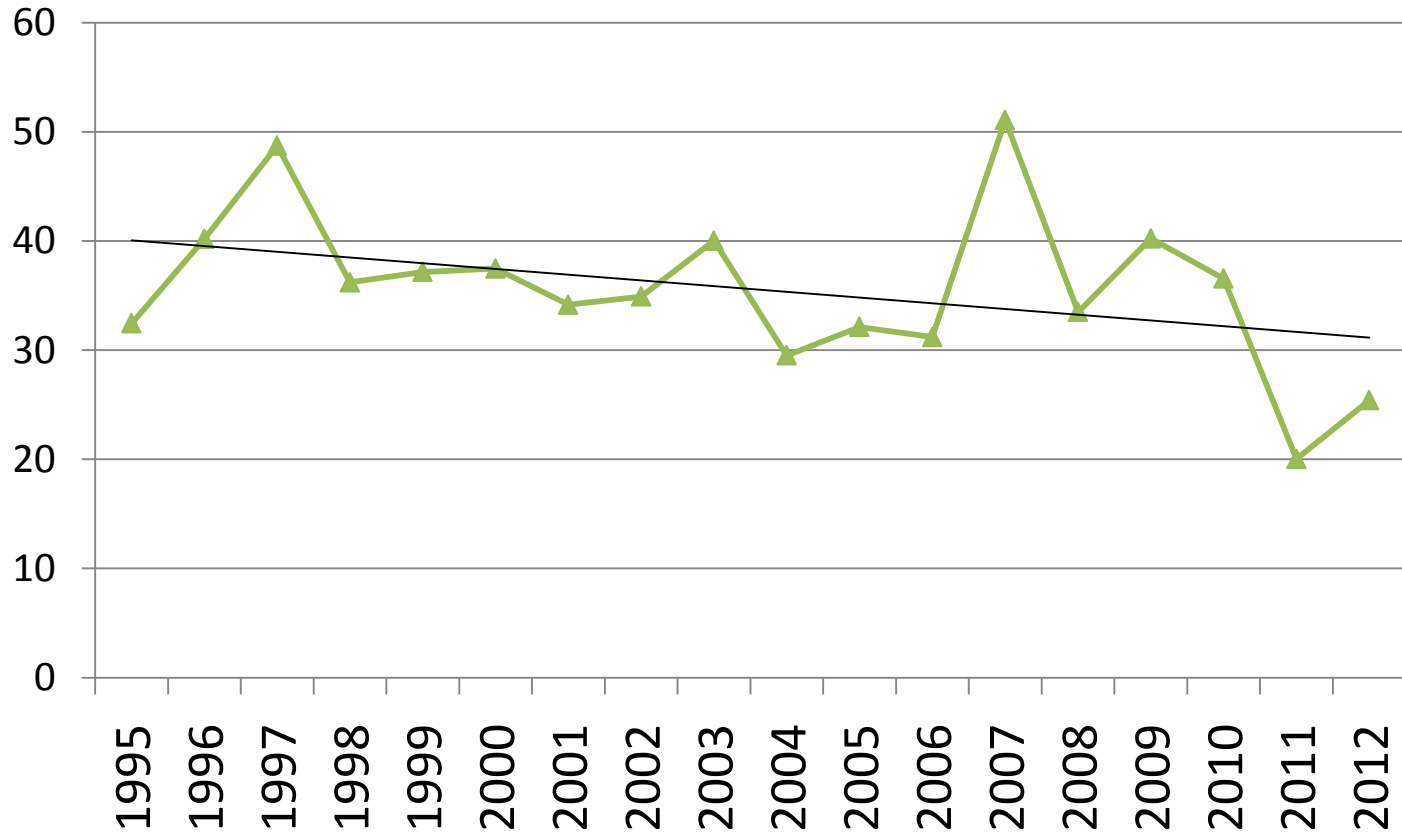
This paper traces the development of Thailand's agricultural sector over the past four decades. It analyzes the factors that are contributing to agricultural productivity changes. Productivity growth in Thai agriculture lags behind that in manufacture, preventing a natural transfer of agricultural workers. The paper analyzes the changing pattern of competitiveness of Thailand's agricultural exports by focusing on their growth and their world market shares. The results indicate that in general the Thai agriculture can remain competitive. Exports of agricultural products have been diversified over the years, and their ability to compete in the world markets has been enhanced. While traditional commodities may lose their importance in the future, new agricultural products will emerge. Processed food industry will be the key to the future of Thailand's agriculture, but maintaining export competitiveness requires constant upgrading of food-safety standards. Dynamism of the Thai agriculture through continued productivity improvement will enable Thailand to cope with new challenges and random shocks from both demand and supply sides.

Keywords: Agriculture, Thailand, productivity; *JEL Classification:* O5

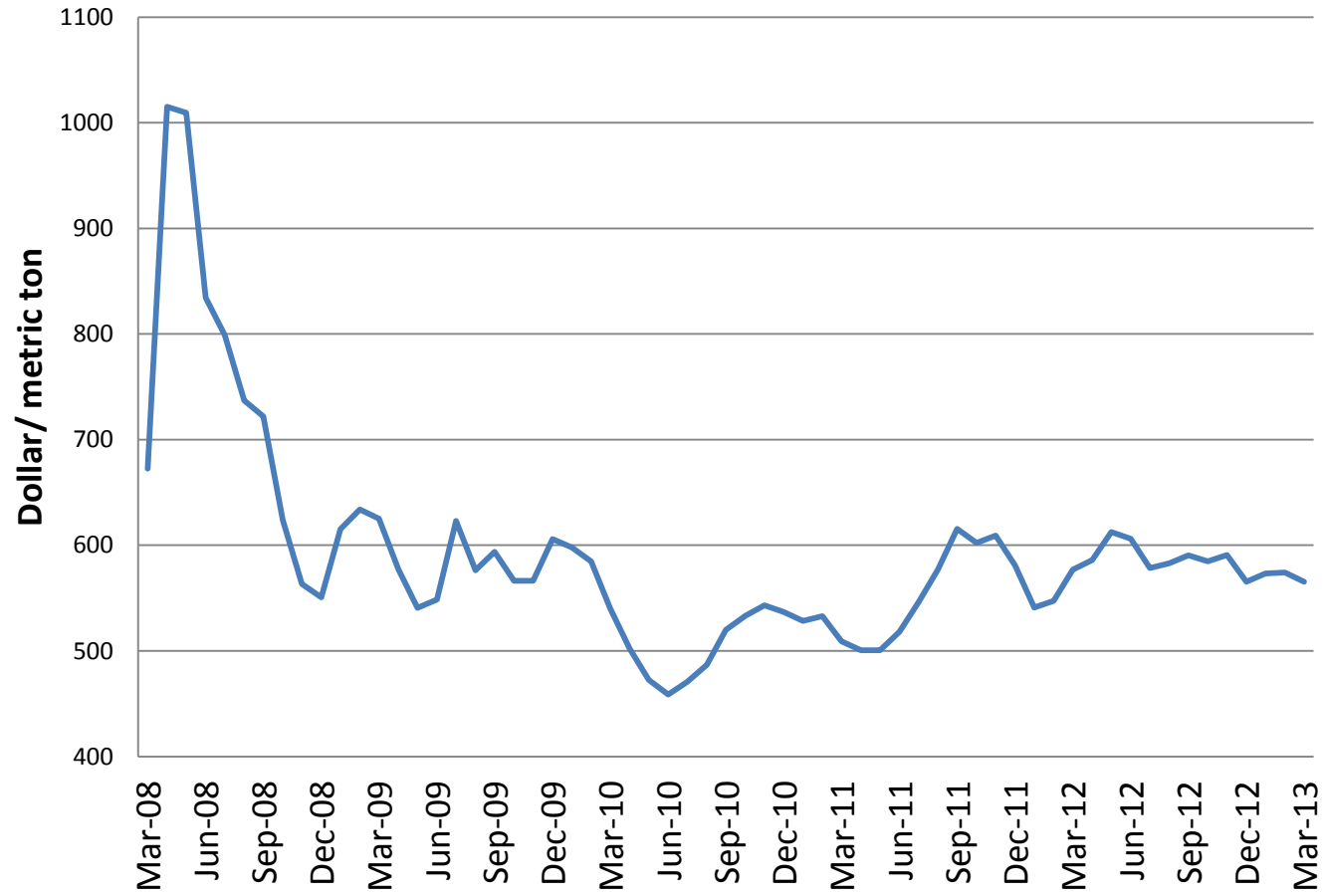
Agricultural exports and agro manufacturing exports



Rice share in total agricultural exports

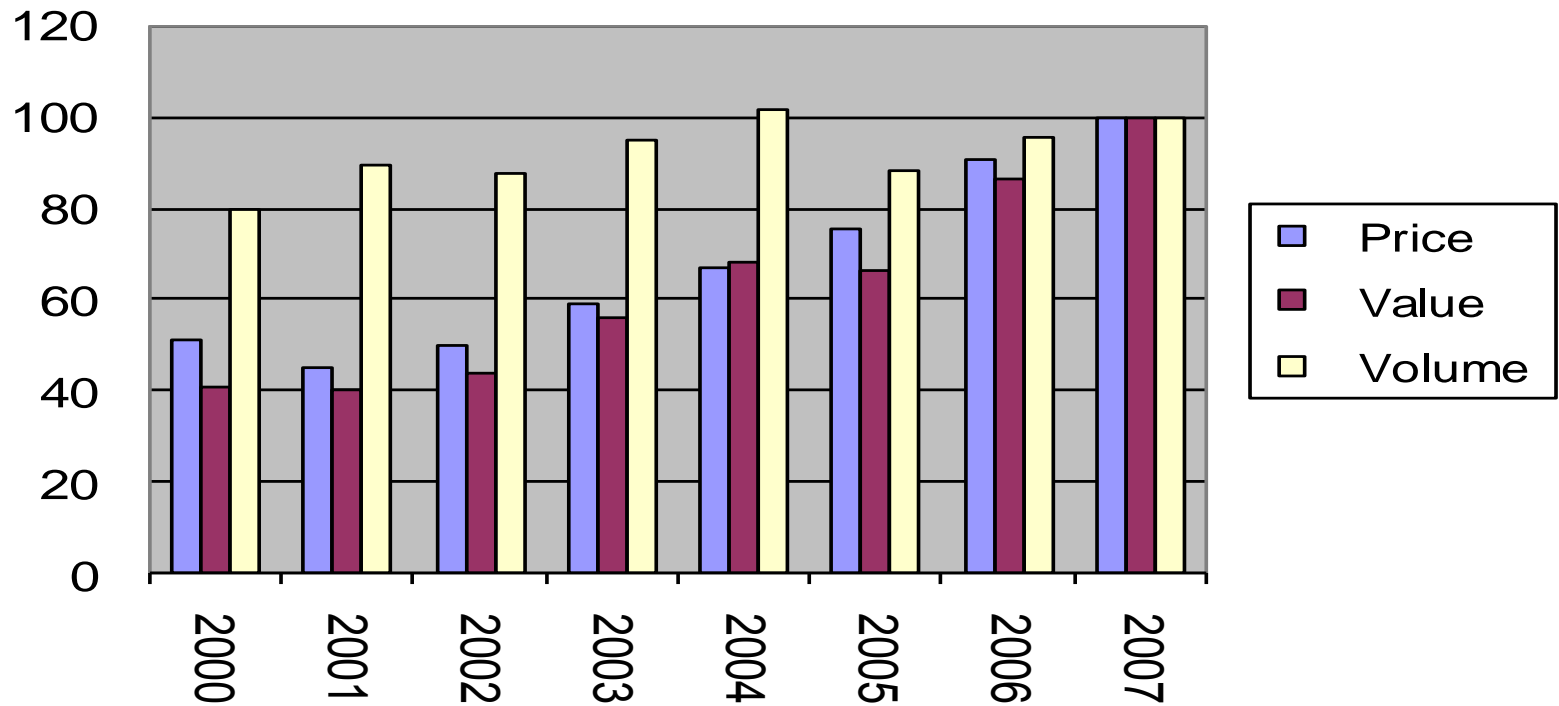


Export Price of Rice



$$\text{Value(income)} = \text{Price} * \text{Volume}$$

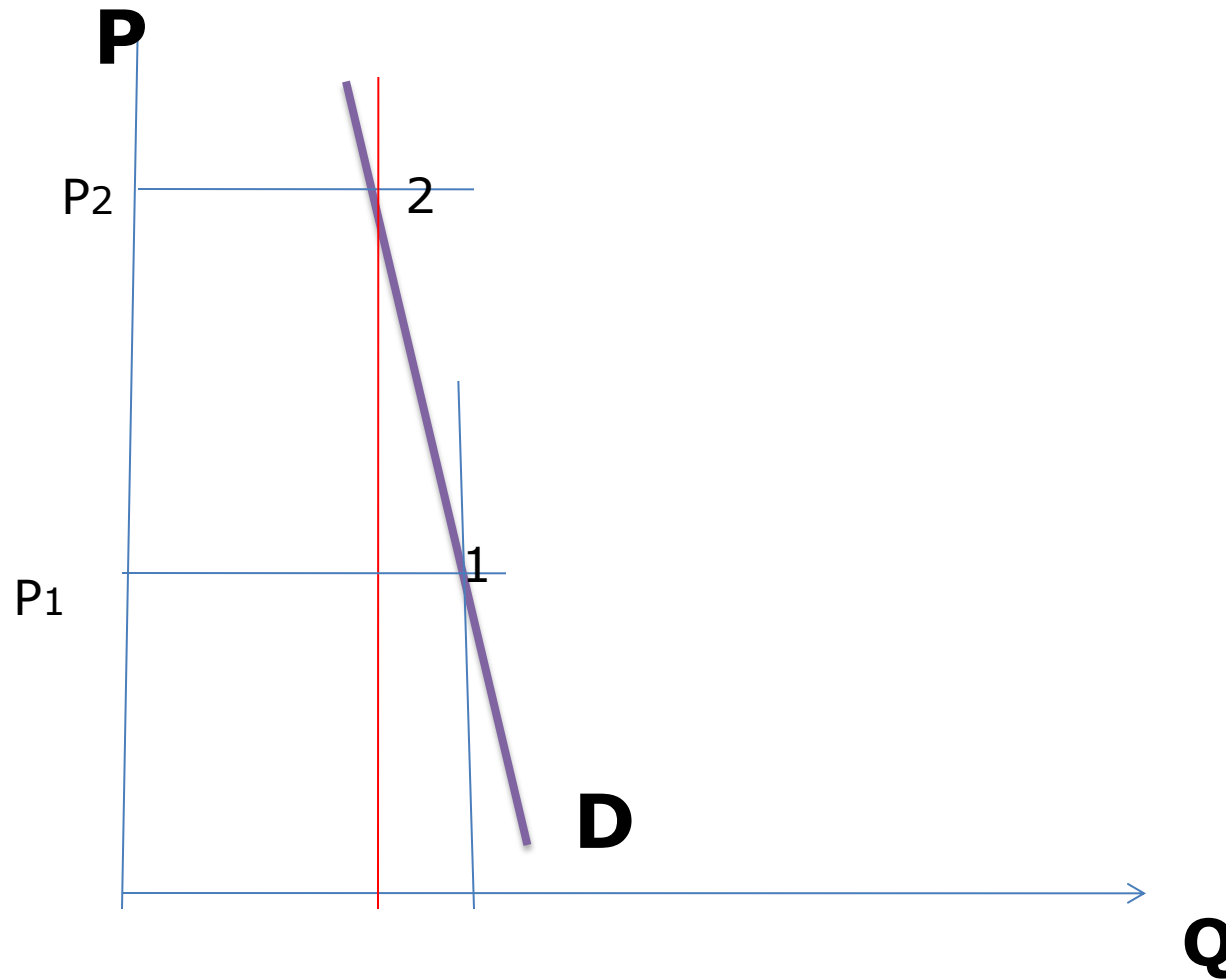
Agricultural Export indexes (USD)



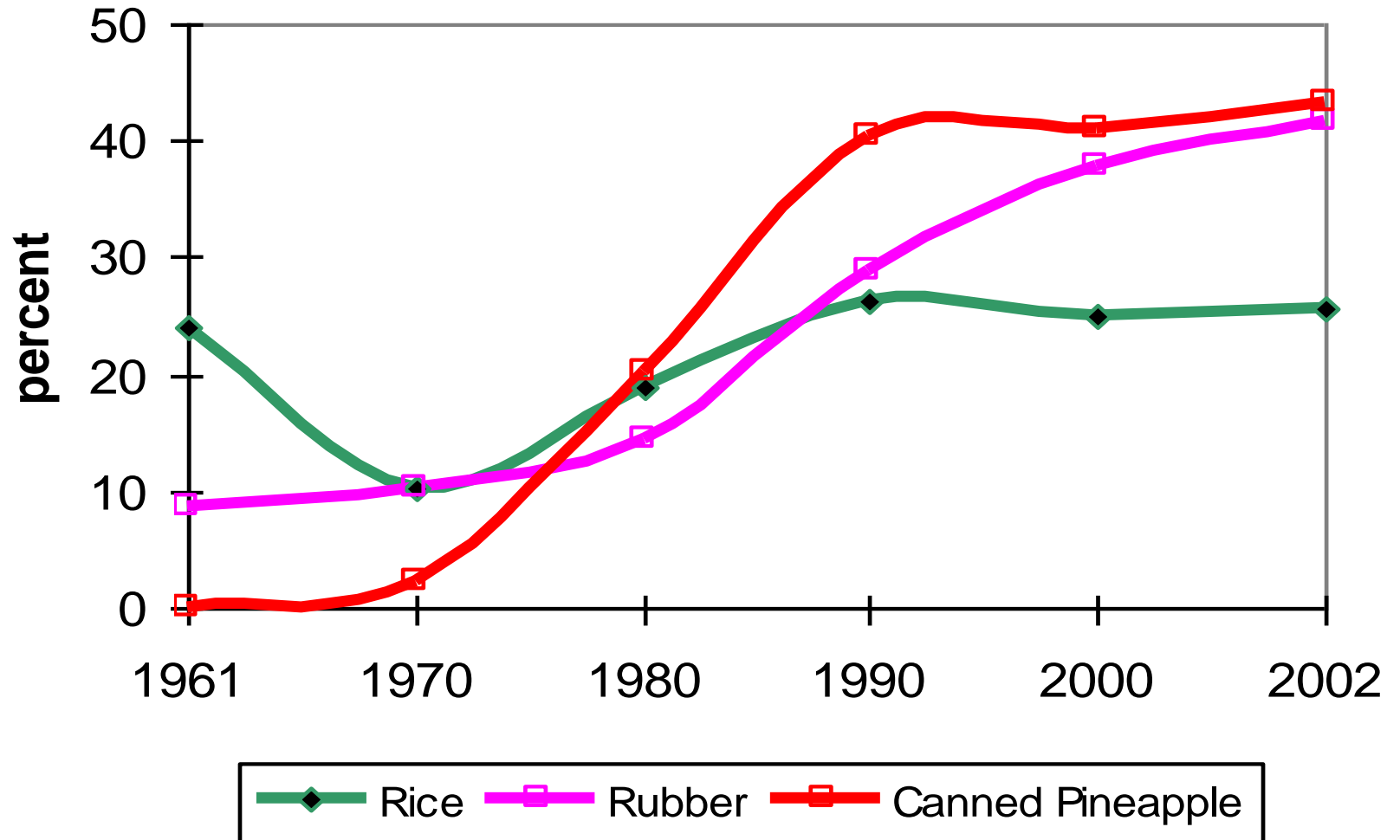
Inelastic demand

- The value index tracks more closely the price rather than the quantity index.
- Exports values are largely determined by price movements rather than volatile quantity.
- Positive correlation between total revenue and prices.
- Can Thai exporters set their own prices?

Nature of agricultural products markets



Shares of Thai Exports in the World



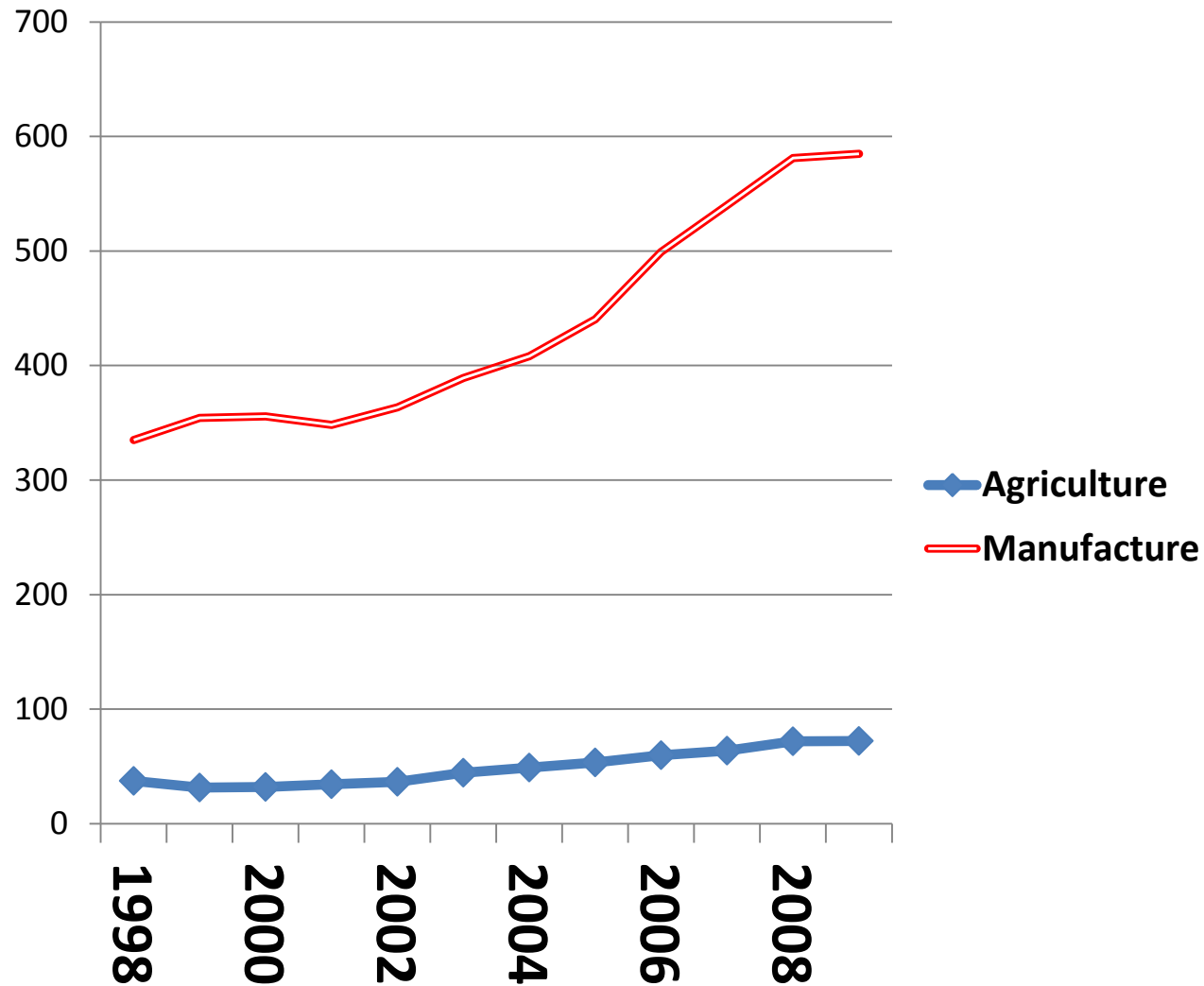
Baumal-Bowen Hypothesis

- **In the rising productivity sector, output per man-hour increases more rapidly than the money wage rate.**
- **The labor cost per unit of output in the progressing sector must fall.**
- **The faster the pace of technological advance, the greater will be the rate of increase in the overall wage rate.**
- **Labor is free to move between the two sectors, the overall real wage must rise, according to the average rate of change of productivity.**

Baumal-Bowen Hypothesis

- **To join the rank of rising productivity industries, the agricultural sector would have to learn to increase output per man and to continue to do so into the indefinite future.**
- **The rising productivity and wage rates in the urban areas put upward pressure on the costs in sectors that lag behind in productivity improvement.**
- **Live performing arts belong to a stable productivity sector of the economy.**

Average product of labor



Accompanying policy on non-agricultural sectors

Policies generating growth in the agriculture sector may not be enough to reduce rural poverty. They must be accompanied by expansion of the non-agricultural sector. Agriculture and non-agricultural sectors are interrelated through migration and financial resource flows in the form of income transfer and deposit-lending activities of the banking sector. Strong growth in the non-agricultural sector can reduce rural poverty despite stagnation in the agriculture sector. Although the income gaps between the agriculture and non-agriculture sectors tend to decline, the convergence process, left to itself, will take a long time. Enhancing agricultural productivity can reduce income inequality more effectively than the mere process of labor migration can do. Dynamism of the Thai agriculture and its survival depend primarily on continued productivity improvement in the sector.

Output per land (ton/rai)





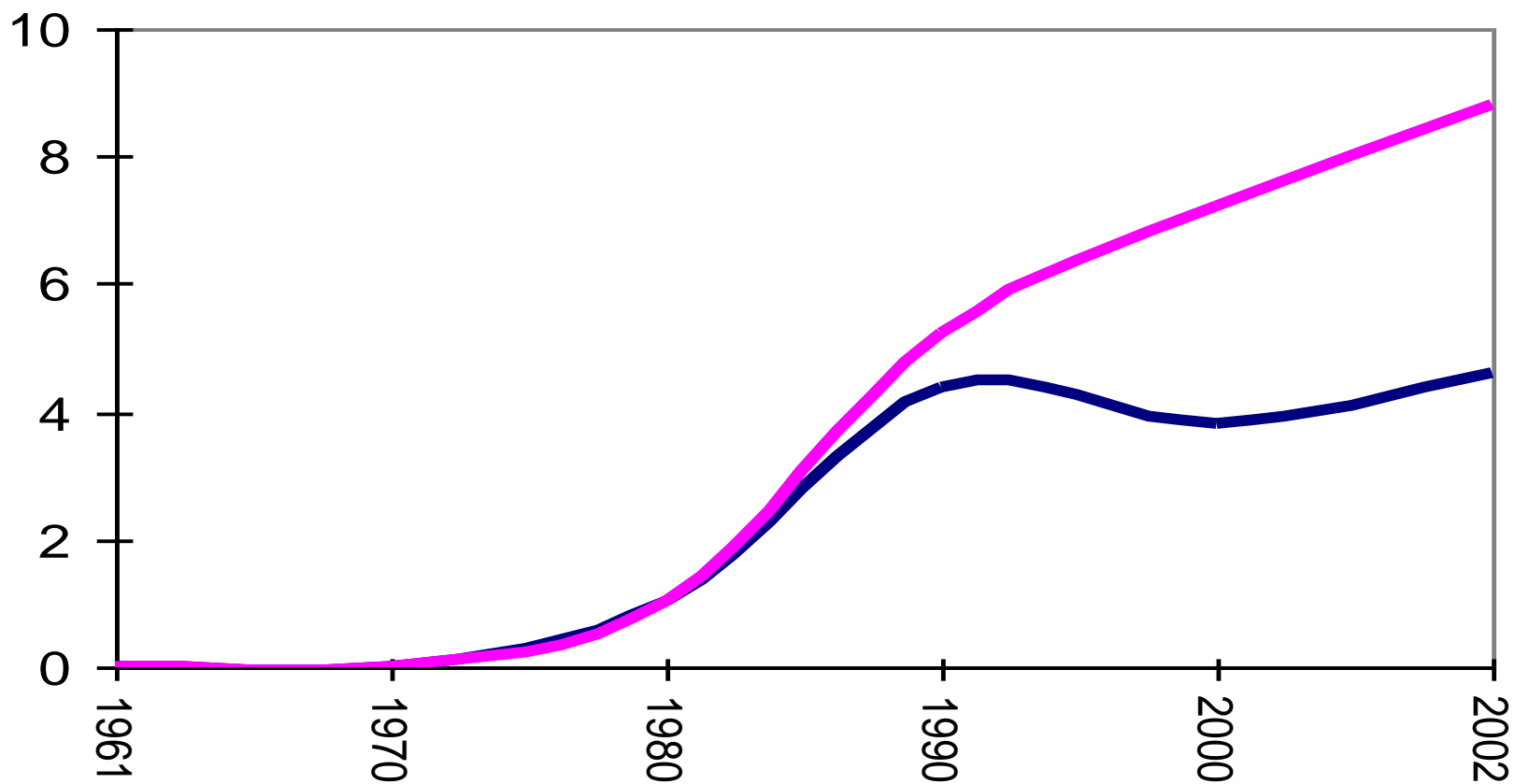
Which country is most likely to lose competitiveness?



Resilient rice and rubber?

- The world market share of Thai rice suffered from a decline from 24 percent in 1961 to only 10 percent in 1970.
- But its *resilience* was demonstrated by the recovery of the *market share*: rising from 19 percent in 1980 to 26 percent in 2000.
- Rubber gained a significant market share from 8.6 percent in 1961 to 38 percent in 2000.
- “Success is not permanent, failure is not fatal”

Shares in the world market of non-traditional exports



— Chicken Meat — Sugar

Table 1: World Markets and Thailand's Exports Growth Rates

| | 1961-1980 | | 1981-2003 | |
|----------------------------|-------------|-------------|--------------|--------------|
| | World | Thailand | World | Thailand |
| Rice | 9 | 8.6 | 3.8 | 3.2 |
| Rubber | 7.5 | 10.2 | 1.8 | 6.3 |
| Chicken Meat* | 13.7 | 80 | 8.6 | 12 |
| Sugar | 12.1 | 45.7 | -0.22 | 5.1 |
| Canned Pineapple ** | 9.4 | 49.7 | 2.4 | 4.8 |
| Cassava Dry | 31.4 | 42.2 | -5.9 | -5.5 |
| Maize | 15.4 | 13.8 | 0.34 | -15.5 |
| Jute-fibers*** | -1.8 | -3.3 | -3.8 | -4 |

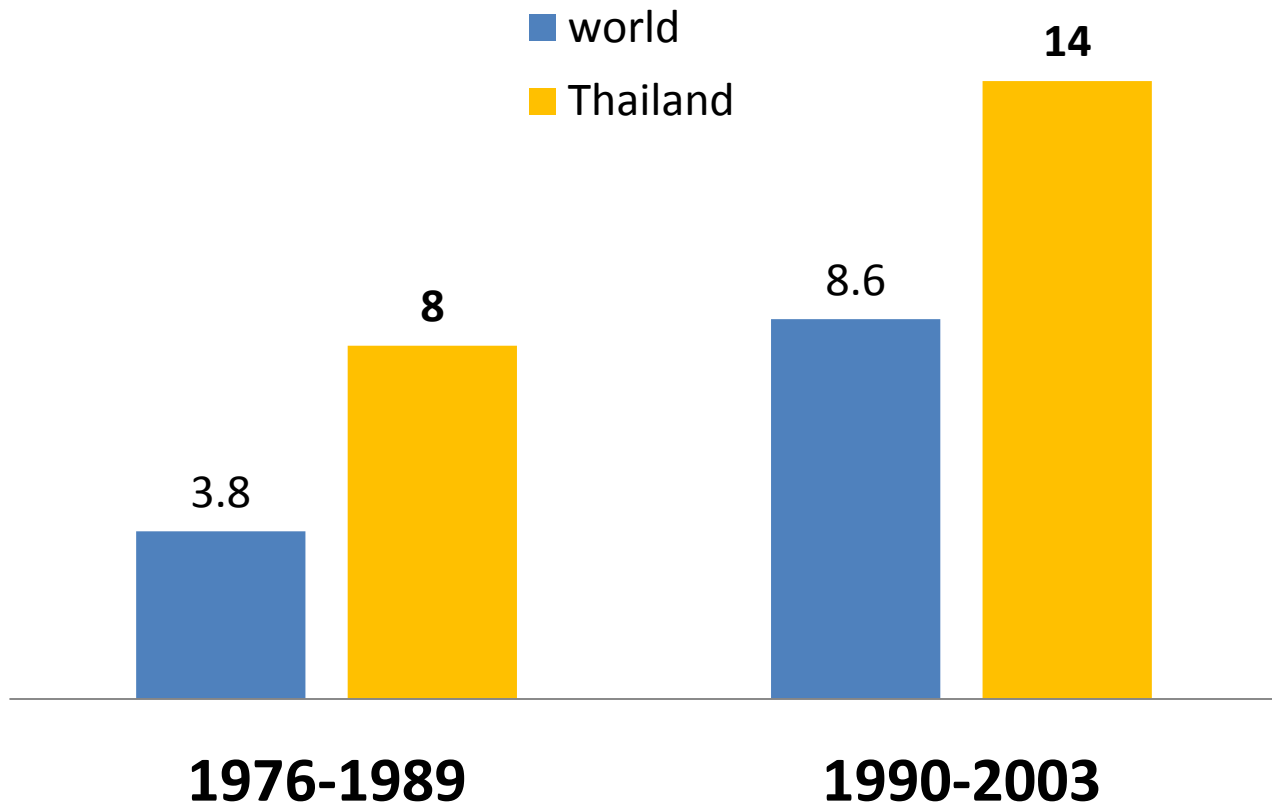
$$\eta = \frac{\partial \ln X}{\partial \ln Y} < 0$$

- Commodities with low income elasticity of demand like jute **disappeared** completely in the period 1981-2003.
- Maize was a commodity boom in the period 1961-1980, Thailand's exports of maize also grew by 13.8 percent.
- Its world growth rate declined to 0.34 percent in the period 1981-2003, when Thailand's exports of maize also declined sharply by 15 percent.
- Cassava also turned from rising stars in the period 1961-1980 into retreat in the second period.
- Thailand's exports of cassava also adjusted accordingly to the negative price incentives and the world market retreat.

Nothing remains unchanged

- Canned pineapple exports of Thailand also adjusted its position from **rising stars** into **falling stars** in the second period.
- The top five agricultural exports commodities followed the same pattern of other successful commodities.
- In the future some of these top products would soon be disappearing and they would be replaced by newly emerging agricultural commodities.
- ***This is the element of dynamism and resilience of Thai agriculture.***

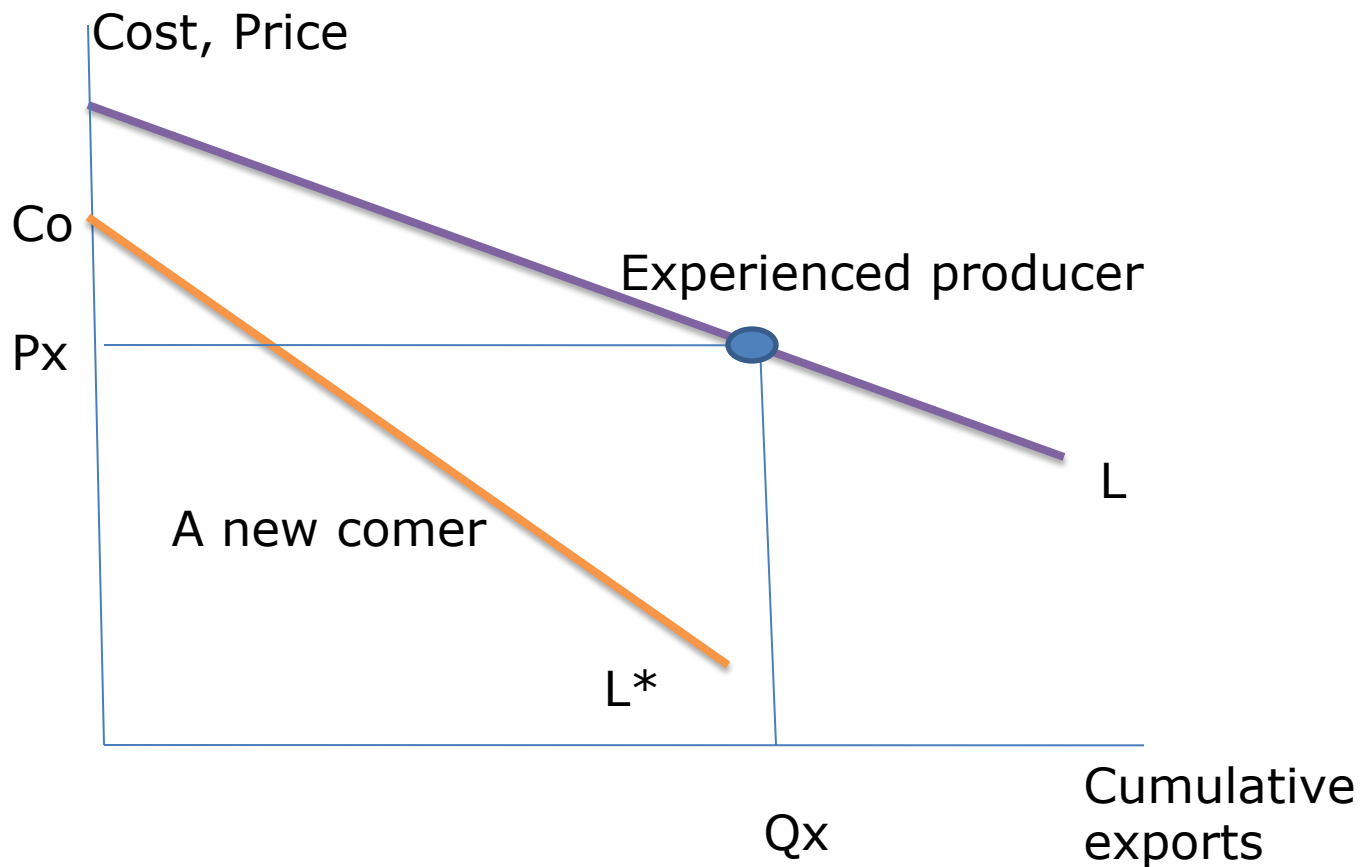
Fresh vegetable exports (% growth)



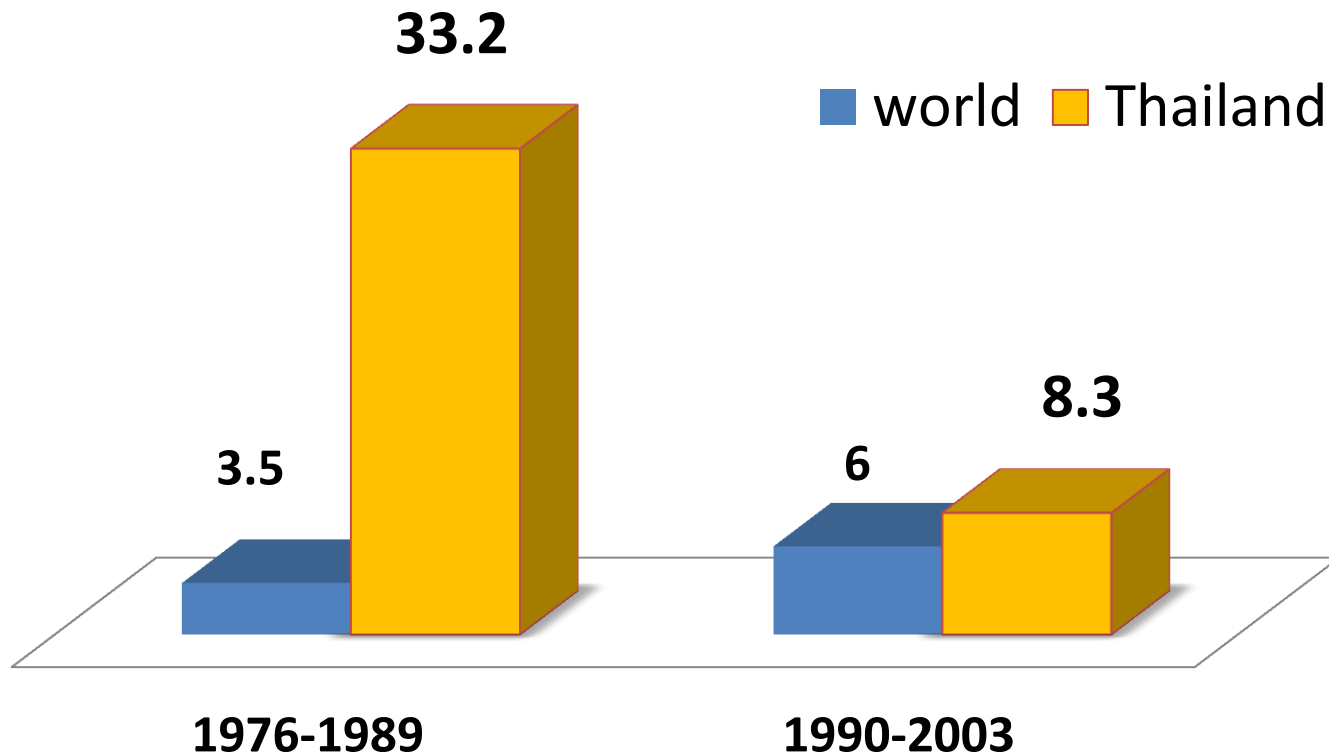
The learning curve effect

- The learning curve shows that unit cost is lower, the greater the cumulative output of a country's industry to date.
- A country that has extensive experience in an industry (e.g. rice production) may have lower unit cost than other countries with little or no experience, even if the second country's learning curve (L^*) is lower, for example, because of lower wage.

Learning by exporting: Give it time



Frozen vegetable exports (% growth) *Low-base effect*



New products

- Vegetable and fruit exports are chosen to illustrate the flexibility of the agricultural export sector.
- When the world market expanded during the period 1976-1989, the Thai industry responded at high growth rates in both value and quantity terms.

Learning-by-doing

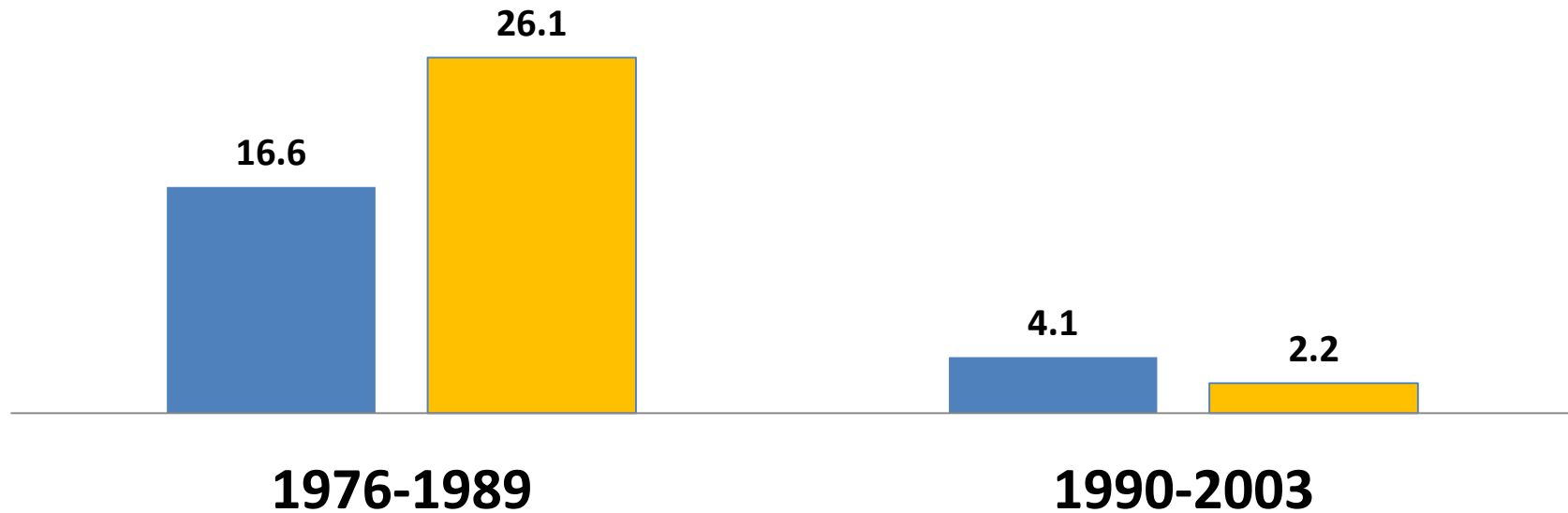
- Doing refers to the capability of workers to improve their productivity by regularly repeating the same type of action.
- The concept of learning-by-doing has been used by Kenneth Arrow in his design of *endogenous growth theory* to explain effects of innovation and technical change.
- Robert Lucas (1988) adopted the concept to explain *increasing returns to embodied human capital*.
- Yang and Borland (1991) have shown learning-by-doing plays a role in the evolution of countries *to greater specialization in production*.
- In both these cases, learning-by-doing and increasing returns provide an engine for long run growth.

Learning by doing (exporting)

- Starting from low bases, growth rates in the first period would always be greater than after the commodities have firmly established their positions and exported in large volumes.
- Thus in the second period between 1990 and 2003, the growth rates slowed down appreciably from the first period.

Pineapple juice exports (% growth) Low-base effect

■ world ■ Thailand



Snapshots from the past

- The changing pattern of Thailand's agricultural exports in the last four decades is shown by snapshots of top five agricultural commodities.
- Shares of rice and natural rubber in total agricultural exports have been declining gradually as new products have emerged and old products have faded away.
- Jute, maize, and cassava are no longer the principal agricultural commodities as there have little productivity improvement.

Principal Agricultural Exports: 1961

(percent of total Agricultural exports)

| | Share |
|---------------------------|-------------|
| Milled Paddy Rice | 42.7 |
| Rubber Natural | |
| Dry | 25.7 |
| Jute | 7.5 |
| Maize | 7.3 |
| Cassava Flour | 5.2 |
| Total of top five: | 88.4 |

High Concentration

- Back in 1961, milled paddy rice and natural rubber were main export products.
- Jute, maize, and cassava flour were other items on the top five items accounting for 88.4 percent of total agricultural exports.

Principal Agricultural Exports: 1970

(percent of total Agricultural exports)

| | Share |
|--------------------|-------------|
| Milled Paddy Rice | 24.3 |
| Rubber Natural | 21.7 |
| Maize | 18 |
| Cassava Dried | 9.8 |
| Jute | 6.9 |
| Total Share | 80.7 |

Principal Agricultural Exports: 1980

(percent of total Agricultural exports)

| | Share |
|------------------------|-------------|
| Milled Paddy Rice | 28.1 |
| Cassava | 19.8 |
| Rubber Natural | 18.1 |
| Maize | 10.5 |
| Sugar (Raw) | 4.3 |
| Total top five: | 80.8 |

Principal Agricultural Exports: 1990

(percent of total Agricultural exports)

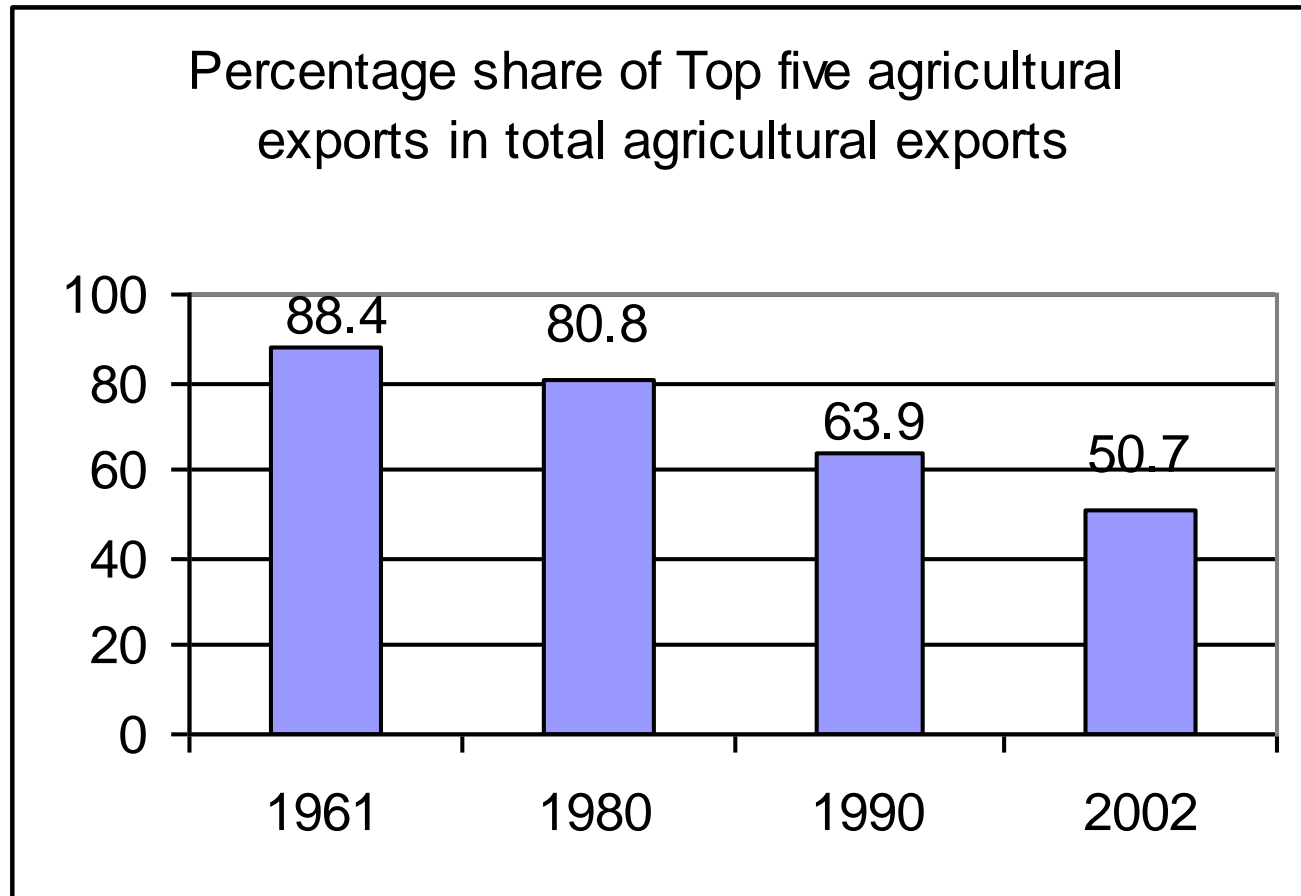
| | Share |
|-------------------------|-------------|
| Milled Paddy Rice | 18.5 |
| Rubber Natural Dry | 16.2 |
| Cassava Dried | 14.7 |
| Sugar (centrifugal raw) | 9 |
| Chicken Meat | 5.5 |
| Total sum of top five: | 63.9 |

Principal Agricultural Exports: 2002

(percent of total Agricultural exports)

| Items | Share |
|---------------------|-------------|
| Rubber Natural Dry | 17.3 |
| Milled Paddy Rice | 17.1 |
| Chicken Meat | 6.5 |
| Meat Canned chicken | 5.2 |
| Sugar refined | 4.6 |
| Total share | 50.7 |

Diversification of agricultural exports



Top agricultural exports in 2011

What about the shares in 2014?

| | Share of Thai exports | Share of world exports | Share of top 3 export markets | Balassa index (RCA) |
|--------------------------|-----------------------|------------------------|-------------------------------|---------------------|
| Rubber | 9.64 | 9.65 | 54.5 | 7.1 |
| Meat | 3.2 | 16.2 | 60.6 | 13.2 |
| Cereals | 2.9 | 5.9 | 26.6 | 4.7 |
| Fish, Crustaceans | 1.33 | 3.18 | 62.1 | 3.1 |
| Vegetable, fruit, nut | 0.92 | 3.78 | 43.3 | 3.0 |

The role of infrastructure development

The role of the government is crucial in providing investment in infrastructure and agricultural research in order to make sure that farm productivity can be enhanced continuously. The government must reduce distortions in markets of farm output and factor inputs. Agricultural credit, an important factor input, has been provided to Thai farmers by the Bank of Agriculture and Agricultural Cooperatives. The current support of the rural sector has gone too far in injecting money into rural areas without considering the basic cost-benefit principle and without concern about alternative uses of limited financial resources. Intervention by the government has already gone to the point of guaranteeing prices of rice and rubber. As experiences of Japan and Taiwan indicate, the decline in agriculture's terms of trade induced resource flows and encouraged industrial development (Hondai, 1985). However, there must be continuous technological change in agriculture to offset the terms of trade that continuously move against agriculture. When productivity in agriculture increases, it will allow labor to shift to non-agricultural sectors rapidly without having to distort the terms of trade in favor of agriculture.

Conclusion

- Being resilient requires flexibility.
- Minimizing export instability can be done through product and market diversification.
- Like doing the right thing and doing the thing right, what and where you export matter.
- Dynamisms is demonstrated by creating new products to suit changing demand pattern.

Questions

- What would be the pattern of Thai agricultural exports in 2020? Would rice and rubber still be the principal agricultural exports?
- How is *Baumol-Bowen* cost disease related to the performance of Thai agriculture?
- How long can Thailand maintain its export market shares in rice and rubber?
- *Is there any relationship between Baumol-Bowen cost disease and the Dutch disease?*