Resilience and Dynamism of Thai Agriculture

Bhanupong

Thai Economy

Lecture 11

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

Main themes

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

Productivity growth in Thai agriculture lags behind that in Manufacturing sector, preventing a natural transfer of agricultural Workers. The sector remains competitive and diversified.

Dynamism of the Thai Agriculture

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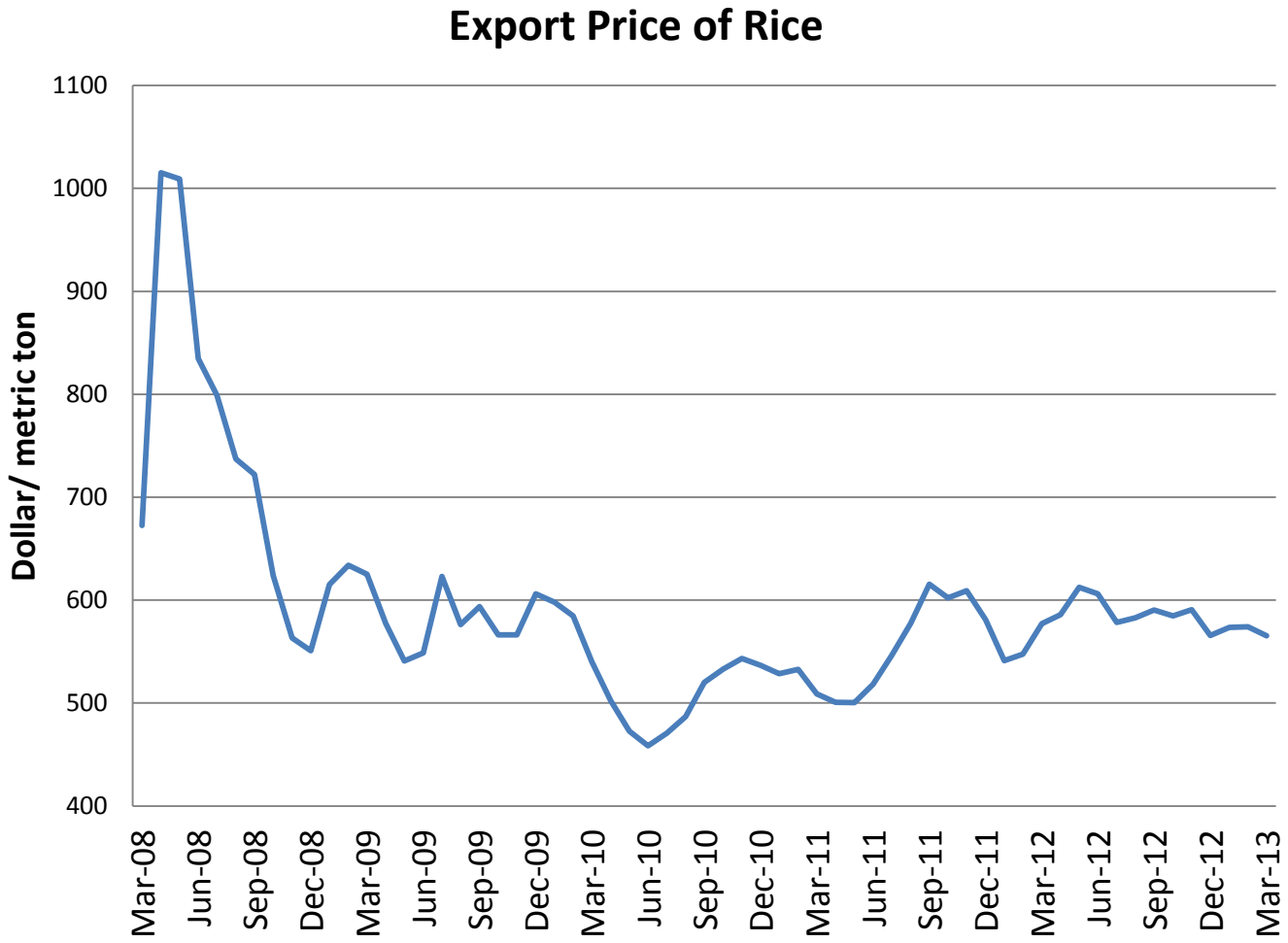
Abstract

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.

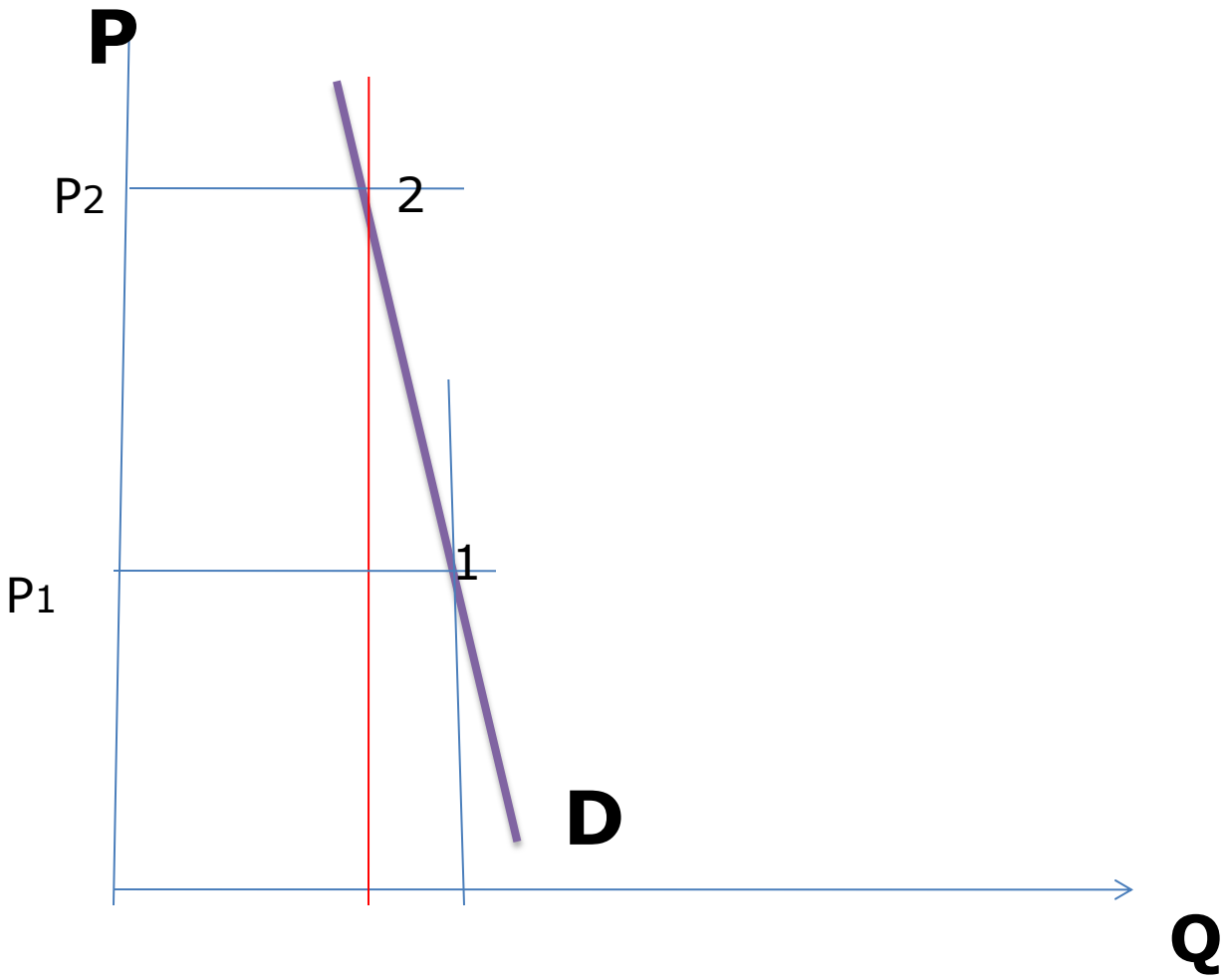
Keywords: Agriculture, Thailand, productivity; *JEL Classification*: 05


Export Price of Rice
Dollar/ metric ton
1100
1000
900
800
700
600
500
400
Mar-08
Jun-08
Sep-08
Dec-08
Mar-09
Jun-09
Sep-09
Dec-09
Mar-10
Jun-10
Sep-10
Dec-10
Mar-11
Jun-11
Sep-11
Dec-11
Mar-12
Jun-12
Sep-12
Dec-12
Mar-13

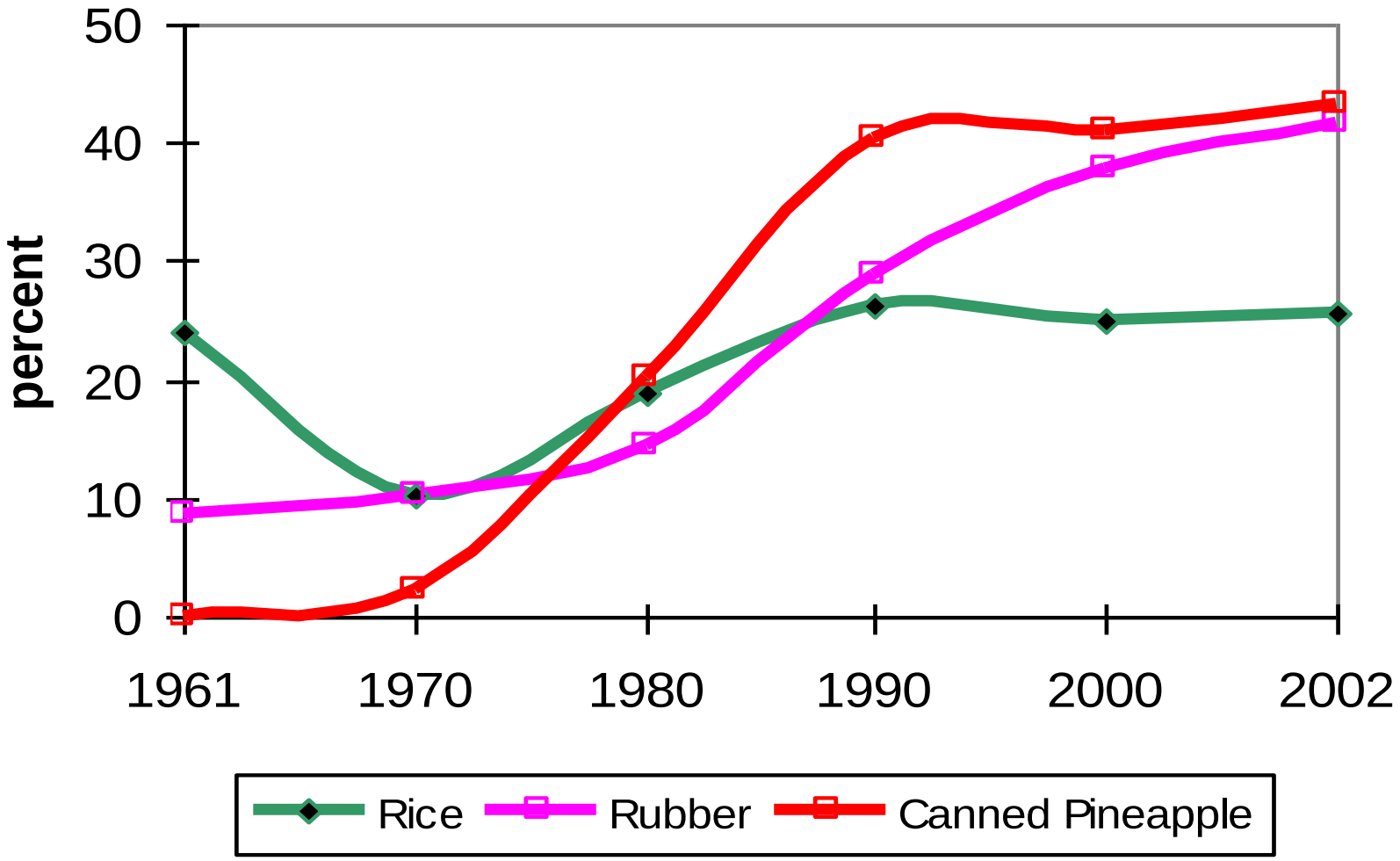
Price elastic or inelastic demand for Thailand's agricultural exports?

- Exports values are largely determined by price movements rather than volatile quantity.
- Can Thai exporters set their own prices?
- Is the small country assumption valid?

Nature of agricultural products markets



Shares of Thai Exports in the World



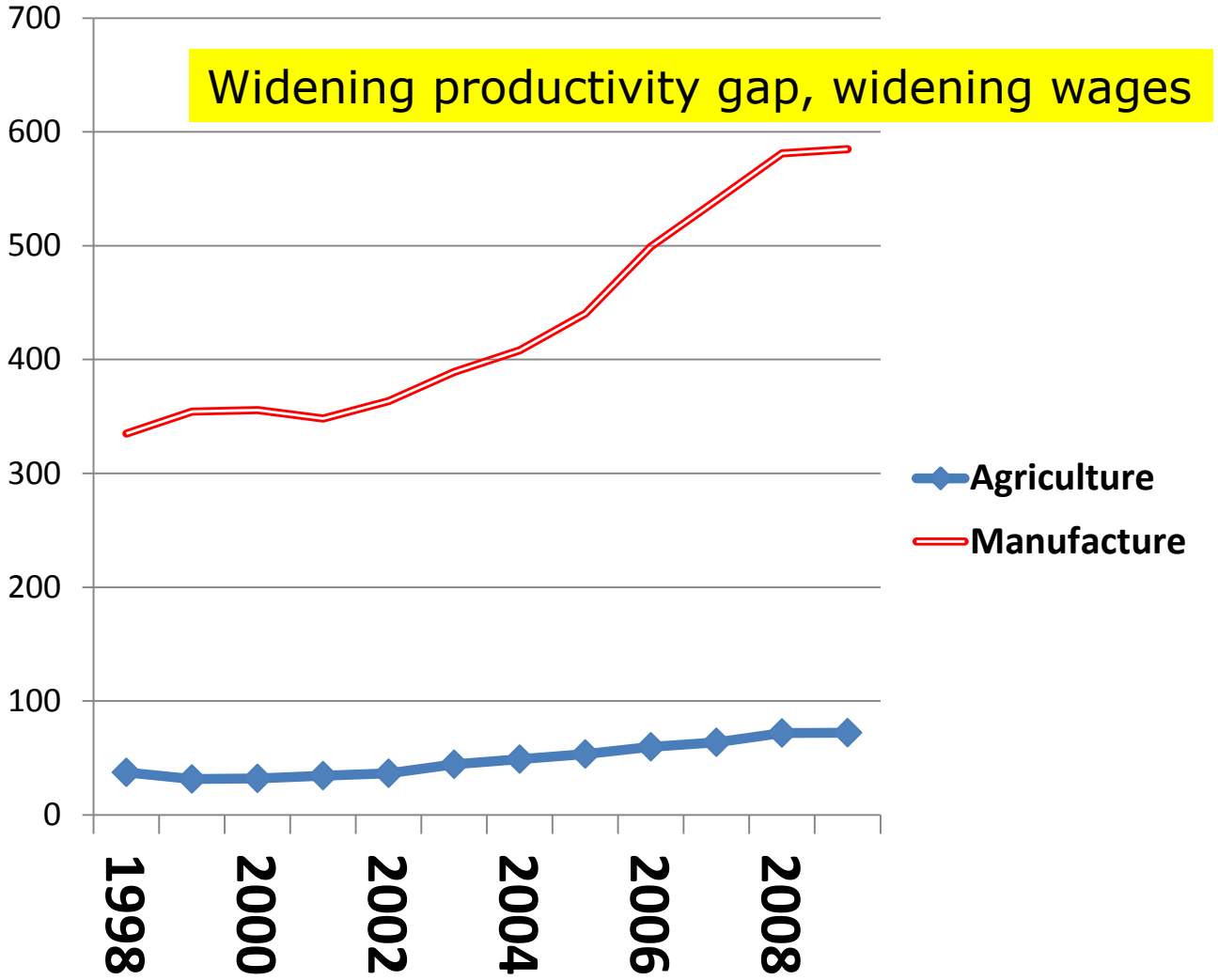
Baumal-Bowen Hypothesis

- **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 rises, 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

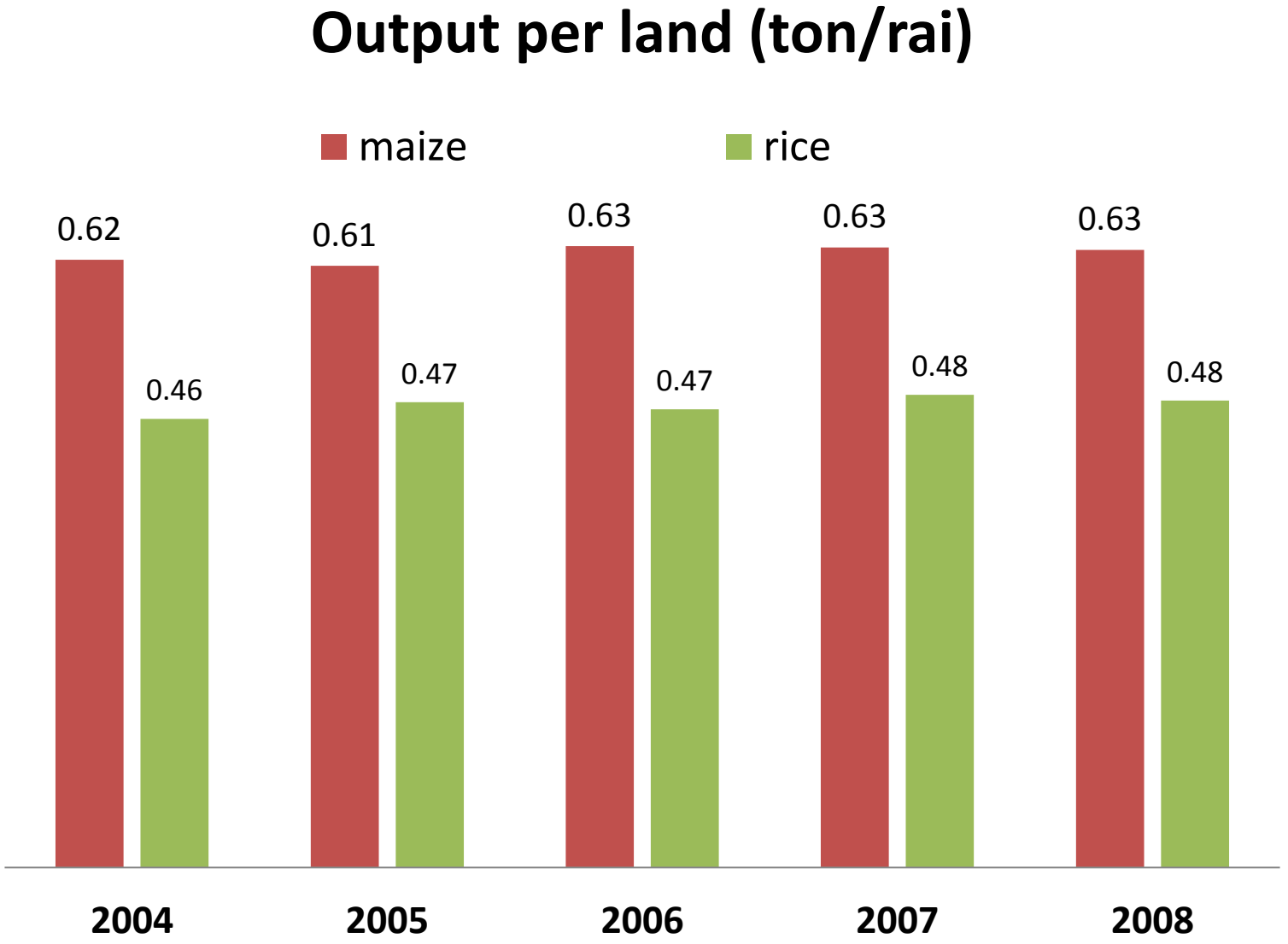


Accompanying policy on non-agricultural sectors

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.

Enhancing agricultural productivity can reduce income inequality. Dynamism and survival of agriculture depend primarily on continued Productivity improvement.

Stagnant productivity growth in rice and maize production



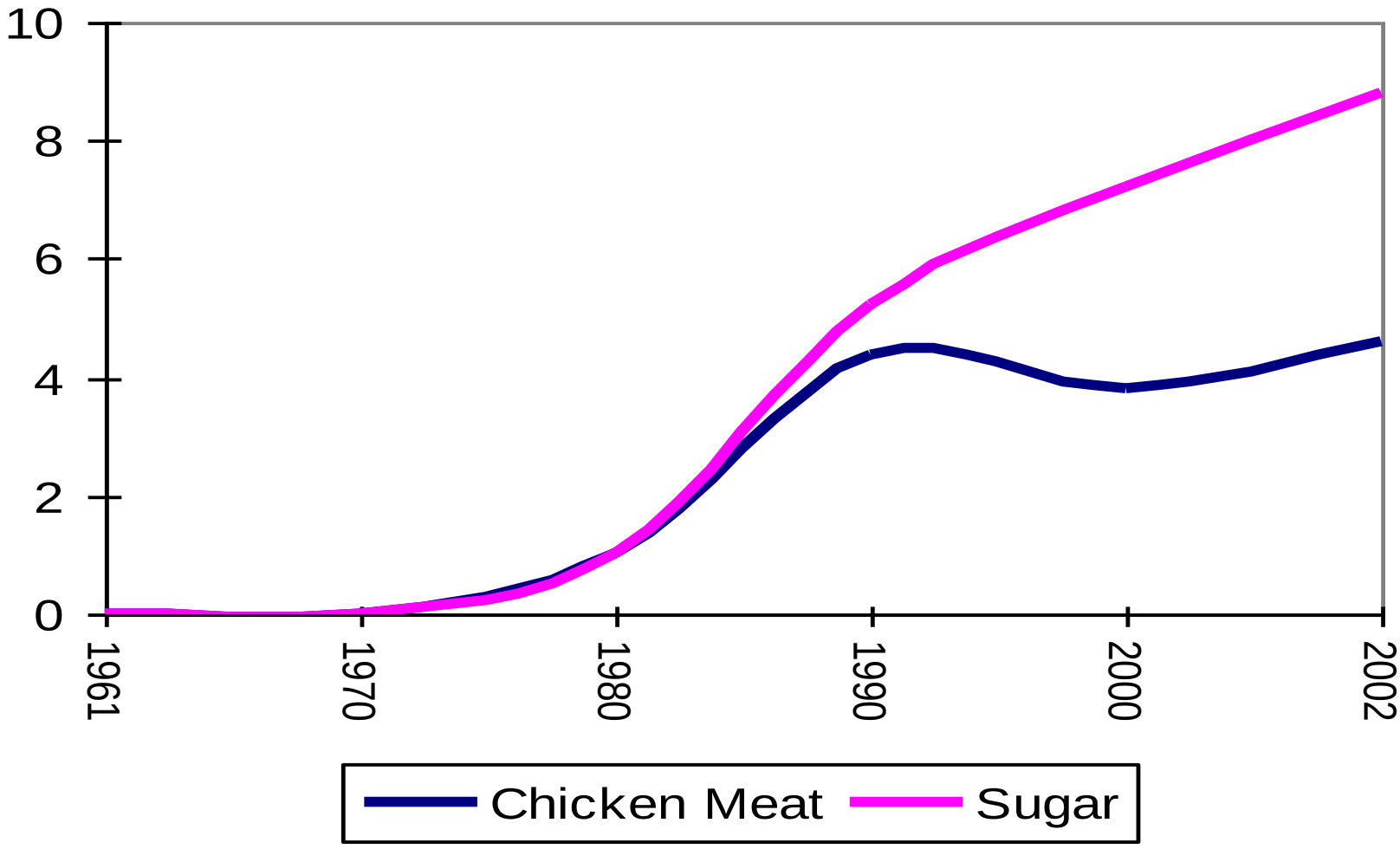
Rice transplanting method has remained unchanged over centuries

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



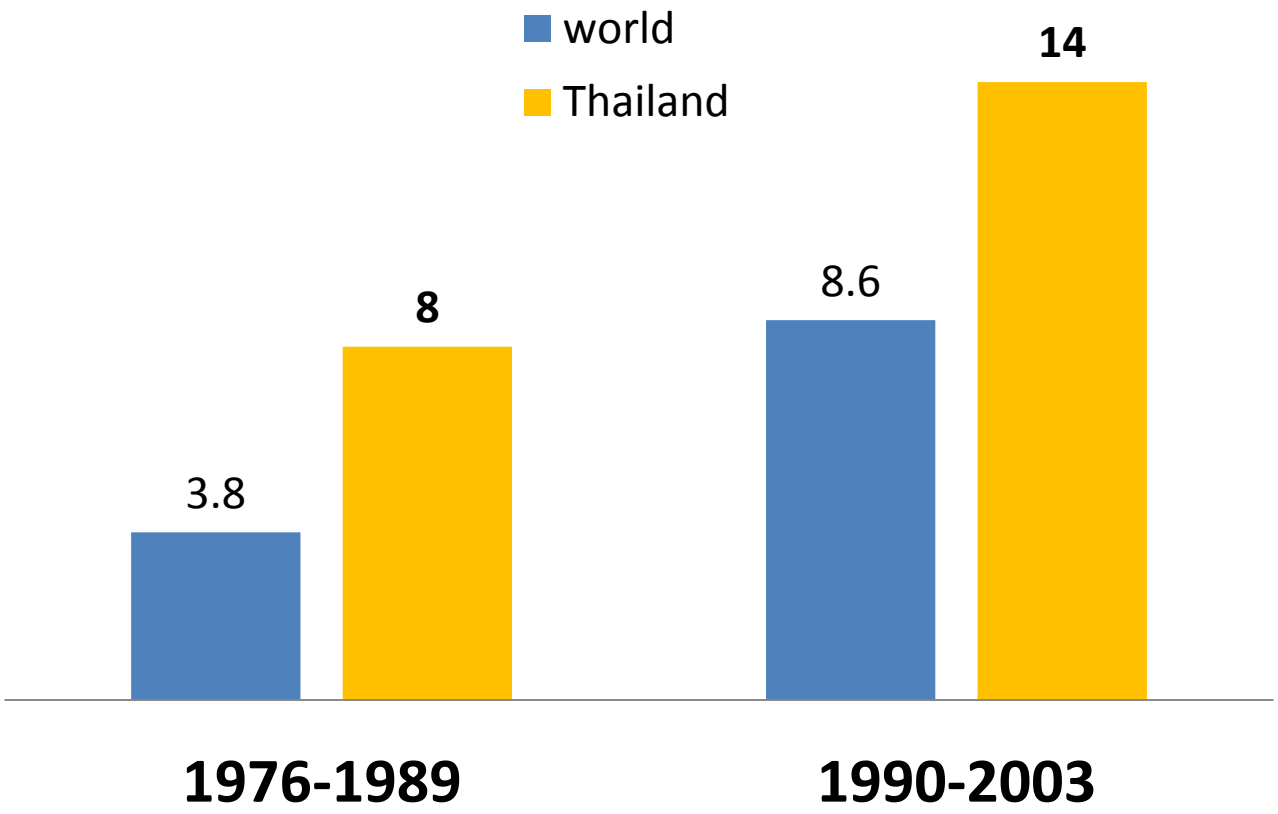
$$\eta = \frac{\partial \ln X}{\partial \ln Y} < 0$$

- **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)



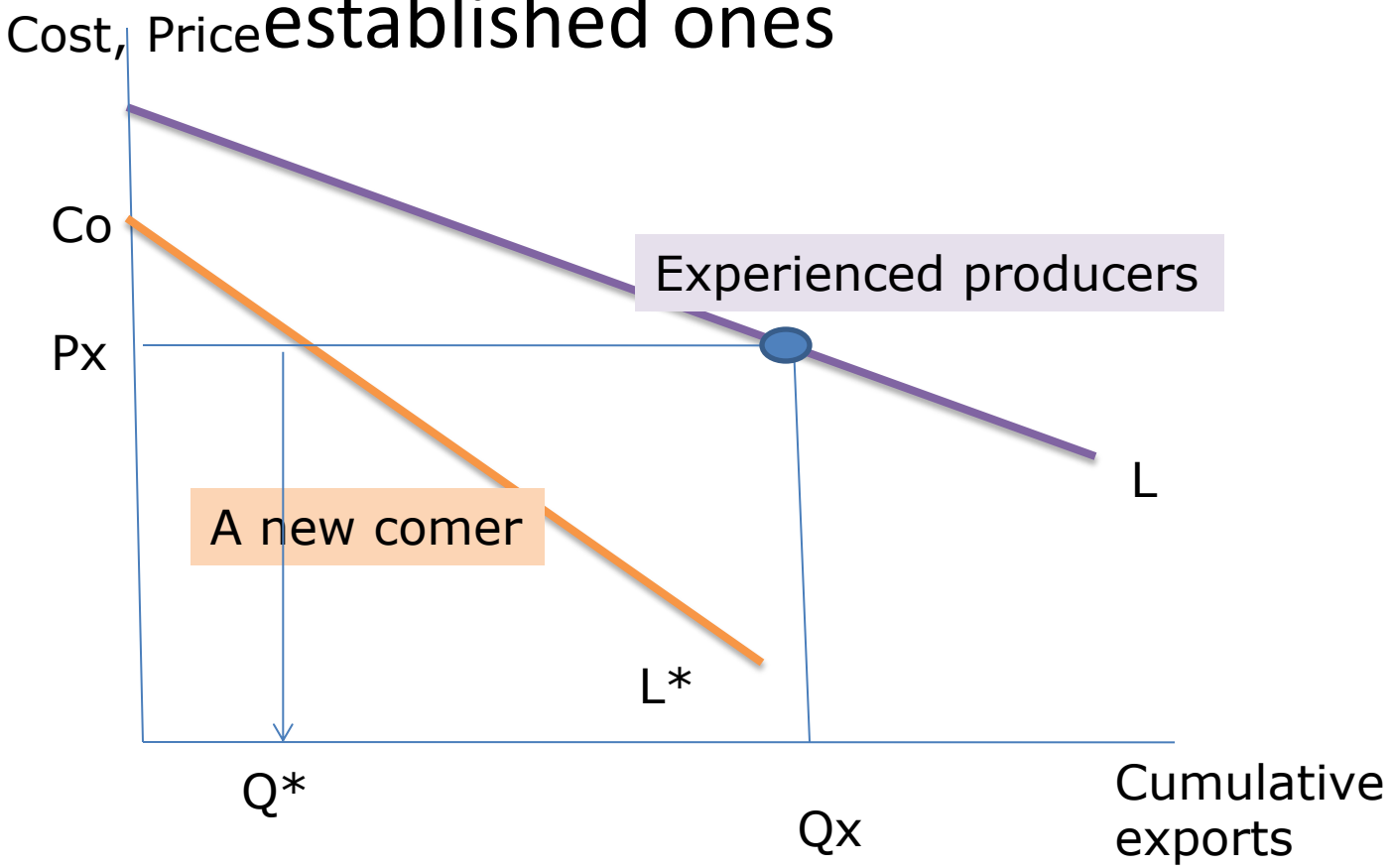
The learning curve effect

- 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 (accumulated output between zero up to Q*), even if the second country's learning curve (L*) is lower, for example, because of lower wage.

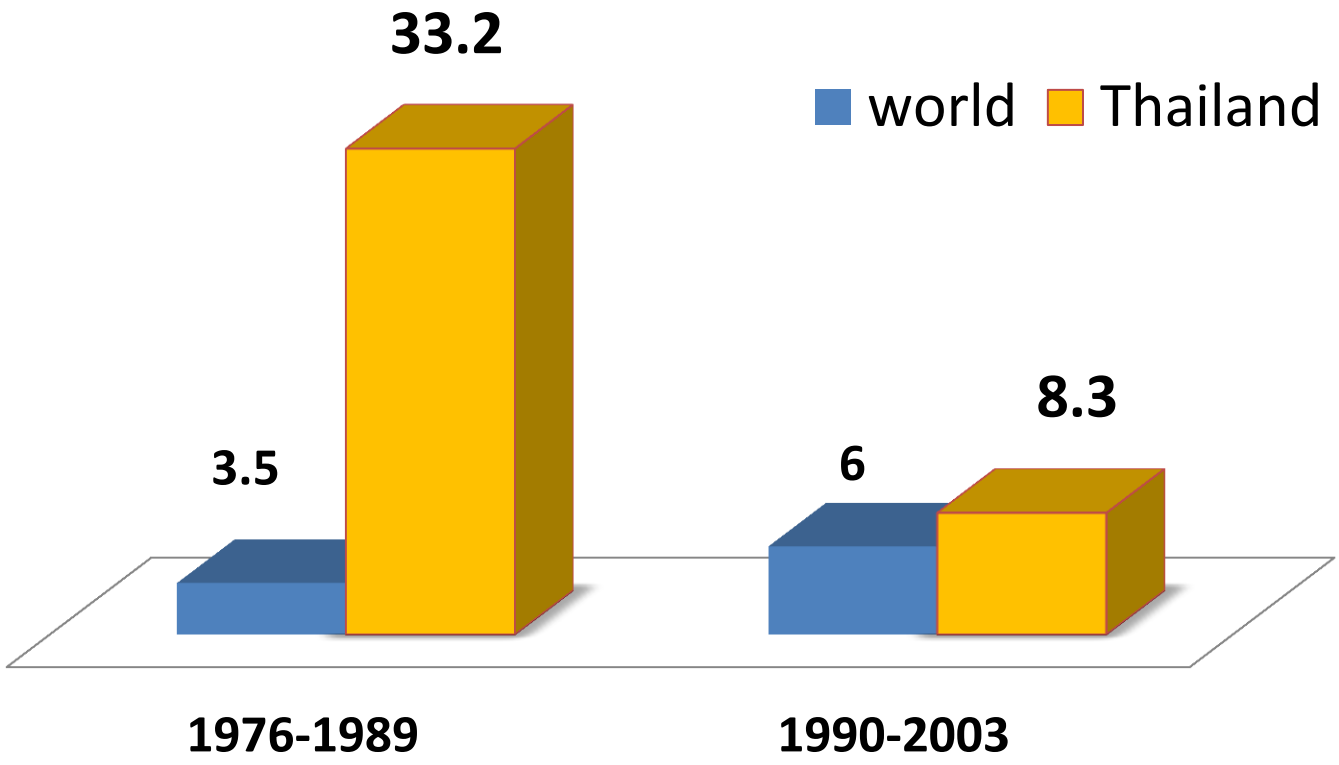
Learning by exporting:

At the end of the day (after Q*),

the new one will be more efficient that the established ones



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.

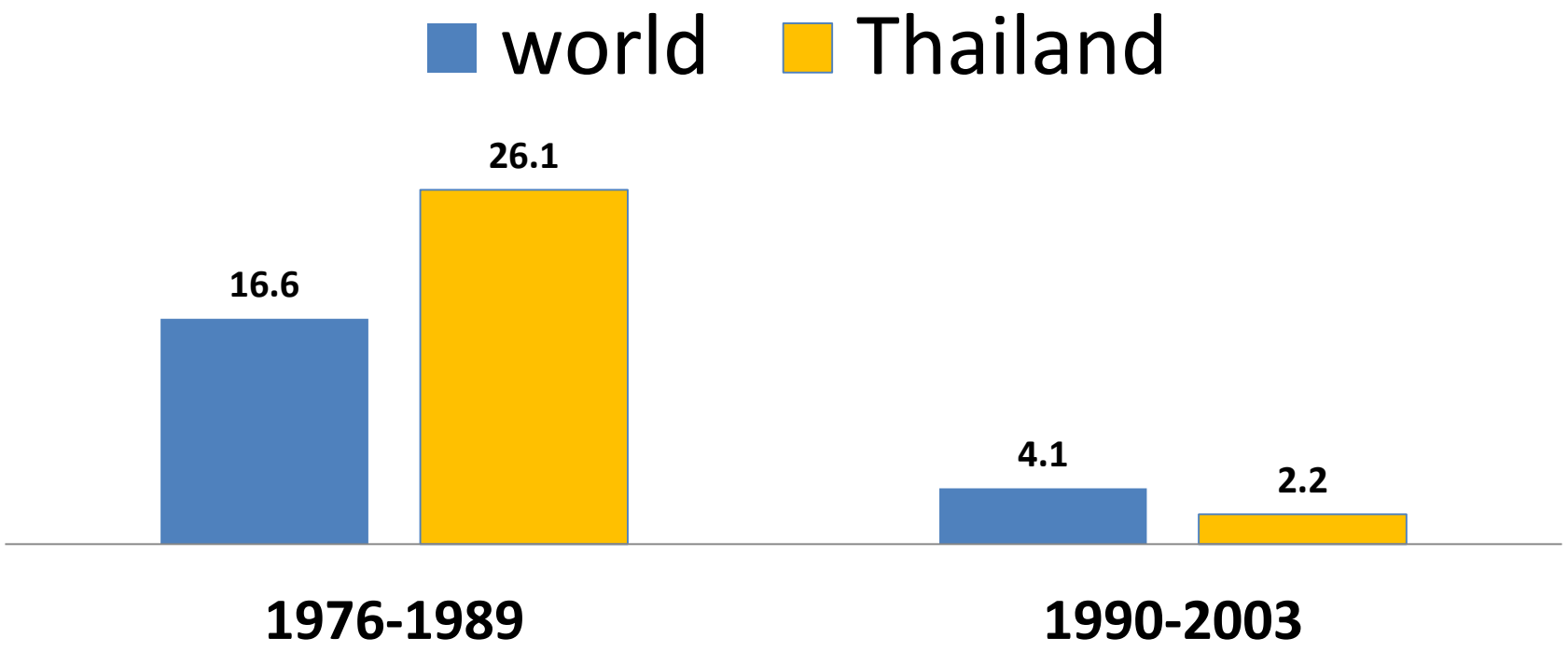
Learning-by-doing and long-term growth

- It 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 *endogenous growth theory,* explaining effects of innovation and technical change.
- Robert Lucas (1988) adopted the concept of learning by doing 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.
- 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



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)

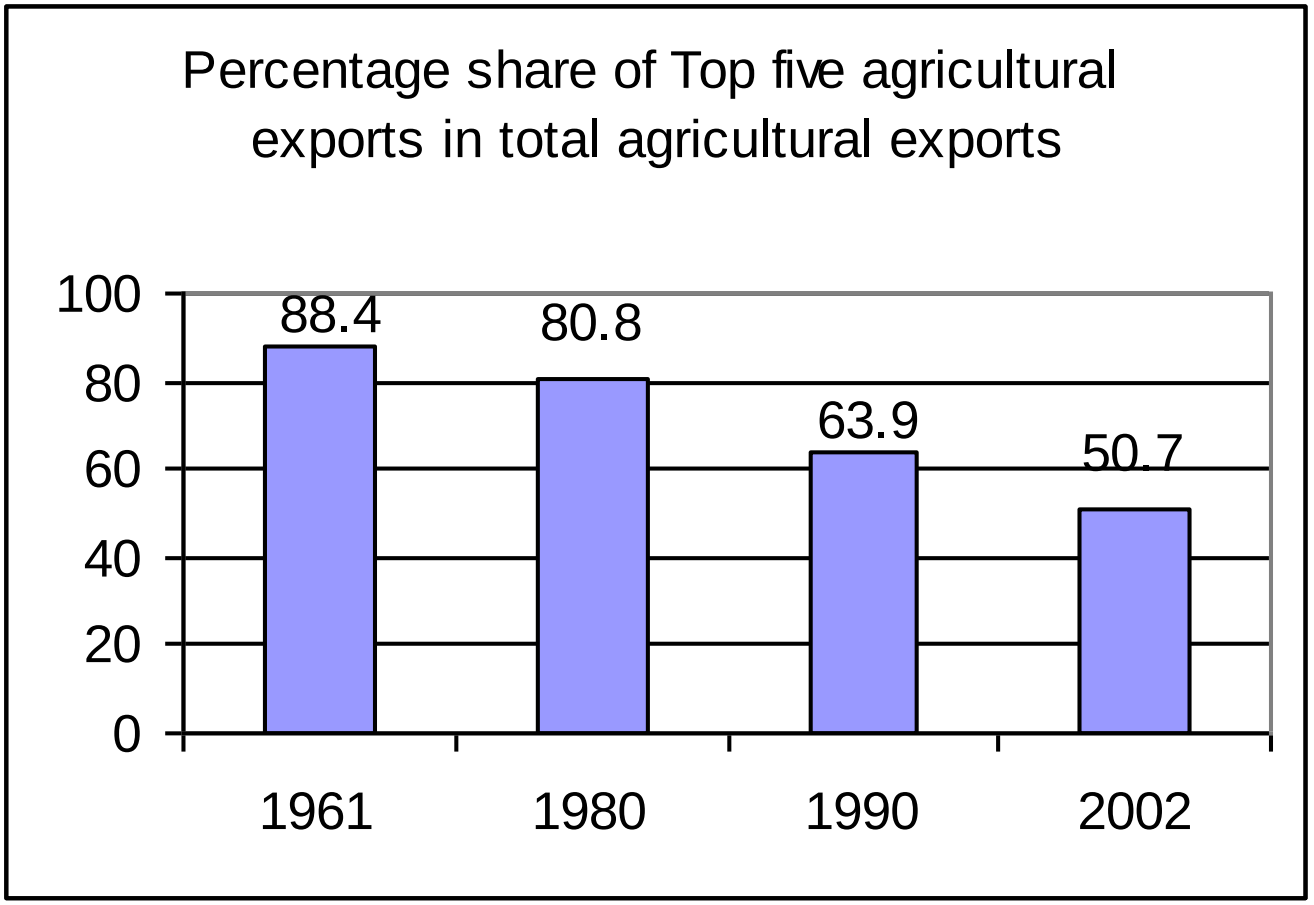
	Share
Milled Paddy Rice	18.5
Rubber Natural Dry	16.2
Cassava Dried	14.7
Sugar (centrifugal raw)	9
Chicken Meat	5.5
Total sum of top five:	**63.9**

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 (rice)	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

If Balassa index exceeds unity, that commodity has comparative advantage

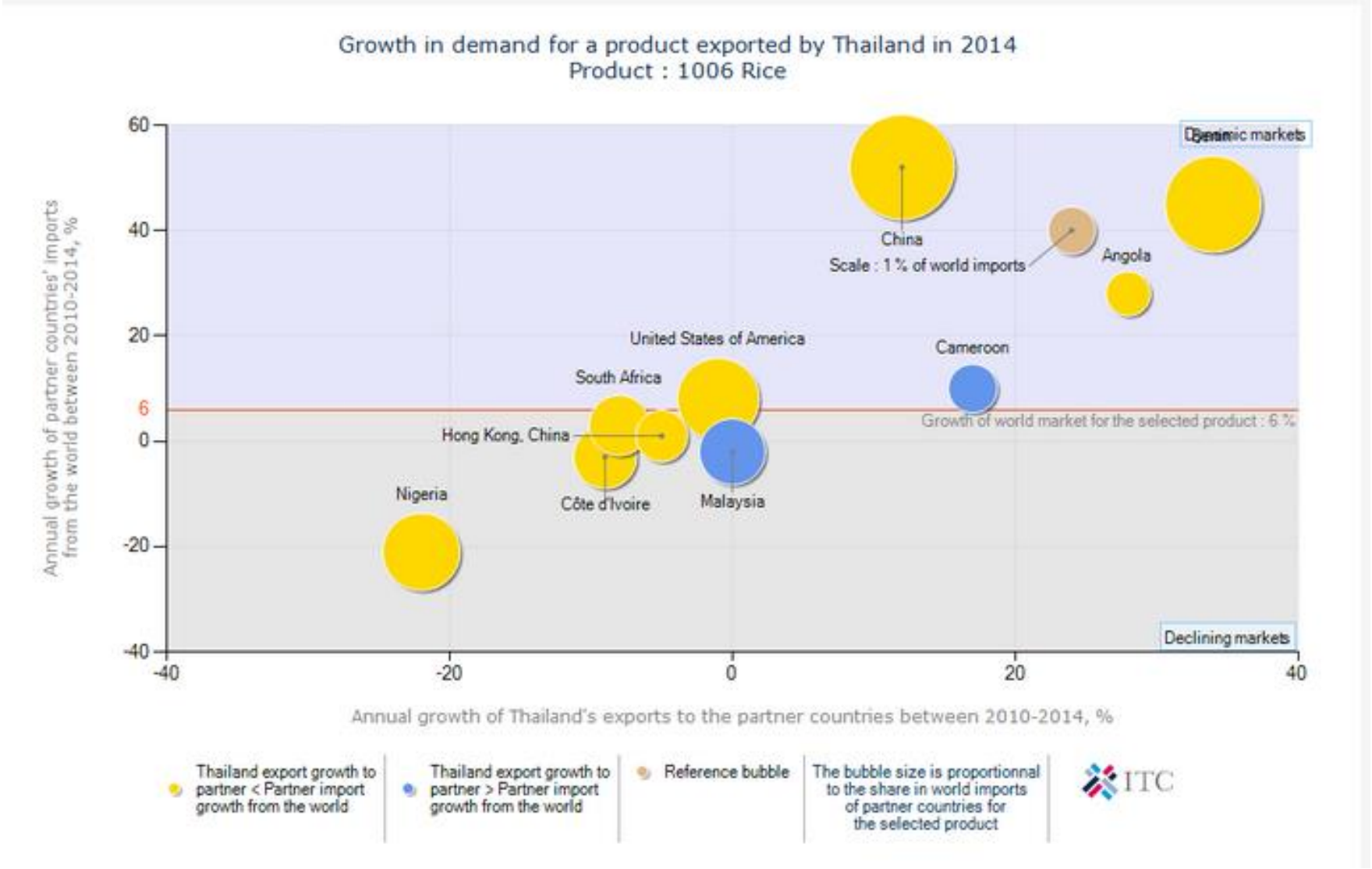
The role of infrastructure development

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.

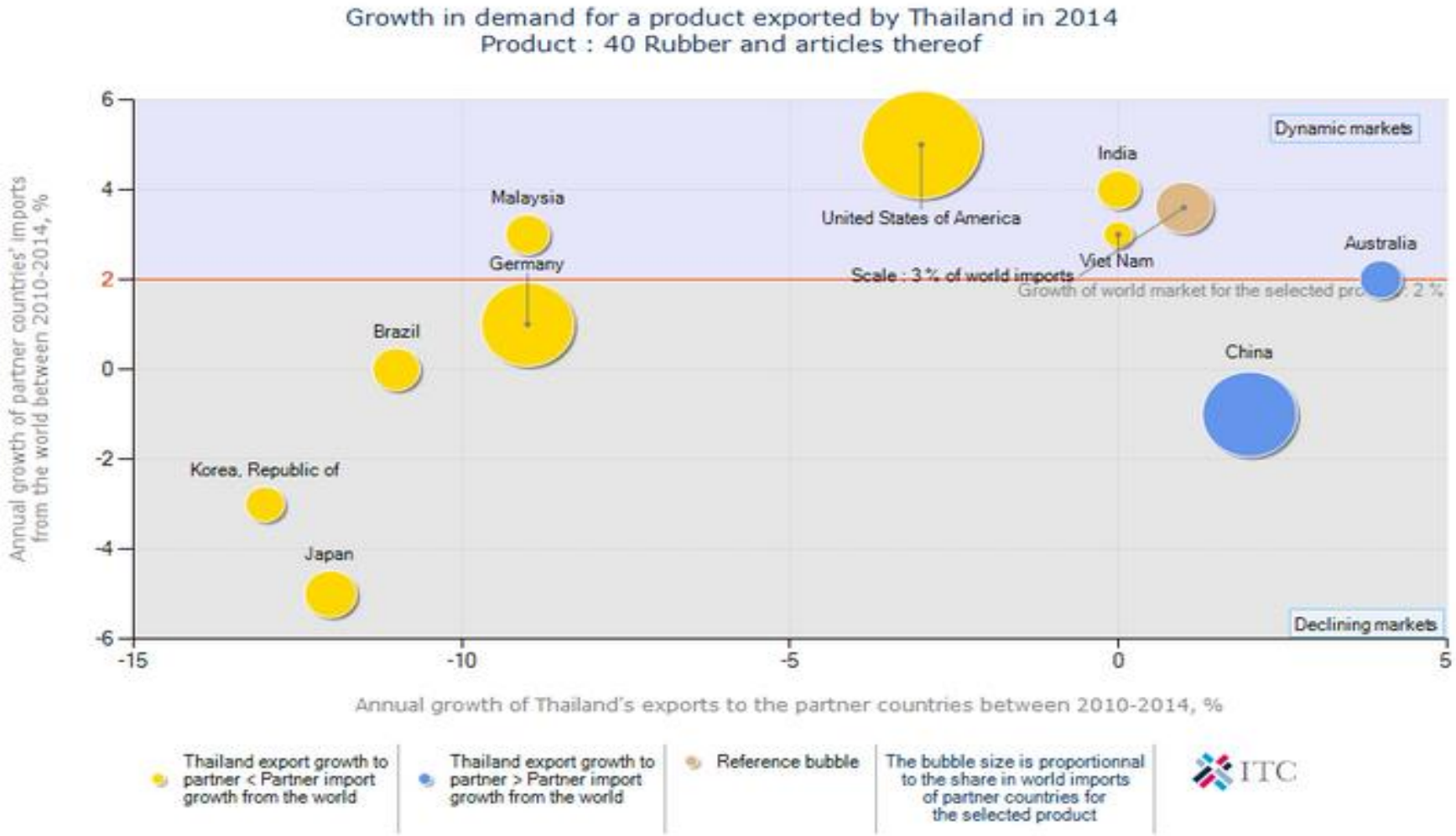
The decline in agriculture 's T/T induced resource flows and Encourage industrial development.
But there must be continuous technological change in agriculture To offset declining T/T to shift labor to non-agriculture.

Industry	Exports as a share of total exports (%)	Exports as a share of world exports (%)	Share of top 3 export markets (%)	Specialisation (Balassa Index / RCA Index)
04 Dairy products, eggs, honey, edible animal product 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

Thailand's export growth of rice vs. partner import growth



Thailand's export growth of rubber vs. partner import growth



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 world market shares in rice and rubber?**
- ***Is there any relationship between Baumol-Bowen cost disease and the Dutch disease?***