Structural Transformation in the CAREC Countries

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Growth & Structural change

Growth is not just more of the same:

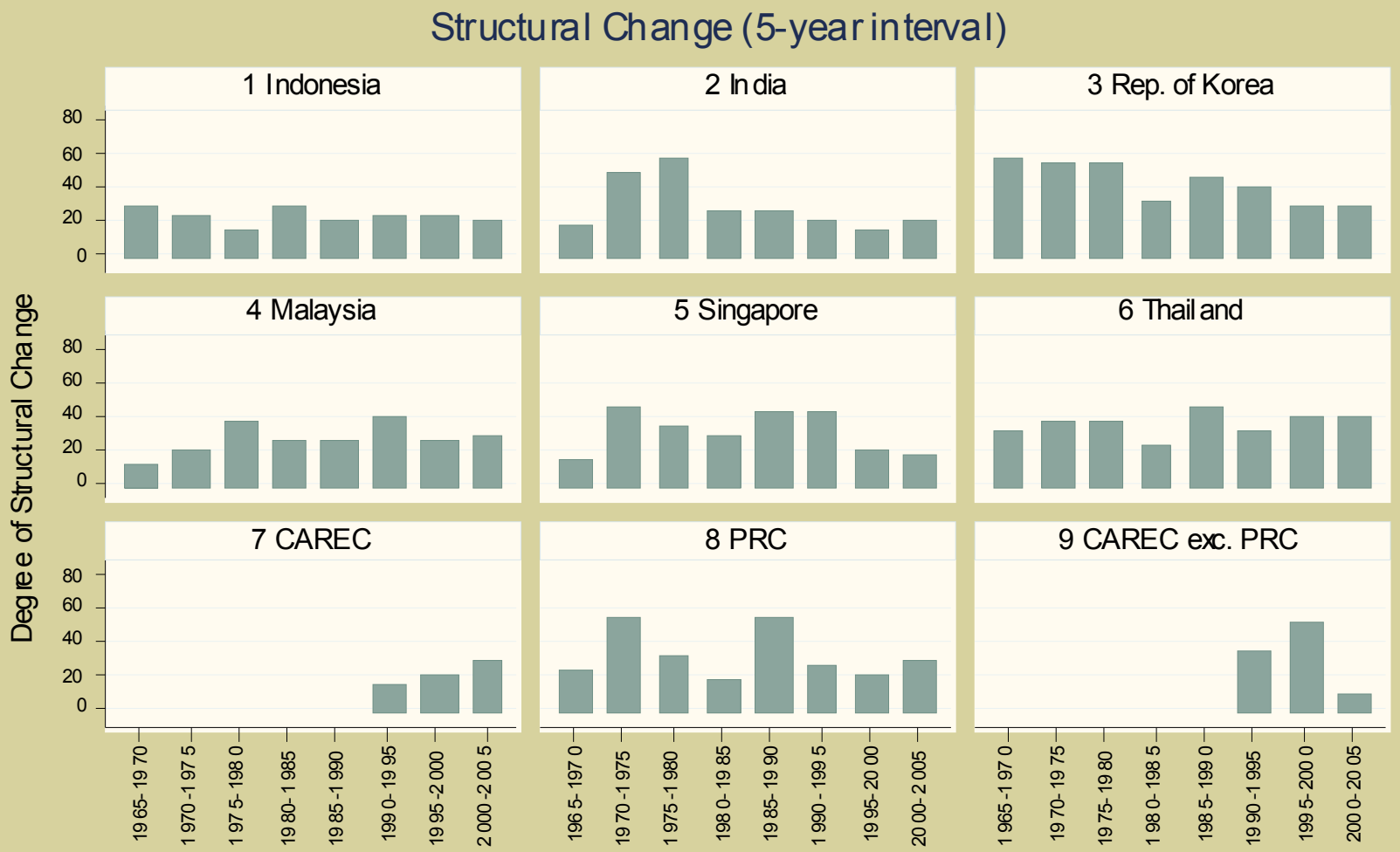
> "A growth miracle sustained for a period of decades ...must involve the continual introduction of new goods, not merely continual learning on a fixed set of goods" (Robert Lucas)

Structural change is about the transformation of the economy by:

- Transferring resources to higher productivity activities
- Upgrading production and exports to more sophisticated products
- Diversifying production

You Are What You Export!

Structural transformation
UNIDO Index



Note: Data for CAREC starts 1992.

Other Measures of Structural Transformation

- **DIVERSIFICATION**

  Number of commodities in which the country has revealed comparative advantage

- **SOPHISTICATION at the product level (PRODY)**

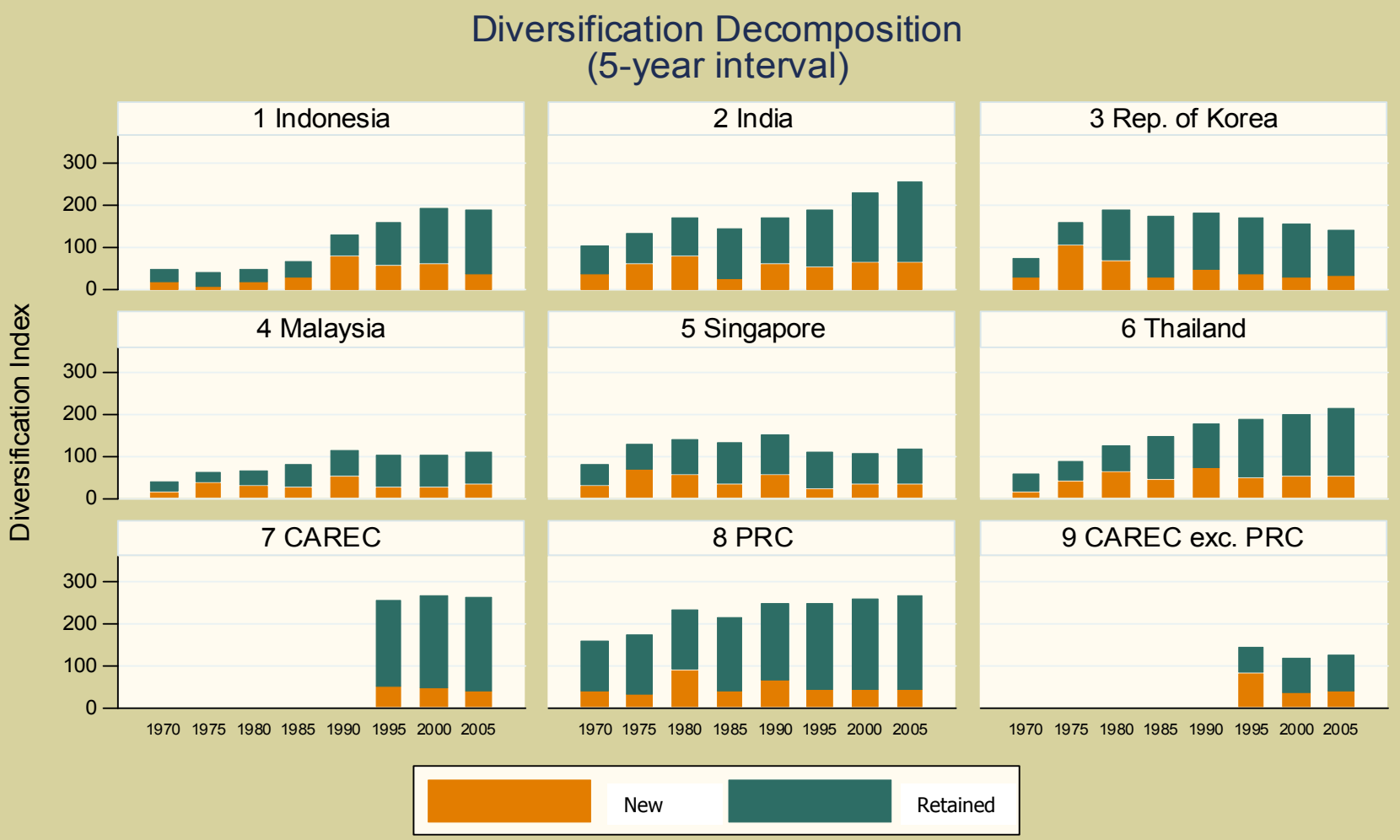
  Weighted average of the GDP per capita of all countries exporting the commodity

- **SOPHISTICATION at the country level (EXPY)**

  Weighted average of the sophistication of all commodities the country exports

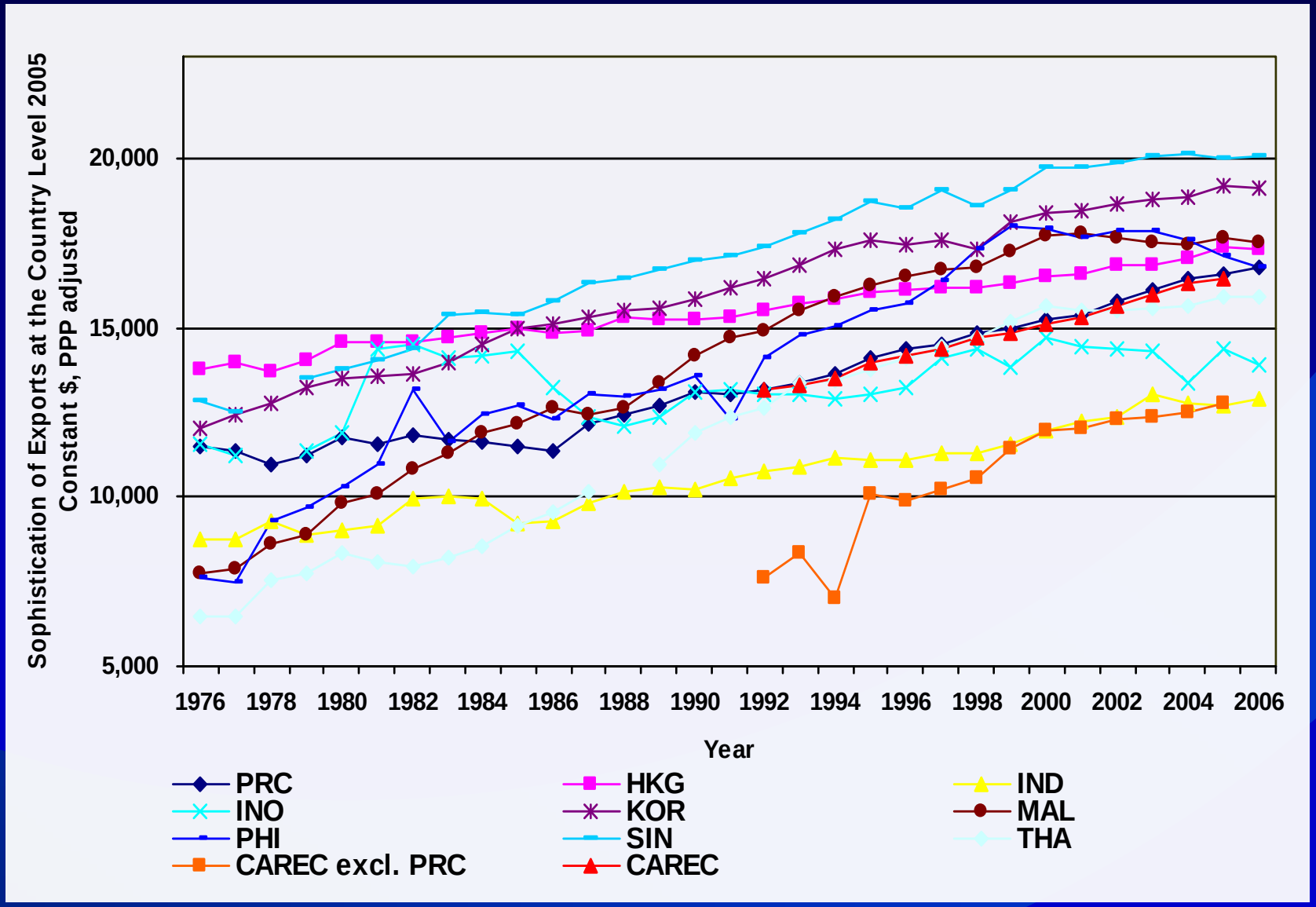
Diversification

New and retained exports with comparative advantage

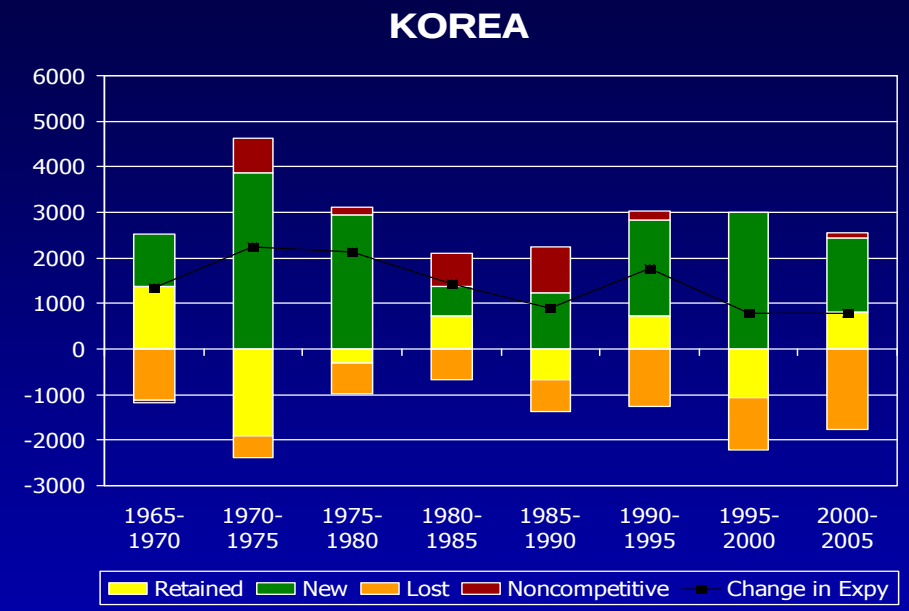


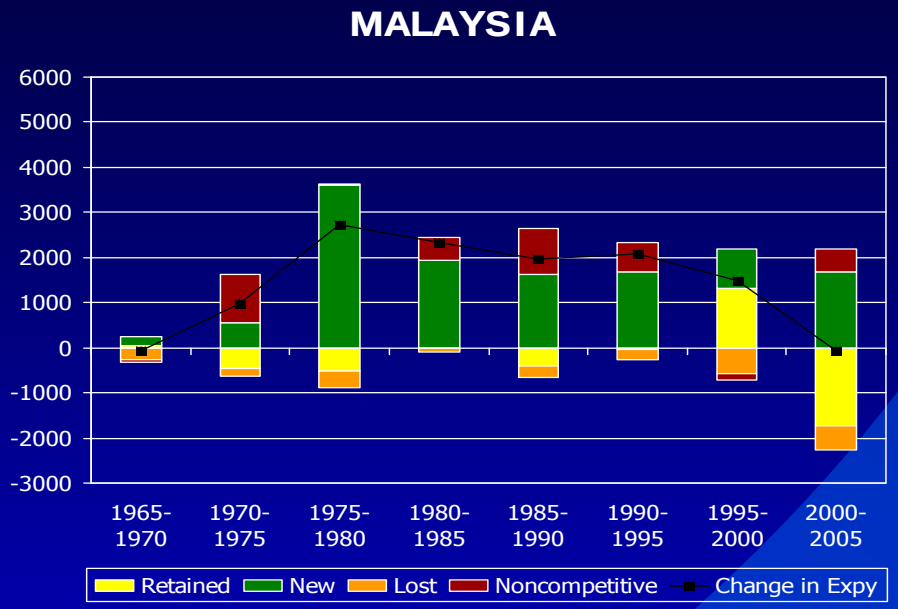
Note: Data for CAREC starts 1992.

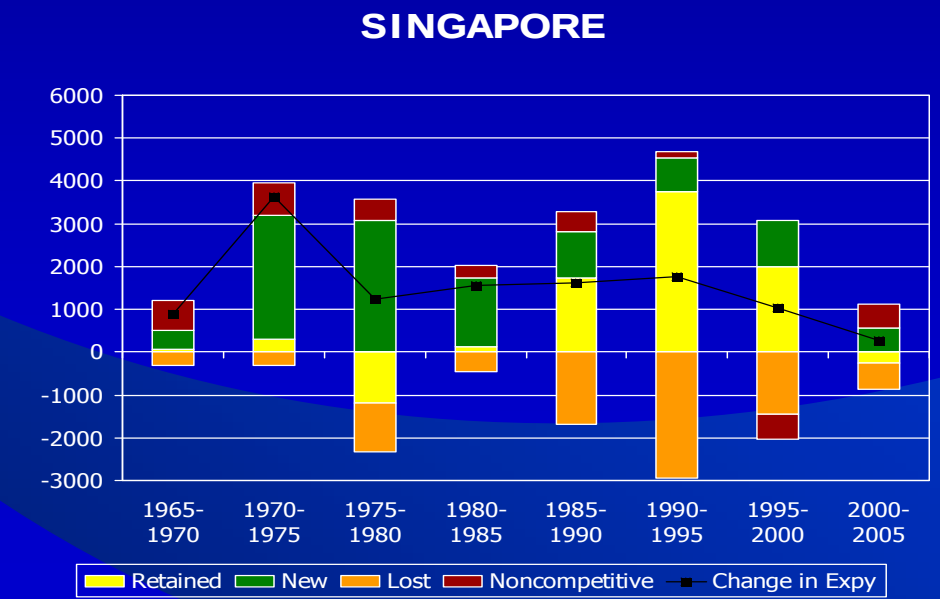
Export sophistication at the country level (EXPY)

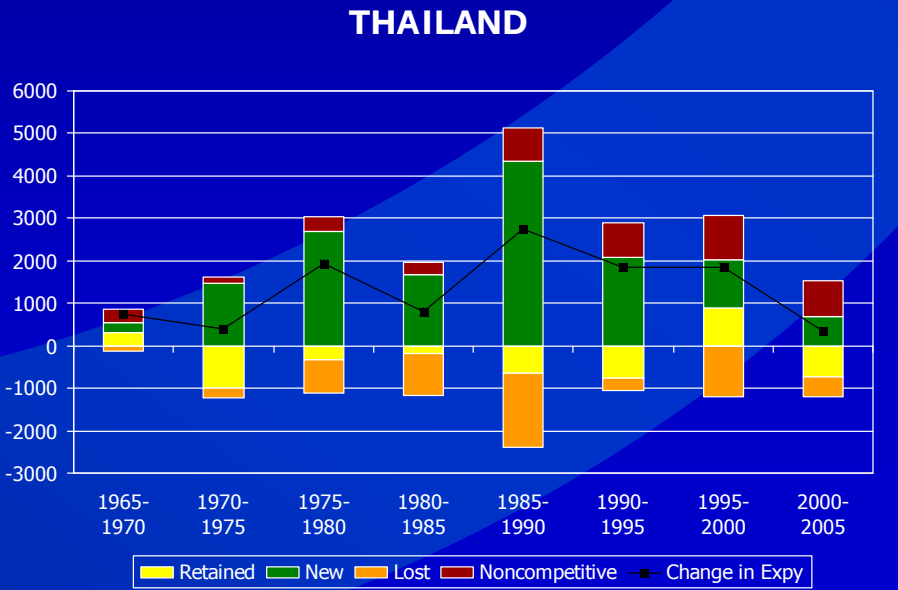


Decomposition of the change in export sophistication (Change in EXPY)









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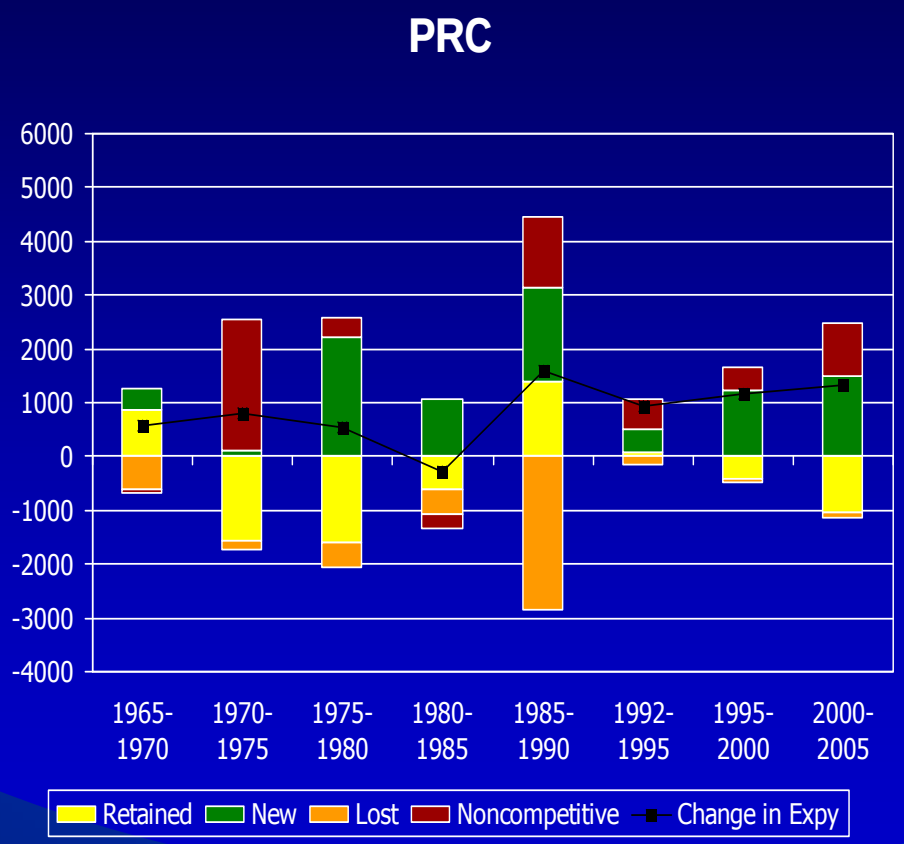
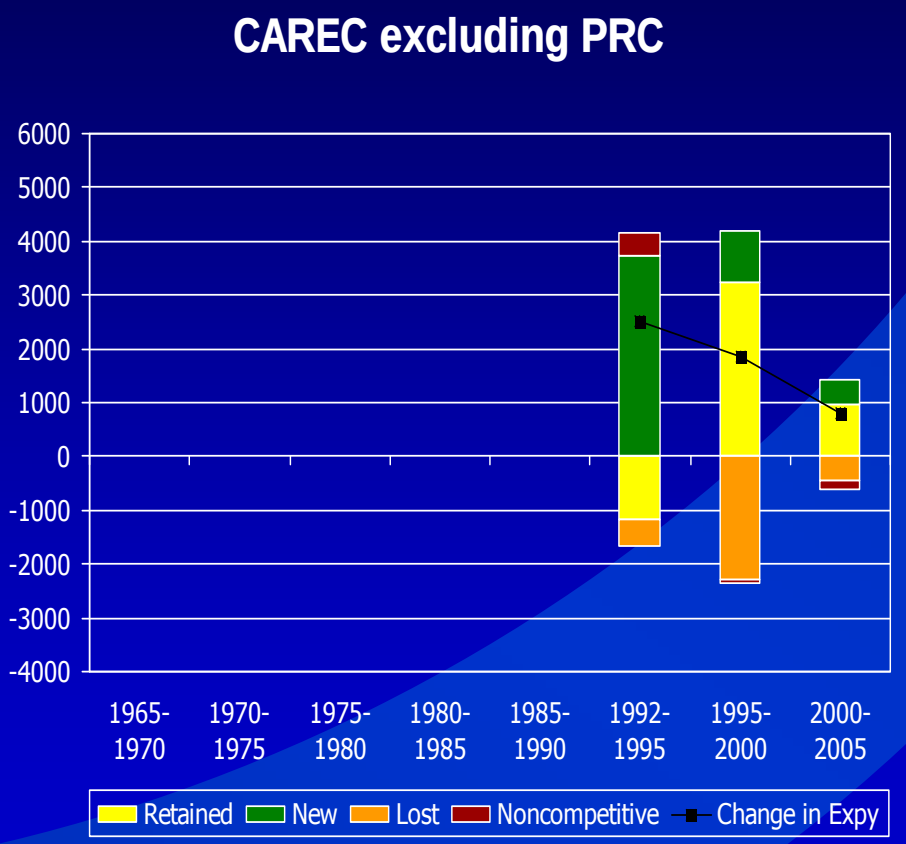




A look into the top exports of the region in 1992 and in 2005 reveals that ...

Sophistication	Share **1992**	**CAREC excluding PRC**
2,036	28.73	Raw cotton, excluding linters, not carded or combed
8,576	9.02	Fertilizers, nes
14,345	6.16	Crude petroleum and oils
8,215	4.38	Ferro-alloys
2,819	4.19	Fine animal hair, not carded or combed
	52.48	

Sophistication	Share **1992**	**PRC**
19,086	7.57	Children's toys, indoor games, etc
12,957	3.63	Travel goods, handbags etc
9,997	6.55	Footwear
8,522	2.39	Womens, girls, infants outerwear, textile
8,045	3.26	Outerwear knitted or crocheted
	23.4	

Sophistication	Share **2005**	**CAREC excluding PRC**
14,345	37.93	Crude petroleum and oils obtained from bituminous materials
8,215	4.29	Ferro-alloys
2,036	3.9	Raw cotton, excluding linters, not carded or combed
6,564	3.04	Copper and copper alloys, refined or not, unwrought
15,165	2.29	Petroleum gases, nes, in gaseous state
	51.45	

Sophistication	Share **2005**	**PRC**
21,053	3.26	Parts, nes of and accessories for apparatus falling in heading 76
20,505	4.91	Parts, nes of and accessories
19,438	4.45	Peripheral units, including control and adapting units
19,086	3.92	Children's toys, indoor games, etc
9,997	3.11	Footwear
	19.65	

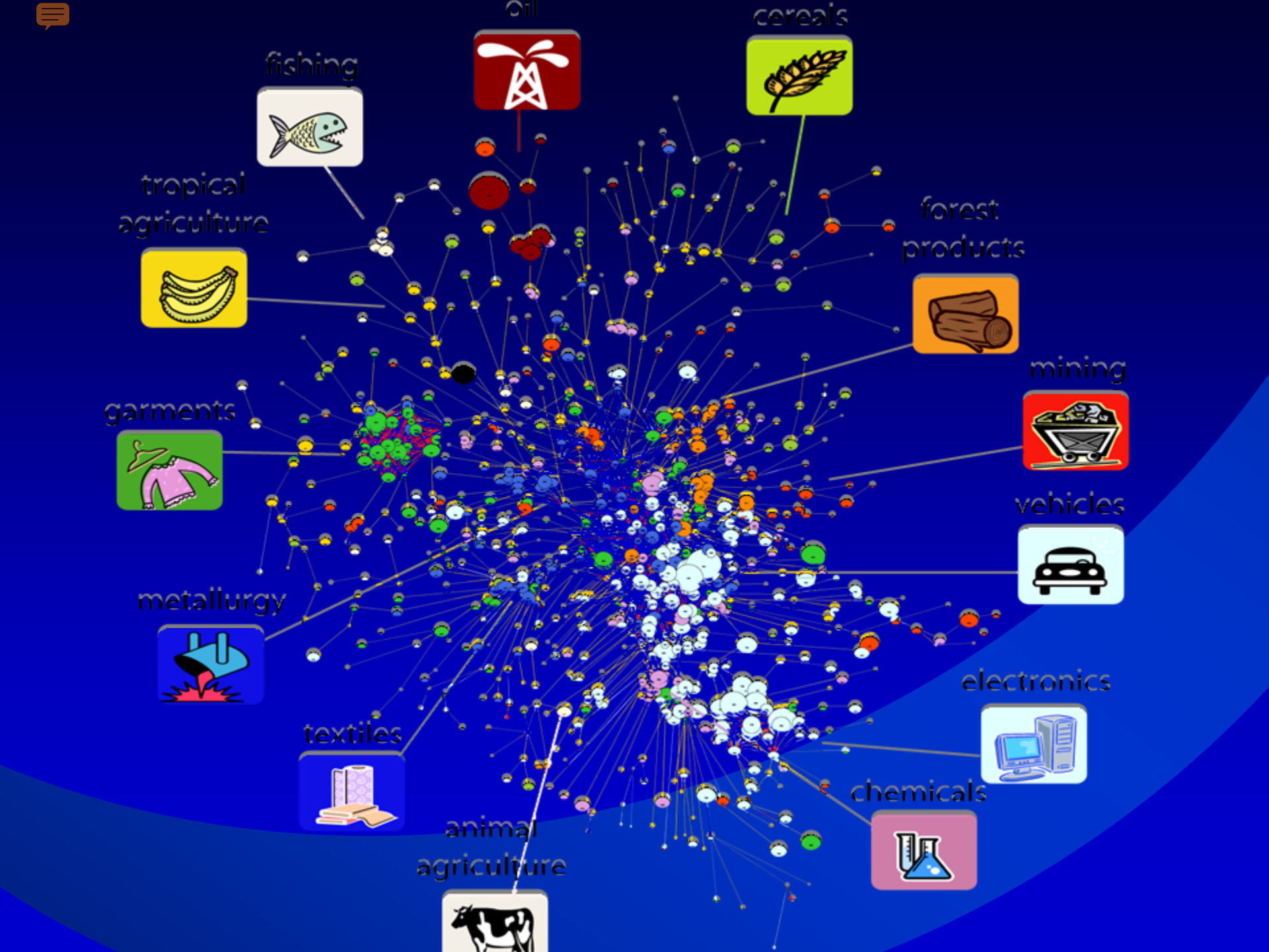
Observations

- Rich countries produce rich country goods (sophistication)
- Rich countries do not just produce more of the same, they produce different goods (diversification)
- Today's level of sophistication is a good predictor of future growth

Why have some countries diversified (to more sophisticated goods) but others have not?

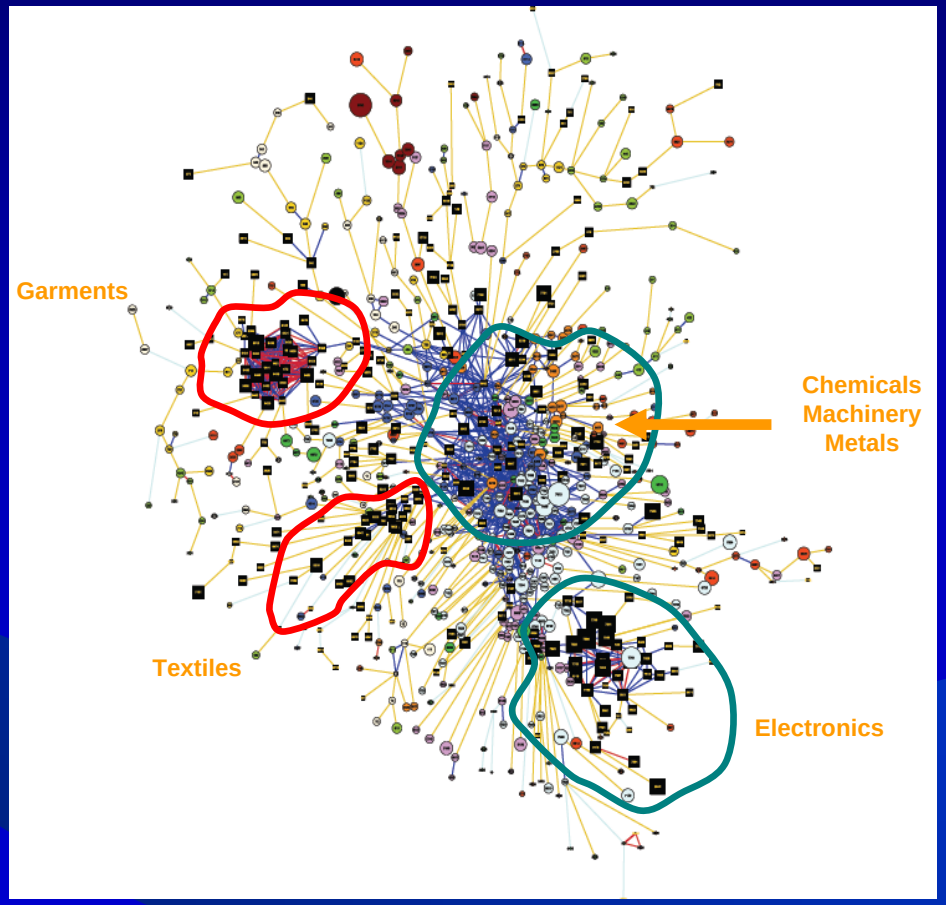
1. The country's existing export basket reflects it Capabilities
   - Each commodity uses a specific set of capabilities
   - Redeploying these factors/skills to the production of a new commodity is costly since they are specific
   - However, the specificity is relative: some products are relatively "near" each other because they use similar capabilities (Proximity)
2. The country could move to new sectors that utilize the existing capabilities

Moving to new sectors requires adaptation of existing capabilities!

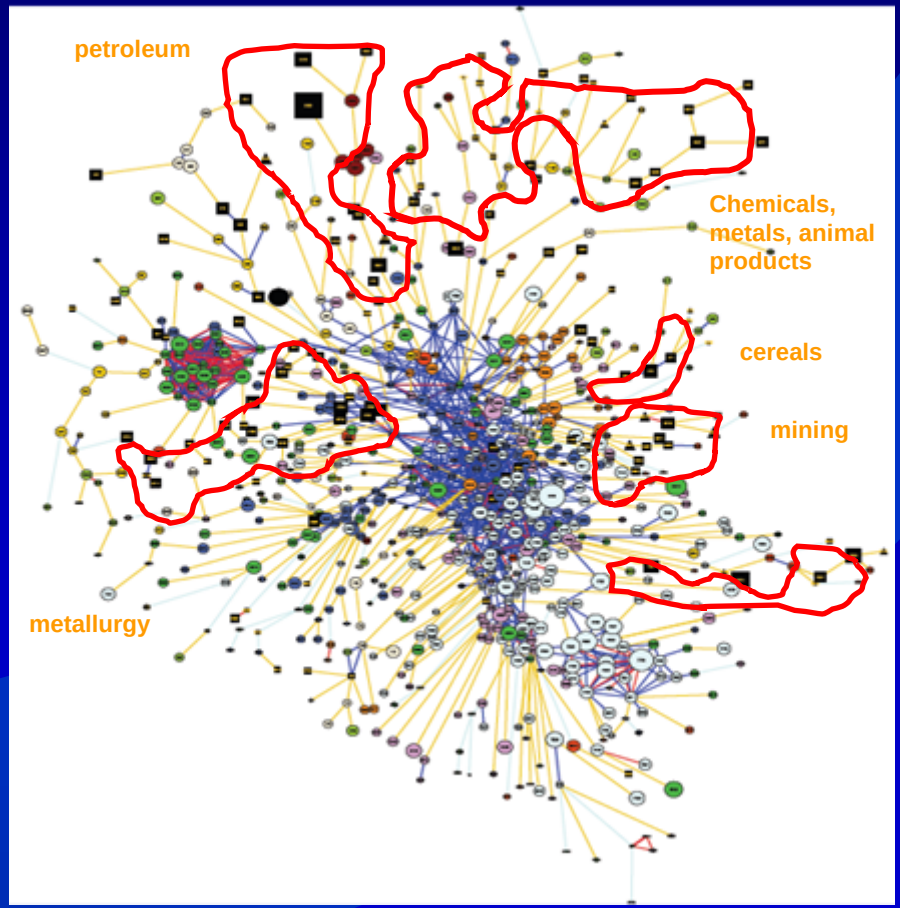

oil
cereals
fishing
tropical agriculture
forest products
mining
garments
vehicles
metallurgy
electronics
textiles
chemicals
animal agriculture

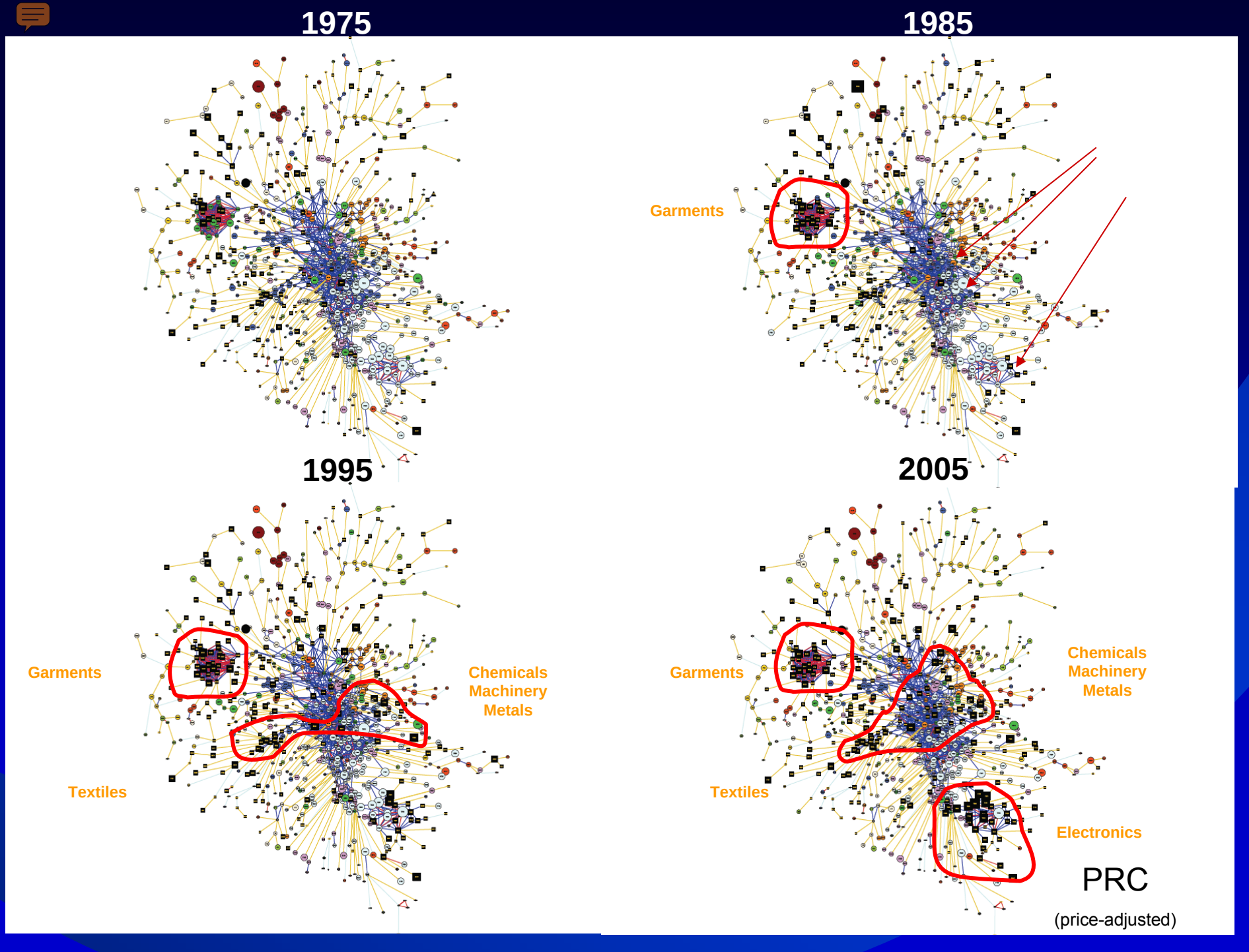
The PRC has comparative advantage in light industry, garments & textiles, electronics; CAREC excluding PRC has specialized in products in the periphery

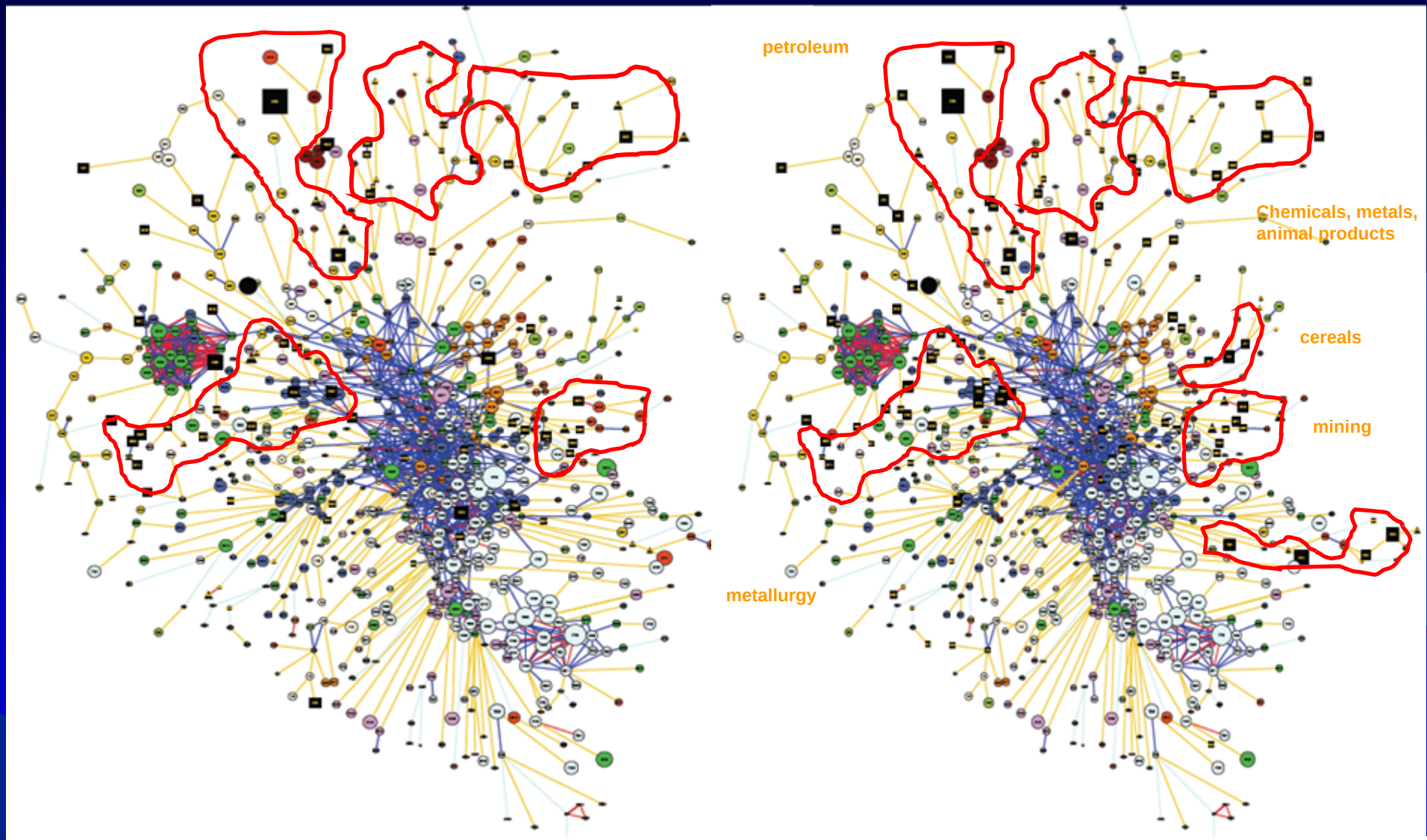
PRC, 2005



CAREC excluding PRC, 2005




1975
1985
Garments
1995
Garments
Chemicals
Machinery
Metals
Textiles
2005
Garments
Chemicals
Machinery
Metals
Textiles
Electronics
PRC
(price-adjusted)



CAREC excl. PRC

(price-adjusted)

Summing up: Growth and Structural Transformation

PRC

- Diversified export basket
- Increasing diversification
- Relatively high initial level of sophistication
- Sustained increase in the level of sophistication
- Products in the core

CAREC excluding PRC

- Concentration on few commodities
- Declining diversification
- Concentration on products with a low level of sophistication
- Deceleration in the rate of increase in sophistication
- Products in the periphery (dependence on natural resource)

The PRC has undergone deep transformation in the 1980s & in recent years; the rest of the region has not.

What steps could be taken next?

- Identify nearby products
- Identify products with the highest spill-over effect in terms of opening up further opportunities
- Conduct surveys of specific industries to identify binding constraints to new export activities
- Identify ways to ease these constraints
- Assess current policies for diversification
- Prepare trade dataset of Xinjiang Uygur Autonomous Region (PRC)

Thank you








Sophistication of a Product

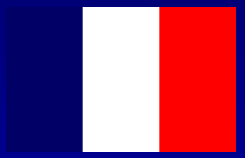
= $ 34k

PRODY

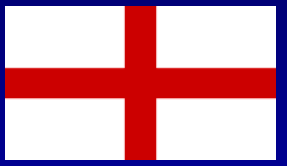
$ 44k

$ 30k

$ 32k



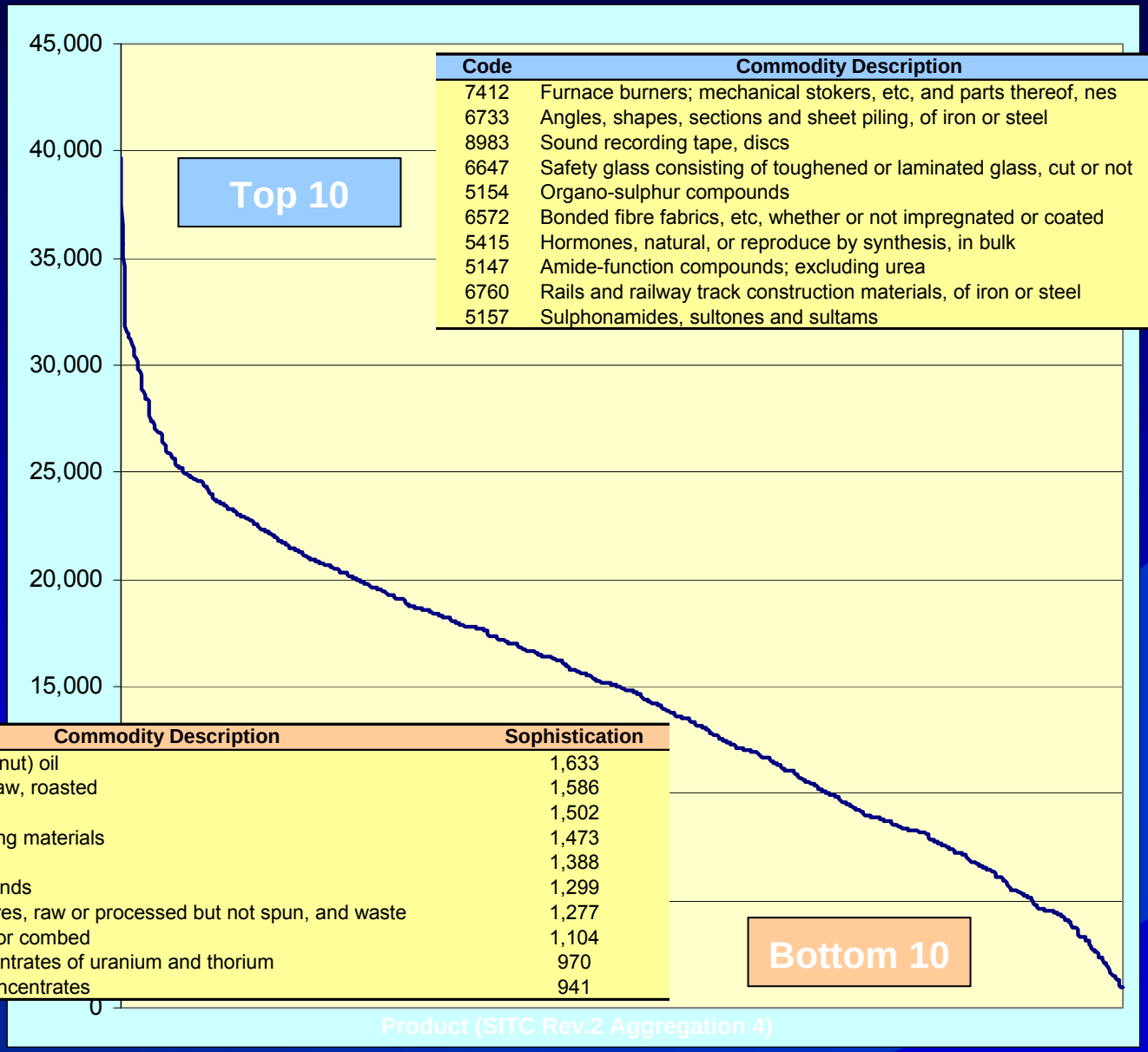
$ 31k



$ 32k

$$PRODY_{i,t} = \sum_{c} \left[\frac{\left(xval_{c,i,t} \Big/ \sum_{i} xval_{c,i,t} \right)}{\sum_{c} \left(xval_{c,i,t} \Big/ \sum_{i} xval_{c,i,t} \right)} \times GDPperCapita_{c,t} \right]$$

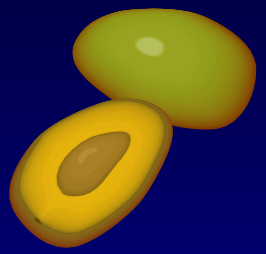
779 products ranked by the level of sophistication



Code	Commodity Description	Sophistication
7412	Furnace burners; mechanical stokers, etc, and parts thereof, nes	39,643
6733	Angles, shapes, sections and sheet piling, of iron or steel	35,634
8983	Sound recording tape, discs	33,886
6647	Safety glass consisting of toughened or laminated glass, cut or not	32,347
5154	Organo-sulphur compounds	31,527
6572	Bonded fibre fabrics, etc, whether or not impregnated or coated	31,413
5415	Hormones, natural, or reproduce by synthesis, in bulk	31,408
5147	Amide-function compounds; excluding urea	31,187
6760	Rails and railway track construction materials, of iron or steel	30,990
5157	Sulphonamides, sultones and sultams	30,608

Code	Commodity Description	Sophistication
4234	Groundnut (peanut) oil	1,633
721	Cocoa beans, raw, roasted	1,586
2632	Cotton linters	1,502
2923	Vegetable plaiting materials	1,473
2225	Sesame seeds	1,388
2771	Industrial diamonds	1,299
2654	Sisal, agave fibres, raw or processed but not spun, and waste	1,277
2634	Cotton, carded or combed	1,104
2860	Ores and concentrates of uranium and thorium	970
2876	Tin ores and concentrates	941

Sophistication at the Country Level



Export share:	50%	20%	30%
PRODY:	$9,000	$12,000	$25,000

EXPY (0.5)•9,000 + (0.2)•12,000 + (0.3)•25,000 = 14,400

$$EXPY_{c,t} = \sum_i \left(\frac{xval_{c,i,t}}{\sum_i xval_{c,i,t}} \times PRODY_{i,t} \right)$$

Revealed Comparative Advantage (RCA)

Export share in the country's export basket: 5%

Export share in the world's export basket: 2%

RCA=5/2>1

→ You have comparative advantage in the export of shirts

$$RCA_{c,i,t} = \frac{xval_{c,i,t} \Big/ \sum_{i} xval_{c,i,t}}{\sum_{c} xval_{c,i,t} \Big/ \sum_{i}\sum_{c} xval_{c,i,t}}$$

Capabilities

Producing asparaguses requires:

- a certain type of soil
- mechanized farming equipment
- agribusinesses firms that know the market, etc.,

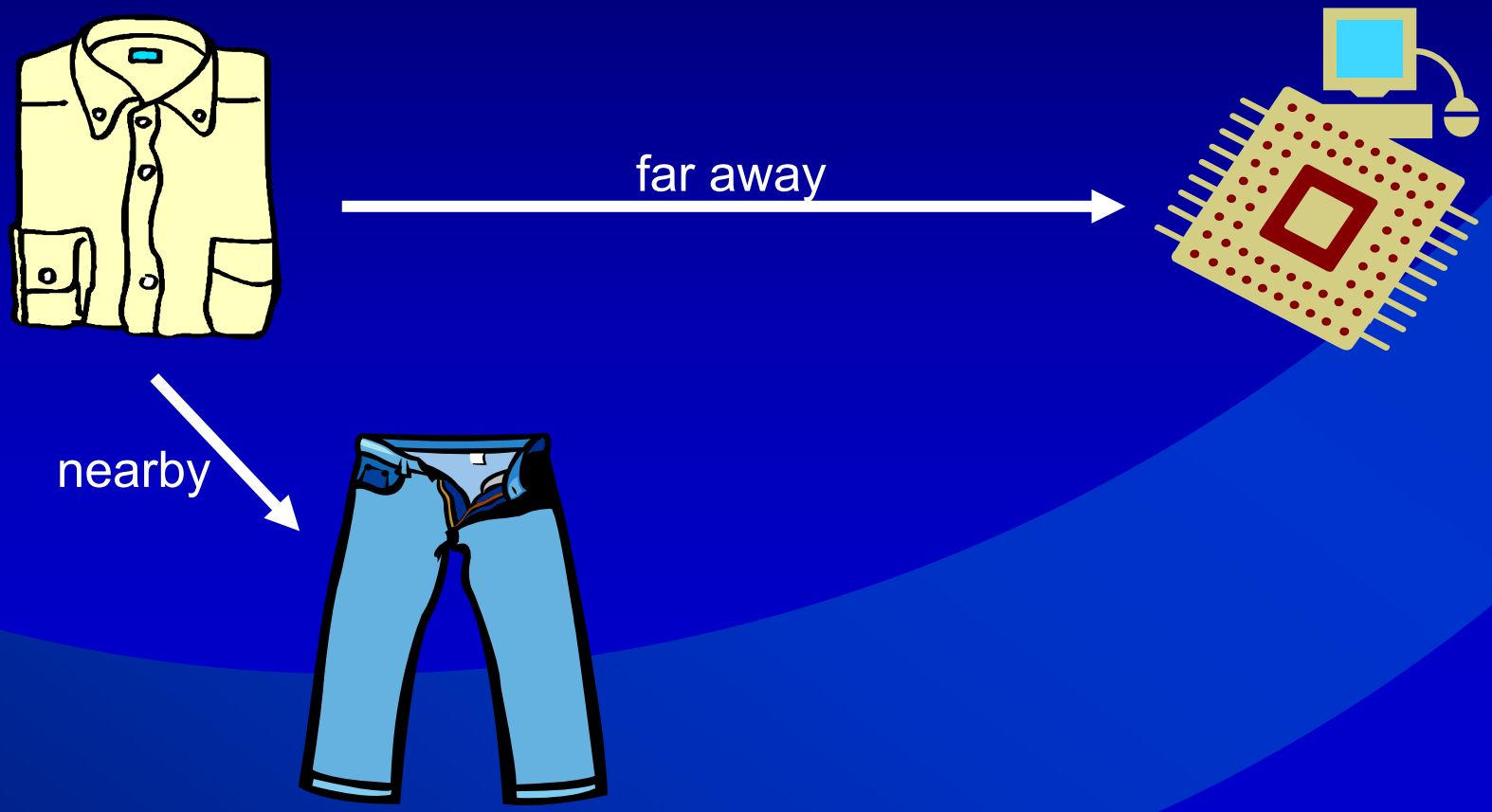
but also "public goods" such as:

- specific property rights
- port infrastructure
- road system
- cold-storage facilities
- phytosanitary regulations
- market access agreements, etc.

Proximity

Some pairs of products use similar factors (e.g., shirt and pants)

Others use totally different factors (e.g., shirt and CPU)



Product classification
(Based on the change in RCA)

	Base year (e.g. 1970)	Comparison year (e.g. 1985)
Newly competitive	RCA<1	RCA≥1
Still competitive	RCA≥1	RCA≥1
Lost competitiveness	RCA≥1	RCA<1
Non-competitive	RCA<1	RCA<1

No. of products with RCA≥1 (comparison yr) = No. of products with RCA ≥1 (base yr) − No. of products that lost competitiveness + No. of products that became newly competitive

Product that are still competitive