

# Research of International Competitiveness of Manufacturing in China and ASEAN

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# Introduction

- locked in the low end of the global value chains
- break through development dilemma, namely, how to build "an expanding space" of Chinese manufacturing industry vertical specialization on CAFTA (China-ASEAN Free Trade Area) platform
- open up a strategic path for "national value chain NVC → CAFTA-VC → Global Value Chain GVC"

# Reviews

- do not form a major breakthrough which just added their own visions to Porter's analysis model
- the methods of industrial international competitiveness are still imperfect
- industrial circumstance → production capacity → trade competitiveness → industry profit margins
- Factor Analysis Method

# The current situation of China and ASEAN Manufacturing

1. Structural Features: Industrial structure similarity coefficient

$$S_{ij} = (\sum X_{ik} X_{jk}) / \sqrt{(\sum X_{ik}^2 \sum X_{jk}^2)}$$

country	China- Indonesi a	China- Malaysia	China- Philippi nes	China- Singapor e	China- Thailand	China- Vietnam	China- Cambodia
similari ty coeffici ent	0.75	0.76	0.70	0.52	0.83	0.67	0.33

## Conclusion:

1. exists imbalance in the structure of manufacturing of ASEAN countries and caused three gradients

2. the structural similarity is higher, which means the competitive is greater than complementary.

Ohterwise, complementary is greater than copetitive

Country	Top five industries of manufacturing
China	Electronic and communication device, Steel Manufacture, Chemical industry, Food and Beverage, Mechanical industry
Singapore	Electronic and communication device, Medical industry, Mechanical industry, Transportation equipment, Chemical industry
Malaysia	Electronic and communication device, Chemical industry, Petroleum Coking, Food and Beverage, Rubber & Plastics
Indonesia	Food and Beverage, Chemical industry, Metal smelting, Tobacco Industry, Textile industry
Philippines	Electronic and communication device, Food and Beverage, Petroleum Coking, Petroleum Coking, Garment and shoes manufacturing industry
Thailand	Electronic and communication device, Food and Beverage, Textile industry, Transportation equipment, Chemical industry
Vietnam	Garment and shoes manufacturing industry, Food and Beverage, Transportation equipment, Nonmetallic, Metal product industry
Cambodia	Garment and shoes manufacturing industry, Food and Beverage, Textile industry, Rubber & Plastics, Wood processing
Laos	Clothing, Wood processing, Food and Beverage, Glass products, Tobacco Industry

2. Industry Level: Factor intensity (labor-intensive, capital-intensive, technology-intensive and so on)

$$\Pi_i = \left( \frac{X_i}{P_i} \right) / \left( \frac{X_t}{P_t} \right)$$

industrycountry	China	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Food and Beverage	1.21	0.88	0.95	1.09	0.45	0.79	1.87
Tobacco	10.86	1.69	1.71	2.85		7.99	3.77
Textile	0.56	0.52	0.46	0.30	0.27	0.76	0.95
Garment leather	0.42	0.32	0.27	0.19	0.25	0.44	0.28
Wood	0.65	0.51	0.45	0.12	0.26	0.51	0.63
Paper	0.89	2.24	0.66	0.51	0.44	1.54	1.07
Print	0.70	1.08	0.85	0.47	0.58	0.93	1.00
Petroleum Coking	2.61	1.62	43.95	94.96	4.96	11.01	2.75
Chemical	1.27	2.33	3.95	1.13	1.75	1.65	2.42
Rubber & Plastics	0.73	0.72	0.55	0.49	0.41	0.74	1.28
Nonmetallic	0.74	1.27	0.88	0.94	0.68	1.13	1.02
Base metals	2.04	2.58	1.15	1.53	1.16	1.38	3.34
Metal	0.78	0.77	0.62	0.41	0.39	0.93	1.33
Standard machinery	0.86	0.99	1.00	1.04	0.55	1.05	0.90
Electrical machinery and equipment	0.99	1.28	0.73	0.56	0.69	1.03	1.52
Electronic and communication device	1.22	1.21	0.99	1.56	1.30	1.62	2.40
Instrumentation	0.85	0.55	0.76	0.17	1.18	0.61	0.72
Transportation equipment	1.14	4.67	1.06	2.67	0.50	1.30	1.95
Furniture	0.52	0.32	0.39	0.24	6.90	0.52	0.59



3. Labor Productivity: productivity is the essence of industrial competitiveness

$$pr_i = \frac{x_i}{p_i}$$

Relative labor productivity:

$$rlp_{ij} = (pr_{ij} - pr_{im}) / \sigma_i$$

industrycountry	China	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Food and Beverage	0.00	-0.68	0.29	0.32	1.91	-0.81	-1.03
Tobacco	1.85	-0.76	-0.34	0.01		0.16	-0.92
Textile	-0.13	-0.52	0.16	-0.39	2.14	-0.35	-0.91
Garment leather	-0.09	-0.48	-0.07	-0.38	2.20	-0.04	-0.78
Wood	0.14	-0.42	0.23	-0.07	2.08	-0.48	-0.85
Paper	-0.29	0.34	-0.13	-0.50	2.03	-0.31	-1.14
Print	-0.34	-0.34	0.16	-0.38	2.18	-0.48	-0.79
Petroleum Coking	-0.65	-0.68	0.68	1.95	-0.03	-0.58	-0.07
Chemical	-0.50	-0.44	0.67	-0.43	2.01	-0.58	-0.73
Rubber & Plastics	-0.16	-0.47	-0.02	-0.22	-2.19	-0.52	-0.81
Nonmetallic	-0.42	-0.37	0.00	-0.05	2.18	-0.49	-0.84
Base metals	-0.14	-0.29	-0.23	-0.11	2.19	-0.64	-0.79
Metal	-0.13	-0.47	0.11	-0.38	2.16	-0.43	-0.87
Standard machinery	-0.35	-0.54	0.25	0.14	2.05	-0.57	-0.98
Electrical machinery and equipment	-0.21	-0.32	-0.11	-0.35	2.22	-0.48	-0.74
Electronic and communication device	-0.35	-0.50	-0.24	-0.03	2.22	-0.45	-0.66
Instrumentation	-0.26	-0.43	-0.13	-0.47	2.25	-0.42	-0.52
Transportation equipment	-0.61	-0.75	-0.23	1.25	1.02	-0.90	-1.26
Furniture	-0.37	-0.39	-0.36	-0.38	2.27	-0.38	-0.39

#### 4. Revealed Comparative Advantage Index

$$RCA_i = \frac{X_i / TX_i}{X_w / TX_w}$$

industry	China	Singapore	Malaysia	Indonesia	Philippines	Thailand	Vietnam
Food	0.40	0.23	1.29	1.98	0.78	1.71	2.35
Fuel minerals	0.11	0.90	0.82	1.72	0.11	0.31	0.73
Metal	0.96	0.21	0.38	0.32	0.10	0.36	0.30
Pharmaceutical chemicals	0.52	0.87	0.50	0.41	0.21	0.76	0.17
Electronic data processing equipment	3.82	2.04	2.66	0.24	4.40	2.58	0.99
Communication Equipment	3.13	0.71	1.37	0.69	0.45	1.09	0.50
Integrated circuits, electronics	1.32	6.73	3.88	0.17	8.01	1.50	0.13
Vehicle products	0.26	0.12	0.07	0.22	0.39	1.31	0.11
Textile	3.09	0.12	0.41	1.43	0.16	1.15	2.46
Clothing	3.72	0.11	0.67	1.68	1.17	0.93	7.14

### Conclusion:

1. export structure of manufacturing in China and ASEAN countries are quiet similar
2. on the whole, the exports of China and ASEAN are quiet competitive, but still remain some complementary industry

5. Revealed Competitive Advantage Index (RCA index after the deduction of the import factor)

$$CA_i = \frac{X_i / TX_i}{X_{wi} / TX_w} - \frac{I_i / TI_i}{I_{wi} / TI_w}$$

industrycountry	China	Singapore	Malaysia	Indonesia	Philippines	Thailand	Vietnam
Food	-0.21	-0.14	0.32	0.92	-0.47	1.08	1.36
Fuel minerals	-0.81	-0.55	0.23	0.51	-0.81	-0.79	0.11
Metal	0.27	-0.23	-0.78	-1.49	-0.58	-1.86	-2.51
Pharmaceutical chemicals	-0.49	0.36	-0.25	-0.59	0.01	-0.20	-0.98
Electronic data processing equipment	2.62	0.67	1.27	-0.36	2.63	1.45	0.23
Communication Equipment	2.34	-0.23	0.37	-0.34	0.00	0.27	-0.75
Integrated circuits, electr onics	-3.01	1.67	-1.74	-0.30	2.25	-0.56	-0.32
Vehicle products	-0.30	-0.03	-0.37	-0.47	-0.13	0.67	-0.44
Textile	2.28	-0.05	0.00	-0.31	-0.41	0.27	-2.15
Clothing	3.64	-0.12	0.58	1.48	1.08	0.82	6.93

## Conclusion:

1. by comparing the index
2. the industry type

# Analyze the international competitiveness of manufacturing in China and ASEAN

Target layer	Secondary target layer	Specific target layer
International competitiveness of manufacturing industries	Competitiveness of industrial environment	foreign direct investment share of GDP (X1)
		the share of R&D staff (X2)
		the share of R&D expenditure (X3)
		higher education enrollment (X4)
		domestic bank lending share of GDP (X5)
		domestic total savings share of GDP (X6)
		Logistics Performance Index (X7)
		road density (X8)
		the share of Internet users (X9)
	Competitiveness of production	fixed assets formation share of GDP (X10)
		manufacturing value added share of GDP (X11)
		capital formation rate (X12)
		overall labor productivity (X13)
		labor productivity contains cost (X14)
	Trade competitiveness	trade competition index (X15)
		(X16)
		international market share (X17)
		unit export costs (minus) (X18)
		the share of export to (X19)
		the share of high-tech product exports (X20)
	Profits competitiveness	manufacturing value added rate (X21)
		every enterprise value added within manufacturing (X22)

Results of the evaluation:

1. The level of the international competitiveness is clearly divided into three grades.

2. The first grade of Chinese and Singapore's manufacturing competitiveness is rising substantially

3. The second grade can be divided according to the size of three layers

4. On third grade, Cambodia and Myanmar manufacturing have a strong international competitiveness



# Conclusions and recommendations

- Increasing R&D investment, promote technology level and innovation technology intensive industries.
- To build China-ASEAN regional co-product specialization chain will locate the value chain of nodes.
- To optimize the division of environment, create vertical specialization environment
- To cultivate big enterprise and form scale economy.

Thank you!