



Regional Impacts of China-US Trade Frictions in China

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Expressions in this report are the author's view, and are not related to the institution which the author is attached



Outline

- **Research Background**
- **Methodology and Data**
- **Preliminary Results**
- **Conclusions**



Background

■ China-US Trade Frictions with Great Uncertainty

(1) More trade frictions since 2018

(2) The trend of deglobalization

(3) The huge shock caused by COVID-19 pandemic

- World Bank 《Global Economic Perspectives (2020) 》 :
The baseline forecast envisions a 5.2 percent contraction in global GDP in 2020—the deepest global recession in eight decades, despite unprecedented policy support.



The Process of US Imposing Tariff on China

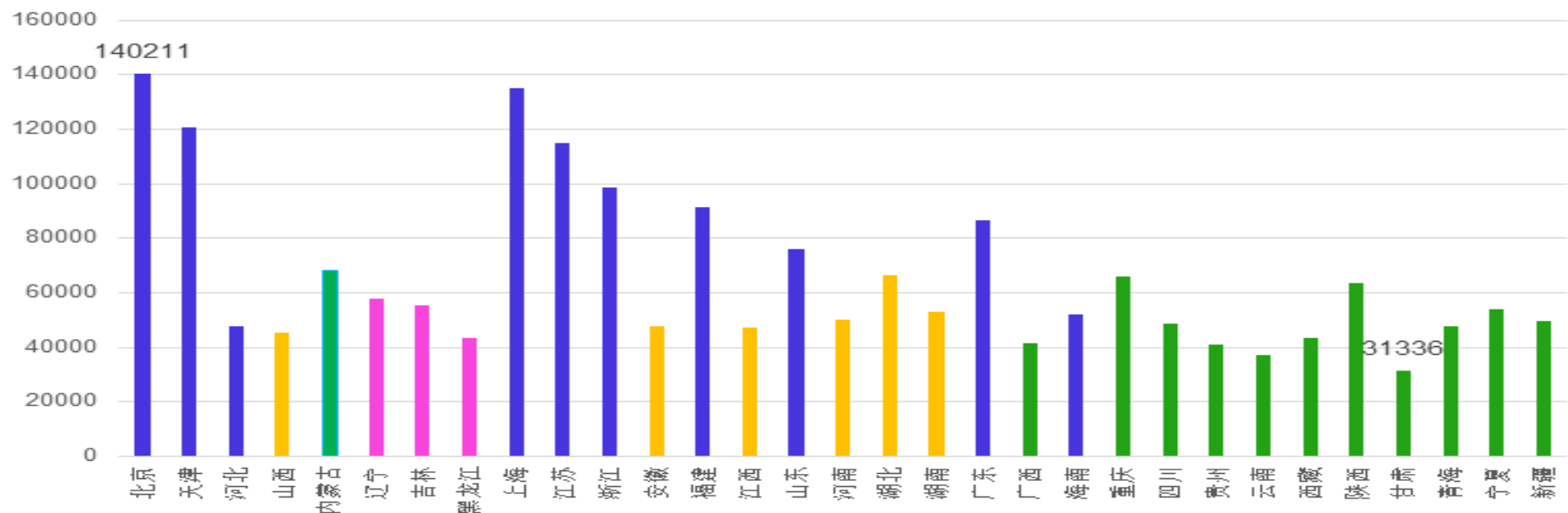
Tariff List		Starting Time	Product Categories	Tariff Rate	
The 1st Round	\$50 billion tariff list	\$34 billion	July 6, 2018	818	25%
		\$16 billion	August 23, 2018	284	25%
The 2nd Round	\$200 billion tariff list		September 24, 2018	6031	10%
The 3rd Round	\$200 billion tariff list		May 10, 2019	6031	25%
The 4th Round	\$300 billion tariff list	Part 1	September 1, 2019	3229	10% (up to 15%)
		Part 2 (unenforced)	December 15, 2019	564	10% (up to 15%)

Data sources: Based on the website of the office of the United States Trade Representative (USTR).



Region as a vital part influenced by China-US Trade Frictions

- China is a large developing country with huge population and tremendous size of territory, the natural endowments, economic and social conditions of various regions differ greatly
- Different regions are completely different in direct trade patterns and participation of global value chains
- The China-US trade friction not only affects Chinese economic growth, but also affects the spatial economic layout



Provincial per capita GDP (Yuan, 2019)



Participation in Regional Value Chains : Trade Patterns

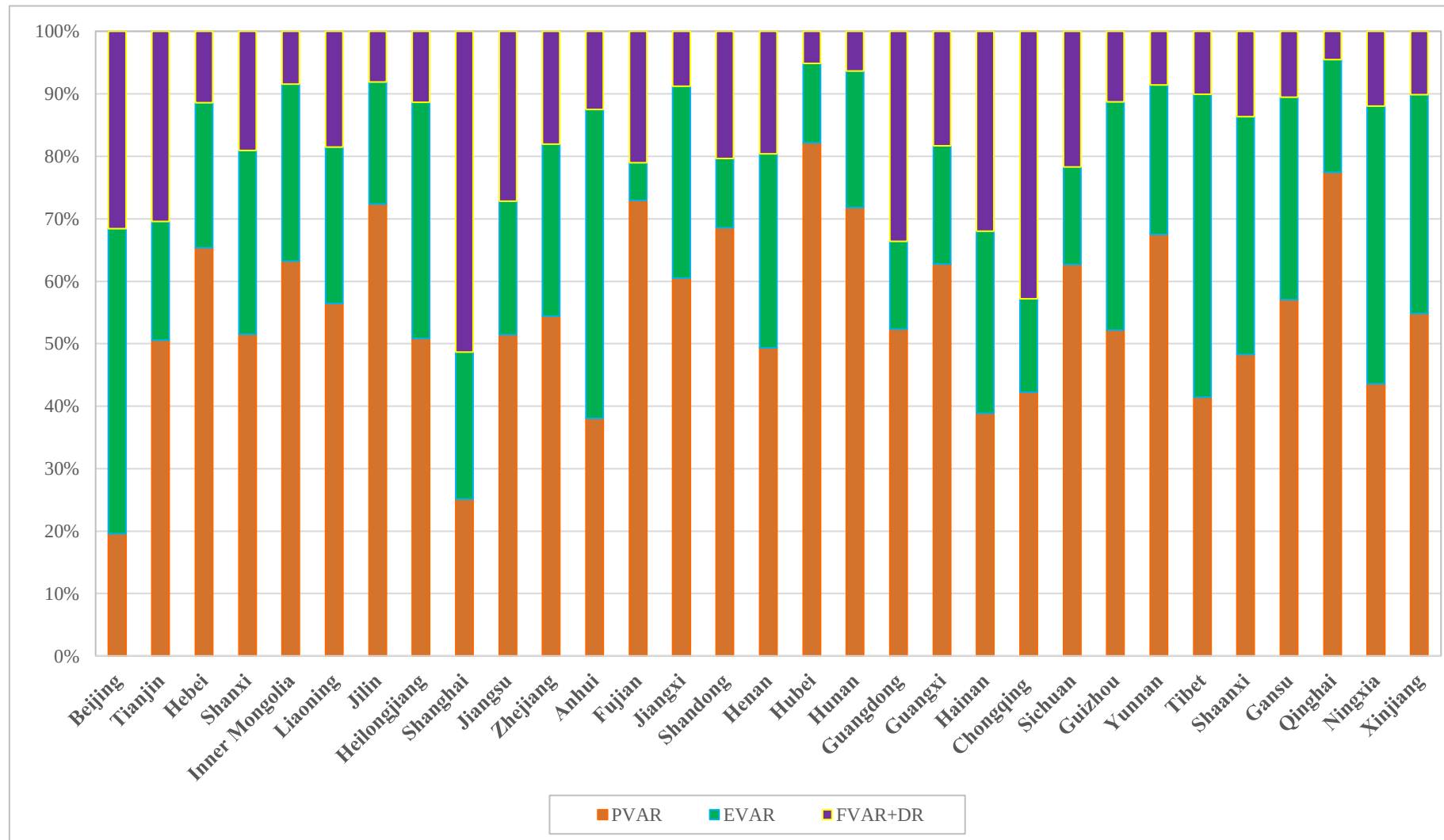
■ Main Destinations of Chinese Provincial Exports in Goods (2018)

Origins	Main Destinations	Exports (\$ Million)	Share of main Destination export in total export	Total exports of goods (\$ Million)	Share of this provincial export in national exports
Guangdong	US	112139	17%	646592	30%
Jiangsu	US	92987	23%	404008	19%
Zhejiang	EU	69686	22%	321138	15%
Shanghai	US	47508	23%	207157	10%
Shandong	US	28990	18%	160124	7%
Fujian	US	24264	21%	115549	5%
Beijing	EU	6340	9%	74090	3%
Henan	US	19834	37%	53777	2%
Chongqing	US	15095	29%	51354	2%
Sichuan	US	13187	26%	50395	2%

Source: China's General Administration of Customs



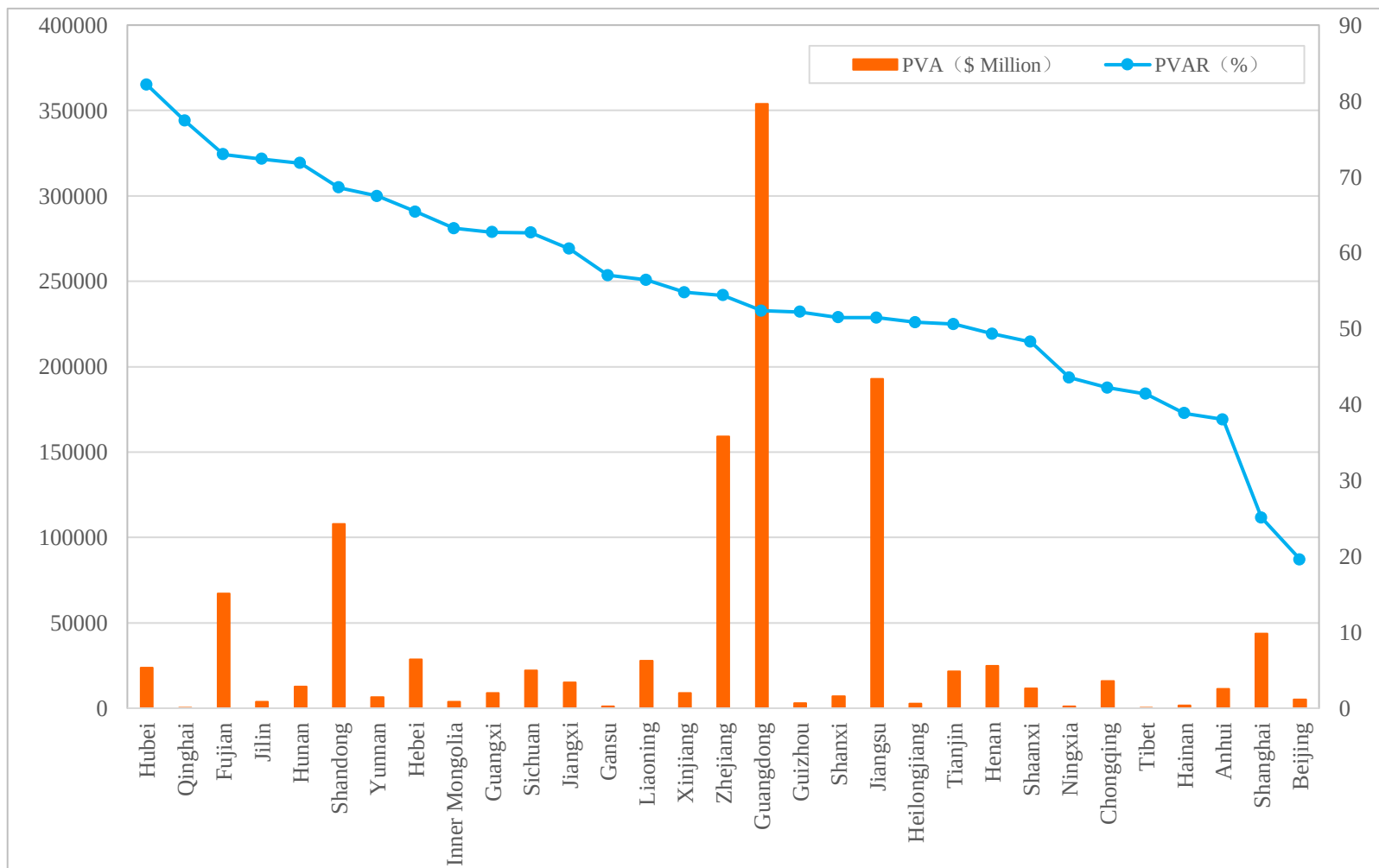
Participation in GVC



The Composition of Provincial Export (2017 , %)



Provincial Value-added in Exports

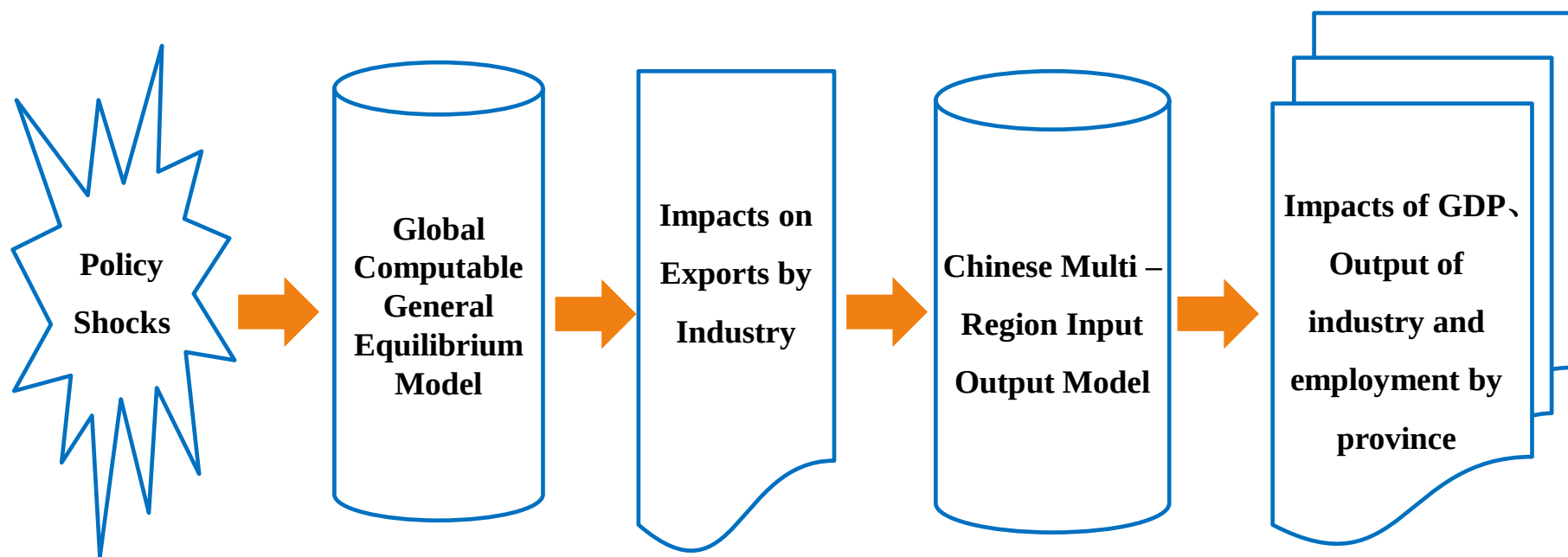


Provincial Value-added in Exports and Ratios (2017)



Methodology and Data

Framework





Methodology and Data

(1) Envisage Model: World Bank

- Global Computable General Equilibrium Model
- The model includes 19 countries and regions
- The model includes 24 sectors of each economy (1 agricultural sector, 21 industrial sectors, 1 construction sector and 1 service sector)

(2) Chinese Multi-Regional Input-Output Model

- Value-added Ratio : 2012
- Leontief Inverse Matrix: 2012
- Export Vector: 2017

(3) Soft Linkage

CGE Simulation Results → Multi-Regional Input-Output Model



Estimations: Impacts on Provincial Export and GDP

(1) Impacts on Provincial Export at Sectoral Level

$$\Delta e = re \cdot e$$

re – relative impact of China-US trade conflicts on Chinese exports;

e – volume of exports;

(2) Impacts on Provincial Value-added in Export at Sectoral Level

$$\Delta v = \widehat{fv} \cdot L \cdot \Delta e$$

$\widehat{fv}$ – diagonal matrix of value added rate;

L – Leontief inverse (the total requirements matrix);



Estimations: Impacts on Provincial Export and GDP

(3) Impacts on Value-added in Export of Province s

$$\Delta v^{s,\cdot} = \theta \cdot \Delta v$$

θ – the summation operator;

(4) Relative Impacts on Provincial GDP

$$rv^{s,\cdot} = \Delta v^{s,\cdot} / g^s$$

g^s – GDP of province s ;



Estimations: Impacts on Provincial Employment

(1) Impacts on Provincial Employment at Sectoral Level

$$\Delta em = \hat{f} \cdot L \cdot \Delta e$$

$\hat{f}$ – the diagonal matrix of employment intensity f (ratio of employment over total output);

L – Leontief inverse (the total requirements matrix);

Δe – change in exports;



Estimations: Impacts on Provincial Employment

(2) Impacts on Employment of Province s

$$\Delta em^{s,\cdot} = \theta \cdot \Delta em$$

θ – the summation operator;

(3) Relative Impacts on Provincial Employment

$$rem^{s,\cdot} = \Delta em^{s,\cdot} / em^s$$

em^s – total employment of province s ;



Value chain division of labor makes the inter-regional economic connections closer

- Value chain division of labor makes the inter-regional economic connections closer, while the driving forces more complicated.
- From the perspective of demand, economic growth of a province is driven not only by their own consumption, investment, and exports, but also by the consumption, investment, and exports of other provinces. In other words, the consumption, investment, and exports of each province will drive the economic growth of other provinces.
- The total economic growth effects of a province driven by export come from two sources: the direct effects from the province's own export; and the indirect effects from the export demand of other provinces, using goods and services produced by this province.

	Consumption	Investment	Exports
Province itself	direct	direct	direct
Other provinces	indirect	indirect	indirect



Scenarios Design

Scenario 1:

Since July 2018, US has imposed additional 25% tariffs on Chinese \$50 billion and \$200 billion exports to the United States.

Scenario 2:

On Sep 1st, 2019, an additional 10% tariff was imposed \$300 billion goods exported to the United States.

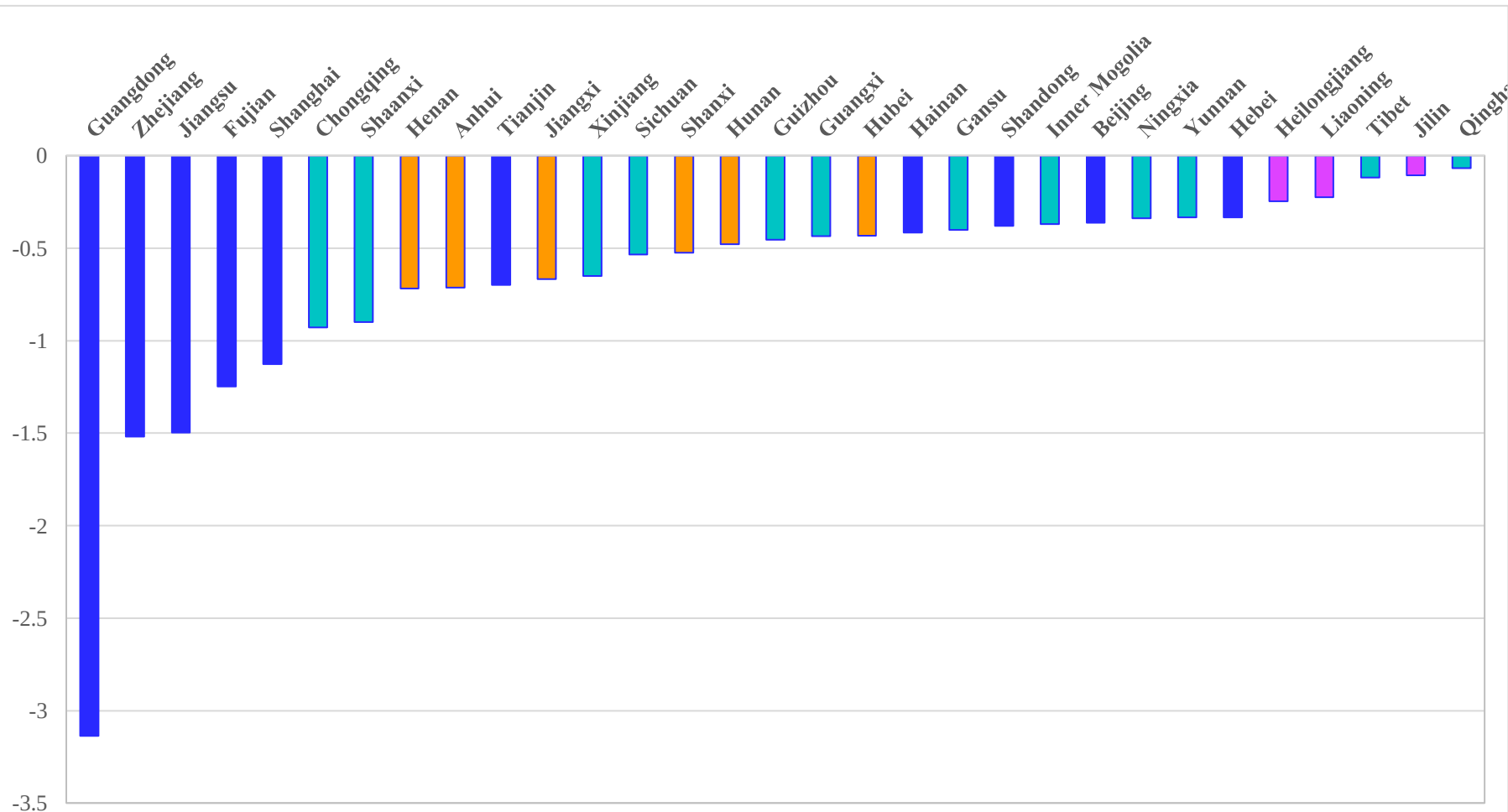
Scenario 3:

An additional 25% tariff will be imposed on the list of \$550 billion goods exported to the United States. (**Scenario 1+ Scenario 2**)



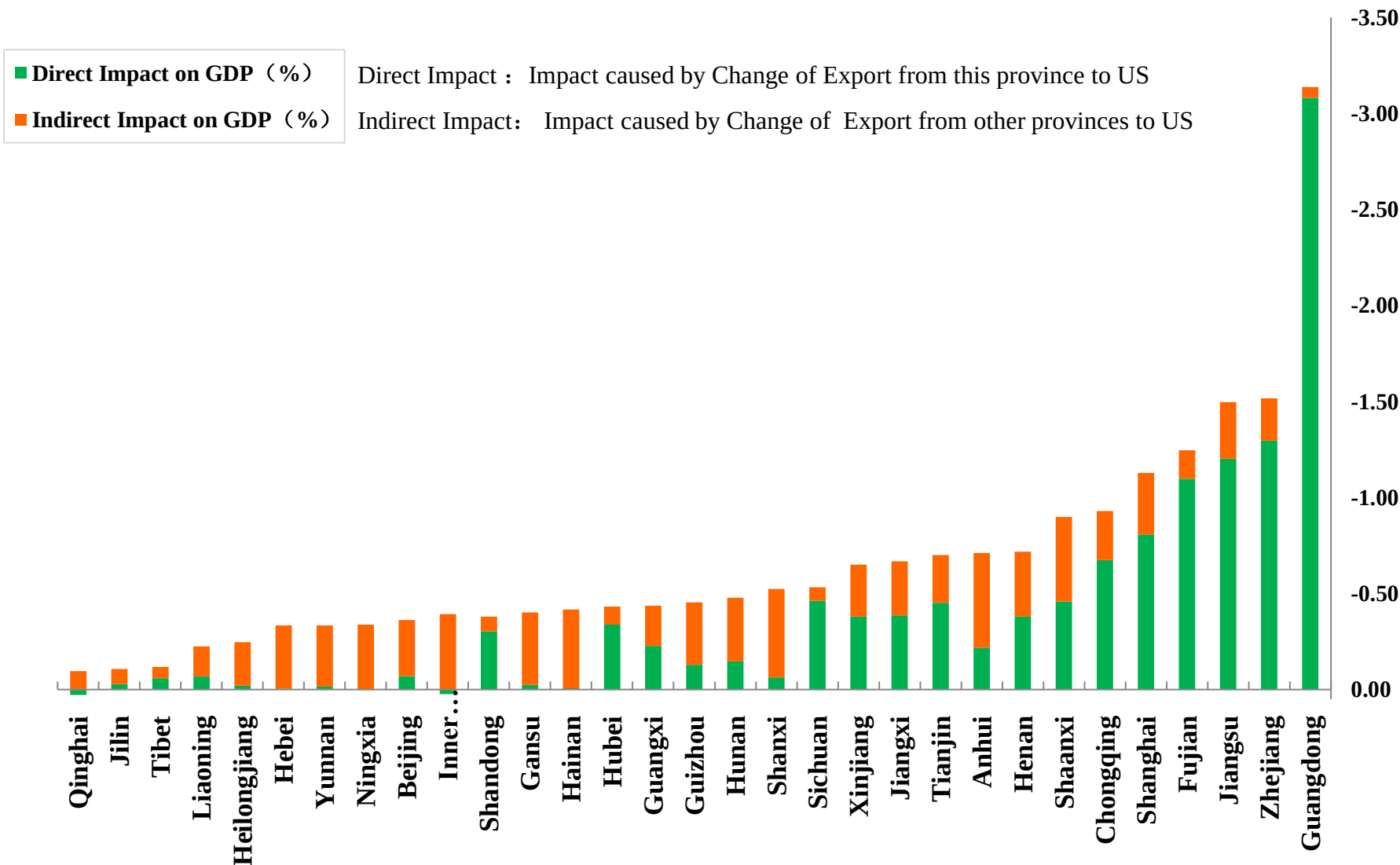
Regional Impacts on Macroeconomy

Impacts on Provincial GDP (% , S3)



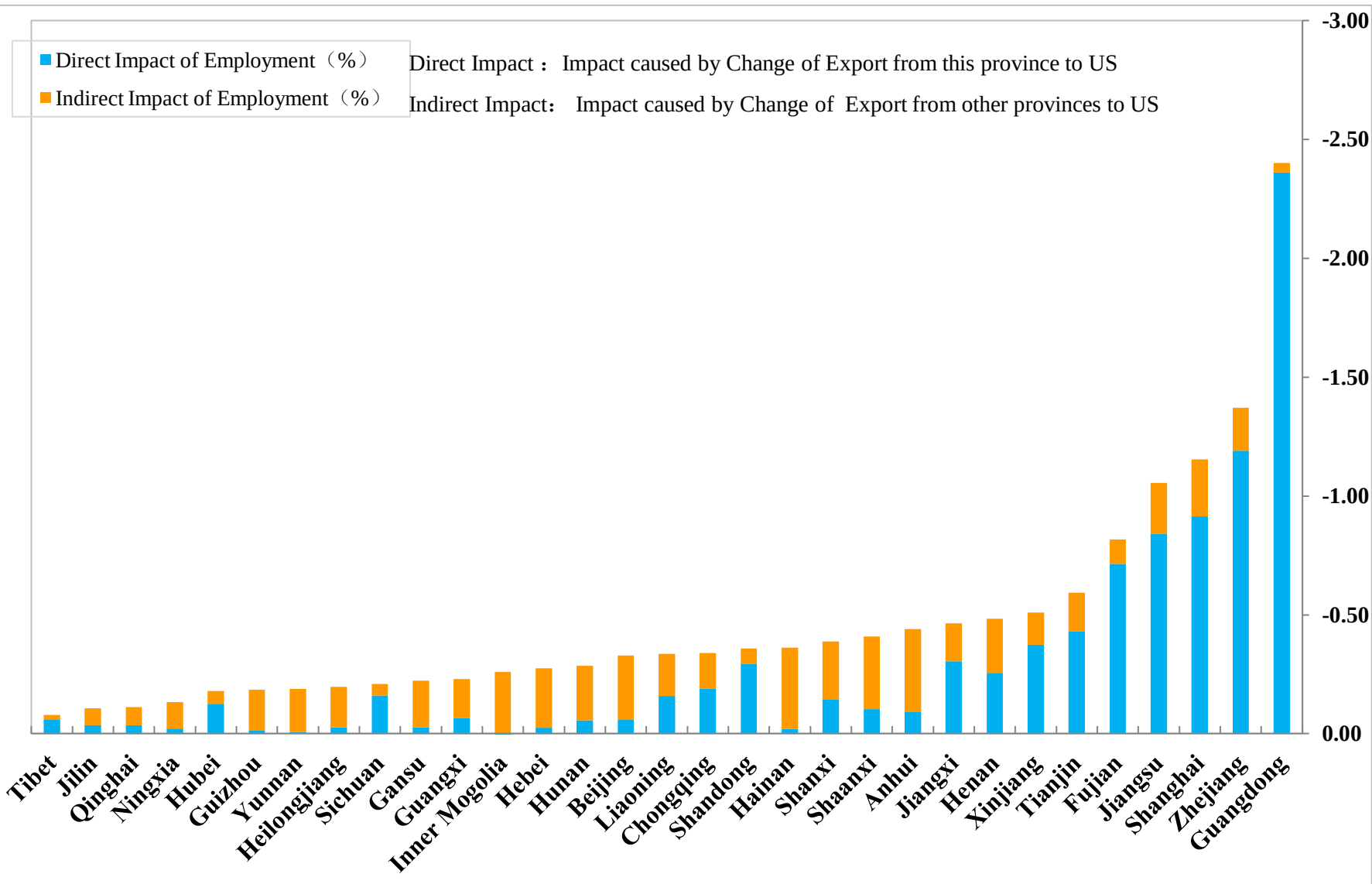


Impact on provincial GDP — Direct and Indirect Impacts



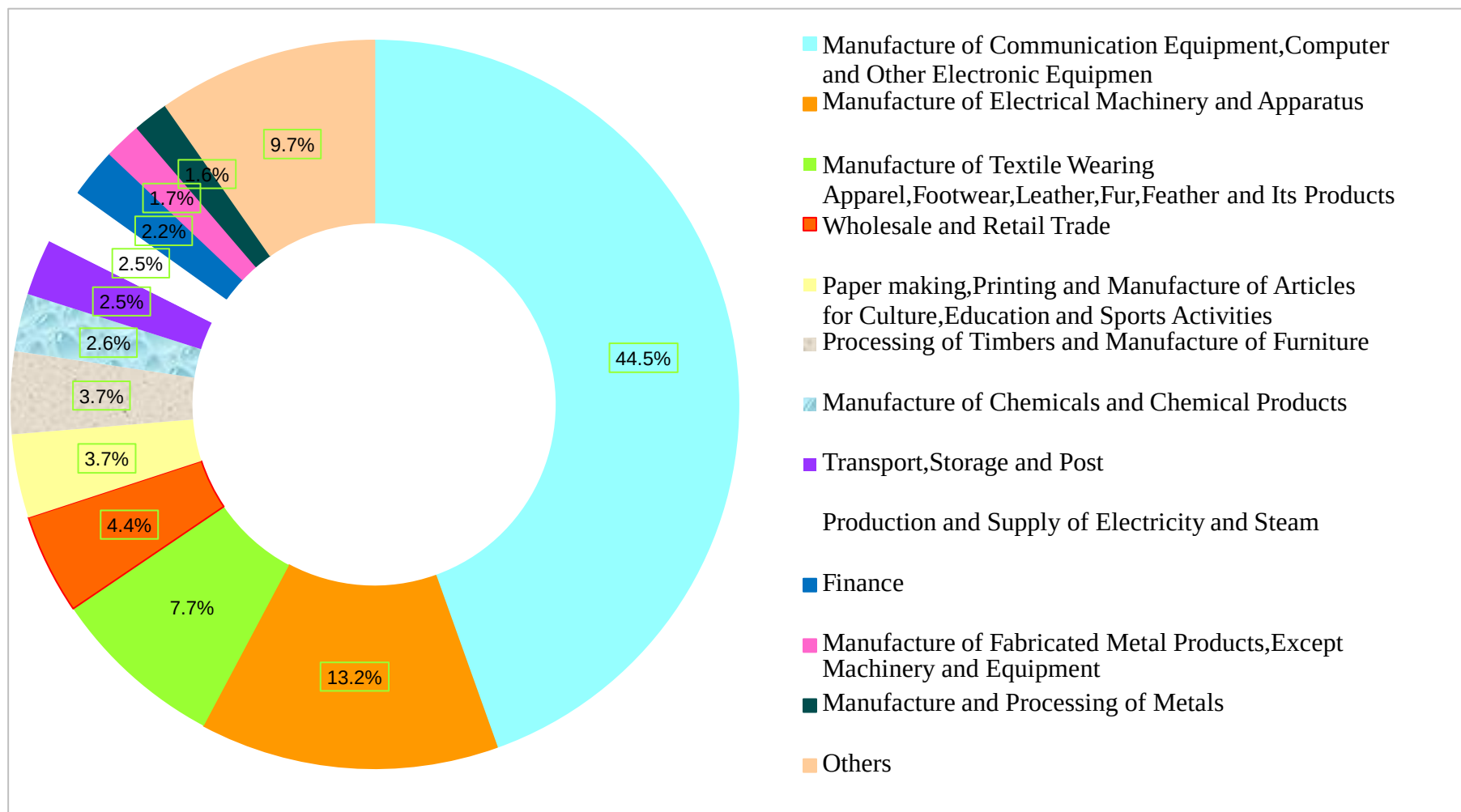


Impact on provincial Employment



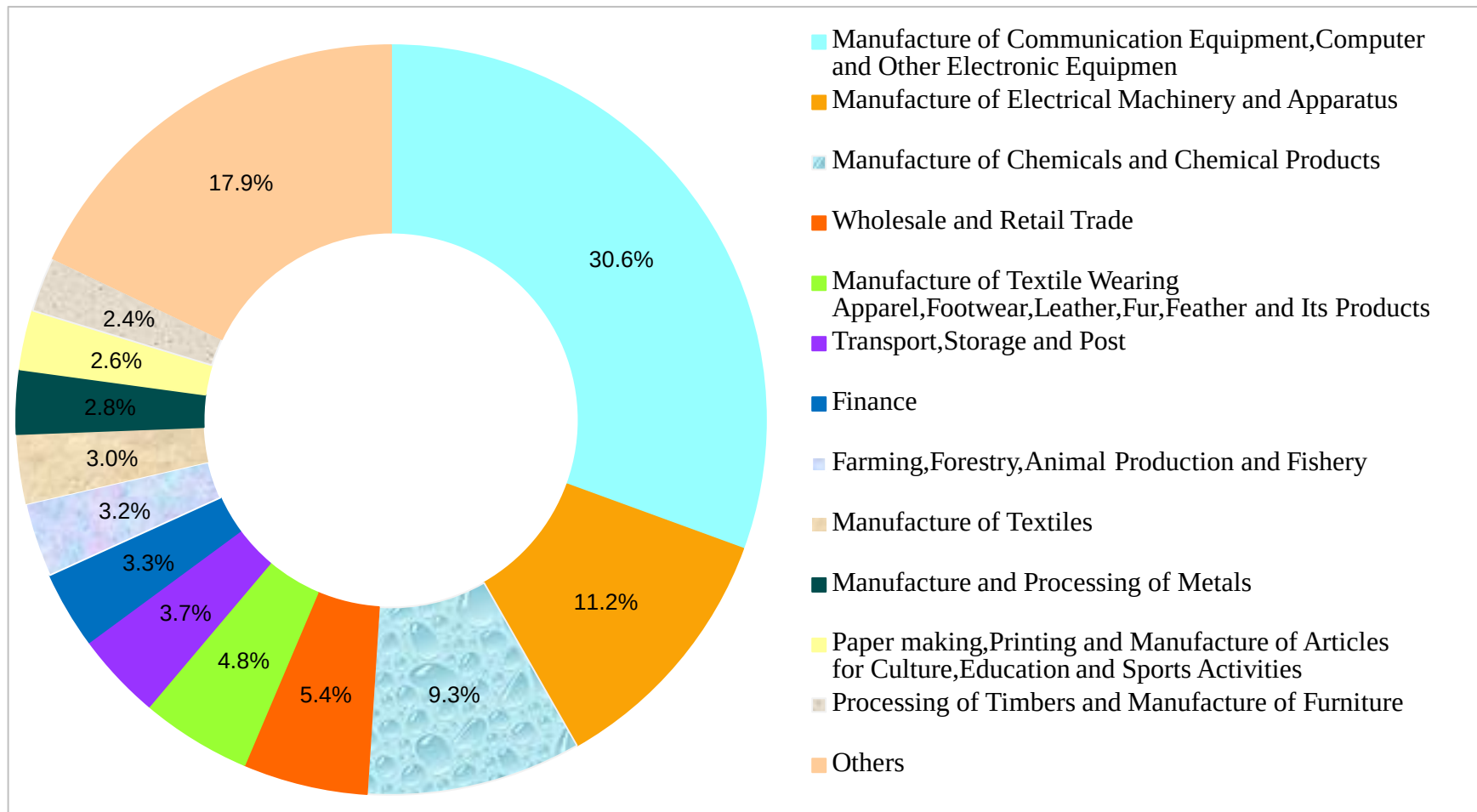


Sectoral Impact in Guangdong Province (S3)



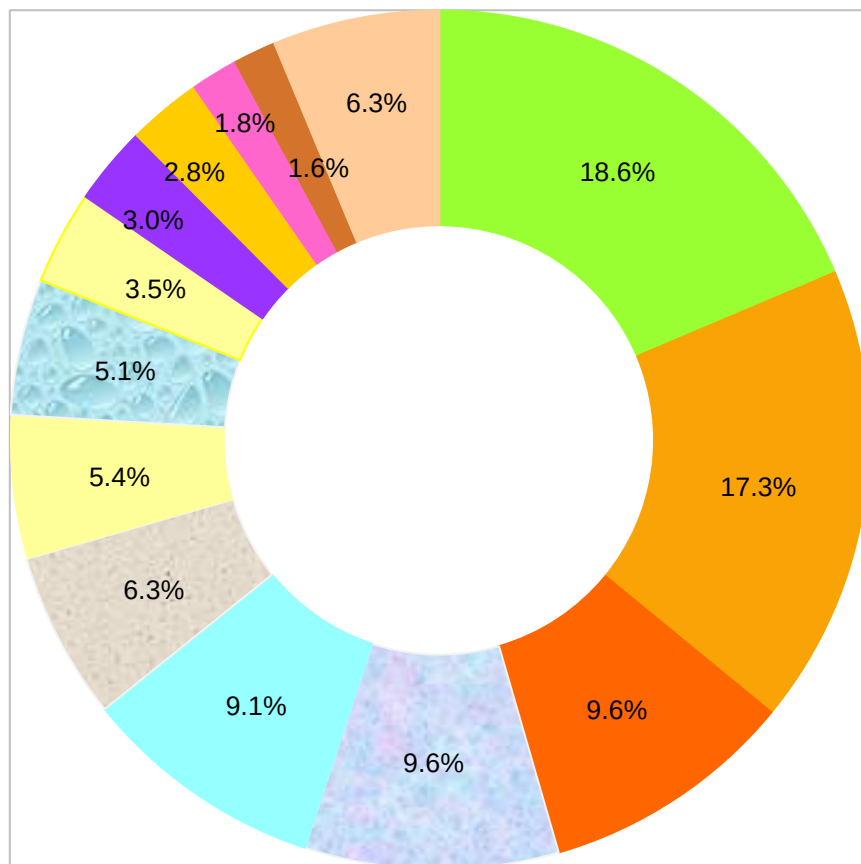


Sectoral Impact in Jiangsu Province (S3)





Sectoral Impact in Zhejiang Province (S3)



- Manufacture of Textile Wearing Apparel, Footwear, Leather, Fur, Feather and Its Products
- Manufacture of Electrical Machinery and Apparatus
- Wholesale and Retail Trade
- Farming, Forestry, Animal Production and Fishery
- Manufacture of Communication Equipment, Computer and Other Electronic Equipmen
- Processing of Timbers and Manufacture of Furniture
- Manufacture of Textiles
- Manufacture of Chemicals and Chemical Products
- Paper making, Printing and Manufacture of Articles for Culture, Education and Sports Activities
- Transport, Storage and Post
- Manufacture of General-Purpose Machinery
- Manufacture of Fabricated Metal Products, Except Machinery and Equipment
- Renting and Leasing, Business Services
- Others



Conclusions

■ The Impact on the Provincial Industries

- For the eastern coastal provinces, the industries mainly affected are:
Communication equipment, computers and other electronic equipment; **E**lectrical machinery and equipment; **T**extiles, clothing, shoes, hats, leather and their products; **W**holesale and retail;
Chemical products; **F**arming, Forestry, Animal Production and Fishery;
- For the central and western provinces , the industries significantly affected are: **F**arming, Forestry, Animal Production and Fishery;
Communications equipment, computers and other electronic equipment; **W**holesale and retail; **C**oal mining products; **M**etal smelting and rolling products.



Conclusions

■ The Impact on the Provincial GDP

- The total and direct impact of US tariff on GDP in eastern coastal provinces of China, such as Guangdong, Zhejiang, Jiangsu, Fujian and Shanghai, are greater
- For central and western provinces such as Anhui, Shanxi, Shaanxi, Inner Mongolia, Gansu, the impact of export in other provinces indirectly affects the GDP of these provinces.

■ The Impact on the Provincial Employment

- Guangdong, Zhejiang, Jiangsu, Fujian, Shandong in coastal provinces and Henan in Central China are affected more obviously
- For coastal provinces, change of the employment is due to direct impact by exports ; but for the central and western provinces , the indirect impact will play a vital role.



Conclusions

- China's participation in GVC division of labor is still in the middle and low end, with low profitability and lack of “irreplaceable”. At present, China's length of participation in the GVC division of labor is still relatively short.
- China's central and western provinces indirectly participate in the GVC division of labor system by providing energy, raw materials and primary products, and have not yet got rid of the dependence on resources. At the same time, China's eastern provinces have to import a large number of intermediate products.
- China needs to further extend and deepen the domestic links of GVC, so that central and western provinces can participate in the GVC more.



Next Steps

- (1) Pay close attention to the latest developments in the Sino-US trade friction and update the scenario settings in time.
- (2) Update **Chinese Multi-Regional Input-Output Model**
- (3) Build a global CGE model with detail China domestic regions to better simulate the impact of trade friction on the value chain.



Thank you very much !