Structural Changes of Manufacture Sectors and Industrial Policy in China

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Note: views presented in this report are those of the author rather than those of the organization where the author works.

Outline

- China's Industrial Policy since launch of reform and opening in late 1970's to 2013
- New Normal State
- Manufacture Sector in China
- Policy Implication

Industrial Policy of China since launch of reform and opening in late 1970's to 2013

- **General** China had learned the international practice of IP in this period. It had integrated industrial structure and IP to be a part of its development planning since its Seventh Five Year Plan. There are evolution of preparation and implementation of IP throughout the later period of Seventh Five Year Planning period.

Industrial Policy of China since launch of reform and opening in late 1970's to 2013

- **Evolution of IP of China**

- Part Ⅱ of Seventh Five Year Plan is industrial structure and IP. Adjustment of industrial structure is raised, especially promote the growth of tertiary sector (or service sector), seven sectoral policies are described in detail, they are agriculture, consumer goods industry, energy (with all sub-sectors), raw material (metals, chemicals and petro-chemicals), mechanical and electronic industry, consumption and material of construction, transport and communication
- The former State Economic Commission had launched large scale import of technology (around 3000 item 1979-1988) for technology re-vitalization of existing enterprises.
- A joint research project " Industrial policy " was implemented between the World Bank and DRC
- Bureau of IP was established in the former State Planning Commission
- The first national IP was promulgated on 1994.3.25

Industrial Policy of China since launch of reform and opening in late 1970's to 2013

- In March 1994, the government promulgated the Policy on Automobile Industry.
- After that, a series of industrial development policies were issued by the government and the State Planning Commission, including "Current Catalogue of Key Industries, Products and Technologies the Development of Which Is Encouraged by the State", "Catalogue of Industries for Guiding Foreign Investment" and so on.
- In the period of the global financial crisis, the government formulated and implemented a plan for restructuring and invigorating ten key industries in 2009. The ten key industries including steel industry, auto industry, ship industry, petrochemical industry, textile industry, light industry, nonferrous metals industry, equipment manufacturing industry, electronic information industry and logistics industry.

Industrial Policy of China since launch of reform and opening in late 1970's to 2013

- In the later half year of 2010, the State Council had issued decisions to develop **seven strategic emerging industries** including accelerate to nurture and develop the high-end equipment, next-generation information network technology, energy conservation and environment protection, new energy, biotechnology and new materials thereby to occupy in advance the commanding elevation of future competition and push forward structural optimization of Chinese industry.

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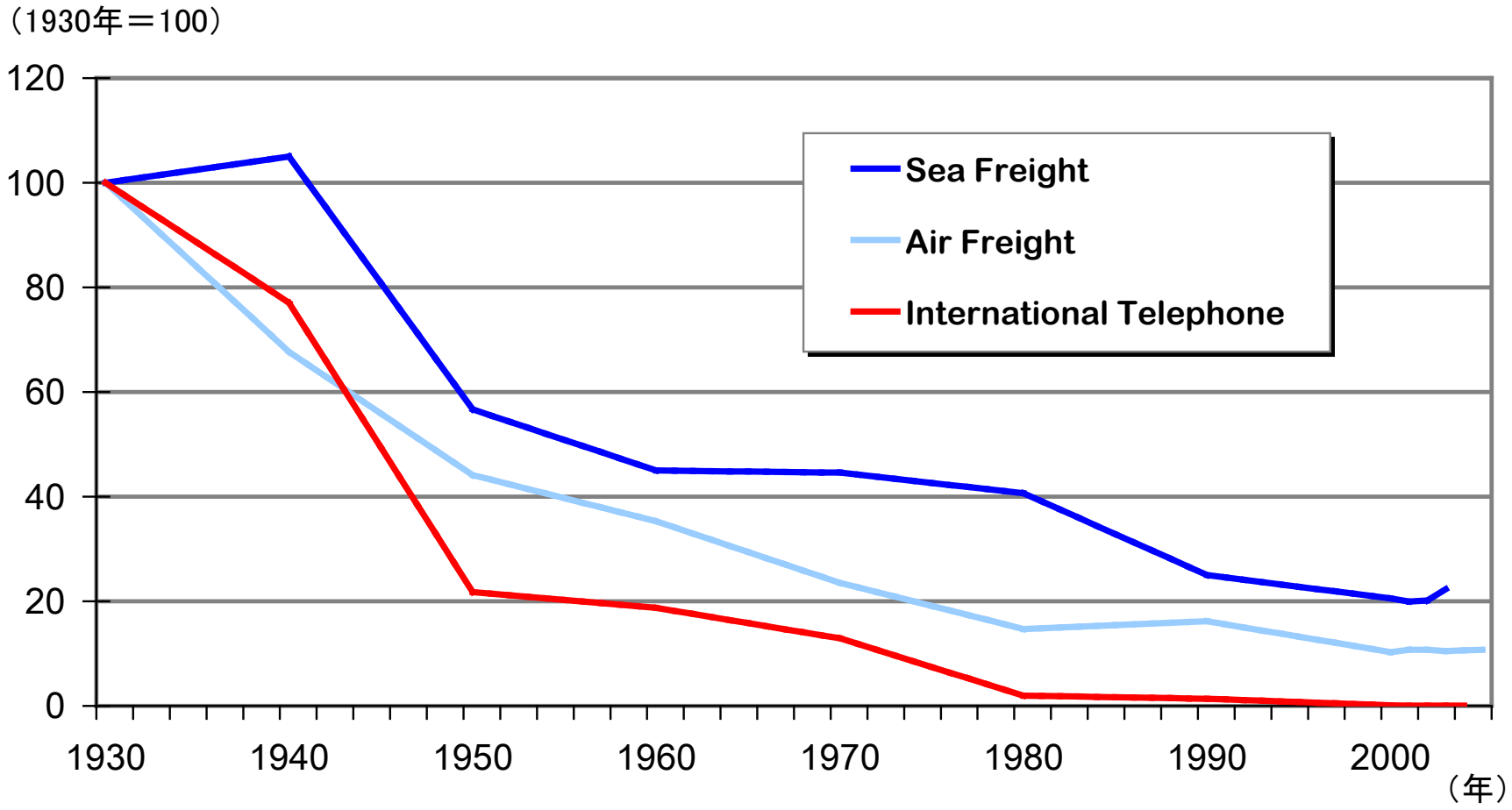
Industrial Policy of China since 2013

- The State Council also announced the action plan of "**Made in China 2025**" and "**Internet**+" in 2015 to achieve the purpose to push forward the transformation of China from a large country to a strong country in its manufacturing industry and also reform and upgrade its traditional industries through internet.
- In 13th Five Year Plan: We should move faster to turn China into a manufacturer of quality and put into effect the **Made in China 2025 strategy**. We should guide manufacturing to see that it develops toward greater specialization and becomes based on closer collaboration. We should promote the application of information technology in marketing, design, and production, and encourage the move toward flexible, intelligent, and lean production

New Normal State

New Situation

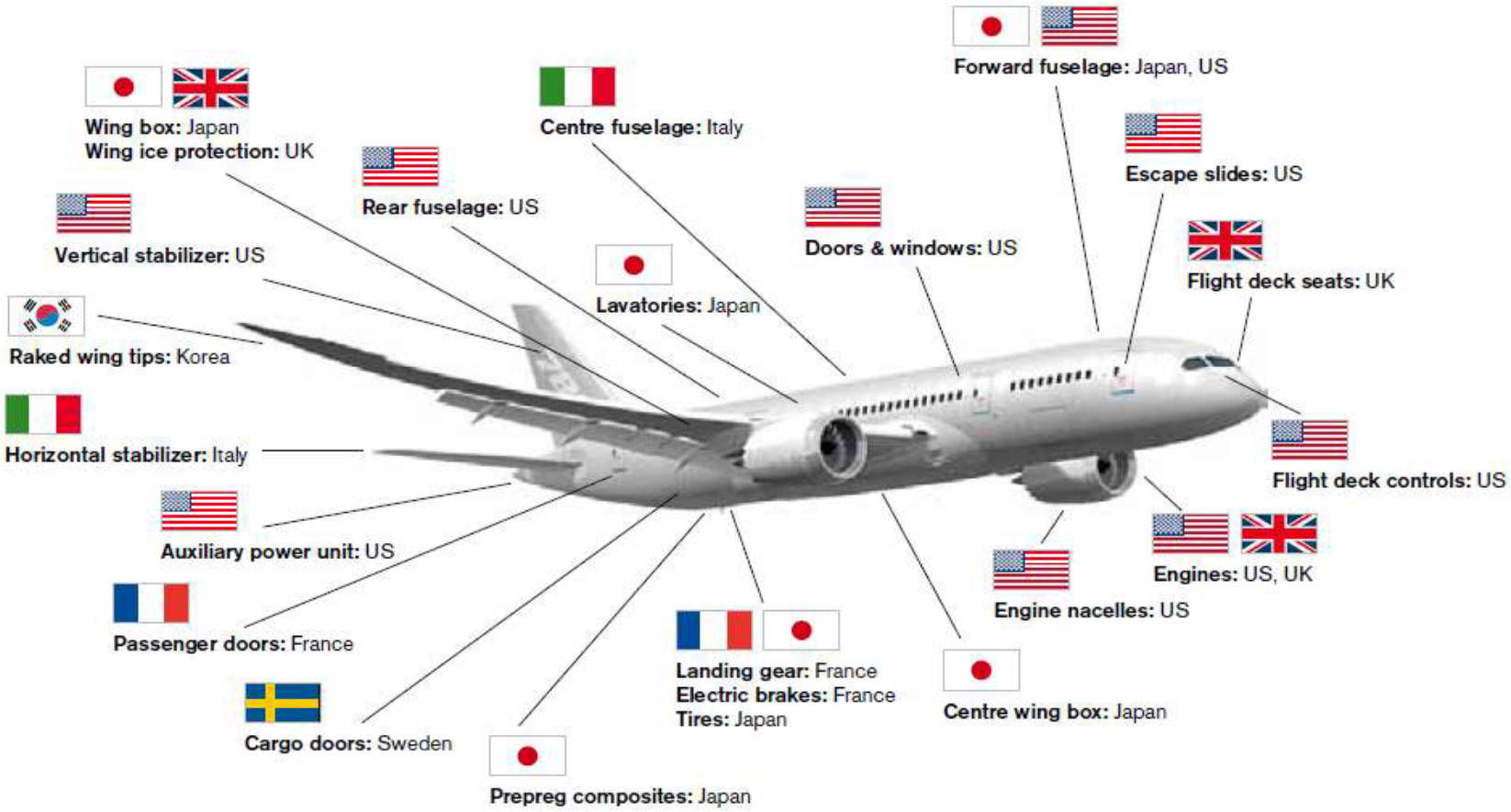
- **There are violent changes of organizational pattern of global production**
  - **The global economy has stepped into a new stage in networking since 80's of 20th century, the global production network is formed increasingly, the mode of global production is changing violently**
  - **The importance of production network/platform is shown increasingly**
  - **In the time of competition of global value chain, the manufacturing element will be changed to lower profit while the two terminal elements (R&D and Marketing and after sales service) will become more profitable, this will raise new challenge to future industrial development of China to be a global large manufacturing country**



Source: Growth and Impact of GVCs? What is so special? (OECD)

Source: 2008 White Paper on International Economy and Trade

Boeing 787

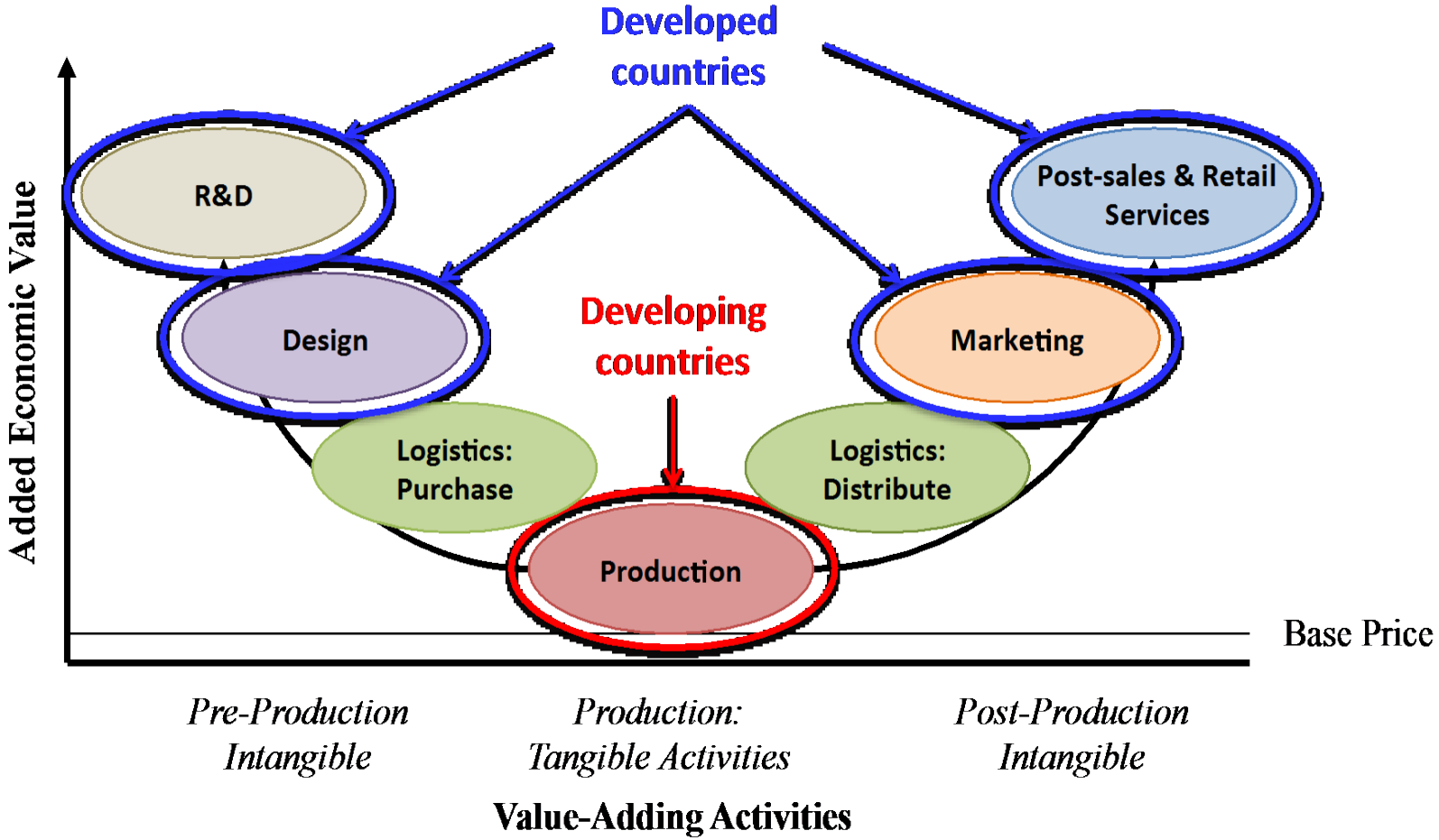


Tools/Software: France
Navigation: US
Pilot control system: US
Wiring: France

Final assembly: Boeing Commercial Airplanes, US

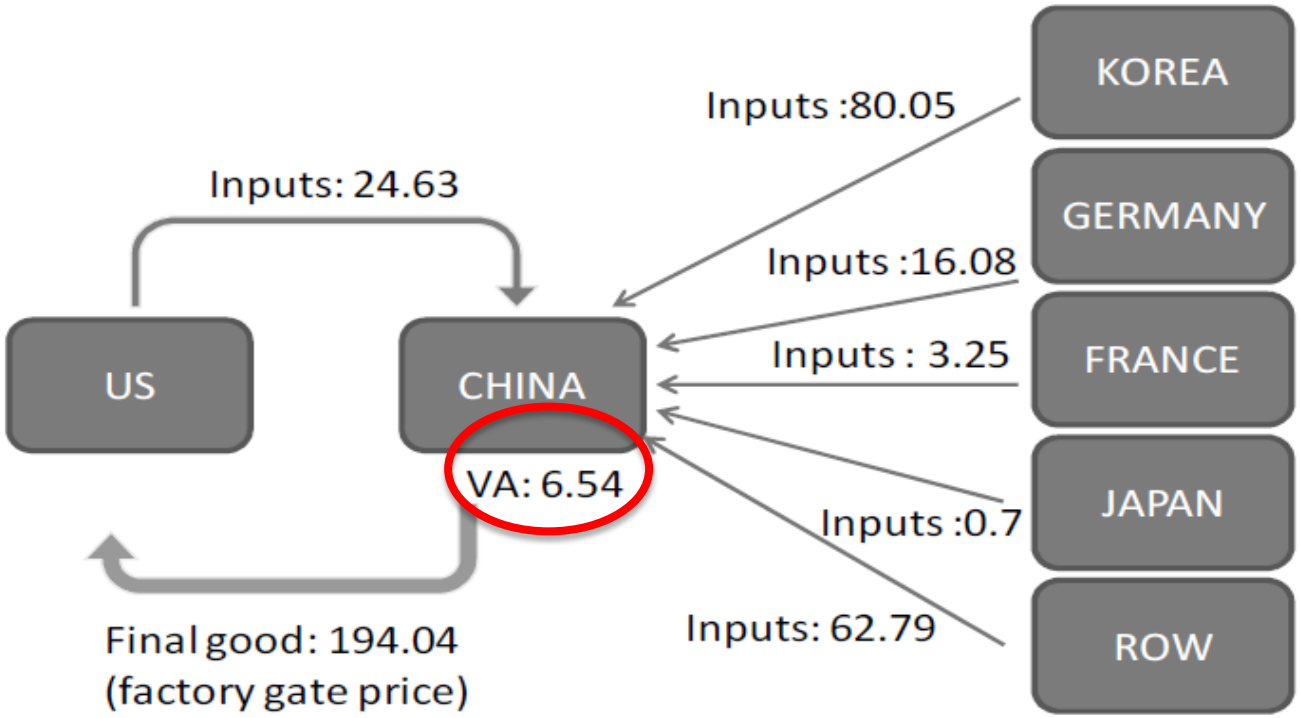
DISTRIBUTION OF VALUE IN GVCS: APPAREL GLOBAL VALUE

There has been a tendency for developed countries to concentrate in higher value activities while developing countries are generally concentrated in lower value activities



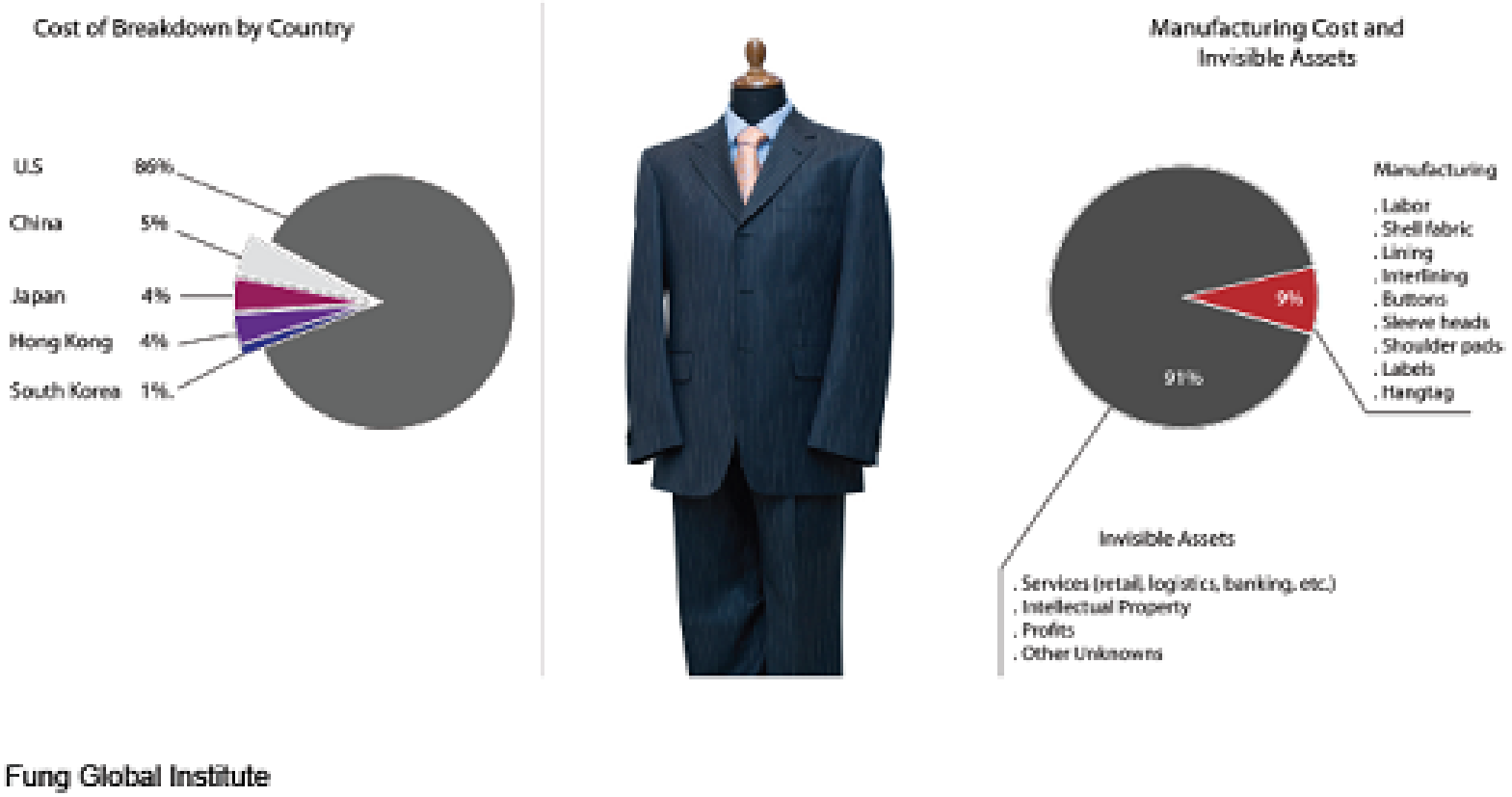
Source: Fernandez-Stark, Karina, Stacey Frederick and Gary Gereffi. (2011). "The Apparel Global Value Chain: Economic Upgrading and Workforce Development. In G. Gereffi, K. Fernandez-Stark & P. Psilos (Eds.), *Skills for Upgrading: Workforce Development and Global Value Chains in Developing Countries*. Durham: Center on Globalization Governance & Competitiveness and RTI International.

Case: iPhone 4（US$）



US trade balance with	CHINA	KOREA	GERMANY	FRANCE	JAPAN	ROW	WORLD
Gross	-169.41	0	0	0	0	0	-169.41
Value added	-6.54	-80.05	-16.08	-3.25	-0.7	-62.79	-169.41

Figure 1: A jacket made in China and sold in the U.S.



Source: Fung Global Institute

西装上衣在美国销售：425美元
制造部分：38美元，占9%，其中中国21美元，占5%

New Situation

- **Division of labor of international industry is in a state of pregnancy with new changes**
  - **Implementation of "Re-industrialization" policy has induced a back flow of high and medium end manufacturing industry into developed countries**
  - **Low income countries is accelerating to absorb labor intensive industry based upon their comparative advantage of low labor cost**
  - **A new round of S&T revolution and industrial change are in pregnancy, competition in occupying the commanding height of industries among countries becoming fierce increasingly**
  - **China is facing double squeeze between developed countries and other developing countries in international division of labor.**

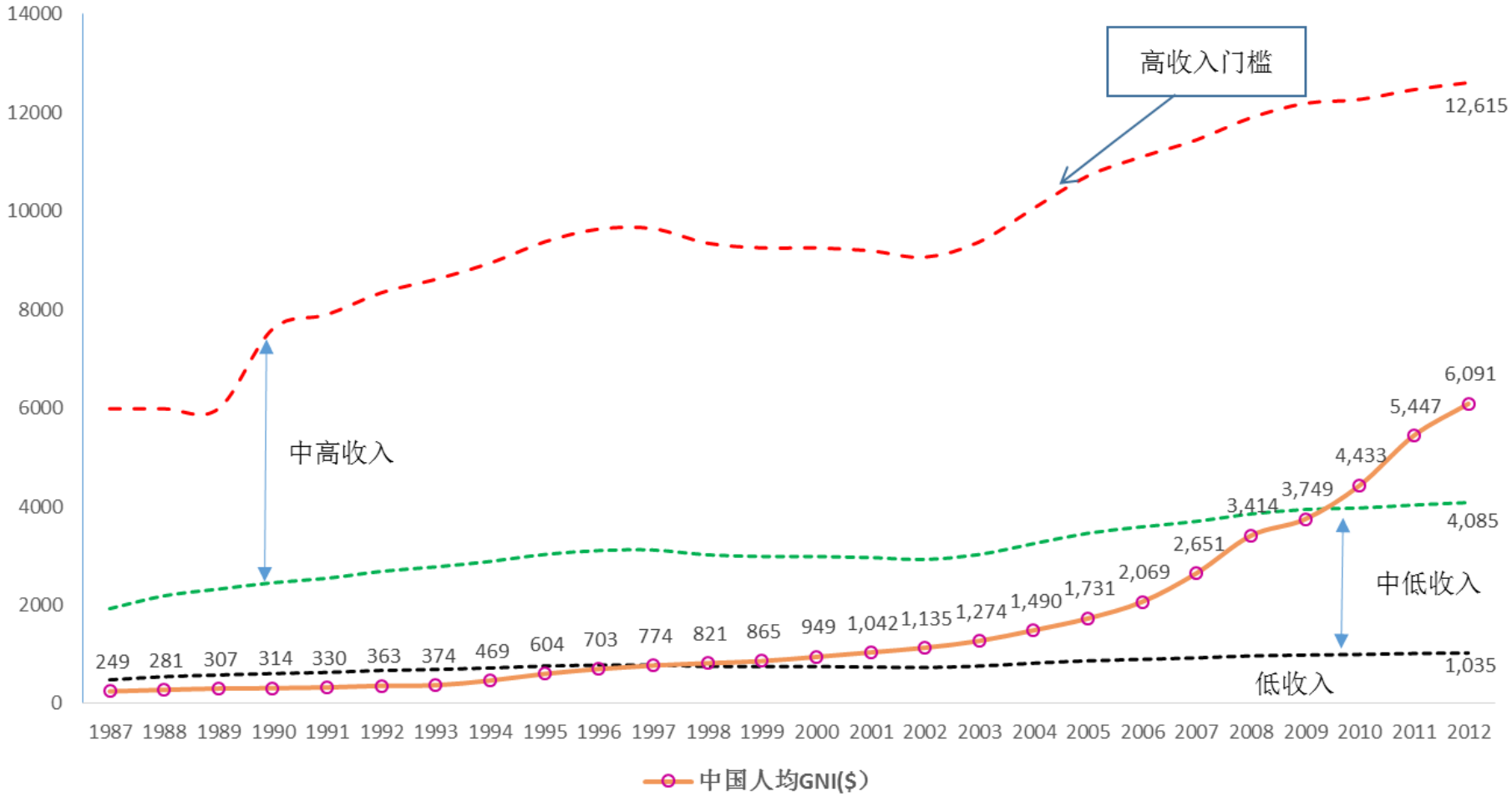
New Situation

- **New changes on rules of global investment and trade are in the process of formation**
  - **WTO has got rid of the passive state of Doha Round, active progress had been achieved in Indonesia and Paris Conference by the end of 2013, regional economic cooperation is booming, there is emergence of large amount of various types of FTA (Free Trade Agreement)**
  - **USA is accelerating to push forward the negotiation of two regional cooperation, the "Trans-Pacific Partnership"(TPP) and "Transatlantic Trade and Investment Partnership" (TTIP). These two regional cooperation's are trying to exclude China in global cooperative regime of trade and investment. It will produce important influence to WTO and pattern of global trade once the rules of negotiation of these two regional cooperation's are in agreements.**

New Situation

- China will be in the crucial stage to march to high income group of countries
- Based upon the classification of income group of countries of the World Bank, China had entered into the income group of Upper- middle income economies by the year 2010, it is projected that China will approach basically the high income group of countries in coming future based upon the standard set up by the World Bank.

China's GNI per capita and Classification of the World Bank



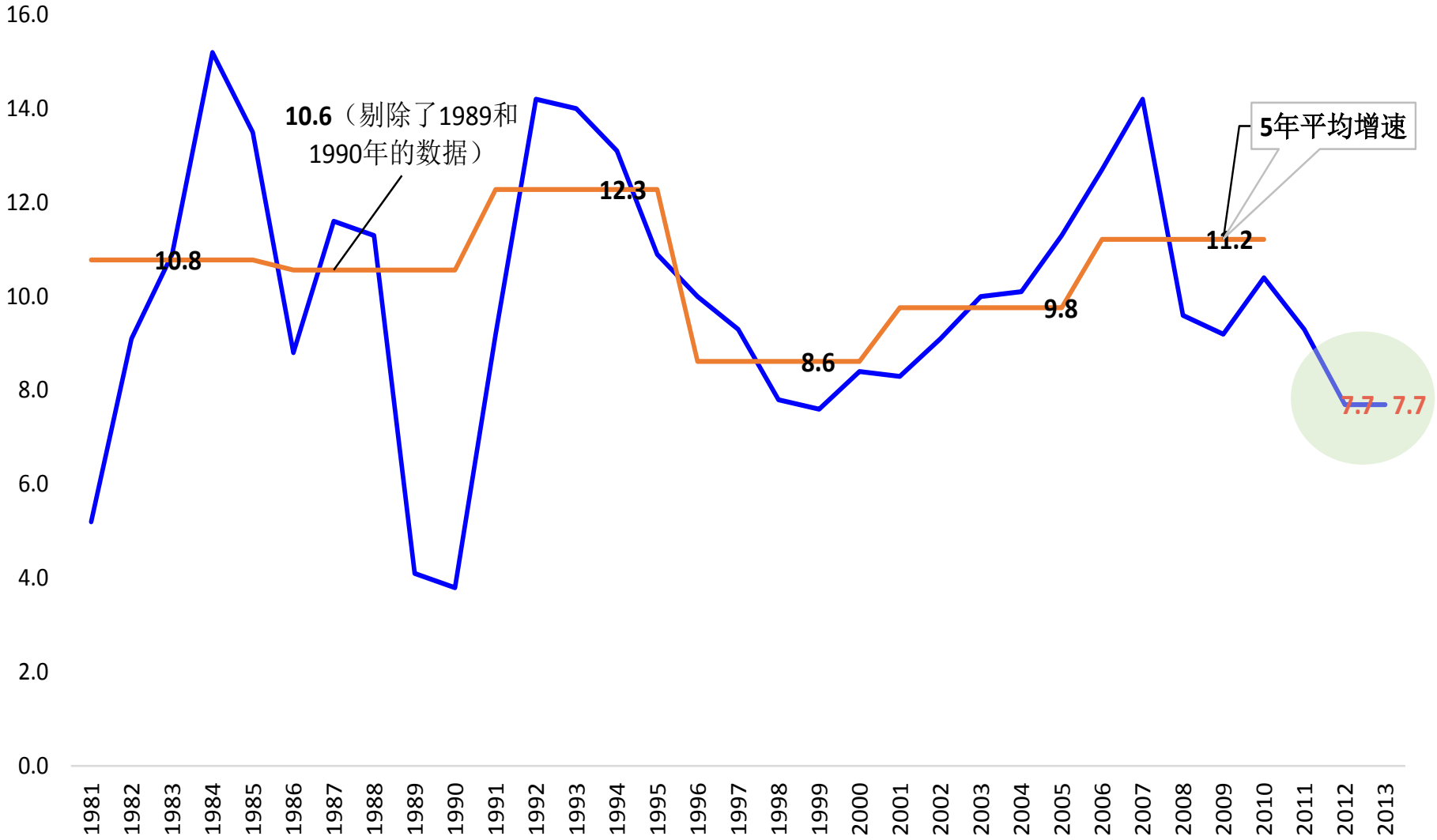
New Situation

- **China will be in an important period to change the growth rate of the economy**

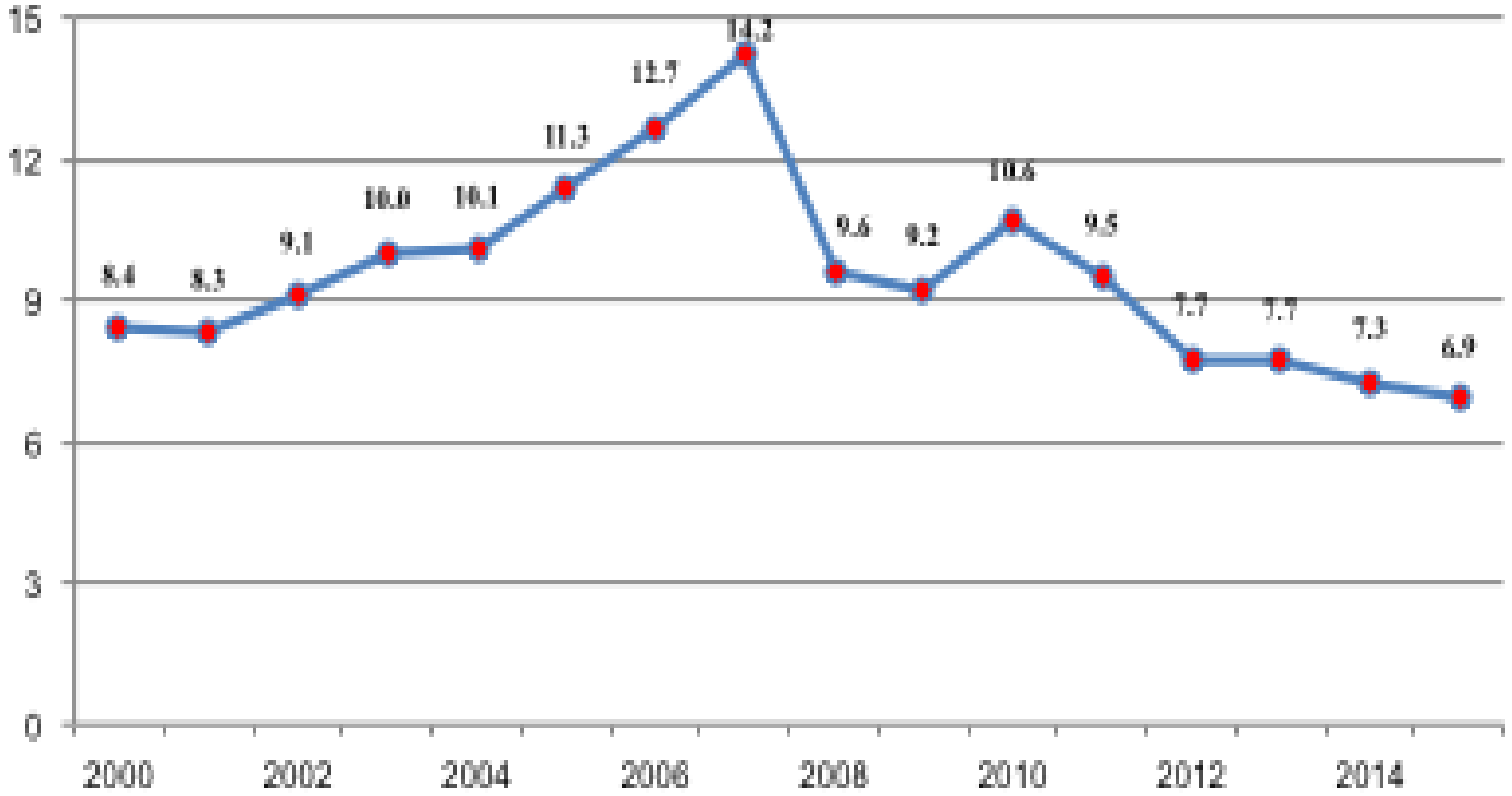
- **Chinese economy had kept an extraordinary growth rate in past thirty years with an average annual growth rate around 10%. But currently, Chinese economy is in the transitional stage from a period with a growth rate of two digits to the period with a growth rate of single digit. It can be seen from international experience that it is hardly possible to continue a growth rate with two digits in the coming future**

Turning points

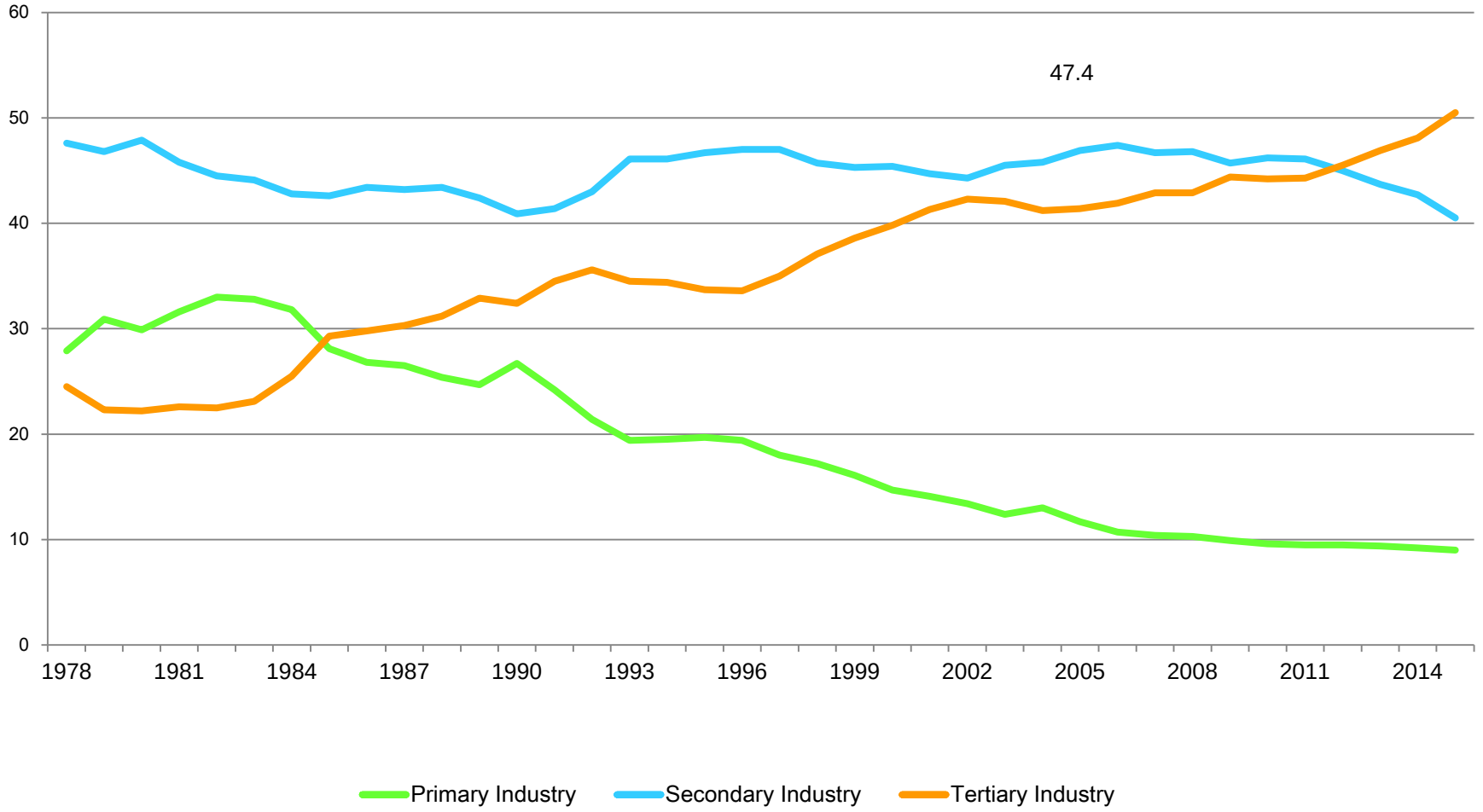
Economic Growth Rate(1981-2013)



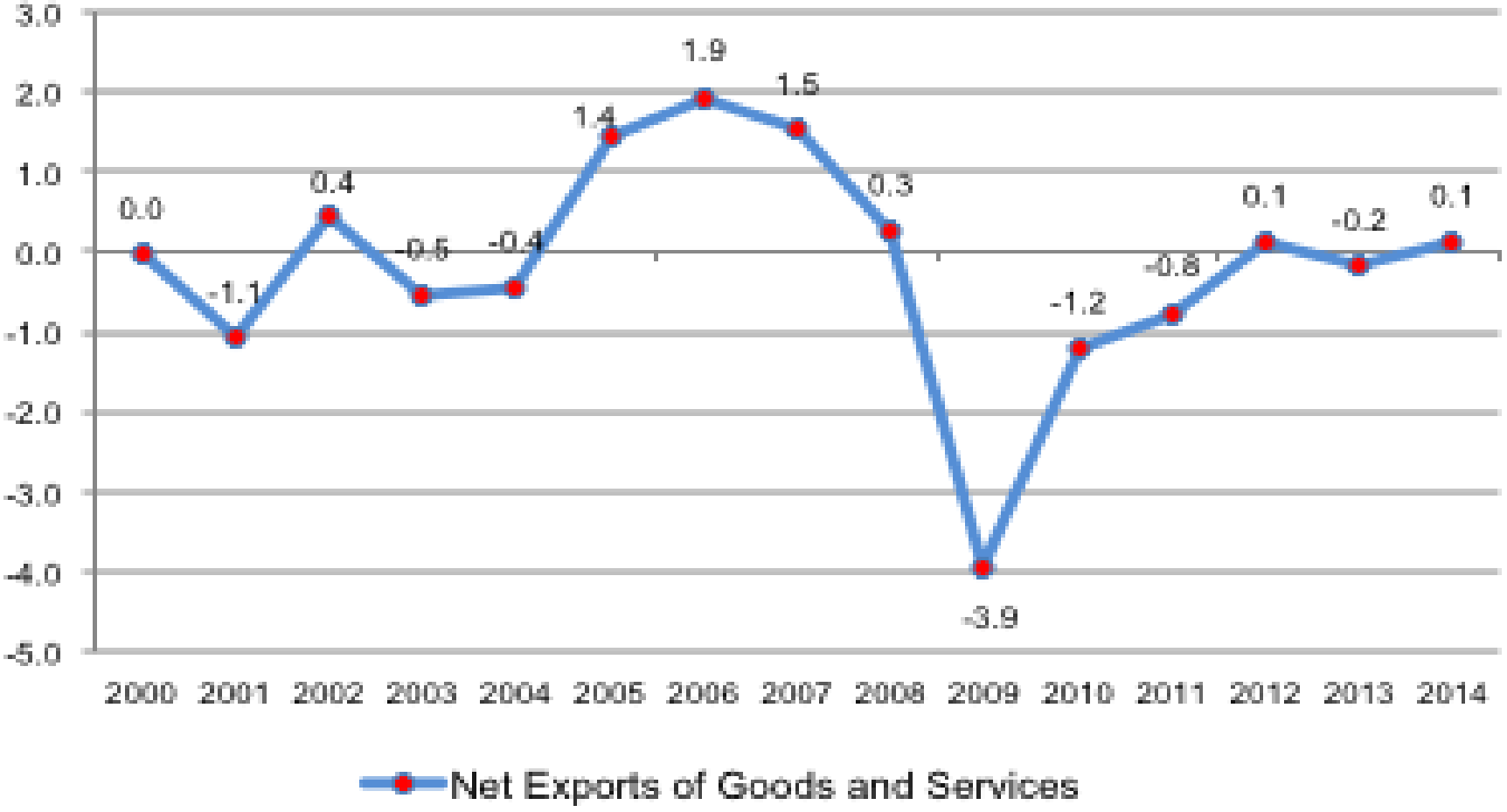
Economic Growth Rate(2000-2015)



GDP Components

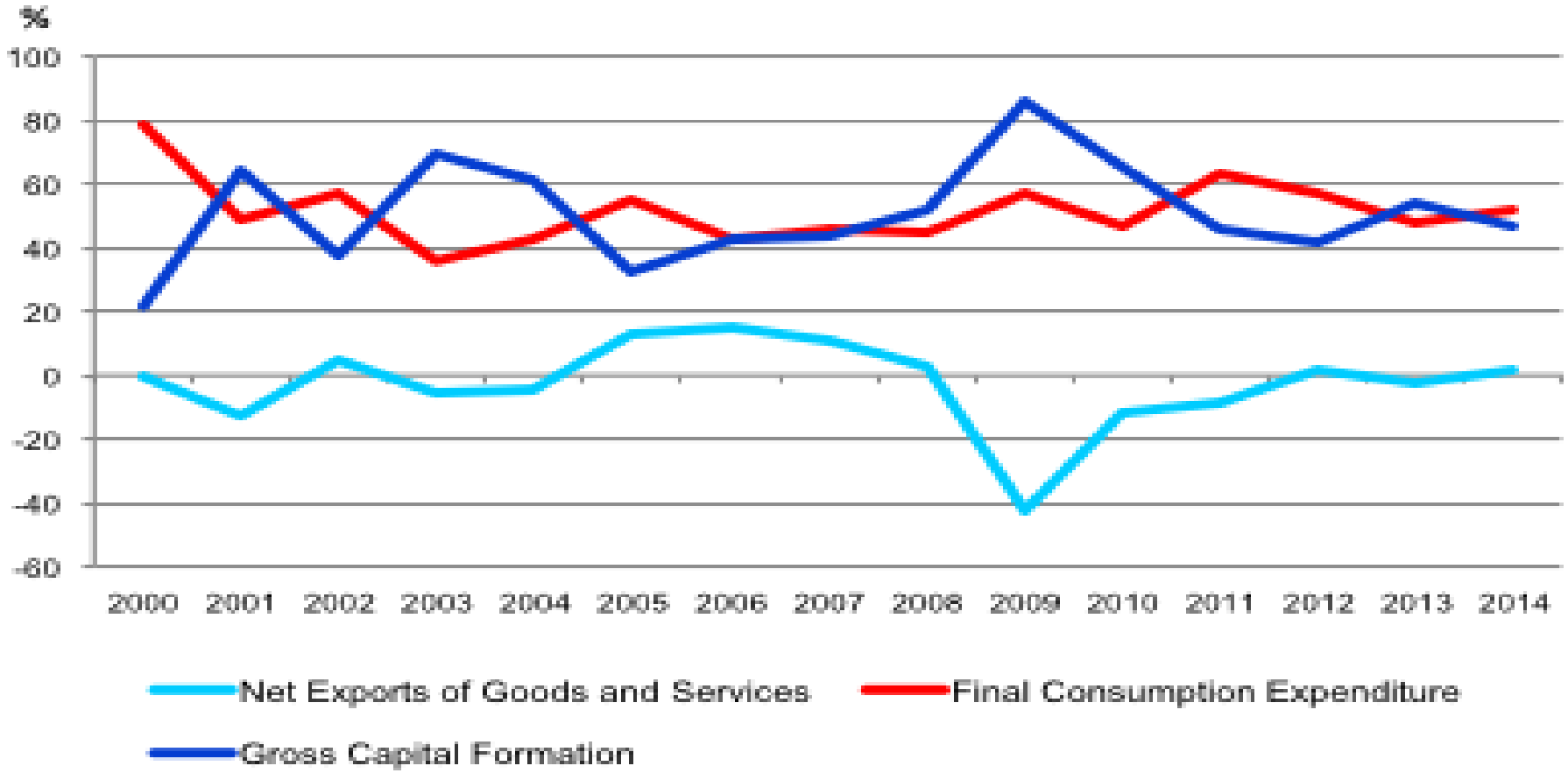


Net Export/GDP(2000-2014)

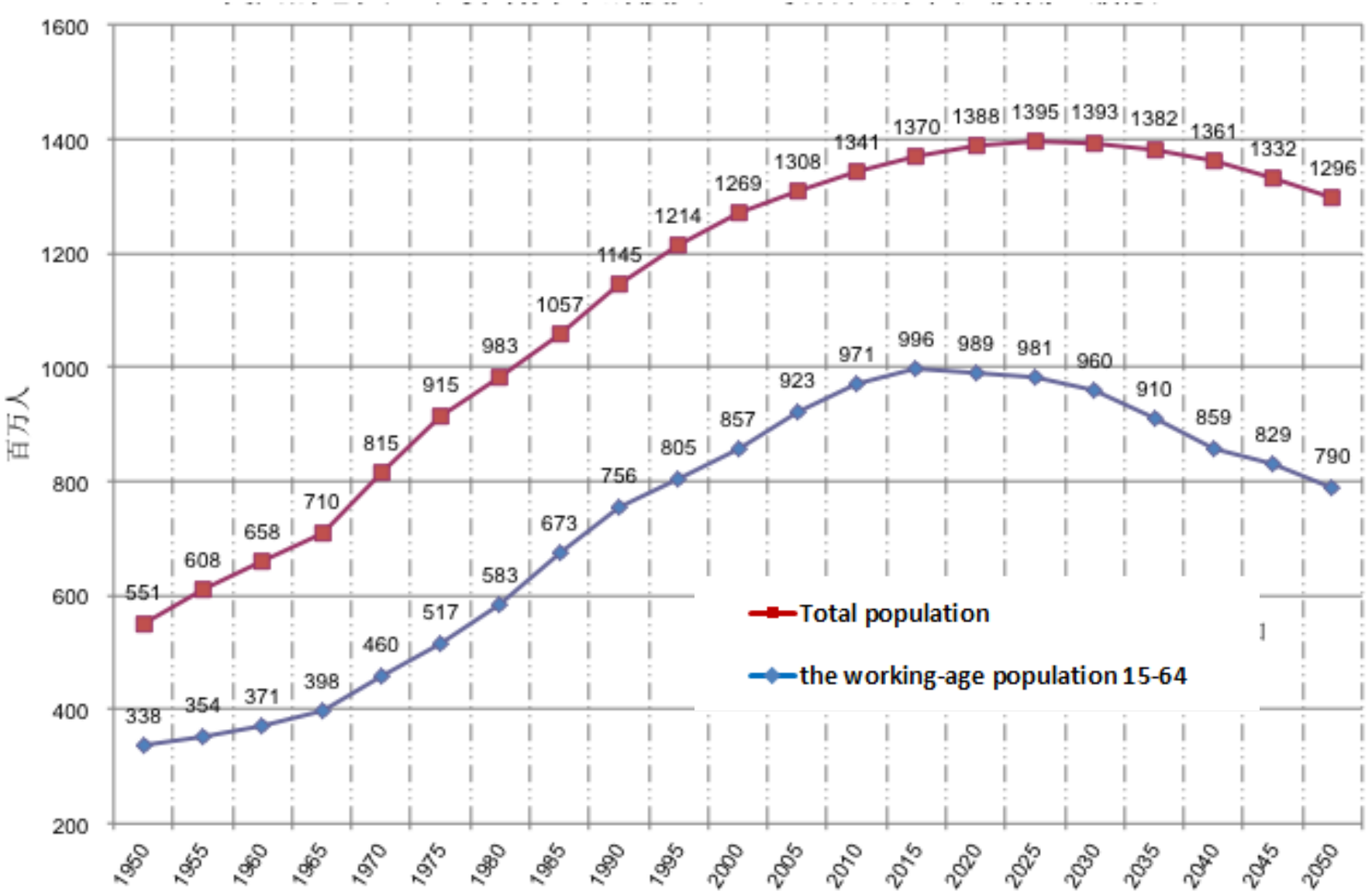


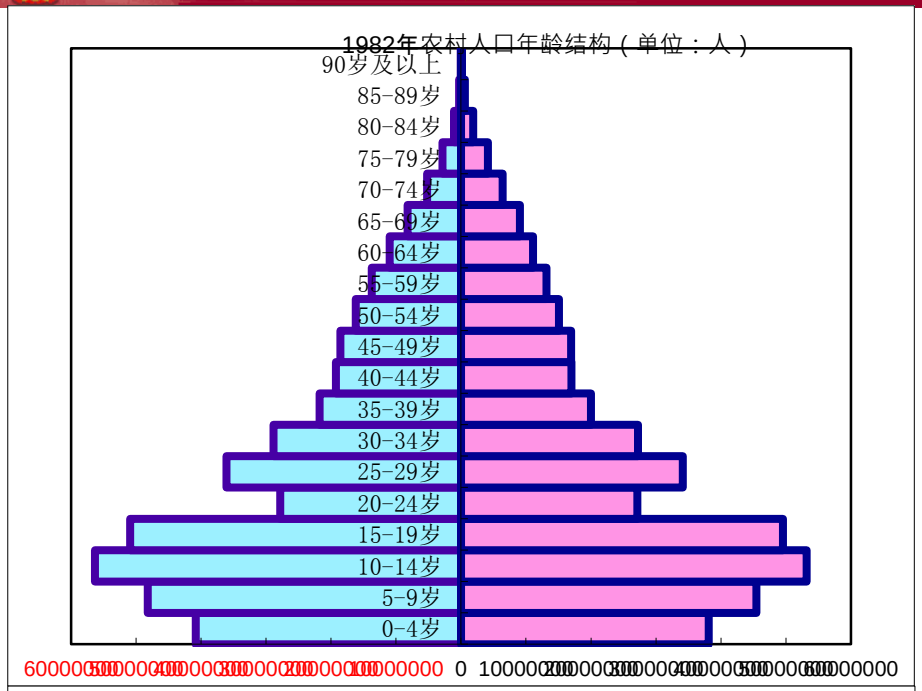
Contribution of Demand

(the contribution of consumption was 66.4% in 2015)



China's total population and the working-age population




1982年农村人口年龄结构（单位：人）
90岁及以上
85-89岁
80-84岁
75-79岁
70-74岁
65-69岁
60-64岁
55-59岁
50-54岁
45-49岁
40-44岁
35-39岁
30-34岁
25-29岁
20-24岁
15-19岁
10-14岁
5-9岁
0-4岁
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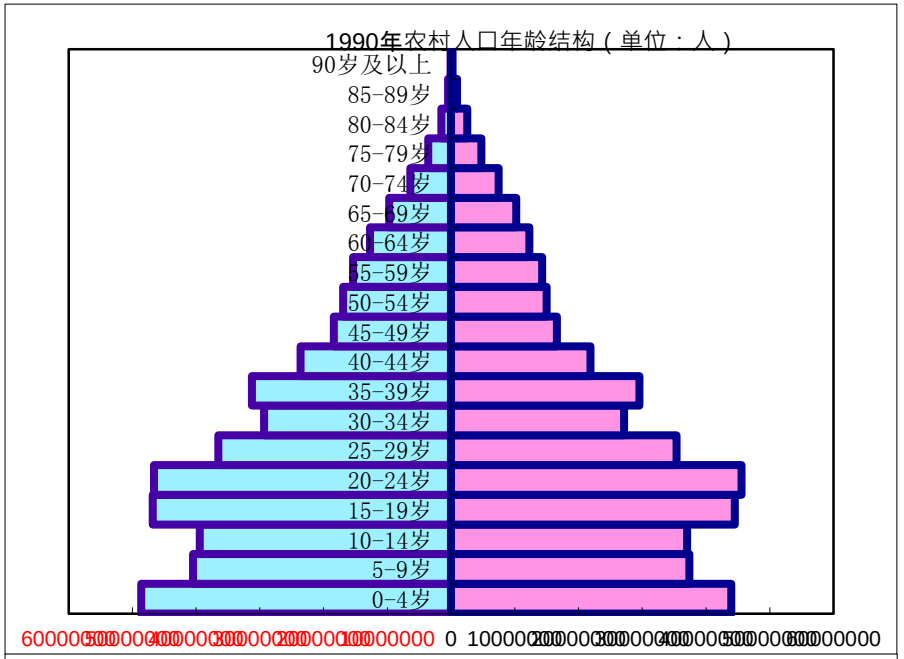
1990年农村人口年龄结构（单位：人）
90岁及以上
85-89岁
80-84岁
75-79岁
70-74岁
65-69岁
60-64岁
55-59岁
50-54岁
45-49岁
40-44岁
35-39岁
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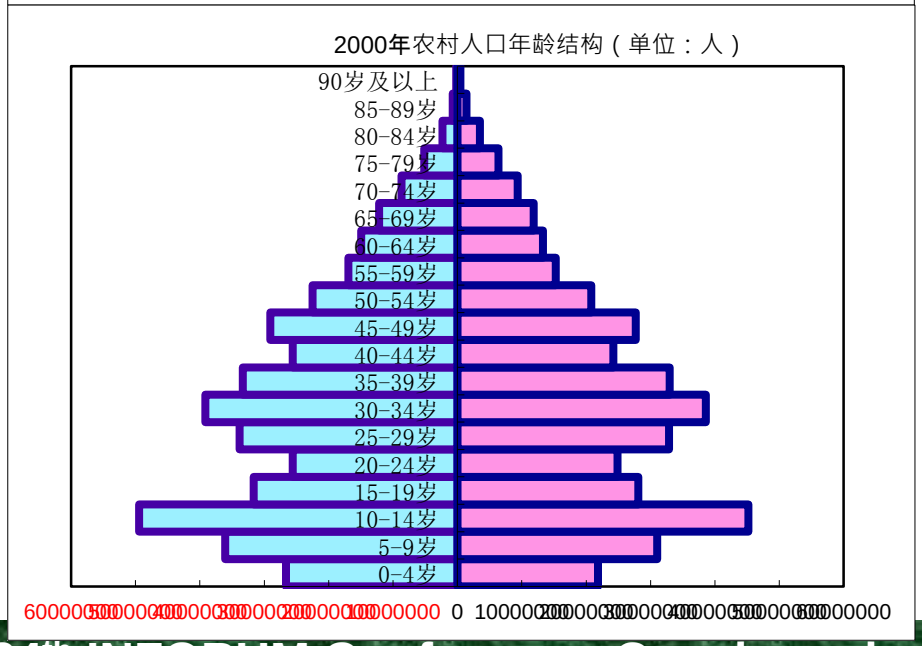
2000年农村人口年龄结构（单位：人）
90岁及以上
85-89岁
80-84岁
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70-74岁
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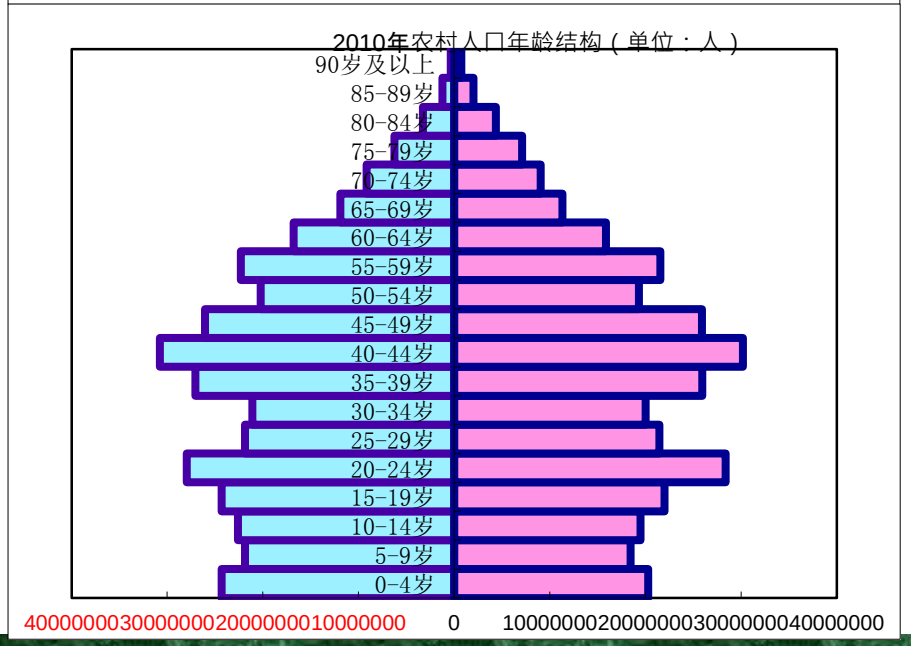
2010年农村人口年龄结构（单位：人）
90岁及以上
85-89岁
80-84岁
75-79岁
70-74岁
65-69岁
60-64岁
55-59岁
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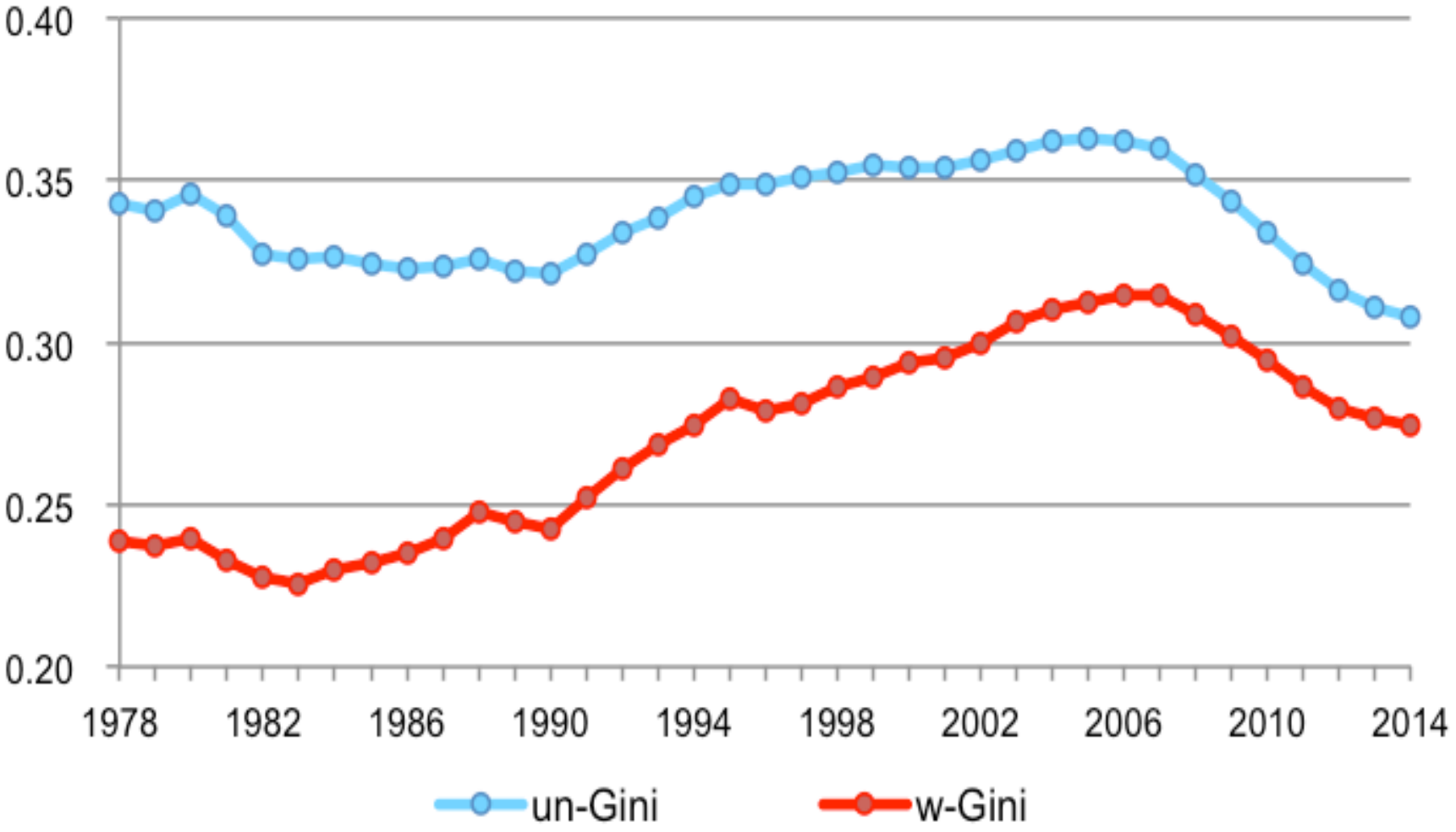
Changes of inter-provincial income disparities measured by Gini coefficient



New Situation

- **Insufficient sustainability of development**

- **In the aspect of allowable trade of resources the share of absolute scale of consumption of crude oil and coal in total global consumption is rising continuously, its external dependence is also increasing in continuity**
- **The constraints of non direct trade elements such as fresh water, land and ecological environment will become stronger increasingly. Pollution of water resource is serious, there is already 54% of water in seven water system which is not suitable for use by the mankind**
- **The amount of discharge of pollutants such as sulfur dioxide, nitrogen oxide, smoke and particulate matter have ranked high to be number one among the world**
- **With the rising level of development, there are higher demands on fresh air, clean water resource and graceful environment from the people**

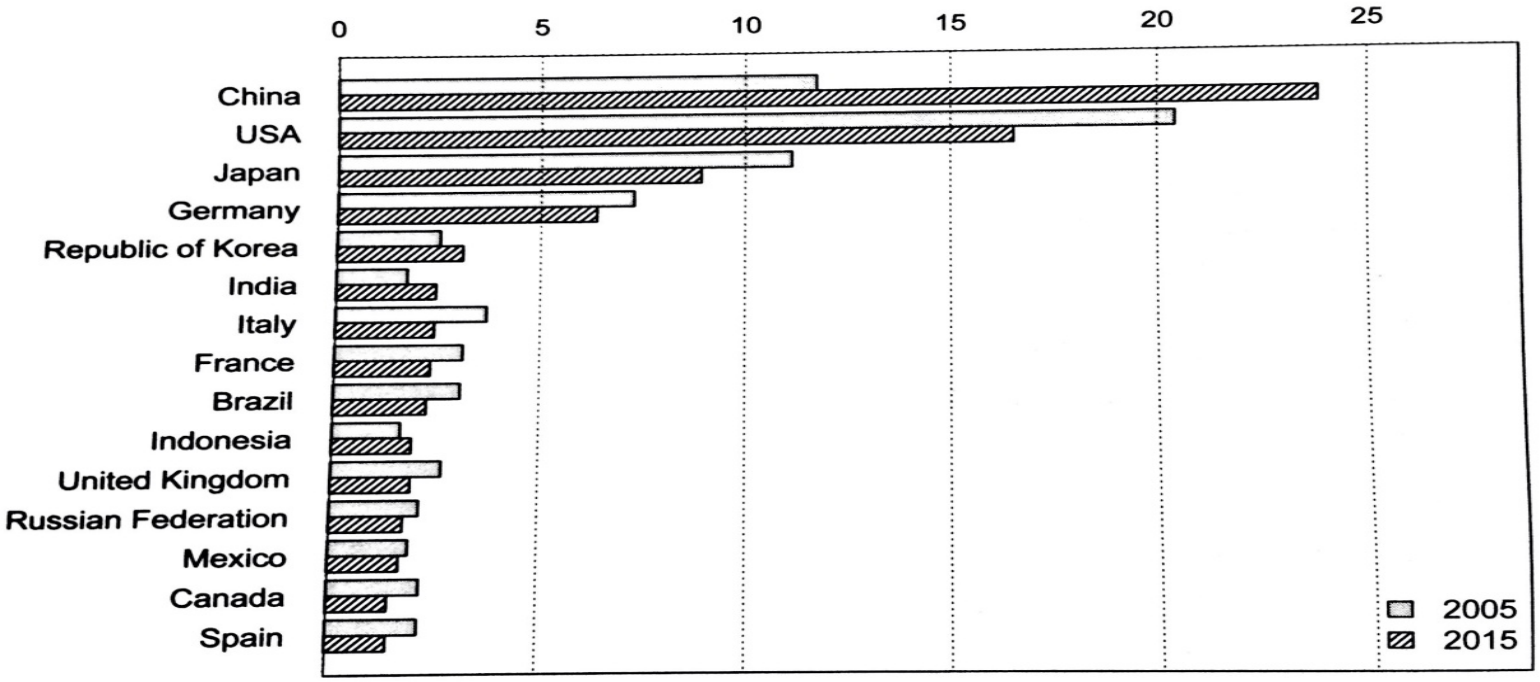
New Normal State

"A new normal state of China's economy has emerged with several notable features. First, the economy has shifted gear from the previous high speed to a medium-to-high speed growth. Second, the economic structure is being constantly improved and upgraded. Third, the economy is increasingly driven by innovation instead of input and investment" President Xi Jinping said at APEC Beijing meeting in 2014

Manufacture Sector in China

China's Manufacturing Sector in the World

- **China's has emerged to be the largest manufacturer of the world in the year 2015.**

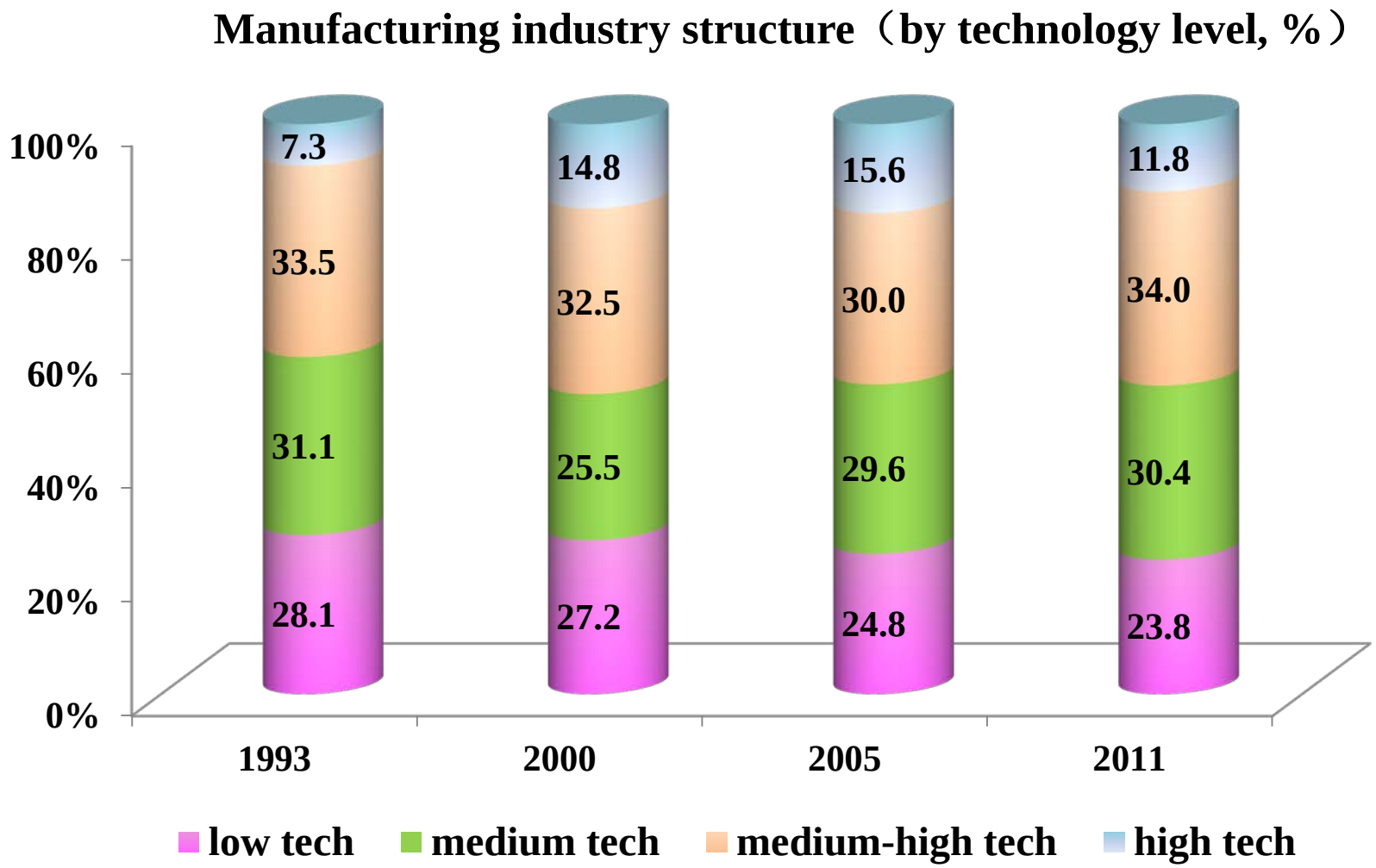


Change of share of leading manufacturers in the World MVA in 2005 and 2015 (at 2010 constant price)

China's Manufacturing Sector in the World

- China ranks number one of VA of eight sectors based upon ISIC division in 2014. They were Textiles (ISIC13), Wearing apparel (ISIC14), Leather and related products (ISIC15), Other non-metallic mineral products (ISIC 23)， Basic Metals (ISIC24), Computer, electronic and optical products (ISIC 26), Electrical equipment (ISIC27), Machinery and equipment n.e.c. (ISIC28).

Optimizing and upgrading the Manufacturing Industry Structure



Manufacturing Industry Structure Based on IO tables 2002-2012

Year	2002	2007	2012
Labor-intensive Industry	**33.1**	**28.8**	**28.0**
Manufacture of Food and Tobacco	12.0	10.9	12.7
Manufacture of Textiles	6.0	5.3	4.2
Manufacture of Textile Wearing Apparel, Footwear, Leather	4.4	4.3	3.9
Processing of Timbers and Manufacture of Furniture	2.9	2.8	2.6
Paper making, Printing and Manufacture of Articles for Culture, Education and Sports Activities	6.4	3.8	4.3
Other Manufacture	1.5	1.7	0.3
Capital-intensive Industry	**37.3**	**41.1**	**42.0**
Manufacture of Refined Petroleum, Coke Products, Processing of Nuclear Fuel	2.8	4.0	4.6
Manufacture of Chemicals and Chemical Product	15.5	13.5	14.2
Manufacture of Nonmetallic Mineral Product	5.1	6.7	7.2
Manufacture and Processing of Metals	10.0	12.8	12.1
Fabricated Metal Products, Except Machinery and Equipment	3.8	4.0	3.9
Technology-intensive Industry	**29.6**	**30.1**	**30.0**
General-Purpose and Special-Purpose Machinery	9.8	9.8	9.6
Transport Equipment	6.8	6.9	7.9
Manufacture of Electrical Machinery and Apparatus	4.6	5.0	5.1
Communication Equipment, Computer	7.3	7.3	6.8
Manufacture of Measuring Instruments	1.2	1.1	0.8

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Paper making, Printing and Manufacture of Articles for Culture, Education and Sports Activities	6.4	3.8	4.3
Other Manufacture	1.5	1.7	0.3
Middle-technology Industry	**21.7**	**27.5**	**27.8**
Manufacture of Refined Petroleum, Coke Products, Processing of Nuclear Fuel	2.8	4.0	4.6
Manufacture of Nonmetallic Mineral Product	5.1	6.7	7.2
Manufacture and Processing of Metals	10.0	12.8	12.1
Manufacture of Fabricated Metal Products, Except Machinery and Equipment	3.8	4.0	3.9
High-technology Industry	**45.1**	**43.6**	**44.2**
Manufacture of Chemicals and Chemical Product	15.5	13.5	14.2
General-Purpose and Special-Purpose Machinery	9.8	9.8	9.6
Transport Equipment	6.8	6.9	7.9
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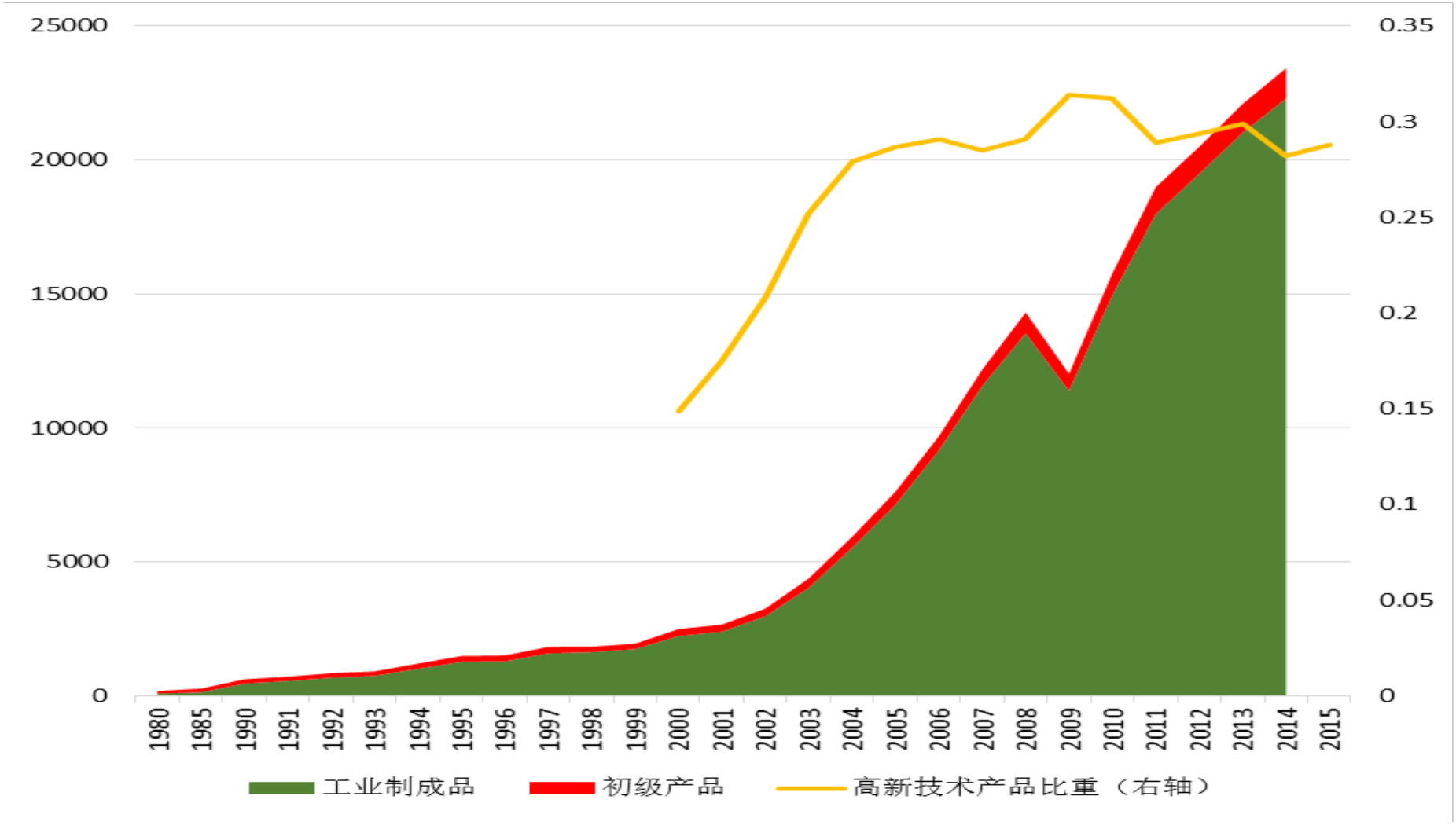

Exports of Manufacture Sectors Based on IO tables 2002-2012

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Processing of Timbers and Manufacture of Furniture	2.9	3.0	3.3
Paper making, Printing and Manufacture of Articles for Culture, Education and Sports Activities	4.2	2.8	5.1
Other Manufacture	1.8	1.6	0.5
Capital-intensive Industry	**18.8**	**22.6**	**20.4**
Manufacture of Refined Petroleum, Coke Products, Processing of Nuclear Fuel	1.1	1.0	1.1
Manufacture of Chemicals and Chemical Product	9.3	9.0	9.0
Manufacture of Nonmetallic Mineral Product	1.8	1.8	2.4
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Fabricated Metal Products, Except Machinery and Equipment	4.6	4.4	3.9
Technology-intensive Industry	**44.8**	**50.3**	**53.7**
General-Purpose and Special-Purpose Machinery	5.6	7.1	9.7
Transport Equipment	2.8	4.1	5.3
Manufacture of Electrical Machinery and Apparatus	8.7	8.5	9.8
Communication Equipment, Computer and Other Electronic Equipment	21.3	26.6	27.4
Manufacture of Measuring Instruments	6.4	4.0	1.6

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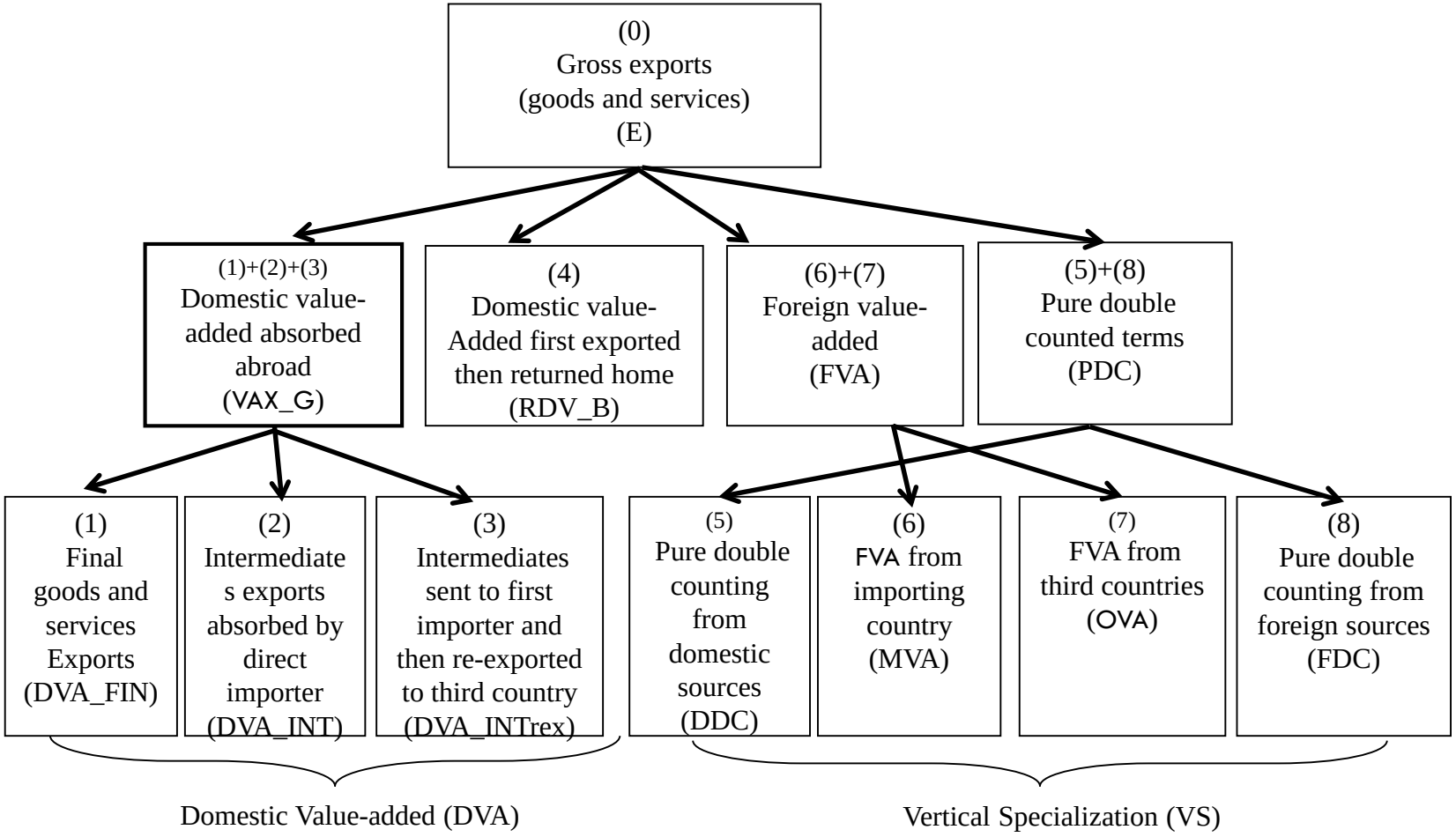
China's Manufacturing Performance in the Global Value Chain

Methodology-KWW



Decomposition of Export

- **Gross bilateral trade flows can be decomposed into 4 buckets:**
  - **DVA** Domestic value-added absorbed abroad **(VAX_G);**
  - **RDV** Domestic value added that is initially exported but finally returned and consumed at home via imports from other countries. It is not part of a country's exports of value-added, but account for part of the country's GDP ;
  - **FVA** Foreign value added used in the production of exports;
  - **PDC** Double counted terms due to intermediate goods being traded back and forth that cross border multiple times.

Comparison of export performance through domestic and foreign VA of selected countries **2011**(Unit 100mil.U.S.D.)

	DVA Implicit Domestic VA in Export	FVA Implicit Foreign VA in Export	DVA Share (%)	FVA Share (%)
Japan	5679	968	81	14
U.S.A.	8820	1745	79	16
Australia	651	131	78	16
China	13286	3249	76	18
Turkey	960	245	75	19
India	1673	567	72	24
Italy	3434	1120	70	23
Germany	9411	3007	69	22
Britain	2740	922	69	23
France	3719	1347	67	24
Spain	1845	767	64	27
Mexico	1482	822	61	34
World	85344	28778	69	23

Comparison of export performance through domestic and foreign VA of selected countries

- The share of domestic VA of China is 76%, which is higher than the average level of the world (69%) by seven percentage points.
- It is higher than most other countries, but it is lower than Japan, U.S.A. and Australia
- This illustrates that China has established a stronger capability to acquire VA of its export through her effort in industrialization around more than six decades. But there is the room to improve their capability to acquire VA.

Comparison of Export of Labor Intensive Product

2011(Unit 100mil.U.S.D.)

	DVA Implicit domestic VA in Export	FVA Implicit Foreign VA in Export	DVA Share (%)	FVA Share (%)
Australia	216	29	87	12
China	3744	540	86	12
Germany	1438	420	74	22
Spain	476	126	77	20
France	840	198	79	19
Britain	545	112	81	17
India	666	355	64	34
Italy	949	233	78	19
Japan	210	24	87	10
Turkey	342	89	77	20
U.S.A.	1517	201	86	11
Mexico	216	66	75	23
World	20010	5406	76	21

Changes of domestic and foreign VA of China's export of labor intensive product 1995-2011

Year	DVA Implicit domestic VA in Export	FVA Implicit Foreign VA in Export	DVA Share (%)	FVA Share (%)
1995	552	97	84	15
1996	566	84	86	13
1997	603	87	86	12
1998	582	76	87	11
1999	552	97	84	15
2000	692	116	84	14
2001	737	116	85	13
2002	840	138	84	14
2003	1003	180	83	15
2004	1180	238	81	16
2005	1514	286	82	16
2006	1927	344	83	15
2007	2384	402	84	14
2008	2724	418	85	13
2009	2532	315	85	11
2010	3090	438	86	12
2011	3744	540	86	12

Comparison of Export of Labor intensive Product

- China has a higher capability of its labor intensive manufacturing sectors to acquire VA in the division of labor of GVC. The domestic VA of export of labor intensive products reached 374.4 billion U.S.D. which ranked number one in the world in 2011. Its share of DVA is 86%, which is equal to U.S.A. and both of them are next to Japan and Australia with their share of DVA of 87%
- There is stable growth of domestic VA of China's export of labor intensive products in the period from 1995-2011. The value of DVA share was 87% in 1998, and it was declined gradually to 81% in 2004. And it was re-rising gradually to 86% in 2011.
- The reason of declining value of DVA share in later period of 1990s was due to the high growth of international sub-contracting of China's textile sector. Higher share of intermediate product from abroad was used, it caused the lowering of share of domestic VA of China's export. While in recent years, there is shift of international subcontracting to the creation of production of China's own brand, therefore, there was re-rising of DVA share.

Comparison of export of capital intensive product

2011(Unit 100mil.U.S.D.)

	DVA Implicit domestic VA in Export	FVA Implicit Foreign VA in Export	DVA Share (%)	FVA Share (%)
Japan	2572	515	87	11
U.S.A.	3914	930	85	13
Germany	4542	1277	79	15
India	599	132	77	17
Turkey	427	86	77	15
China	3757	911	75	18
Mexico	469	117	75	19
Australia	370	89	74	18
Britain	1306	433	67	22
France	1632	572	66	23
Italy	1813	678	65	24
Spain	862	391	61	27
World	36903	12359	67	22

Changes of DVA and FVA of China's export of capital intensive product 1995-2011

Year	DVA Implicit domestic VA in Export	FVA Implicit Foreign VA in Export	DVA Share (%)	FVA Share (%)
1995	283	44	84	13
1996	332	46	86	12
1997	426	61	85	12
1998	411	50	87	11
1999	552	97	84	15
2000	490	81	82	14
2001	516	79	83	13
2002	593	99	82	14
2003	776	158	79	16
2004	1081	269	75	19
2005	1311	339	74	19
2006	1676	422	74	19
2007	2308	573	74	18
2008	2939	679	75	17
2009	2342	455	80	15
2010	3025	669	77	17
2011	3757	911	75	18

Comparison of export of capital intensive product

- China's capital intensive manufacturing sectors have lower capability to acquire VA in the division of labor of GVC
- Although China has a higher value of DVA in 2011 which reached 375.7 billion U.S.D, only next to Germany and U.S.A. in the same year, but its value of DVA share is only 75%, equal to Mexico in the same year. And this value is lower than Japan, U.S.A., Germany and even Turkey and India.
- The DVA share is declined from 84% in 1995 to 75% in 2011.
- This decline of DVA share can be explained from two causes: on the one side, China's capital intensive product has used a larger share of intermediate product and parts from abroad in integration into the division of labor of GVC; but it also shows that China has not upgraded its capability of capital intensive manufacturing sector to acquire VA in the division of labor of GVC on the other side

Comparison of export of technological intensive product

2011(Unit 100mil.U.S.D.)

	DVA Implicit domestic VA in Export	FVA Implicit Foreign VA in Export	DVA Share (%)	FVA Share (%)
Japan	2897	430	84	12
U.S.A.	3390	615	82	15
Australia	65	14	79	17
India	409	80	78	19
Germany	3431	1310	76	2
China	5784	1799	71	22
Italy	672	209	71	22
Turkey	190	71	68	25
Britain	890	377	65	28
France	1247	578	63	29
Spain	507	250	82	3

Comparison of export of technological intensive product

- China has a relatively lower capability of its technological intensive manufacturing sectors to acquire VA in the GVC
- DVA share is only 71%, not only it is lower than Japan (84%) and U.S.A. (82%), it is even lower than India (78%). Therefore, it is necessary to improve the performance of China's technological intensive sectors.

Summing up the performance of implicit domestic VA of export of China's manufacturing sector

- China's manufacturing sector has established a relatively higher capability to acquire VA in the division of labor of global value chain (GVC) through more than six decades of process of industrialization. The export of China's manufacturing sector has not only a large content of implicit domestic VA, and the share of implicit domestic VA of export is higher than the average level of the world and also the level of major emerging economies, but there is still disparities existed between China and developed countries such as U.S

Summing up the performance of implicit domestic VA of export of China's manufacturing sector

- It can be seen from above analysis that different types of manufactures have large difference of capability to acquire VA in the division of labor of GVC.
  - China's labor intensive manufacturing sector has a higher capability to acquire VA in the division of labor of GVC, and it has the feature that it is rising steadily in recent years;
  - The capital and technological intensive manufacturing sectors have a lower capability to acquire VA in the division of labor of GVC, furthermore, they are declining to certain extent in recent years.

Policy Implication

- **Actively participate the division of labor of GVC, raise the share of DVA of China's export of manufacturing sector**.
  - To embed seriously the concept of GVC in national overall development strategy and policies
  - To push forward China's manufacturing sector to participate the division of labor of GVC actively through providing a favorable environment for investment and conditions for capital construction
  - To strengthen the productive capability of local firms through upgrade of product, process, function and industrial value chain to raise China's firms in strengthening their capability to acquire VA in GVC

Approaches to Upgrading in a Value Chain

- Process upgrading
  - Firms can process tasks with greater efficiency and lower defect rates than their rivals or process more complex orders
- Product upgrading
  - Firms can supply higher value-added products than their rivals through superior technological sophistication and quality
- Functional upgrading
  - Firms can provide competitive products associated with higher value-added in new segments of a GVC
- Chain upgrading
  - Firms are able to participate in or switch the locus of their activities to new GVCs producing higher value-added products/ services

Policy Implication

- **Adjust industrial policy properly**
- China has implemented sectoral targeting industrial policy for quite a long period. This type of industrial policy is favorable to accelerate the catching up process. But in accompanying the rise of level of development, growth of various industrial sectors, and the increasing uncertainty of demand of the market and the direction of technological innovation, continuing the adoption of sectoral targeting industrial policy may cause systematic mistakes sometimes. By the mean time, sectoral targeting industrial policy will support in general so called emerging industry and neglect to support traditional industries.

Policy Implication

- From the perspective that China's labor intensive industry has a higher capability to acquire VA in the division of labor of GVC, therefore, it is suggested to adjust China's industrial policy appropriately from sectoral targeting to support of crucial tasks

Thank you very much !