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Trade & Investment in Services

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Hongxu Yang

Central University of Finance and Economics, China

“Servicification of Manufacturing Firms: Evidence from China”



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中央财经大学
Central University of Finance and Economics

Content

- What is “Servicification”? How to measure?
- What is “Servicification” like in China?

What is “Servicification”?

- The increasing **input & output, use and sales of services** in **manufacturing firms** are “servicification” of manufacturing” (Low, 2013; Lanz et al.; 2015)
- **service inputs** by manufacturing firms (**outsourcing and offshoring**). And the fact of **output** are sold together with goods as “**solutions**” or “**bundles**” (Miroudot, 2019)

Phenomenon of “Servicification”

- **Sourcing and using service**, the rise of use in manufacturing in **Australia** [Breunig and Bakhtiari (2013)], **Spain** [Merino and Rodríguez (2007)], **Dutch** [Timmer and de Vries (2015)], **the United Kingdom** [Sako (2006)], **the United States** [Berlingieri (2013)] and **Japan** [Jiang et al. (2007)].
- **Sell and export services**, manufacturing firms increasingly take part in sales service, such as **Finland** [Pilat and Wölfl (2005)], **France** [Crozet et al. (2014)], **Germany** [Kelle (2013)], **Austria** [Walter and Dell’mour (2010)] and **Sweden** [Lodefalk (2014)]

How to measure “Servicification” ?

- Due to **data limitation**, it is **difficult to measure** the extent of “in-house” servicification (Lodefalk, 2014).
- Some studies used the **share of service employment**. (Miroudot and Cadestin, 2017)
- Some recent researches take use of **Input-Output tables (IOTs)** as input side (Timmer et al., 2015, Thangevelu et al., 2018).
- From output side, by the **share of service in total sales** (Crozet and Milet, 2017) or **questionnaire and censuses** of whether to offers service (Dash, 2013)(Neely, 2014).

How we measure “Servicification” ?

- We have provided a more precise method to measure servicification from the perspective of service “output”.
- We directly use service production sales of China manufacturing firms.

Data Source

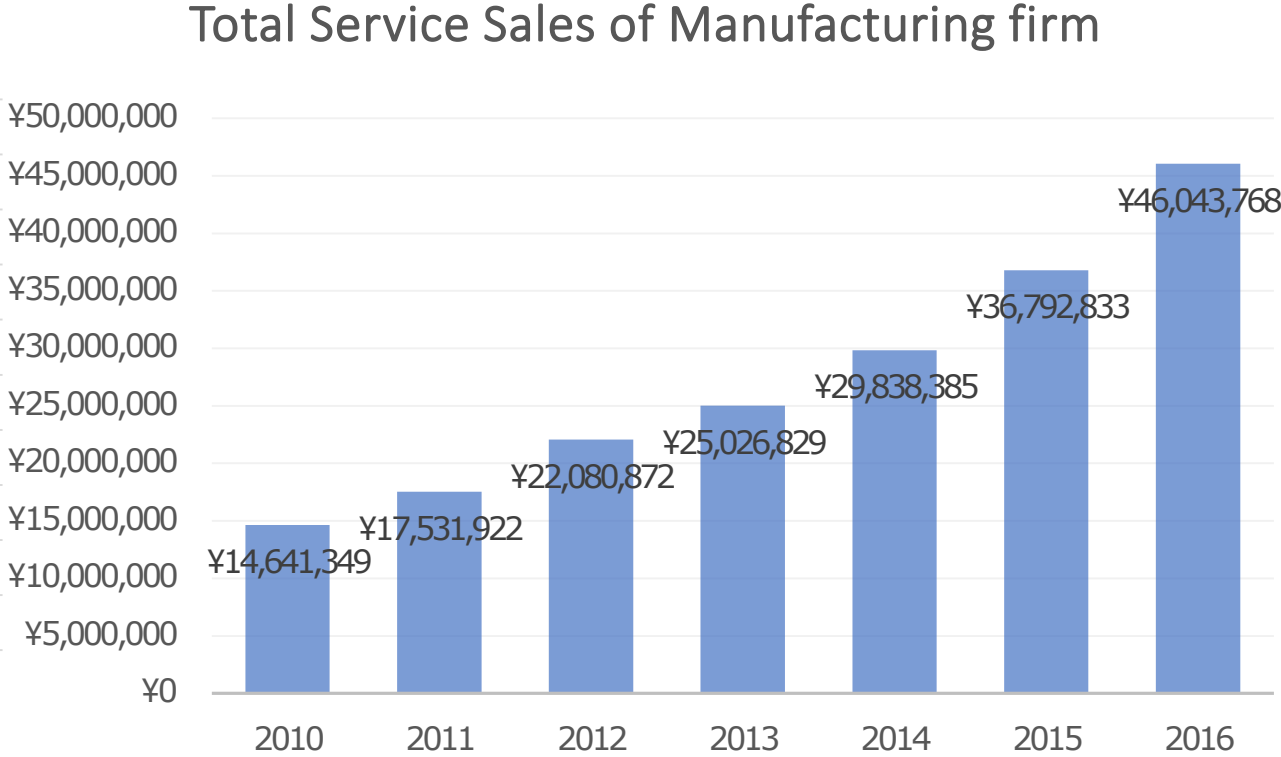
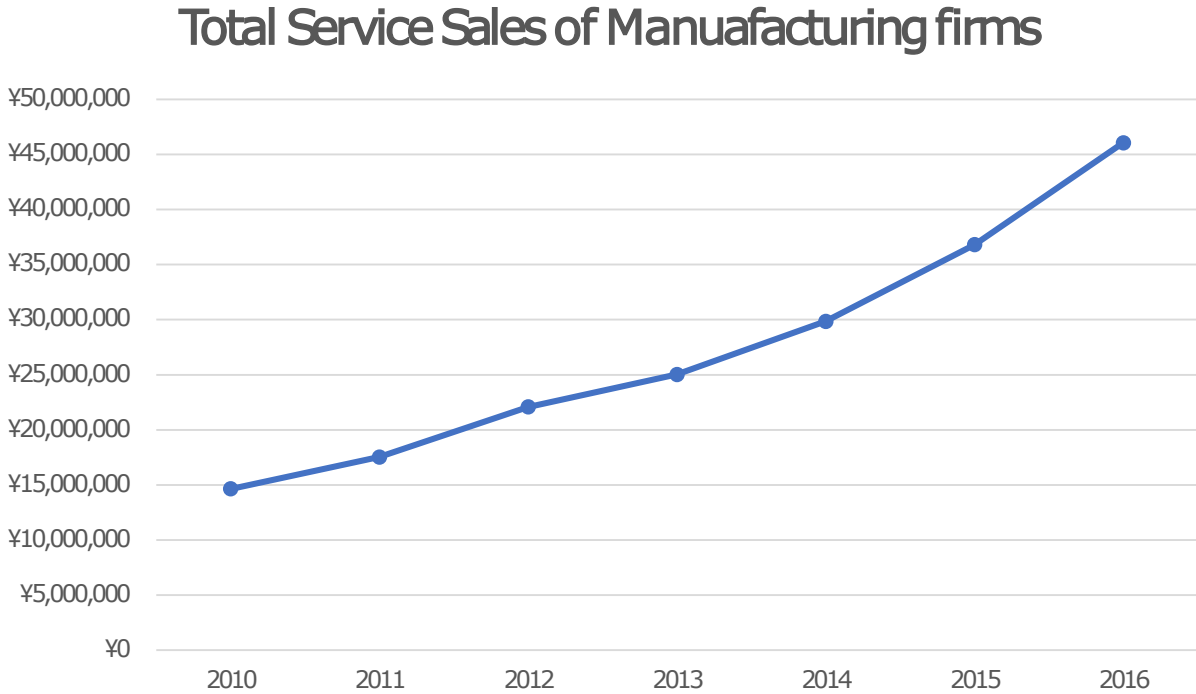
- Our data comes from **databank of listed firms** by WIND database, <https://www.wind.com.cn/en/edb.html>
- reserved 2,215 manufacturing firms after **screen out abnormal firms**
- We downloaded each firm' s **statement of operating revenues table** and listed all intuitive products. We got **11,023 types of products**, and **picked out service products**
- The final **setting contains 18 service industries**. We then sort out the service product and added up in the 18 industries for each firm
- Then we got 279,090 observations of 2,215 manufacturing firms in 18 services industries from 2010 to 2016

	2018-12-31	2017-12-31	2016-12-31	2015-12-31	2014-12-31	2013-12-31	2012-12-31	2011-12-31
Total Operating Revenues	256,490.13	233,093.22	187,600.65	129,507.61	30,718.13	30,444.82	33,148.08	1,398.08
Products	256,490.13	233,093.22	187,600.65	129,507.61	30,718.13	30,444.82	33,148.08	1,398.08
Locomotive operation and maintenance	159,355.33	114,882.28	81,397.35	76,559.85				
Traffic signal system	47,118.02	39,909.39	33,951.71					
Public works maintenance	28,550.36	49,784.01	30,863.77					
Power supply system operation	7,773.89	14,579.33	12,767.11	14,866.19				
Finance lease	370.07							
Hotel			17,793.47	30,609.32				
Station and depot dispatching				976.02				
Locomotive running preparation								
Catering Service					12,991.57	12,484.82	13,537.99	
Accommodation Service					9,074.20	8,913.99	10,502.14	
Leisure Service					4,867.59	4,620.66	4,327.25	
Entertainment Service					2,112.52	2,700.55	3,128.95	
Realty management					1,166.31	1,116.60	1,025.57	
Merchandise trade							22.97	
Products Before 2012								913.79
Other Main Business	13,322.47	13,938.21	10,827.24	6,496.24				
Other Business					505.94	608.21	603.21	
Location	256,490.13	233,093.22	187,600.65	129,507.61	30,718.13	30,444.82	33,148.08	1,398.08
China Mainland	252,525.21	232,688.16	187,364.63	128,996.67	30,212.19	29,836.62	32,544.87	1,398.08
Overseas	3,964.92	405.05	236.02	510.94				
Others					505.94	608.21	603.21	
营业成本	131,019.33	119,119.08	88,600.81	68,013.77	16,975.14	16,684.34	16,876.34	1,101.72
产品	131,019.33	119,119.08	88,600.81	68,013.77	16,975.14	16,684.34	16,876.34	1,101.72
机车车辆运营维护系列	82,613.68	61,511.46	35,203.59	39,071.58				
轨道交通信号系统	22,231.77	19,218.88	15,523.06					
工务维护系列	15,360.84	26,227.86	16,345.37					

Several China Cases of “Servicification”

- **Shanghai Huawei**, a subsidiary of Huawei, decide to no longer produce and sell traditional devices, only focused on technology service business such as R&D, KPO.
- **GAC Honda**, a large car company in Guangzhou. After 2012, the company chose to produce more outsourcing services such as logistics, KPO and advertising. From 2012 to 2017, they has reduced tax burden by 5% due to cost of producing service became lower

Servicification of China Manufacturing Firms

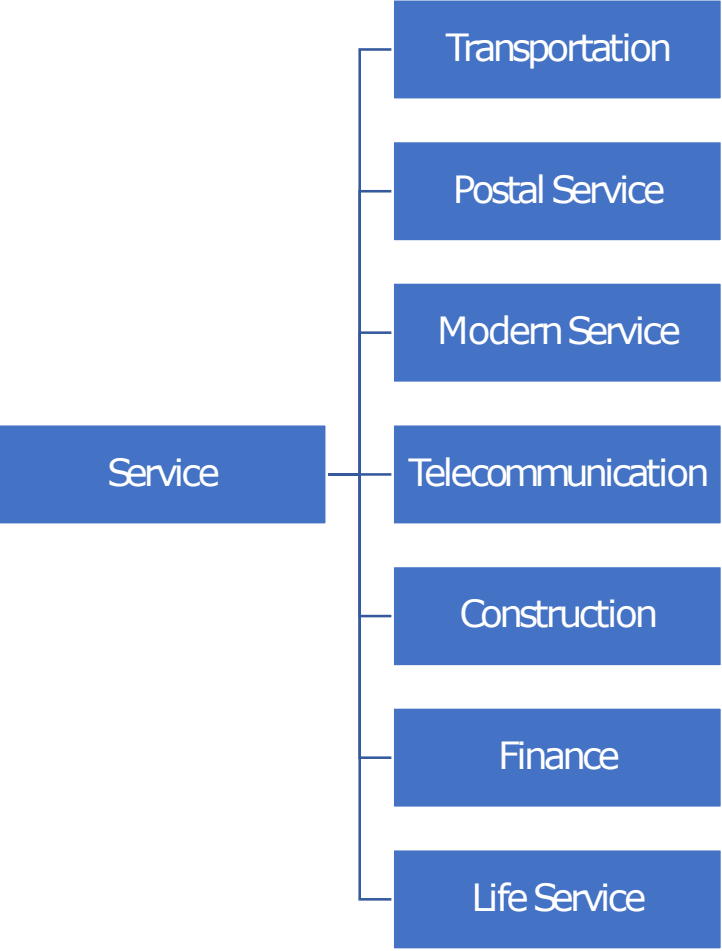


Data source:
China's listed manufacturing firms from WIND database

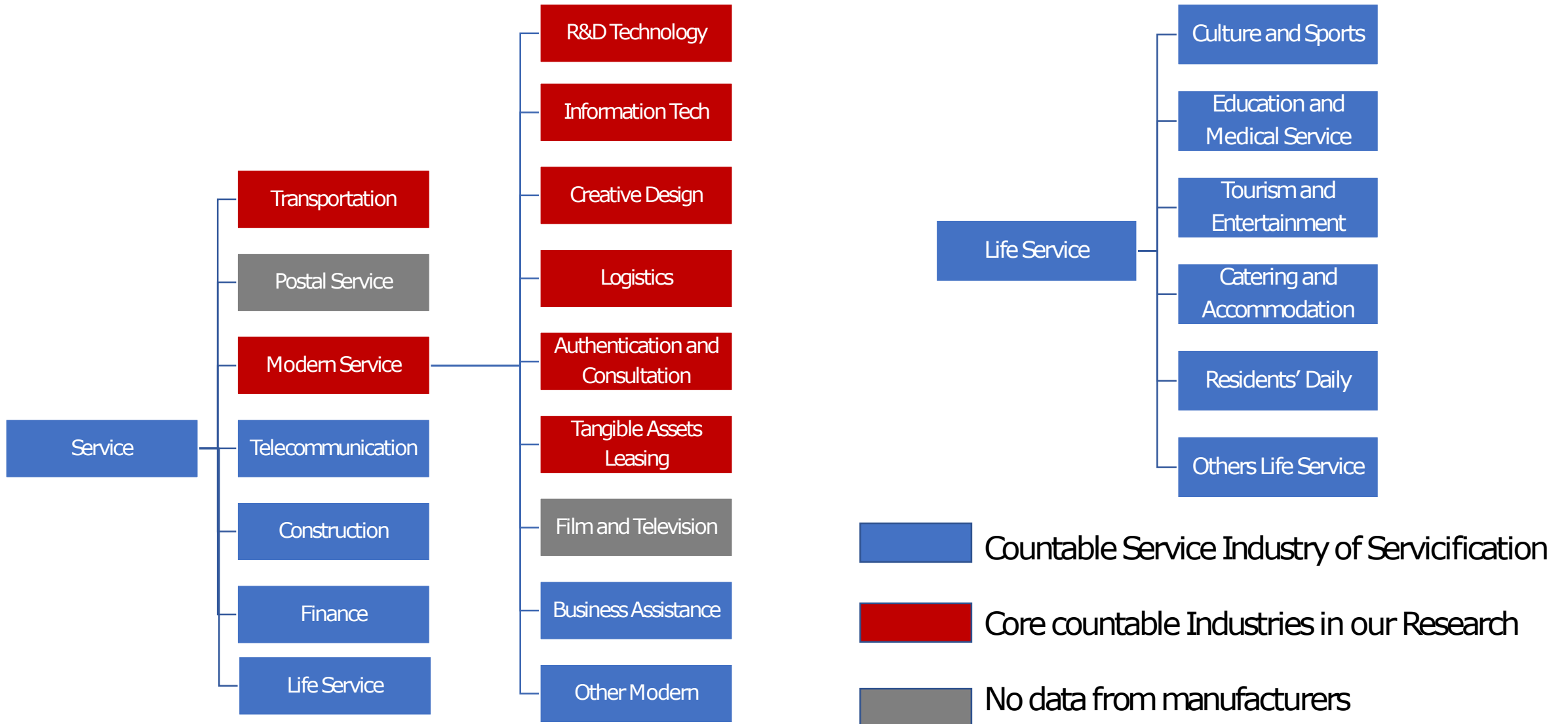
Trend of Servicification in Industry Level

- Service can be classified into **7 service sectors** according to China's State Administration of Taxation
- All **sectors** could be divided into more detailed **industries**
Such as: Modern Service & Life Service

Classification of tax payable service catalogue By State Administration of Taxation

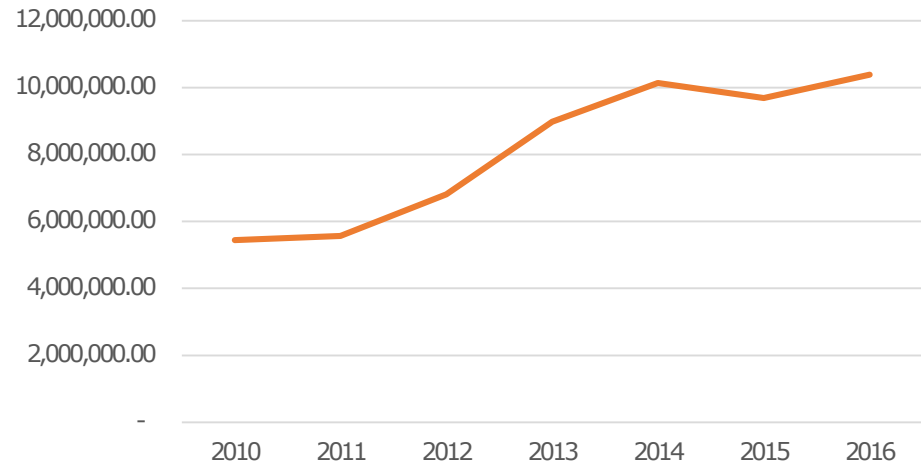


Modern & Life Service

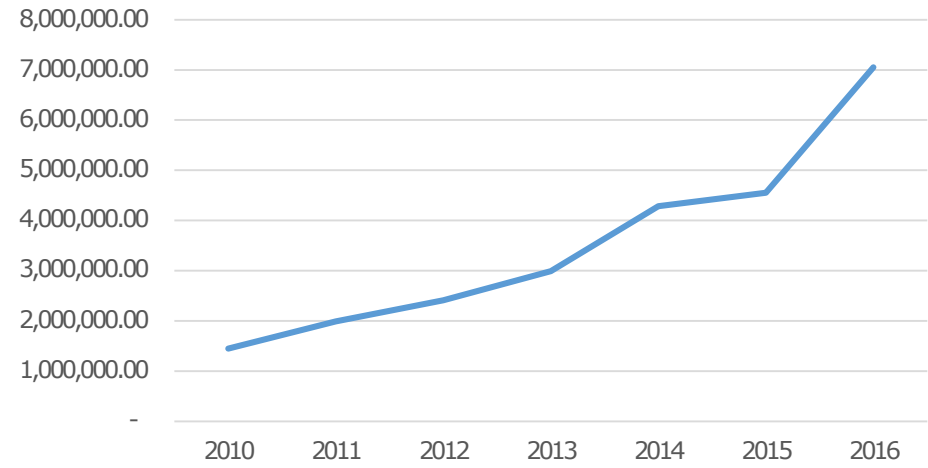


Trend of Servicification in Industry-Level

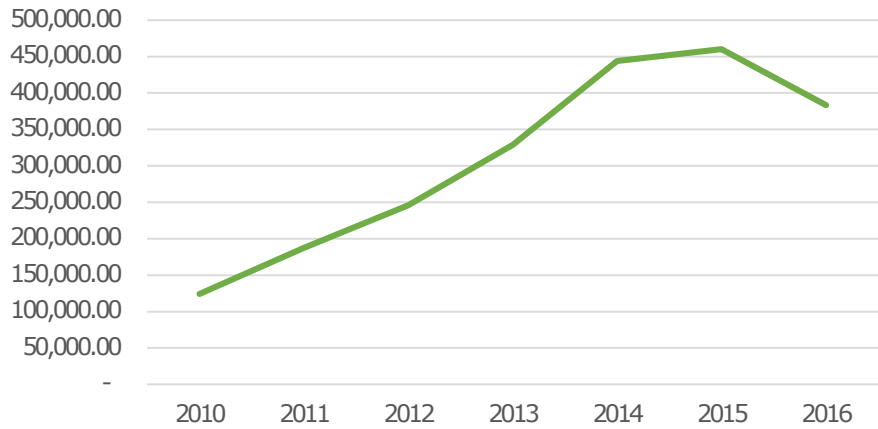
Construction



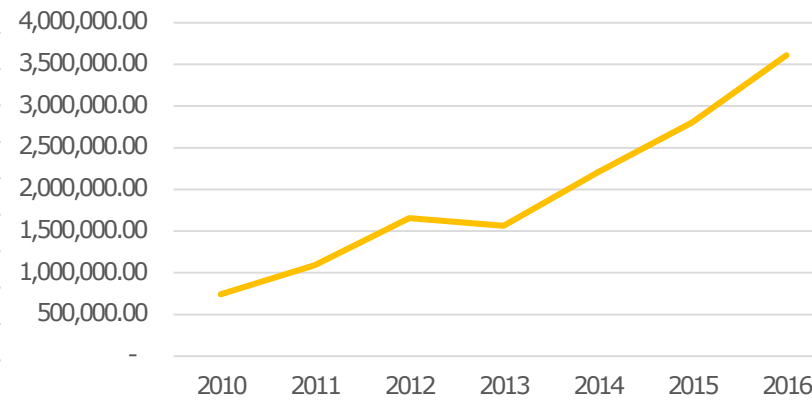
Telecommunication



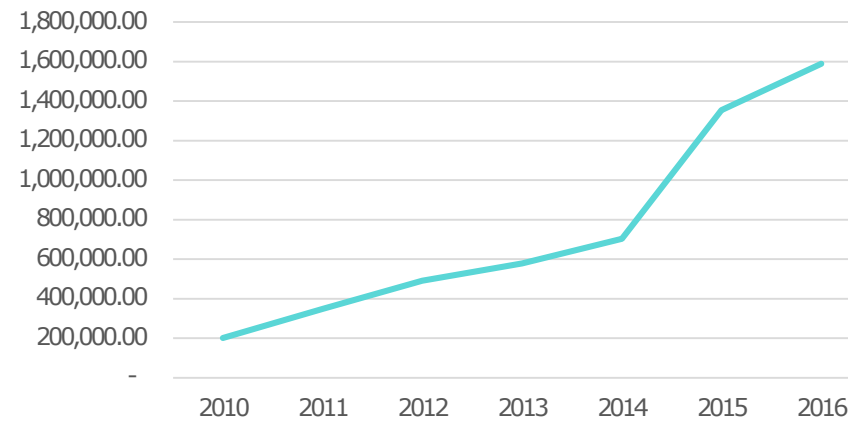
Transportation



Finance

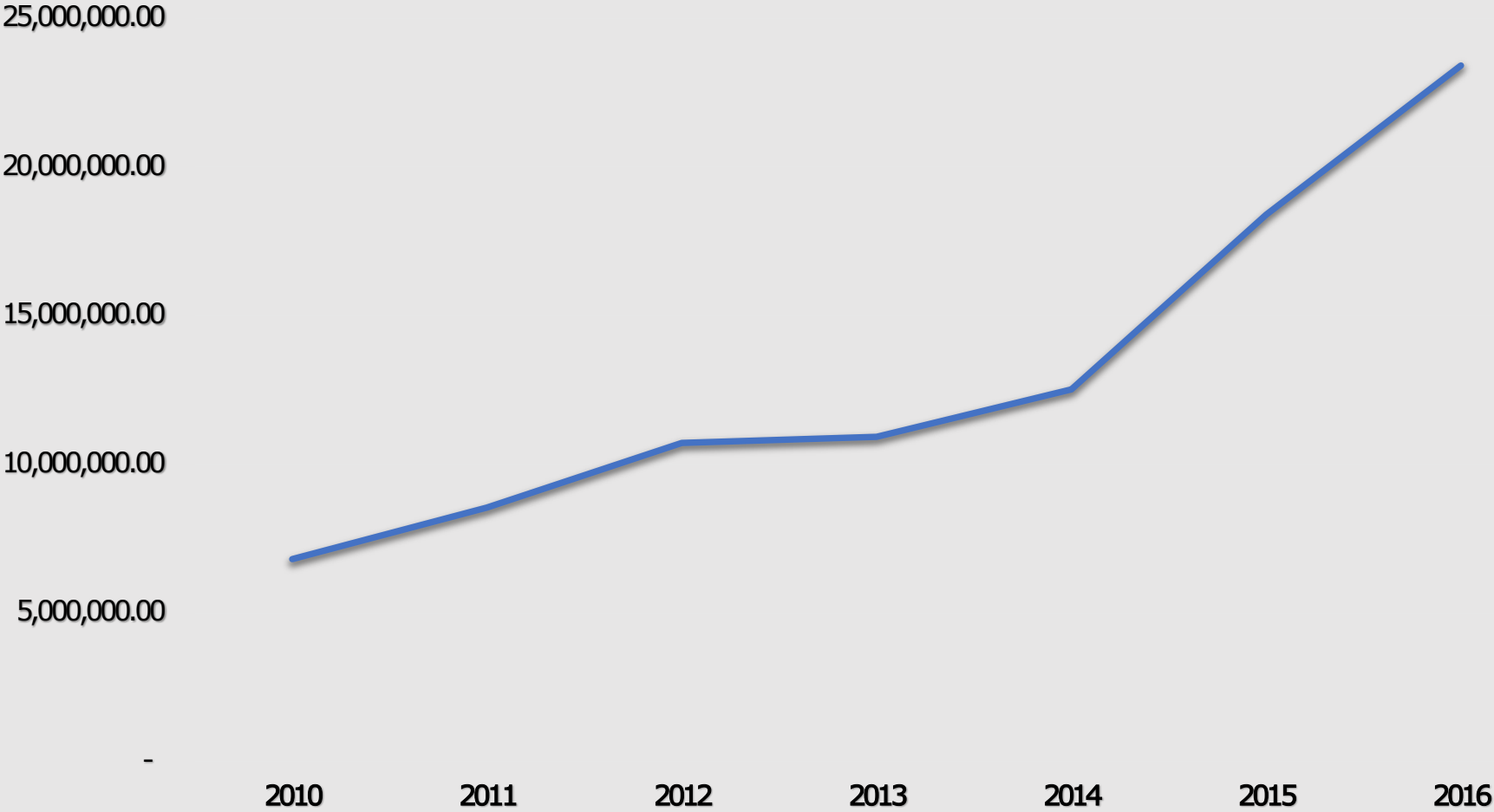


Life Service



Data source:
China's listed manufacturing firms from WIND database

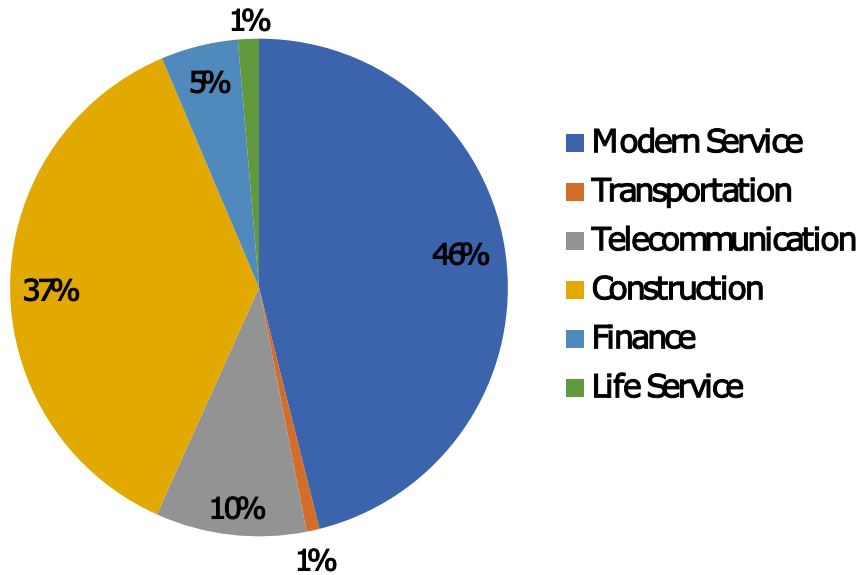
Modern Service



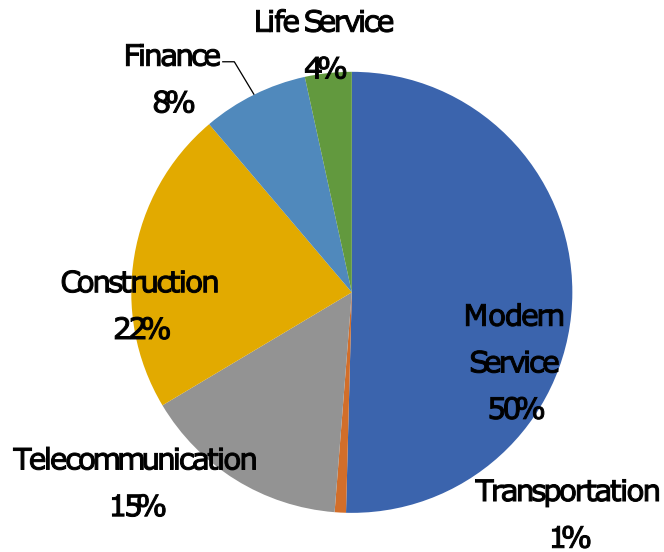
Data source:
China's listed manufacturing firms from WIND database

Modern Service in Servicification Share

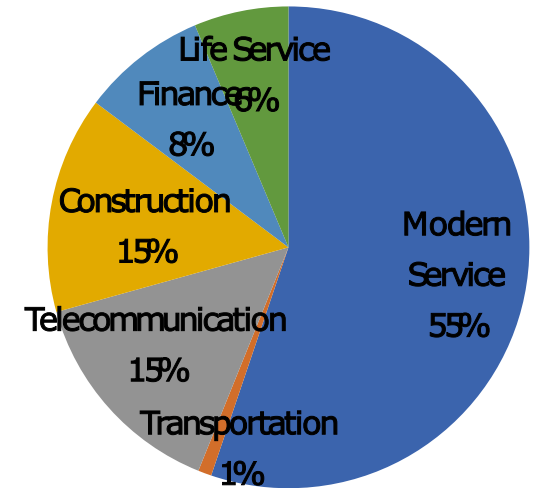
China Manufacturers' servicification share in 2010



China Manufacturers' servicification share in 2016

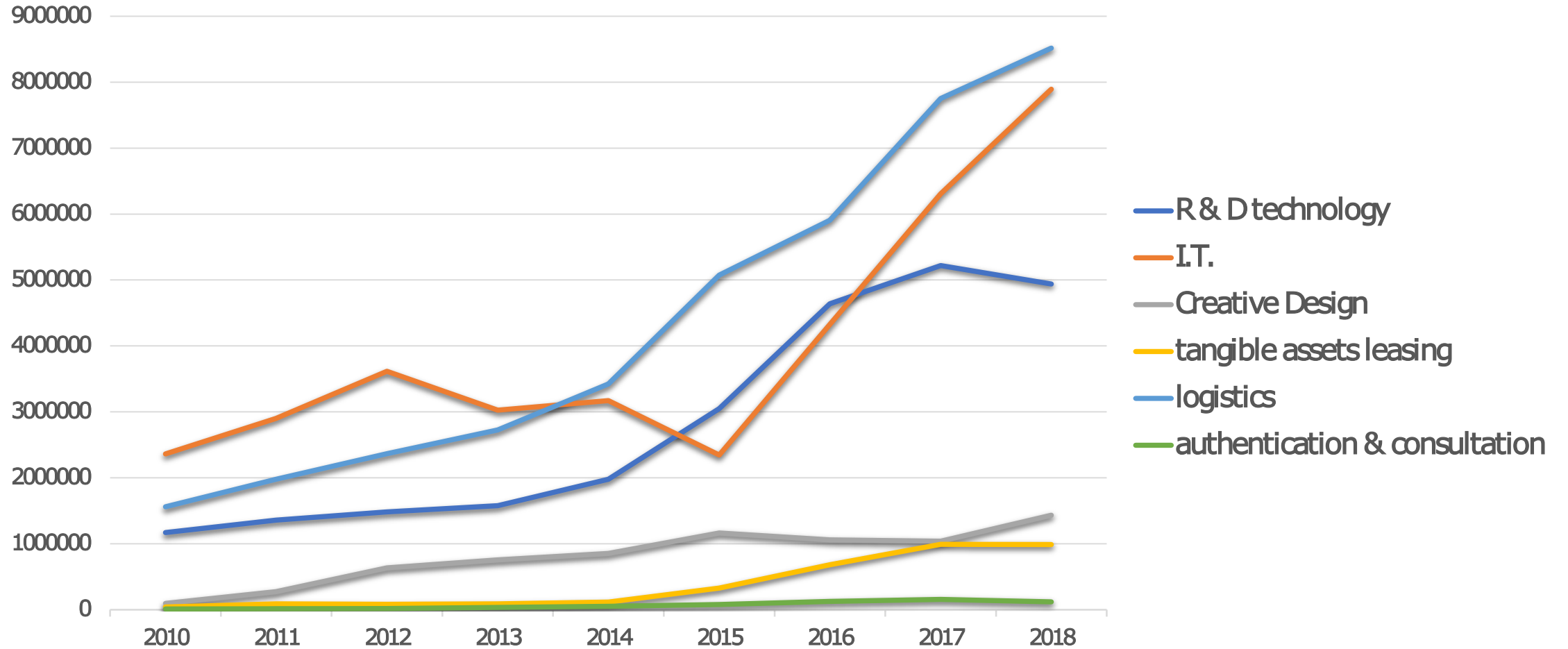


China Manufacturers' servicification share in 2018



Data source:
China's listed manufacturing firms from WIND database

Trend of Servicification in Modern Services

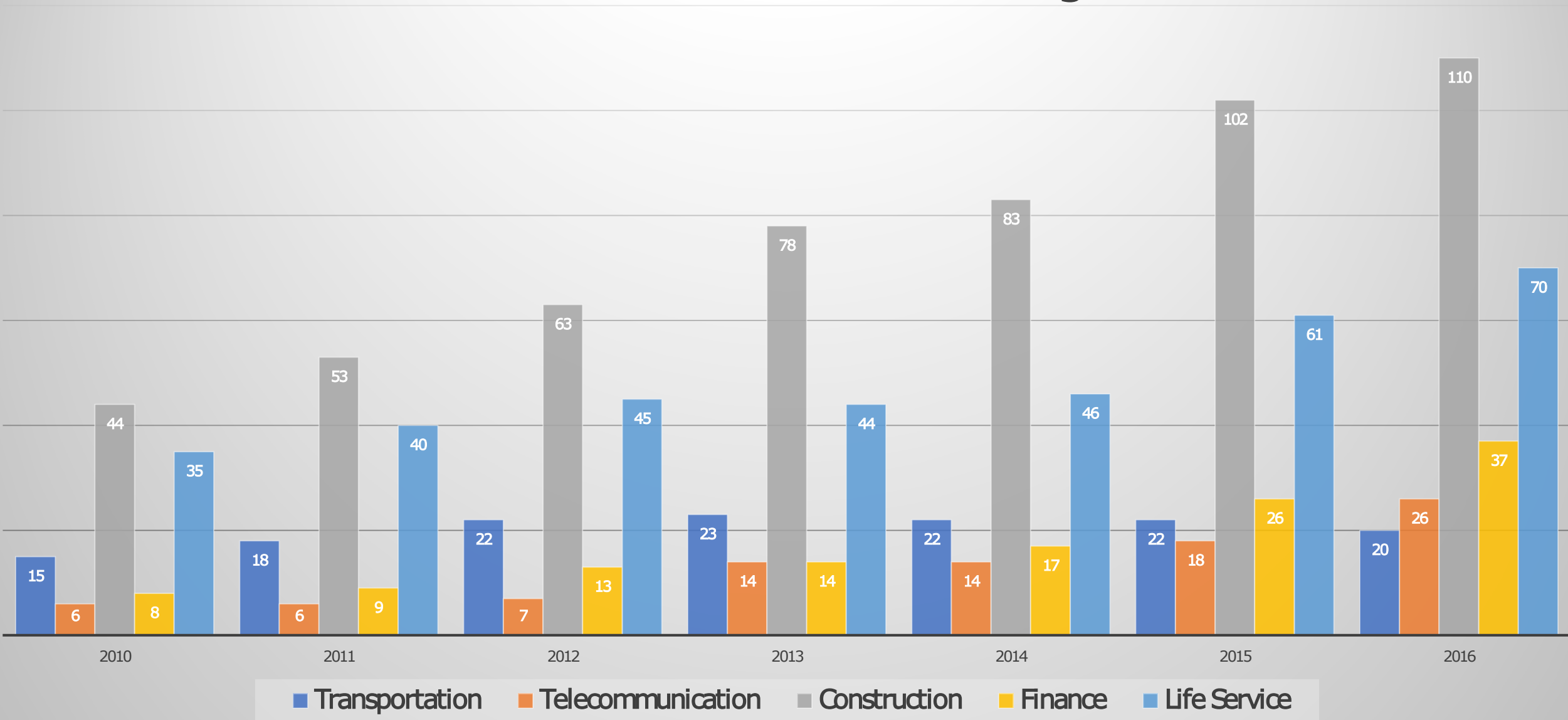


Data source:
China's listed manufacturing firms from WIND database

Trend of Servicification in Firm-Level

- If a firm provides service, we regard it as servicification firm
- We have counted to the number of servicification firms

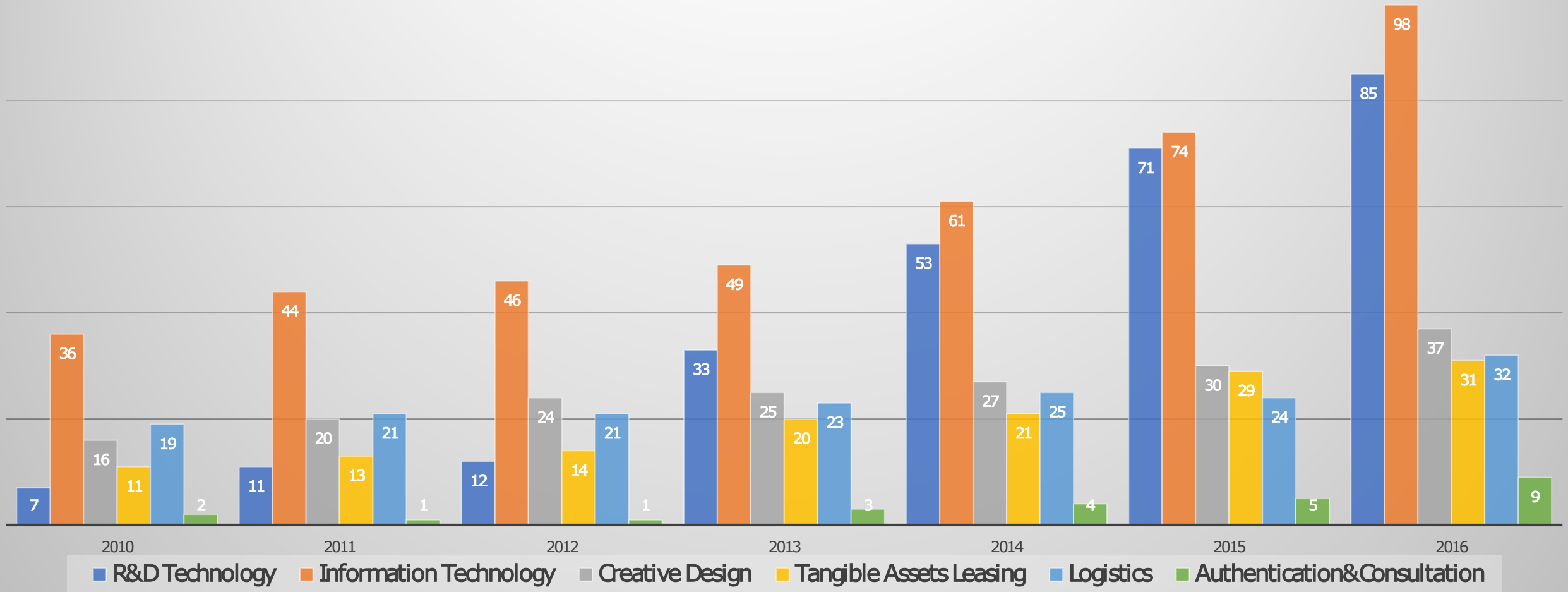
Number of Servicification Manufacturing Firms



Data source: WIND database

Estimated by 2215 China's listed manufacturing firms

Number of Servicification Manufacturing Firms (Modern services)



Data source: WIND database

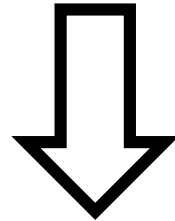
Estimated by 2215 China's listed manufacturing firms

Trend of Servicification in Manufacturers

- We have picked 2,215 manufacturing firms. We wonder **what kind of manufacturers** like to have servicification.
- Firms are from **27 manufacturing industries** (classification by China Securities Regulatory Commission, **CSRC**)
- We reclassified 27 industries into 9 manufacturing sectors.

27 manufacturing industries

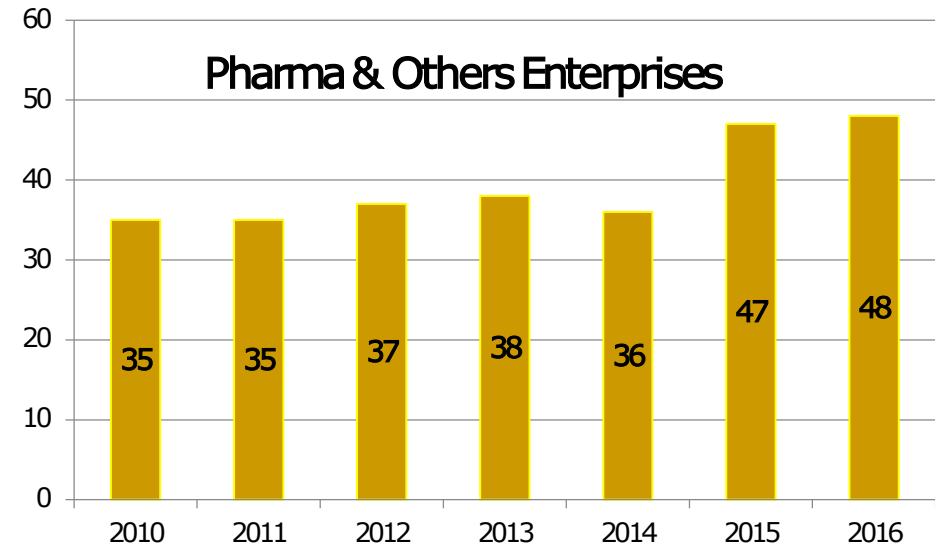
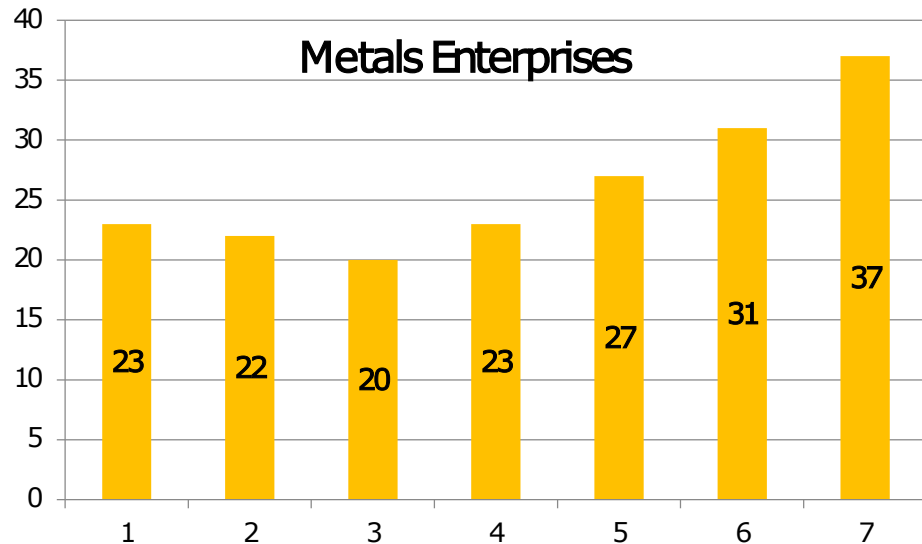
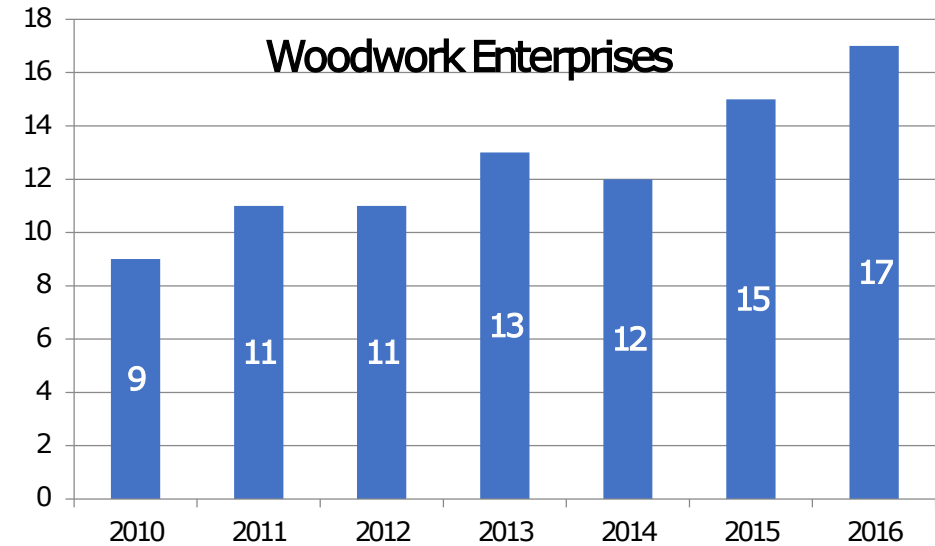
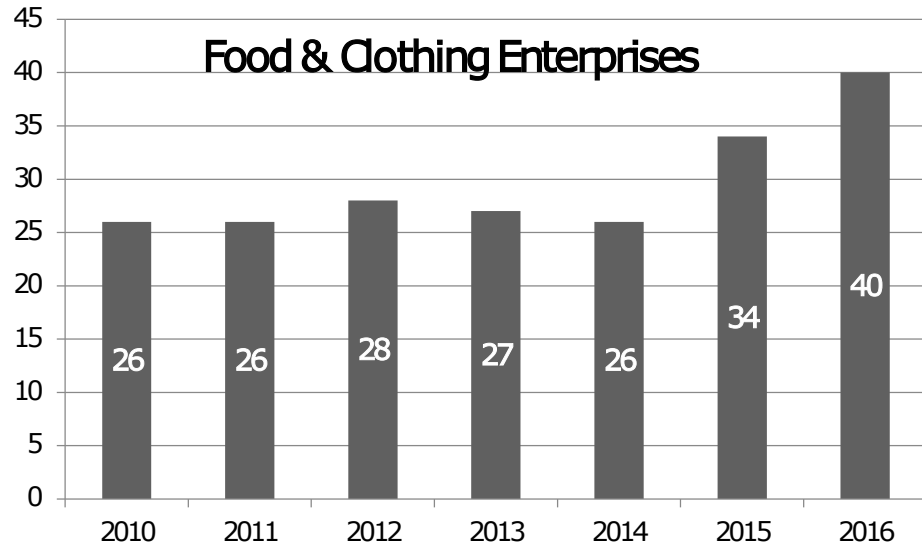
Adjustment to better exhibition



9 manufacturing sectors

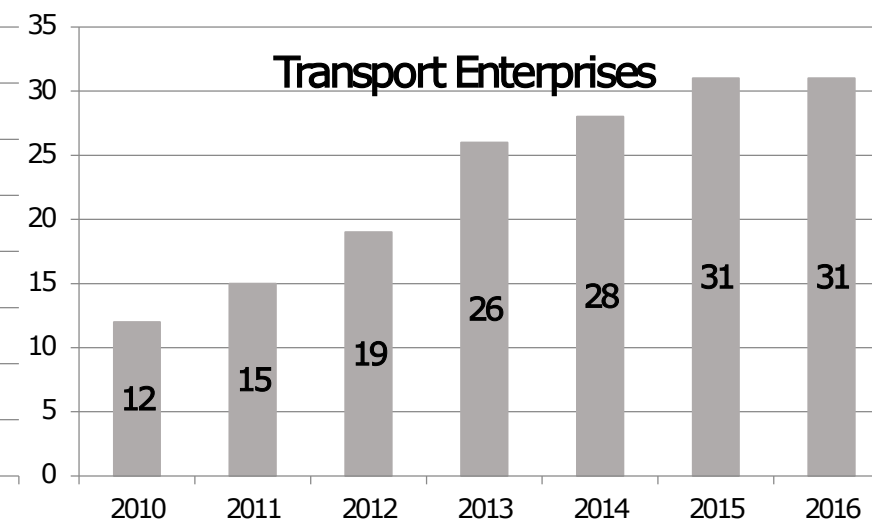
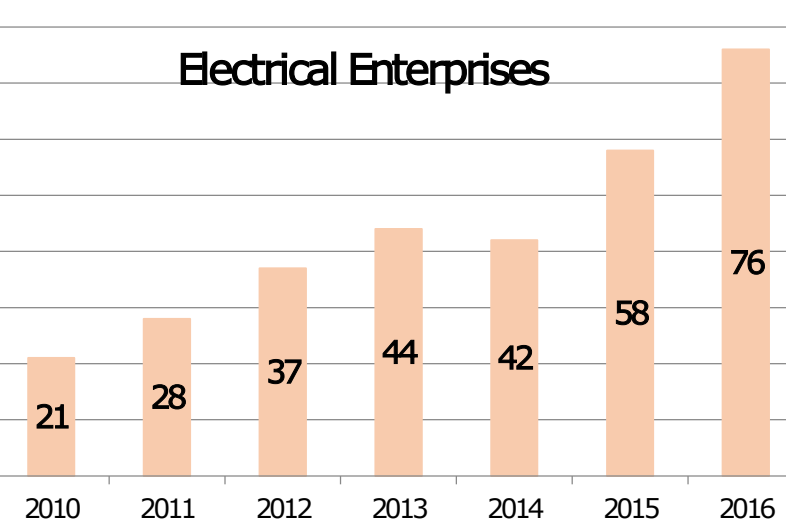
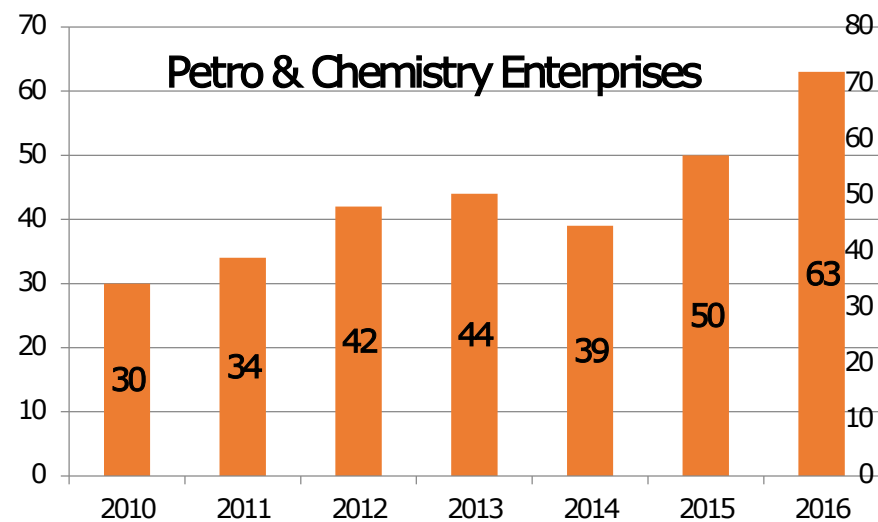
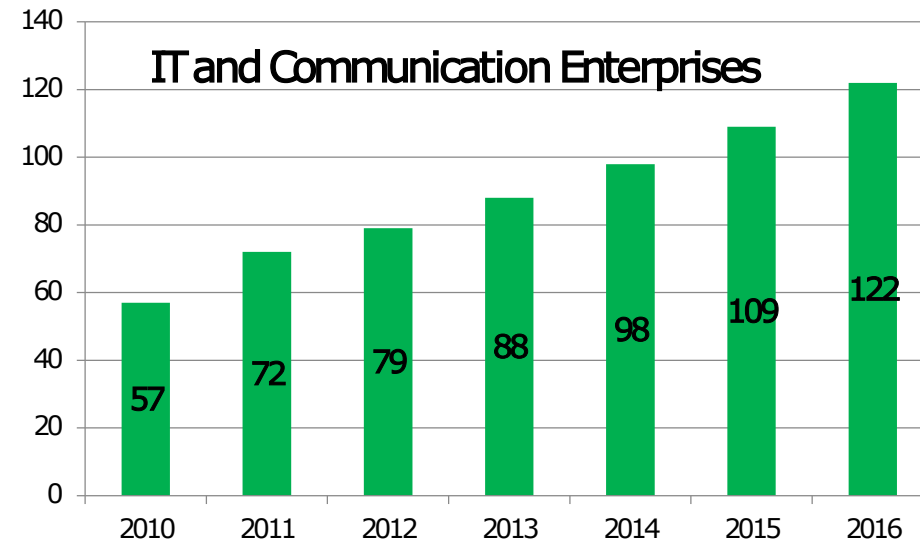
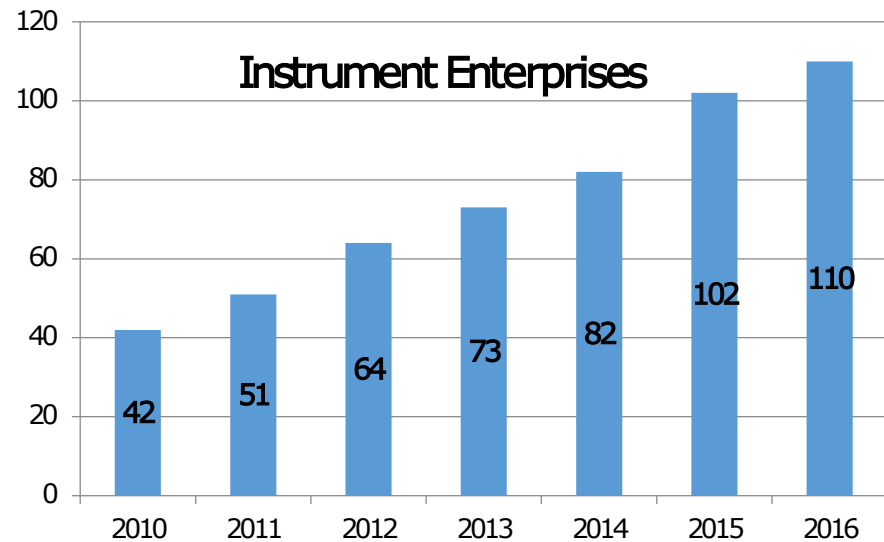
Agricultural and Food Manufacturing	Food and Clothing
Wine, Beverage and Tea manufacturing	
Textile Manufacturing	
Clothing Manufacturing	
Leather, Fur, Feather Manufacturing	
Culture Entertainment Products Manufacturing	
Wood and Grass Manufacturing	Wood and Paper
Furniture Manufacturing	
Papermaking Products Manufacturing	
Printing and Recording Manufacturing	
Fuel Processing Manufacturing	Petro and Chemical
Chemical Products Manufacturing	
Fiber Manufacturing	
Rubber and Plastic Manufacturing	
PC and Communication Equipment Manufacturing	IT and Telecommunication
Non-Metallic Mineral Manufacturing	Mineral and Metal
Ferrous Metals Processing Manufacturing	
Non-Ferrous Metals Processing Manufacturing	
Metal Products Manufacturing	
General Equipment Manufacturing	Instrument
Special Equipment Manufacturing	
Instrument Manufacturing	
Transportation Equipment Manufacturing	Transport
Automobile manufacturing	
Electrical Machinery and Equipment Manufacturing	Electrical
Pharmaceutical Manufacturing	Pharmaceutical
Waste Treatment and Utilization	

Trend of Servicification in Manufacturing level



Data source: China's listed manufacturing firms from WIND database

Trend of Servicification in Manufacturing level

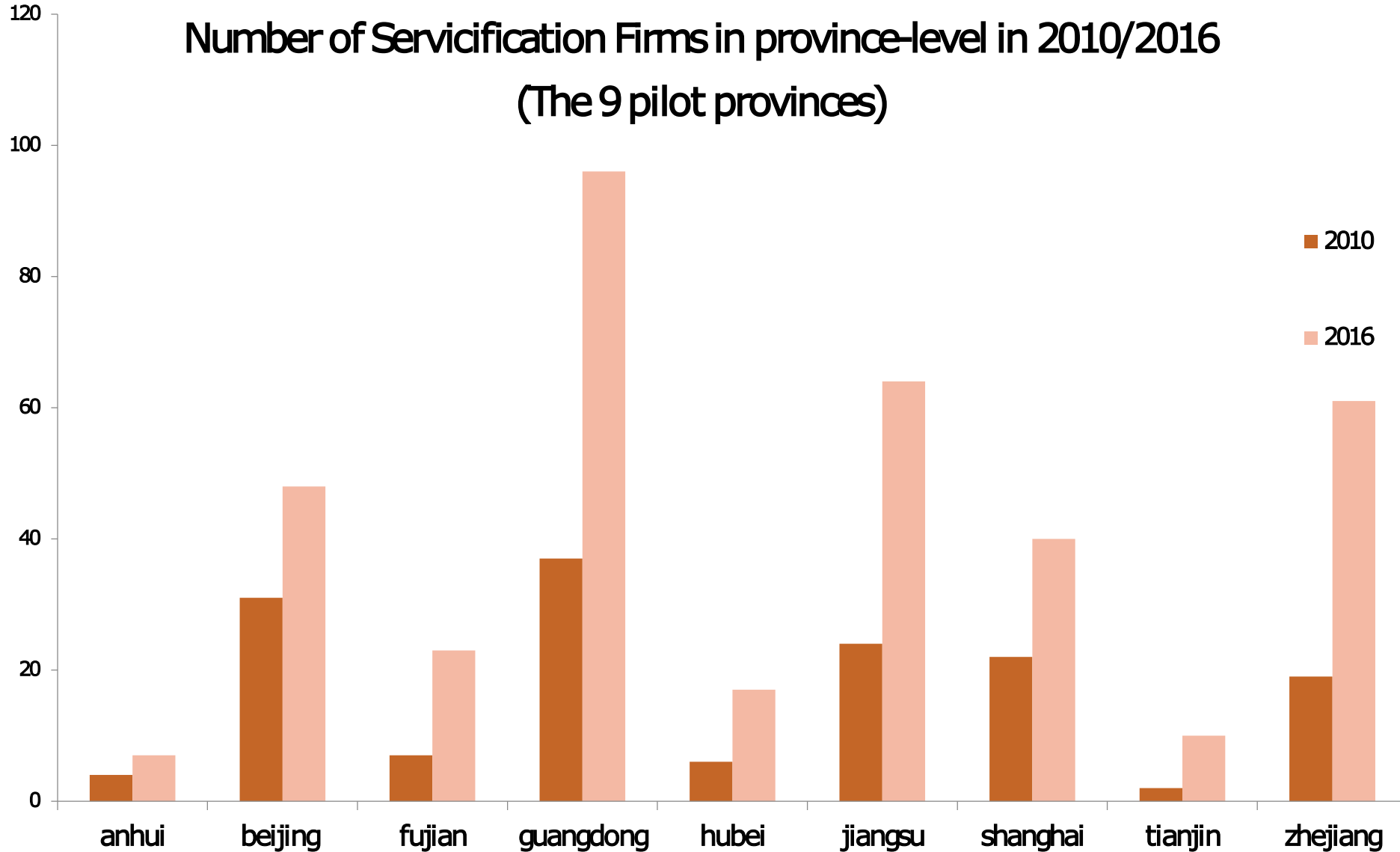


Data source: China's listed manufacturing firms from WIND database

Trend of Servicification in Province-level

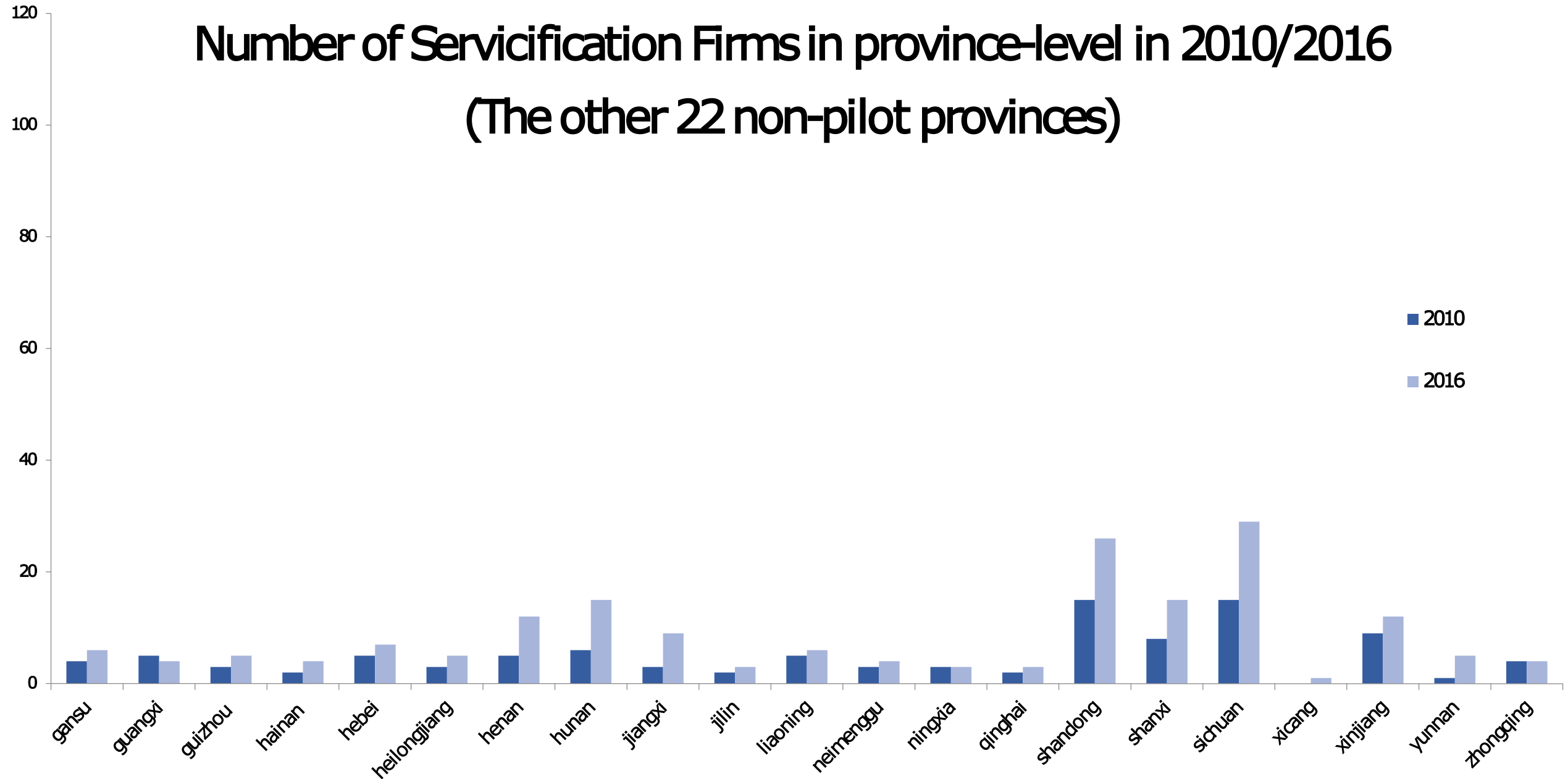
- Each Manufacturing Firm located in one of 31 provinces in China
- There are 2 groups of provinces who take service VAT reform at different time.
 - ⊖ **9 provinces** were selected as **pilot** of service VAT reform in 2012
(Shanghai, Zhejiang, Tianjin... etc.)
 - ⊖ The other **22 provinces** are **non-pilot** provinces
(Shandong, Xinjiang, Tibet...etc.)

Trend of Servicification in Province level



Number of Servicification Firms in province-level in 2010/2016

(The other 22 non-pilot provinces)



Thanks for listening and suggesting!

Report by:

Hongxu Yang

Ph.D. Candidate, SITE, CUFE

Address: hnzzyhx001@163.com