

Will Shanghai be the Detroit of China?

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So what? – the logic of economic geography

- China is the world's biggest producer of new motor vehicles

29,015,434	18,132,595	17,458,189
China	EU	NAFTA

- In both Europe and the US production of parts and final assembly has regrouped into an auto “alley” or “corridor” [Rubenstein & Klier]
 - As a weight-gaining industry, this minimizes production logistics costs
 - These corridors centered on the core of the sales market, which likewise lowers transport costs
 - Agglomeration effects, too: industrial districts & regional specialization
- So ought not production in China also centralize?

Core *tentative* conclusions

- Final assembly widely disbursed
 - And does not match geography of sales
- Suppliers far more concentrated
- Yangtze River Basis is central
 - But (surprisingly) Zhejiang Province outstrips Shanghai-Jiangsu
- Data characteristics make conclusion tentative
- Does product development have same geography?
 - Initial scan suggests yes but no proper analysis

Volkswagen is opening 4 plants...[28 May 2018 news]

- Where?
 - Hefei, Anhui Province [opened in May, JV with Jianghuai Auto]
 - Qingdao, Shandong Province [opened in May, JV with FAW]
 - Foshan, Guangdong Province [JV with FAW]
 - Tianjing (provincial-level city) [JV with FAW]
- But do these locations make economic sense?
 - **NO! – in a world of JIT production management**
- China is a **big** place



- Foshan, Guangdong, China
- Hefei, Anhui, China
- Qingdao, Shandong, China
- Tianjin, China
- Add destination

OPTIONS

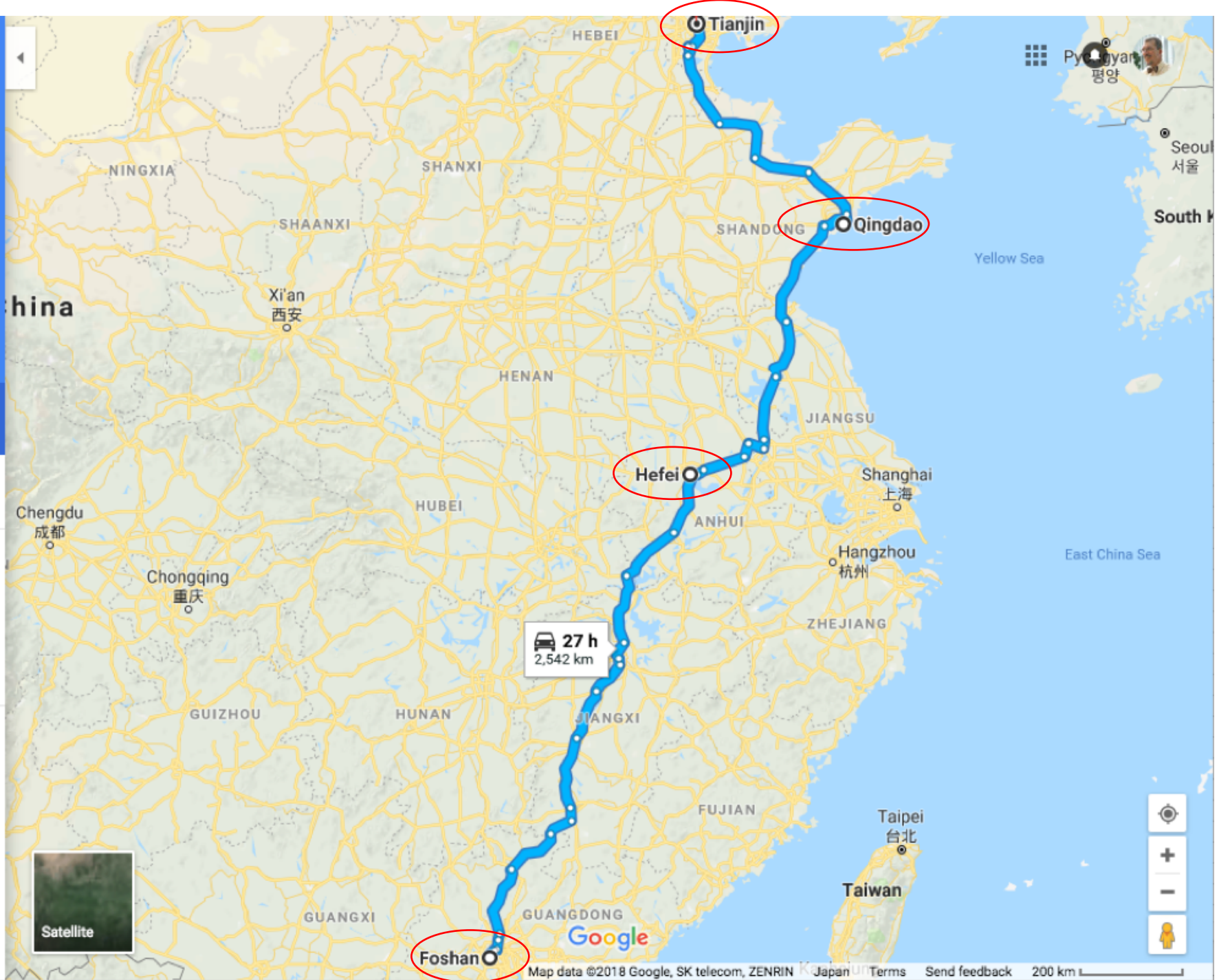
Send directions to your phone

via G45大广高速 27 h

27 h without traffic 2,542 km

⚠ This route has tolls.

[DETAILS](#)



27 h
2,542 km



So...which will dominate?

- Political economy?
 - To each province an auto company...
- Economic geography?
 - Production centered on core market
- BUT
 - China is BIG
 - It may be able to support more than one production center
- Received wisdom
 - 6 Centers:
 - Manchuria, Beijing-Tianjin, Shanghai, Guangzhou, Wuhan, Chongqing-Sichuan
 - Hypothesis: not sustainable

Quick findings

- Despite discussion of 6 automotive centers in China
 - Over half of parts firms are in the greater Shanghai region
 - Smaller shares (18% each) are in two other regions
 - the Pearl River Delta region around Guangzhou
 - the northeast plains around Beijing up into Manchuria
 - Very few suppliers in the center-west (Chongqing & Sichuan)
- Finally assembly remains disbursed
 - Overlaps neither parts firms nor geography of sales
- Regional political economy remains the enemy of efficiency
 - Or logistics costs aren't so central for final assembly??

Rubenstein & Klier: NAFTA and EU Geography

North America, 2013

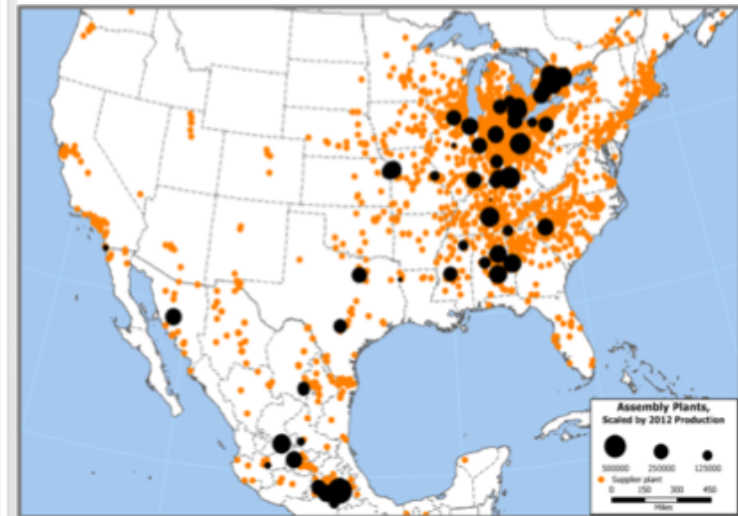


73% of region's assembly

Europe, 2013



78% of region's assembly



Parts Production vs Assembly

China is a big place

- Approximate size of Continental United States
 - 31 Top Administrative Units: 27 Provinces, 4 Provincial-level Cities
- Until 1994 all maintained border controls on “foreign” trade
 - NOT a unified market
 - Vestigates remain strong
- So while VW’s largest operation is in Shanghai, only Hefei is near to their core location
 - Localism remains strong

CHINA



X U.S.

Canada

Edmonton

Harbin

North Atlantic Ocean

Ottawa

Beijing

Washington, D.C.

Shanghai

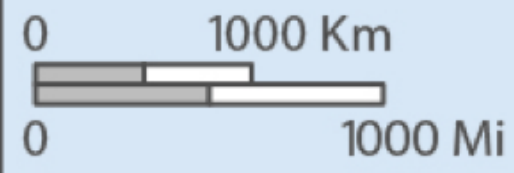
Los Angeles

Lhasa

Guangzhou

Taipei

North Pacific Ocean









Huge number players across entire geography

LCVs	LCVs + Trucks	Province
17	17	Hubei
13	39	Beijing, Jiangsu, Shandong
12	12	Chongqing
11	22	Guangdong, Zhejiang
10	30	Sichuan, Hunan, Fujian
9	18	Liaoning, Jiling
8	24	Shanghai, Hebei, Jiangxi
7	7	Anhui
6	6	Guangxi
5	10	Shaanxi, Henan
3	9	Yunnan, Shanxi, Tianjin
2	2	Xinjiang
1	4	Guizhou, Inner Mongolia, Heilongjiang, Hainan
0	0	Gansu, Tibet, Qinghai, Ningxia
104	200	TOTAL



Data

- Annual industry directory. Used 2016 edition.
- Lists of suppliers by type of component. Did 3 large categories
 - Engine components
 - 25 categories
 - 2,692 firms (includes duplicates – firms making more than one component)
 - Chassis & Transmission
 - 38 categories
 - 3,485 firms
 - Electrical & Electronics
 - 29 categories
 - 2,771 firms

B

汽车工业蓝皮书

BLUE BOOK OF AUTOMOTIVE INDUSTRY

中国汽车零部件产业 发展报告 (2015~2016)

中国汽车工业协会
中国汽车工程研究院
编 著

ANNUAL REPORT ON AUTO PARTS INDUSTRY
IN CHINA (2015-2016)

社会科学文献出版社
SOCIAL SCIENCES ACADEMIC PRESS (CHINA)

2016
版

中国汽车工业协会 编
北京中汽华轮信息技术有限公司

[2016 版]

中国汽车工业企业事业 单位信息大全

CHINA AUTOMOTIVE INDUSTRY ENTERPRISES & ADMINISTRATIVE ORGANIZATIONS

2015款科帕奇 全新登场
美式大SUV七座版 **17.99** 万元起



科帕奇 CAPTIVA

探索无止境 FIND NEW ROADS

雪佛兰
CHEVROLET



人民交通出版社股份有限公司
China Communications Press Co., Ltd.

Geography: by province

Then I counted each category by province

Total			离合器	离合器泵 离合器附件	变速器	变速器壳体	同步器同步器环	转动齿轮	变速器其他配件
61	Beijing	北京	1	1	5	3			1
54	Tianjin	天津		2	1	2		2	2
172	Hebei	河北	2	9	5		5	5	9
17	Shanxi	山西		2					
8	Inner Mongolia	内蒙古	1			1			1
97	Liaoning	辽宁	2	6	2		1	6	1
140	Jilin	吉林	7	5	6	4	1	6	
20	Heilongjiang	黑龙江		4	2			2	3
133	Shanghai	上海	5	9	3	2	1	5	6
267	Jiangsu	江苏	7	16	5	4	7	15	6
997	Zhejiang	浙江	17	97	15	3	7	32	22
146	Anhui	安徽	2	8	4	3	1		3
137	Fujian	福建		7	4	1	5		1
48	Jiangxi	江西		1	7		1	5	3
361	Shangdong	山东	4	7	9	6	2	17	2
114	Henan	河南		5	1	6		5	
267	Hubei	湖北	6	13	4	4	4	17	6
32	Hunan	湖南	2		4			4	1
140	Guangdong	广东	5	6	3	2		3	4
43	Guangxi	广西	1	4	3		1	3	
1	Hainan	海南							
119	Chongqing	重庆	3		10	4	6	19	1

And used Google maps to calculate travel time

Province City	Beijing beijing	Tianjin tianjin	Hebei baoding	Shandong jinan	Shandong qingdao	Jiangsu suzhou	Shanghai shanghai	Jiangsu nanjing	Zhejiang ningbo	Zhejiang hangzhou	Zhejiang wenzhou
beijing	0										
tianjin	2	0									
baoding	1.5	2.3	0								
jinan	4.5	4	4	0							
qingdao	7	6.5	6.5	4	0						
suzhou	12	11.5	11.5	8.5	7.5	0					
shanghai	12.5	12	12	9	8	1.5	0				
nanjing	11	10	10	7	7	2.5	4	0			
ningbo	14.5	13.5	13.5	10.5	10	2.5	2.5	5	0		
hangzhou	13.5	13	13	10	9	2	2	3.5	2	0	
wenzhou	17	16	16.5	13.5	12.5	5.5	6	7.5	3.5	4	0
fuzhou	20	20	19.5	16.5	16	9	10	10.5	7	8	4
wuhu	11.5	11	11	8	7.5	3	4	1.5	5	3.5	6.75
hefei	11	10	10	7	8	4.5	5.5	2.5	2	5	8.5
wuhan	11.5	11.5	10.5	9	11.5	8.5	9	6.5	4.5	9	10.25
zhengzhou	7.5	7.5	6	5	8	9	10	7	12	10	14
changsha	15	15	14	12.5	15.5	11.5	11.5	10	8.5	10	10.5
guangzhou	22	22	20.5	19	20.5	15	15.5	15	13	13.5	13.25
guilin	20	20	19	17.5	20.5	16	16	15	13.5	14.5	15
chenzhou	18	18	17	16	18.5	14	14	13	11.5	12	12.5
chongqing	20	20	18.5	17.5	20.5	18	19	16.5	15	19	20.25
chengdu	20	20	18.5	18	21	20.5	21.5	19	17	21.5	23
shenyang	7	6.5	8.5	10	12	17	17.5	16	19.5	18.5	22
changchun	10	9	11	12.5	15	20	20	18.5	22	21	24

	Fujian fuzhou	Anhui wuhu	Anhui hefei	Hubei wuhan	Henan zhengzhou	Hubei changsha	Guangdong guangzhou	Guangxi guilin	Hubei chenzhou	Chongqing chongqing	Sichuan chengdu	Liaoning shenyang
fuzhou	0											
wuhu	9.5	0										
hefei	10	2	0									
wuhan	10.5	6	4.5	0								
zhengzhou	15.5	7.5	6	5.5	0							
changsha	10	9	8	4.5	9	0						
guangzhou	10	14	13	11.5	16	8	0					
guilin	13	14	13	8	14	5.5	5	0				
chenzhou	10	12	11	9.5	12	4	4	4	0			
chongqing	20.5	16	14.5	11	12	11	16	10.5	13.5	0		
chengdu	23	18.5	17	13	14	14	18	12.5	16	4.5	0	
shenyang	26	17	16	18	14	21.5	28	26	24	26	26	0
changchur	28	19.5	19	20	16	24	30	29	27	29	29	3

And then summarize by region

	Total	离合器	离合器泵 离合器附件	变速器	变速器壳体	同步器同步 器环	转动齿轮	变速器其他 配件	减速器 差速 器 分动箱 取 力器及其配 件
Manchuria	7%	13%	7%	10%	8%	5%	9%	5%	7%
North	16%	19%	14%	21%	21%	16%	14%	23%	17%
North plus Shandong	27%	24%	18%	30%	33%	21%	25%	25%	29%
Yangtze	48%	50%	67%	27%	27%	44%	46%	53%	38%
Yangtze plus Shandong	58%	56%	70%	36%	40%	49%	57%	56%	50%
Yangtze less 50% Zhejiang	33%	38%	43%	20%	24%	36%	35%	39%	31%
Yangtze plus Shandong less 50% Zhejiang	44%	44%	46%	29%	36%	41%	46%	41%	43%
South	13%	17%	11%	10%	13%	12%	15%	13%	20%
West	5%	9%	0%	14%	15%	16%	16%	3%	9%
Not in a regional grouping	9%	4%	7%	8%	17%	12%	3%	5%	18%

Grand Summary

			Engine	Chassis	Electrical	Light Vehicle Assembly
Manchuria			6%	7%	4%	11%
North			16%	16%	13%	28%
North + Shandong			25%	27%	17%	35%
Yangtze			48%	48%	58%	24%
Yangtze + Shandong			57%	58%	62%	31%
Yangtze - 50% Zhejiang			36%	33%	43%	n/a
Yangtze + Shandong - 50% Zhejiang			45%	44%	47%	n/a
South			13%	13%	17%	23%
West			7%	5%	3%	13%
Not in a grouping			6%	9%	5%	6%

Problems with data

- Overcounting: Unable to readily distinguish
 - production versus aftermarket
 - Passenger vehicles vs commercial vehicles vs specialty vehicles
- No information on firm size or sales
 - Found partial information online for all of a sampling of firms, but very time intensive
- Undercount: in general headquarters but not branch plants
 - Hella has 14 locations in China, did not see separate entries
 - Adient (former JCI) has 30 locations, can spot check

Qualifications and observations

- Because data miss multiple establishments,
 - Eg seating and other plants where large firms appear to dominate
 - Likely understates size of local supply base, eg, in the West
- Nevertheless disjuncture between locus of production and suppliers
- At category level, lots of clustering apparent:
 - Spinoffs = “Wenzhou” model?
 - Software / High Tech in Beijing
 - Audio/infotainment in Guangdong
 - Zhejiang has too many suppliers to be true?
- Still, Shanghai is the center of the supplier universe

Body Makers

36	Beijing
55	Hebei
91	Greater Beijing
132	Shandong
20	Shanghai
74	Jiangsu
28	Zhejiang
122	Yangtze

Where Next?

- Need to add literature survey. Perhaps 8 papers
 - most in Chinese, so useful to know what's out there
- Need to add data on sales by prefecture to see match with assembly

Additional directions

- Directory lists suppliers by end customer
 - Have yet to explore. Less helpful as by firm not factory.
- Can scan for information on R&D and aftermarket vs sales
 - Most but far from all entries provide sufficient detail
- Can detail by city – all entries include mail code
 - Not clear will learn more from doing so, given data quality
- Probably cannot dive down to individual data
 - \approx 15 minutes per firm to locate online and read information
 - Still hard to know if it captures branch plants

Sample counts

Major Foreign Parts Firms	
Shanghai	66
Beijing	21
Tianjin [near Beijing]	1
Guangzhou	2
Wuxi [near Shanghai]	2
Other Yangtze [includes Wuhan]	3

Distribution of Suppliers to Major Customers

零部件生产配套情况参考索引 Index firms by Customer	Northeast	North	Yangtze	Central (includes Wuhan ?!)	West	Total
一汽—大众 FAW - VW	104 (25%)	31 (7%)	232 (55%)	42 (10%)	15 (4%)	424
上海通用 Shanghai GM	15 (3%)	31 (8%)	312 (78%)	30 (7%)	13 (3%)	401
上海通用五菱 Shanghai GM Wuling	14 (5%)	19 (7%)	146 (53%)	56 (20%)	40 (15%)	275
	133	81	690	128	68	1,100of

制造设备， 模具

Production Equipment and Tooling

	Yangtze	North	Central	South	Total
涂装设备， 生产线 Paint and Assembly Line Equipment	41	26	8	10	85
机床等通用设备 Machine Tools and other Equipment	69	40	20	11	140
测量设备 Metrology Equipment	7	6	3	2	18
Specialized Automotive Machinery 汽车专用设备	85	50	16	25	176
Total	202	122	47	48	419
Share	48%	29%	11%	11%	

Are these global supplier plants are in my dataset? (Google Earth shot of suppliers around the GM Shanghai Plant)

