

Changes in the Auto Parts Global Value Chain between 2000 and 2018

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Purpose

- This study investigates the changes in the auto parts manufacturing global value chain (GVC) between 2000 and 2018.

Big change between in 2000 and 2018, Car Production

	Country	Total	Share
1	USA	12,799,857	21.9%
2	Japan	10,140,796	17.4%
3	Germany	5,526,615	9.5%
4	France	3,348,361	5.7%
5	South Korea	3,114,998	5.3%
6	Spain	3,032,874	5.2%
7	Canada	2,961,636	5.1%
8	China	2,069,069	3.5%
9	Mexico	1,935,527	3.3%
10	UK	1,813,894	3.1%

	Country	Total	Share
	Total	95,634,593	100.0%
1	China	27,809,196	29.1%
2	USA	11,314,705	11.8%
3	Japan	9,728,528	10.2%
4	India	5,174,645	5.4%
5	Germany	5,120,409	5.4%
6	Mexico	4,100,525	4.3%
7	South Korea	4,028,834	4.2%
8	Brazil	2,879,809	3.0%
9	Spain	2,819,565	2.9%
10	France	2,270,000	2.4%

Auto parts are key for Car production and R&D

- In the automobile industry, auto parts and components are important both for production and R&D (Baba 2013, 2016; Fujimoto 2013)
- Without well-designed auto parts, cars could fail to meet customer expectations of shape, performance, and durability.
- Similarly, without strong auto parts manufacturers, with the ability to produce trial auto parts for car designers during R&D, the industry could find it difficult to improve new automobiles or complete new designs quickly.

Target

- HS8407 : Gasoline engines
- HS8408 : Diesel engines.
- HS8409 : Engine parts.
- HS8708 : Representative code for general auto parts. It includes items such as bumpers, seat belts, body parts, brakes, gear boxes, driving-axles, wheels, suspensions, radiators, exhaust pipes, clutches, steering wheels, airbags, and other miscellaneous parts.

Product Mix Issue

- Codes HS8407 to HS8409 includes those for car manufacturing and for other usage; the so called “product mix.”
- However of this, this study conducted because
 1. We would like to get a rough view of the ability to produce engine itself,
 2. In GVC analysis, trading engines also very interesting and meaningful,
 3. We would like to analyze higher value added items beyond general auto parts (HS8708) (I’ve gotten this advice many time in past GERPISA conferences)

Data Source

- UN Comtrade Database: Trade Statistics Raw Data
- World Bank Open Data Base : To compare trade values in different years, this study use a 2018 deflator calculated according to the U.S. Consumer Price Index (CPI) extracted from the World Bank Open Data Base. The deflator of 1.4582 calculated is used to convert the 2000 price to the 2018 price.
- OICA : Automobile production data are from International Organization of Motor Vehicle Manufacturers (OICA).

Analysis and Results

GVC situation in 2000 and 2018

- GVCs of Auto parts, gasoline engine, diesel engine, and engine parts are described detail in the paper on pp.2-9.
- GVC situation are divided three parts, 1. overview (exports plus imports), 2. supply side(exports), 3. demand side(imports).

Example: auto parts in 2000 overview (1)

- 161 countries taking part in the GVC for general car parts (HS8708)
- The total trade value was 86.9 billion US dollars
- The top 10 countries occupied 80%
- The top five represented 55%
- Top 20 represented 91%.

Example: auto parts in 2000 overview (2)

- The top 10 are the US, Canada, Germany, Japan, France, the UK, Mexico, Spain, Italy, and Belgium.
- In detail, top five were : the US at \$86.9 billion (21.6%), Canada at \$42.2 billion (10.5%), Germany at \$36.0 billion (8.9%), Japan at \$28.1 billion (7.0%), and France at \$26.9 billion (6.7%).

GVC changes from 2000 to 2018

- GVC changes between 2000 and 2018 of Auto parts, gasoline engine, diesel engine, and engine parts are described detail in the paper on pp.9-19.
- GVCs are divided also as same , 1. overview (exports plus imports), 2. supply side(exports), 3. demand side(imports).

Example: overview

- Automobile production 58.4 M
→ 95.6 M, multiplying by 1.6
- Auto parts multiplied by 2.1
- Gasoline engines 1.3 times
- Diesel engines 2.1 times
- Engine parts 1.8 times.

	Exports [⌘]	Imports [⌘]	Total [⌘]
Auto Parts [⌘]	2.1 [⌘]	2.1 [⌘]	2.1 [⌘]
Gasoline Engines [⌘]	1.4 [⌘]	1.2 [⌘]	1.3 [⌘]
Diesel Engines [⌘]	2.1 [⌘]	2.2 [⌘]	2.1 [⌘]
Engine Parts [⌘]	1.9 [⌘]	1.8 [⌘]	1.8 [⌘]
Car production [⌘]			1.6 [⌘]

“Emerging,” “Remaining,” “Moderate Change,” “Declining.”

- Four groups : “Emerging,” “Remaining,” “Moderate Change,” “Declining.”
- **Emerging** : countries moving **up more than ten spot**
- **Remaining**: countries **maintaining** their ranking **within four**
- **Moderate** change: countries changing spots **in the range of five to nine**
- **Declining**: countries **decreasing** their ranking **more than ten**

Example: Change of auto parts in total

- Top 5
- **Emerging : China**
- **Remaining** :US, Germany, Mexico, and Japan
- Top 20 which countries are Emerging?
- Slovakia(14 ← 27)
- Romania(19 ← 50)

	Rank _o		Share _o		Difference _o (2000–2018) _o	
	2018 _o	2000 _o	2018 _o	2000 _o	Rank _o	Share _o
US _o	1 _o	1 _o	14.1% _o	21.6% _o	0 _o	-7.4% _o
Germany _o	2 _o	3 _o	13.5% _o	8.9% _o	1 _o	4.6% _o
China _o	3 _o	14 _o	7.7% _o	1.2% _o	11 _o	6.6% _o
Mexico _o	4 _o	7 _o	6.9% _o	5.8% _o	3 _o	1.1% _o
Japan _o	5 _o	4 _o	5.4% _o	7.0% _o	-1 _o	-1.6% _o

Discussion and Conclusion

Big, Semi-Big, Hope, Newcomer

- **Big**: Countries in the Remaining in the **top 5 both 2000 and 2018**
- **Semi-Big** : Major car and car parts production countries followed by big
- **Hopes** : Countries in the **Emerging group in the top 5 in 2018**
- **Newcomers** : **Emerging group** not yet ranked in top 5 but **in the top 20**

Big, Hopes, and Newcomers in GVC: Total, Overview

	Big	Hopes	Newcomers
Auto parts, general	US, Germany, Mexico, Japan	China	Slovakia, Romania
Gasoline engines	US, Germany, Japan, Mexico, Canada		China, Thailand, Singapore, UAE, Russia
Diesel engines	US, Germany, Mexico, UK, Japan		
Engine parts	Germany, US, Japan, Mexico	China	India

Big, Hopes, and Newcomers in GVC: supply side

	Big	Hopes	Newcomers
Auto parts general	Germany, US, Japan, Mexico	China	Thailand, Romania
Gasoline engines	Japan, US, Germany, Hungary, Mexico		China, Thailand, UAE, Singapore, Poland
Diesel engines	USA, Germany, Japan, UK, France		Turkey
Engine parts	Germany, Japan, US, Mexico	China	South Korea, Poland, Thailand, India

Big, Hopes, and Newcomers in GVC: demand side

	Big	Hopes	Newcomers
Auto parts general	US, Germany, Mexico, Canada	China	Czechia, Slovakia, Russia
Gasoline engines	US, Canada, Germany, Mexico	China	Czechia, Russia, Turkey, Singapore, India, Qatar
Diesel engines	US, Mexico, Germany, Spain	(China)*	Czechia, Russia, Thailand, Slovakia
Engine parts	US, Germany, UK, Mexico	(China)*	India

Next Study

- This study can show which country have grow in which components in which side of demand or supply
- The change between 2000 and 2018 are very interesting
- Next study plan. There are many studies in Hope category (Ching), but not enough in new comers.
- I would like conduct studies in detail and actual situation of new comer countries.

Thank you very much for listening