

Group of Experts on
National Accounts

Interim meeting on Global
Production

3-4 April 2013

Geneva, Switzerland

Measuring Global Value Chains using the WIOD : Focused on Korea with Major Countries

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I. Introduction

- ◆ Korea has the highest dependence on trade (110.3 % in 2011) among G20 Countries.
- ◆ Korea exports at least 1/3 of its total manufacturing products .
 - Also, assembly and producing goods account for more than 1/2 of total Korean exports .

Share of assembly and processing goods in total Korea's exports

(%)

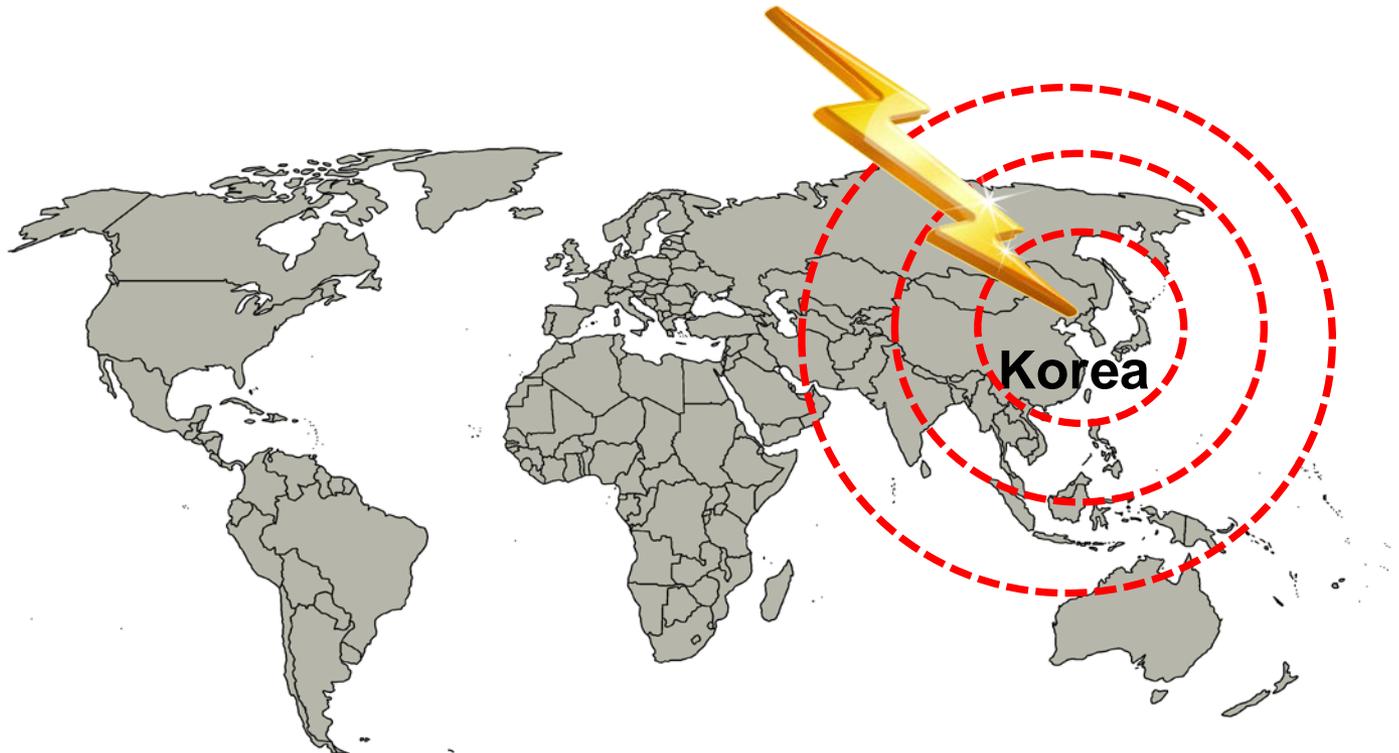
1995	2000	2005	2010
43.6	48.5	54.7	54.1

Source : Korean Input Output Tables



I. Introduction

- ◆ Korea is expanding its role in global production networks, but at the same time Korea is more vulnerable to changes in external factors.



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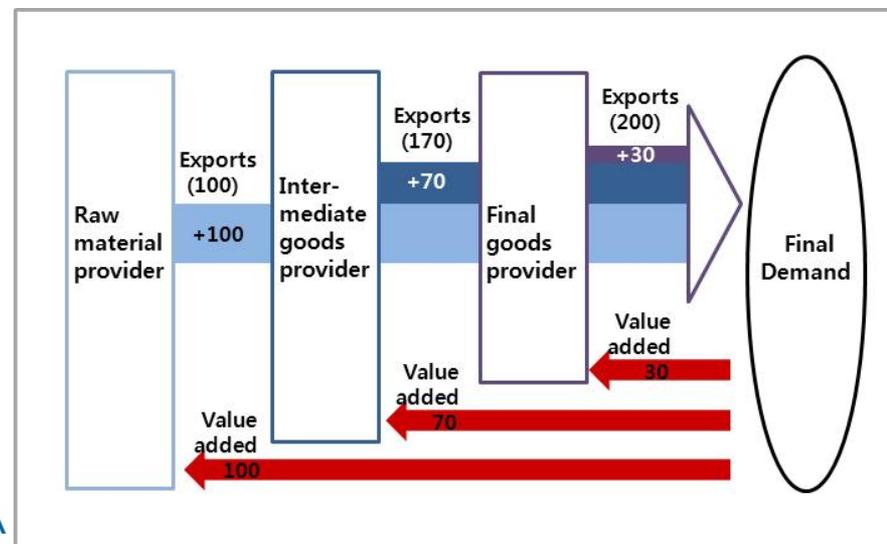
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(Concept of Trade in Value Added)

- ◆ Trade in Value Added (TiVA) is value added of a country directly and indirectly embodied in final demand of another country.
- Value Added inflow(VA-in) : domestic value added generated by foreign final demand
- Value Added outflow(VA-out) : foreign value added generated by domestic final demand

Gross exports vs. Value added flows



(Analytical Approach)

- ◆ This study shows...
 - Interrelationships between Korea and its major trading partners
 - Difference in trade data between gross amount and value added terms
 - Global chains related to Korean final exports

- ◆ Data source : World Input Output Database

- ◆ Approach : Input Output Analysis

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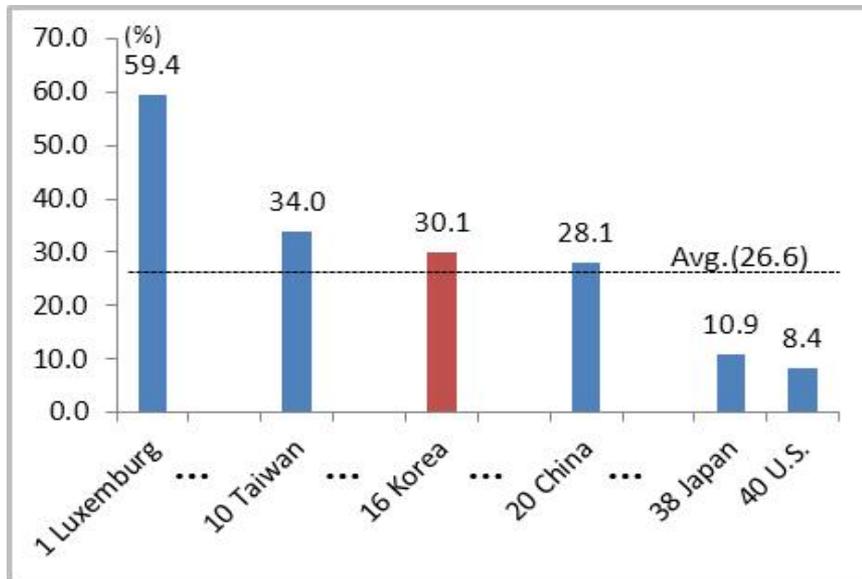
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(Value Added Inflows)

- ◆ The value added from foreign demand accounts for 30.1% of total value added in Korea.
- ◆ Korea's GDP dependence on foreign demand ranked at 16th among 40 countries in WIOD data.

GDP dependence on Foreign Demand(2009)

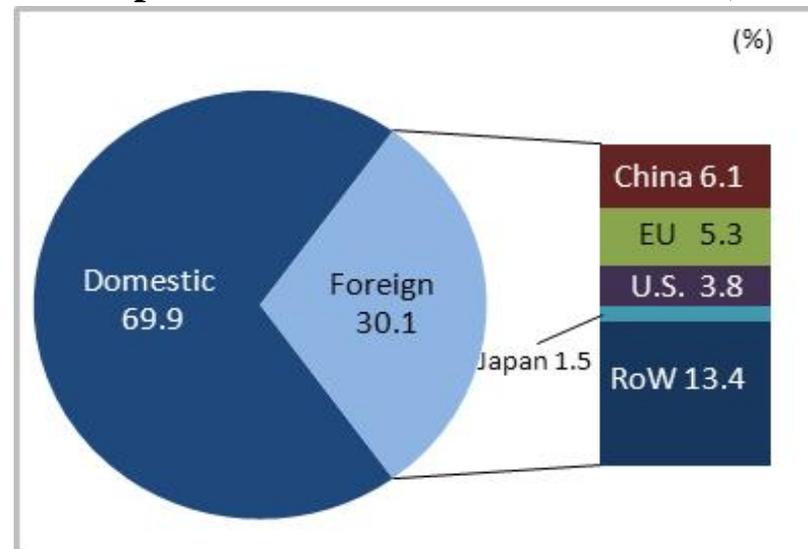


- An average of 40 countries in WIOD is 26.6%, with 59.4% of Luxemburg being the highest and 8.4% of the United States being the lowest.

(Decomposition of Korea's Value Added)

- ◆ China takes the largest part (6.1%), followed by EU 27 countries (5.3%), the United States (3.8%), and Japan (1.5%).
 - Among EU countries, Germany (1.4%) and France (0.8%) take relatively large portion.

Decomposition of Korea's value added ¹⁾ (2009)

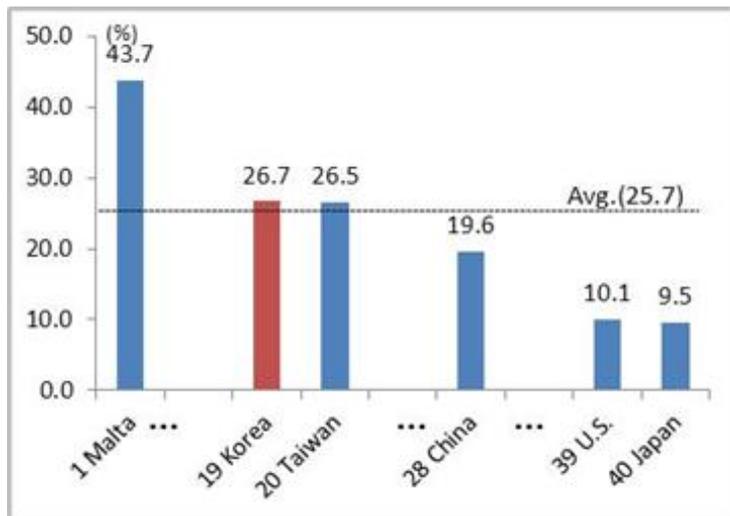


Note : 1) Contribution of each country to Korea's GDP

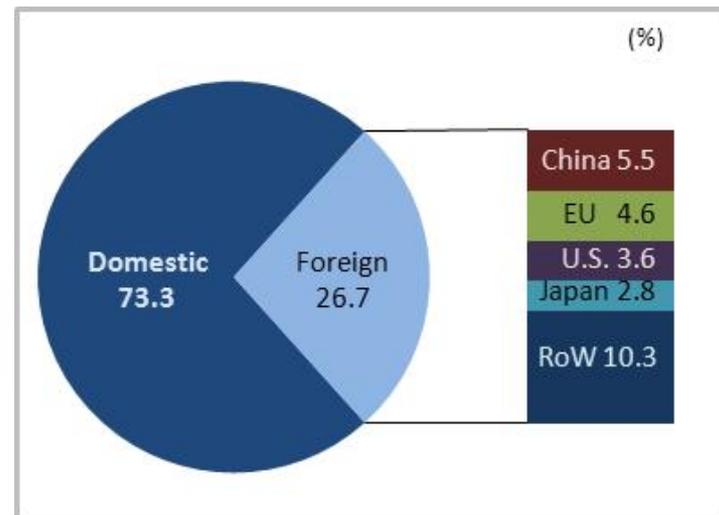
(Value Added Outflows)

- ◆ Among value added created by Korea's final demand, 73.3% is created in Korea, and the rest 26.7% is generated in other countries.
 - China takes the largest part as 5.5%, followed by EU (4.6%), the United States (3.6%), and Japan (2.8%).

Shares of foreign value added in total value added created by domestic final demand(2009)



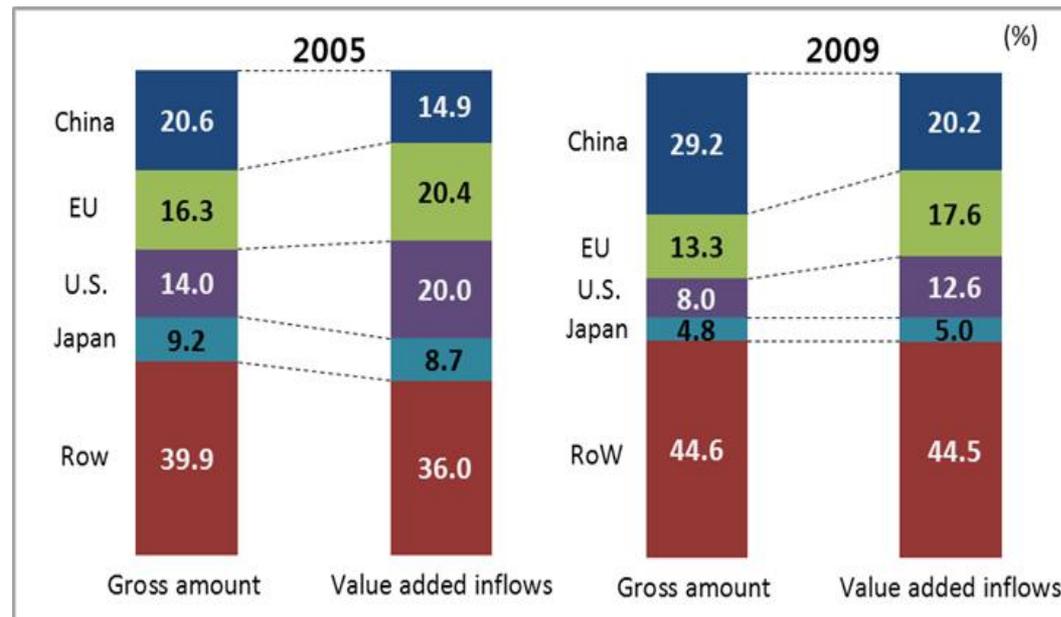
Decomposition of Value Added created by Korea¹⁾ (2009)



Note : 1) Value added induced by Korea's final demand

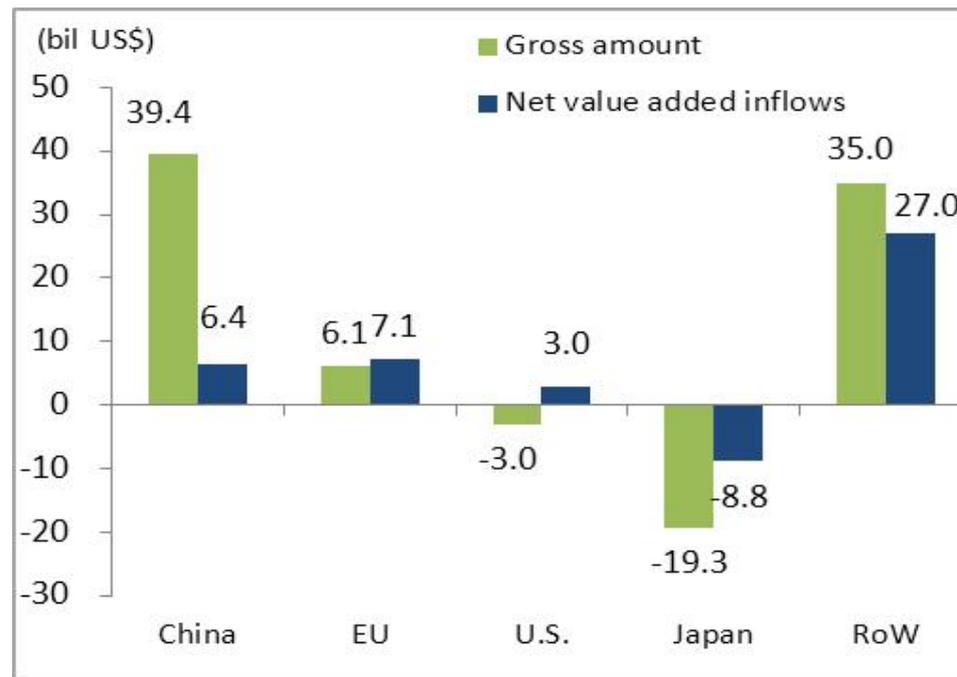
(Korea's Exports, in Gross and Value Added)

- ◆ In 2009, China's share in value added inflows to Korea is 20.2%, which is 9%p less than its share in Korean exports (29.2%).
- ◆ Shares of EU and the US in value added inflows to Korea are at least 4%p more than those in Korean exports.



(Differences in Trade Balances, in *Gross vs. Value Added*)

- ◆ Korea's trade surplus in value added terms significantly differs from when it is measured in Gross amount .
 - Trade surplus with China decreases by 83.8%, and trade deficit with Japan decreases by 54.4%.



(Supply Chain driven by Korea's Exports)

- ◆ Total 257 billion USD of intermediate goods are produced in the world, when Korea exports 100 billion USD of final goods.
 - \$161bil(62.8%) in Korea, the rest \$96bil(37.2%) in other countries.
 - \$45.1bil of intermediate product are exported to other countries.

Supply Chain driven by Korea's Exports of Final Goods(2009)

(billion US\$, %)

Country	Induced intermediate products ¹⁾			
	Amount	Exports ²⁾		
		Amount	(Share)	Exports to Korea ³⁾
Korea	161.1	0.5	(1.2)	-
China	26.9	9.4	(20.8)	<87.6>
Japan	14.6	5.6	(12.5)	<87.6>
EU	13.7	7.3	(16.3)	<59.7>
U.S.	8.1	4.2	(9.4)	<73.3>
RoW	32.2	17.9	(39.8)	<75.5>
Total	256.6	45.1	(100.0)	<76.7>

Notes : 1) Intermediate products induced by Korean final demand worth 100 billion USD.

2) Exports of intermediate products

3) Portions of exports to Korea in total intermediate products exports

(Value Chain driven by Korea's Exports)

- ◆ Total \$92 billion value added created by Korean exports of \$100bil final goods.
 - \$59bil (63.9%) in Korea, the rest \$33bil (36.1%) in other countries
 - China (7.1%), EU(5.4%), Japan(5.1%), and the U.S.(4.0%)

Value Chain driven by Korea's Exports of Final Goods¹⁾(2009)
(billion US\$, %)

Country	Induced value added ¹⁾		Inducement rate ²⁾
	Amount	(Share)	
Korea	58.7	(63.9)	58.7
China	6.5	(7.1)	69.4
EU	4.9	(5.4)	67.5
Japan	4.7	(5.1)	83.3
U.S.	3.7	(4.0)	87.7
RoW	13.2	(14.5)	73.7
Total	91.8	(100.0)	

Notes : 1) Value added induced by Korea's final goods exports of \$100bil.

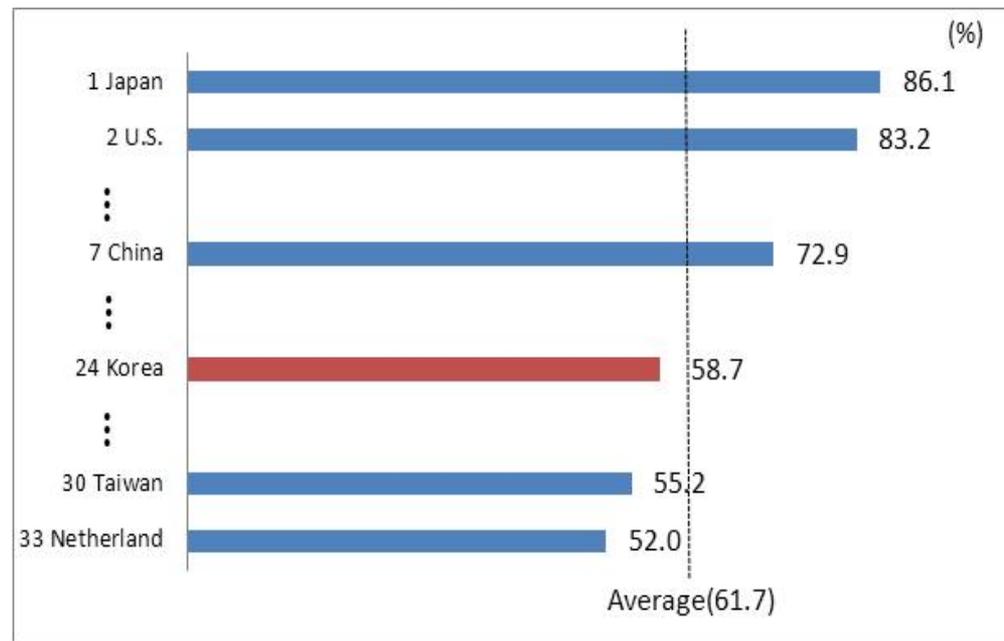
2) The ratio of induced value added to intermediate goods exports

(For Korea, the ratio of induced value added to final goods exports)

(Contribution of Exports to Domestic VA)

- ◆ Contribution of Korea's exports of final goods on domestic value added is 58.7%, which is below the average(61.7%) of 40 countries in WIOD.
 - Japan(86.1%) and the U.S.(83.2%) are higher than other countries.

Contribution of Final Goods Exports to domestic value added¹⁾(2009)



Note : 1) Domestic value added created by unit final export

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IV. Conclusion

- ◆ We confirmed that the differences of trade data between in gross amount and in value added terms are significant. Also, we believe that the importance of TiVA will increase, considering the fact that global production networks are rapidly extending.
- ◆ The results of analysis show that some portions of Korea's exports to China are generated by countries other than China. In addition, Korea's domestic value added inducement effect from its final goods exports is below the average of 40 countries. This is due to Korea's heavy dependence for raw materials on imports and to the structural features of Korean exports, among which assembly and processing goods make up large proportions.
- ◆ However, TiVA has a significant weakness. Since TiVA is a calculated indicator from international IO tables, it differs depending on data sources. In order to improve accuracy of TiVA and to use TiVA as official statistics, it is vital to compile an official international IO table.



Differences between WIOD & GIO; Korean case

Differences in Korea's Trade Balances, WIO vs. GIO

(billion US\$, %)

	Partner	WIOD	GIO(OECD)
Trade balance in gross amount(A)	China	39.4	56.9
	U.S.	- 3.0	3.0
	Japan	-19.3	- 8.5
Trade balance in value added terms(B)	China	6.4	10.4
	U.S.	3.0	10.9
	Japan	- 8.8	- 0.4
Difference(B-A)	China	-33.0(84%)	-46.5(82%)
	U.S.	6.0(200%)	7.9(263%)
	Japan	10.5(54%)	8.1(95%)

Comparison with Balance of Payment

(billion US\$)

	Partner	BOP	WIOD		GIO(OECD)	
			Amount	(BOP-WIOD)	Amount	(BOP-GIO)
Trade balance in gross amount	China	38.1	39.4	- 1.3	56.9	-18.8
	U.S.	0.9	- 3.0	3.9	3.0	- 2.7
	Japan	-23.9	-19.3	- 4.6	- 8.5	-15.4



Thank you !!



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