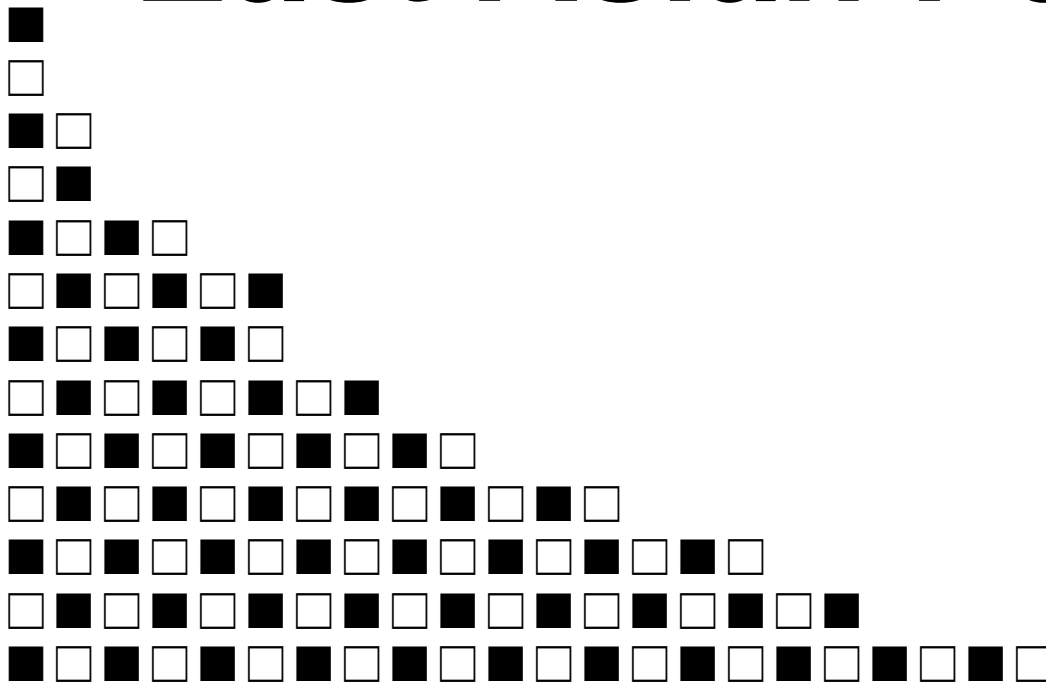


# Trade in Value-Added

## East Asian Perspective



Satoshi Inomata  
IDE-JETRO



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# Trade patterns and global value chains in East Asia:

## From trade in goods to trade in tasks



# International value distribution of iPhone

**DESIGNED BY APPLE  
IN CALIFORNIA,  
ASSEMBLED IN CHINA**

Retail price of  
iPhone in 2009  
= \$500  
(64% margin for  
the Apple)

# Cost structure of parts for iPhone3G

Manufacturer	Components	Unit Price
Toshiba (Japan)	Flash Memory	US\$24.00
	Display Module	US\$19.25
	Touch Screen	US\$16.00
Samsung (Korea)	Application Processor	US\$14.46
	SDRAM-Mobile DDR	US\$8.50
Infineon (Germany)	Baseband	US\$13.00
	Camera Module	US\$9.55
	RF Transceiver	US\$2.80
	GPS Receiver	US\$2.25
	Power IC RF Function	US\$1.25
Broadcom (US)	Bluetooth/FM/WLAN	US\$5.95
Numonyx (US)	Memory MCP	US\$3.65
Murata (Japan)	FEM	US\$1.35
Dialog Semiconductor (Germany)	Power IC Application Processor Function	US\$1.30
Cirrus Logic (US)	Audio Codec	US\$1.15
Others		US\$48.00



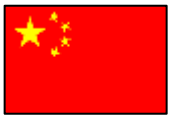
**Customer services**



**Marketing**



**Distribution**



**Assembly**



**Parts procurement**



**Material procurement**

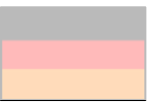
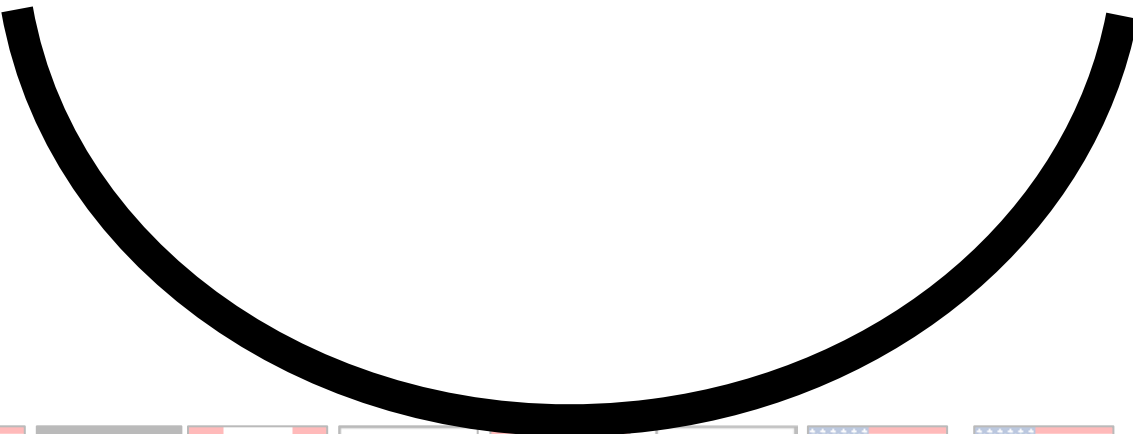


**R & D**



**Product design**

**Value-added**



**Production process**

**Product design**

**R & D**

**Material procurement**

**Parts procurement**

**Assembly**

**Distribution**

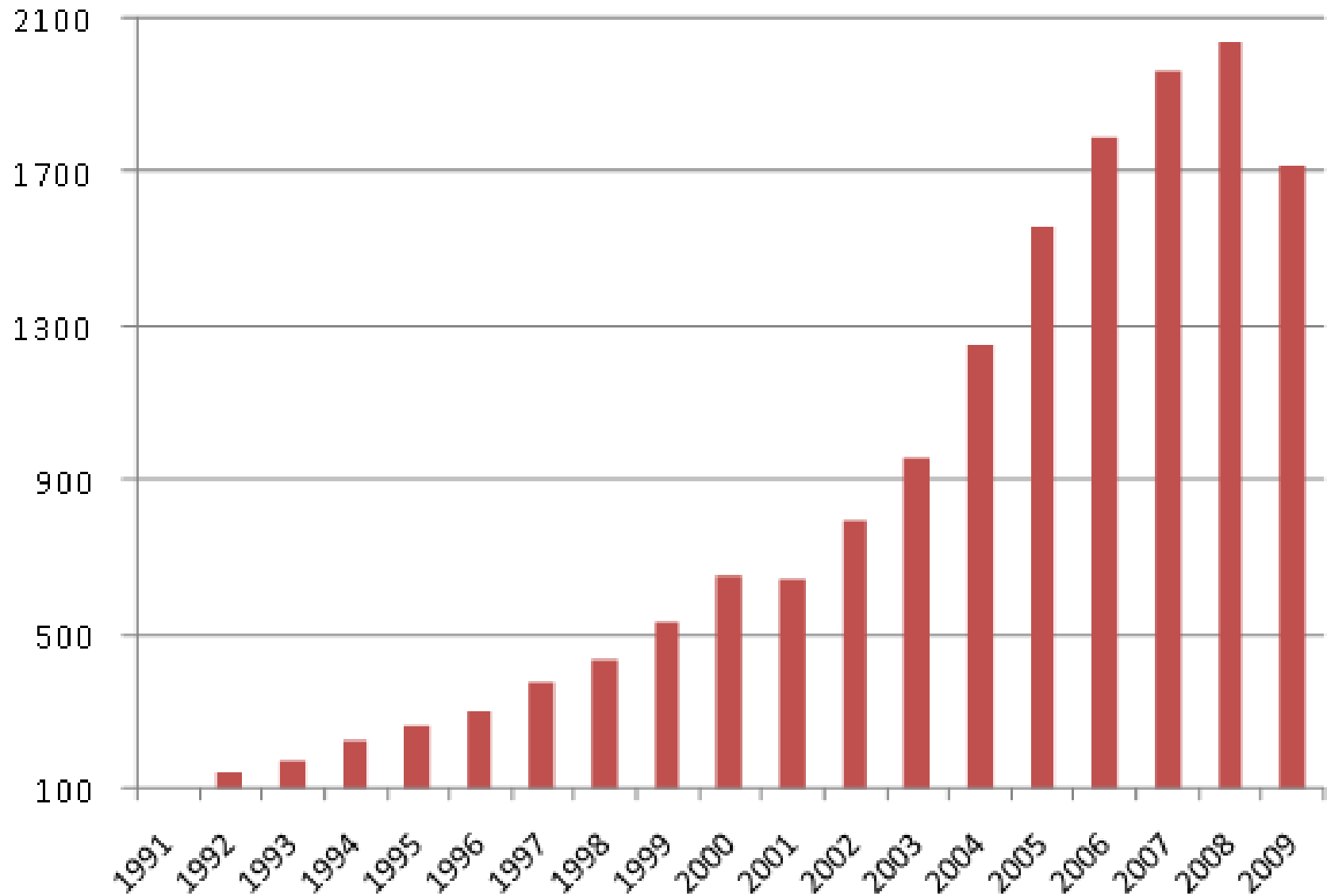
**Marketing**

**Customer services**

# International value distribution of iPhone

**Retail price of  
iPhone in 2009  
= \$500  
(64% margin for  
the Apple)**

# The US trade deficits with China (1991 = 100)





# Trade in ~~value-added~~ services

# Input-Output Table (3 sectors)

		Intermediate Transaction			Final Demand				
		Agri & Mining	Manu- fact'ing	Service	Cons- umption	Invest- ment	Export	Import	Total Output
Intermediate Transaction	Agri & Mining	8 0 0	1 8 0 0	2 0 0	6 0 0	4 0 0	3 0 0	-100	4 0 0 0
	Manufacturing <sup>1</sup>	6 0 0	6 0 0	5 0 0	0	3 5 0	2 0 0	-250	3 0 0 0
	Service	4 0 0	3 0 0	9 0 0	3 5 0	5 0	0	0	2 0 0 0
Value Added	Wages	8 0 0	2 0 0	2 5 0					
	Profits	2 5 0	5 0	1 0 0					
	Depreciation	1 0 0	3 0	4 0					
	Taxes	5 0	2 0	1 0					
Total Input		4 0 0 0	3 0 0 0	2 0 0 0					

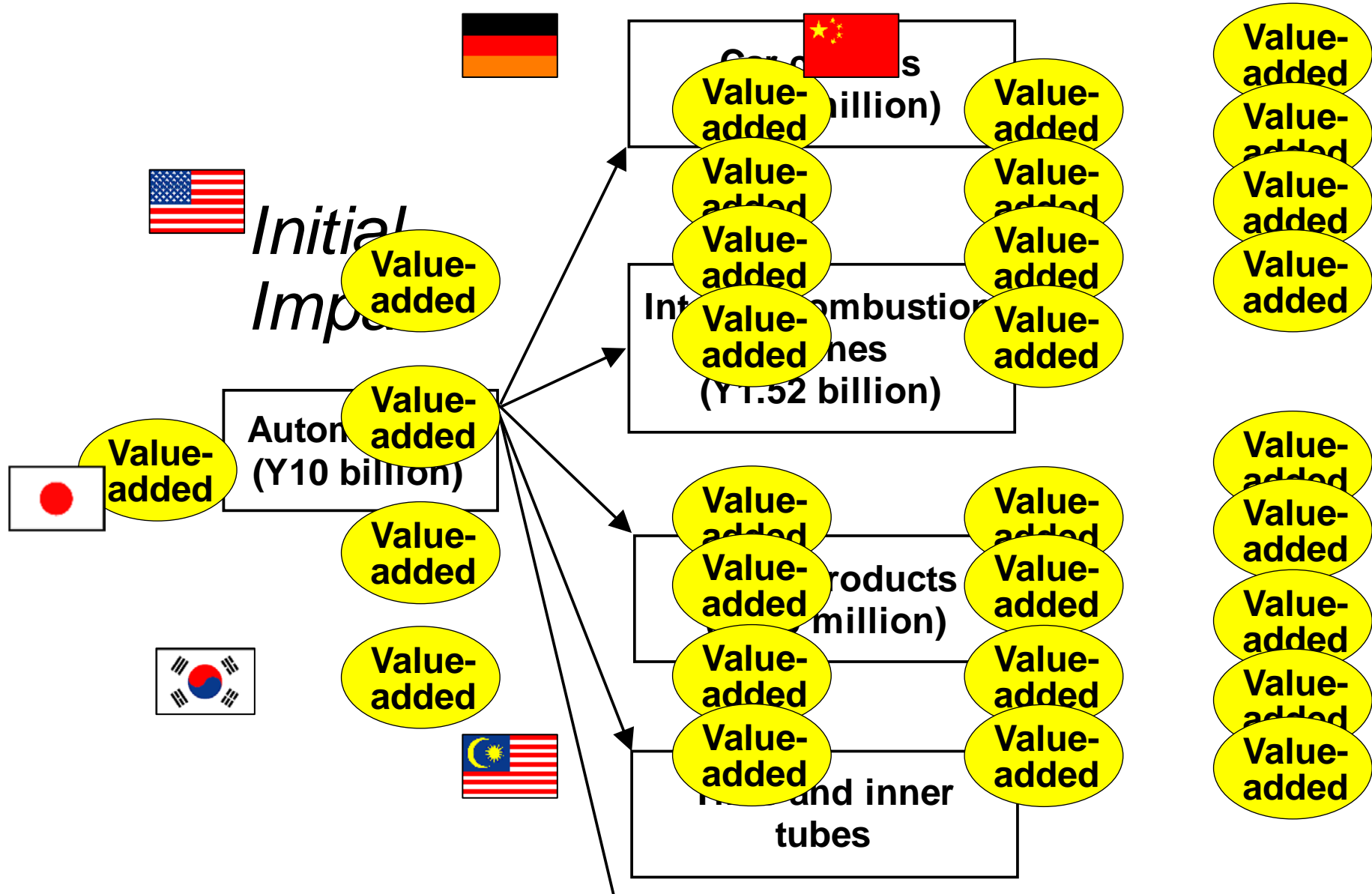
	<b>Agri &amp; Mining</b>	<b>Manu- fact'ing</b>	<b>Service</b>
<b>Agri &amp; Mining</b>	8 0 0	1 8 0 0	2 0 0
<b>Manufacturing</b>	6 0 0	6 0 0	5 0 0
<b>Service</b>	4 0 0	3 0 0	9 0 0
<b>Total Output</b>	4 0 0 0	3 0 0 0	2 0 0 0

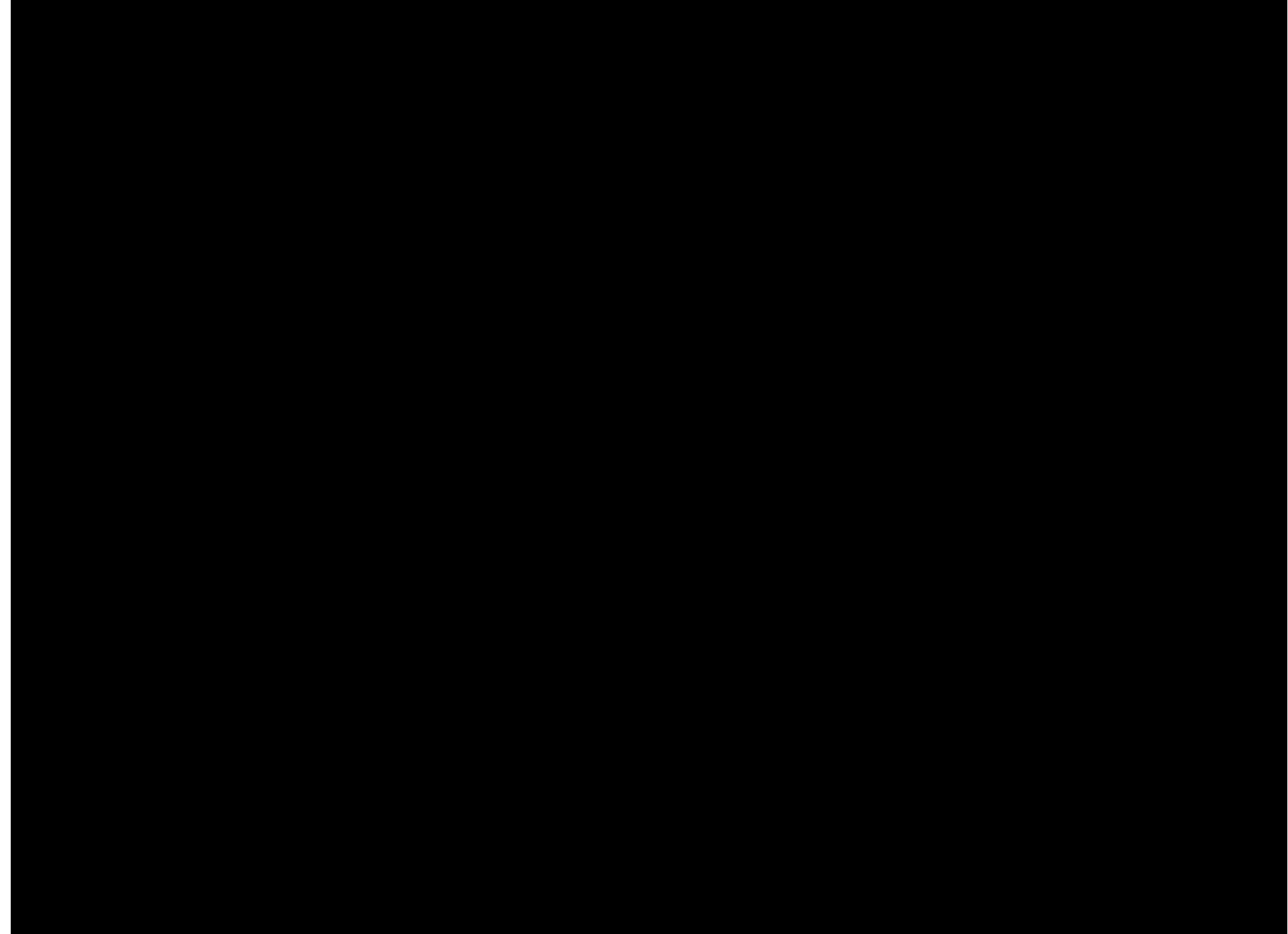




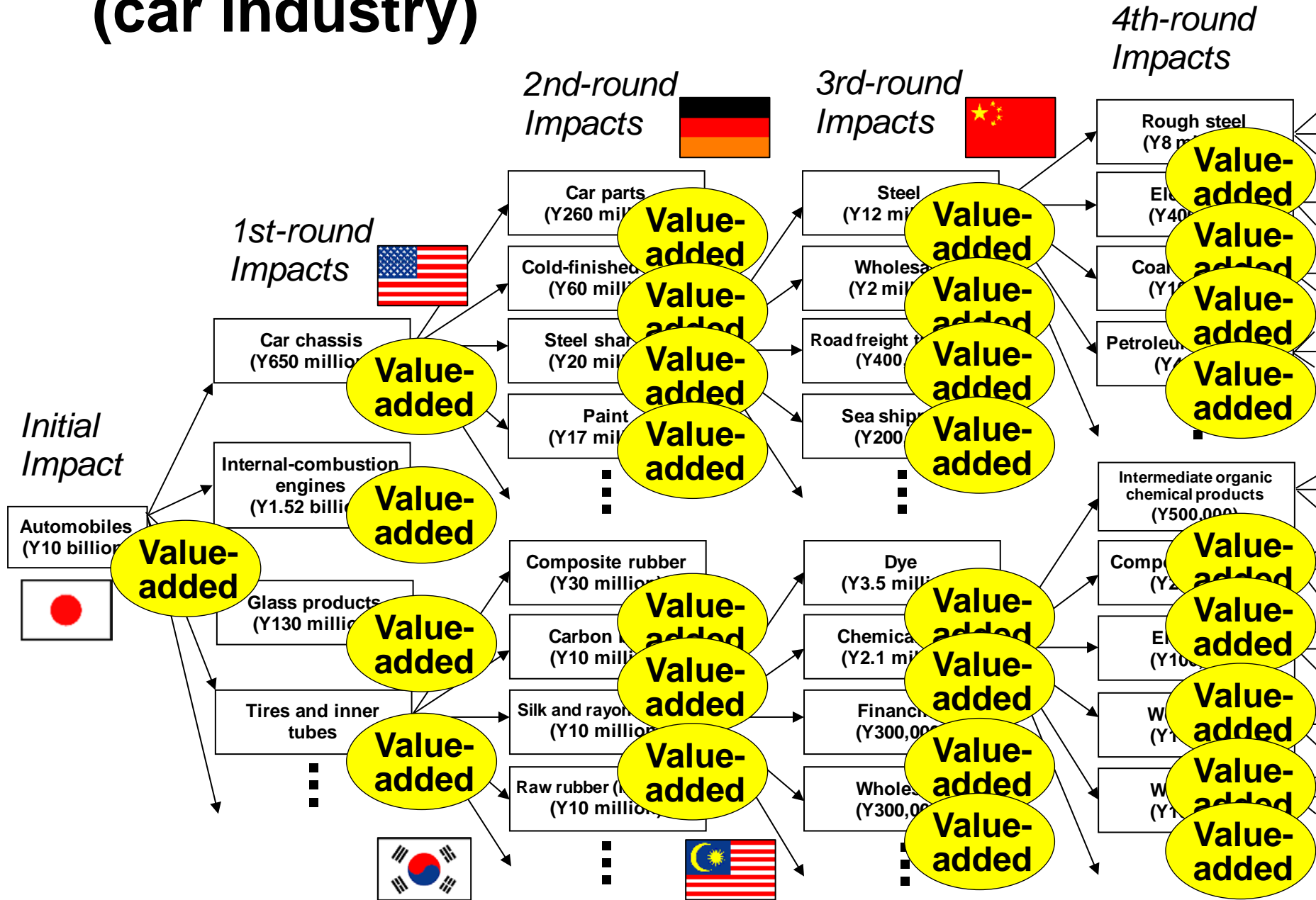
# Production spillover (car industry)

## 1st-round Impacts





# Production spillover (car industry)





# Main Data

## OECD-WTO TiVA Database

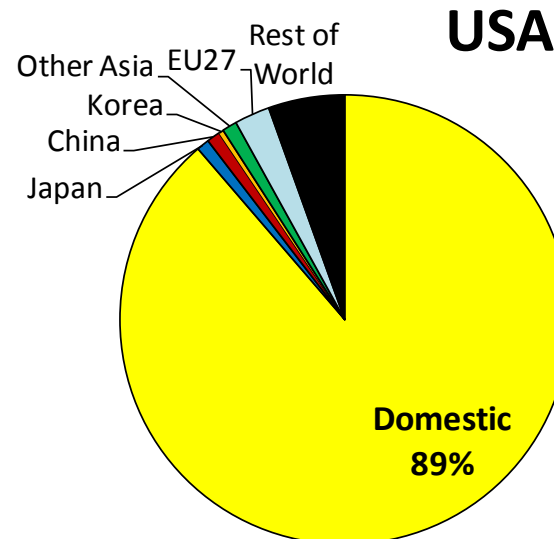
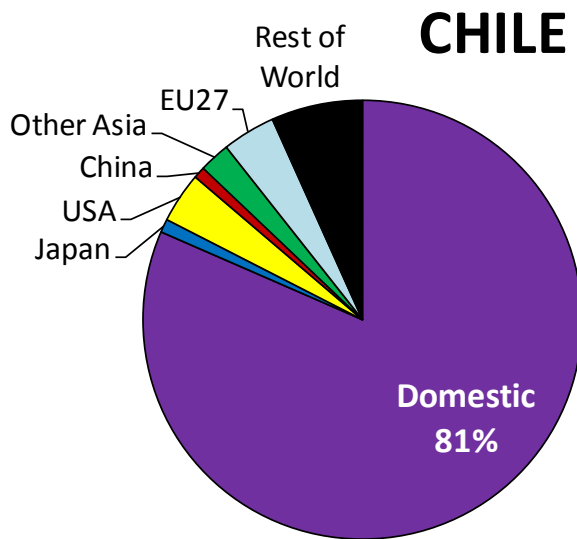
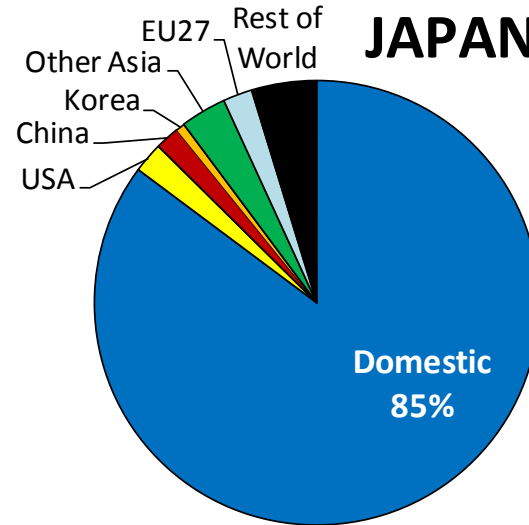
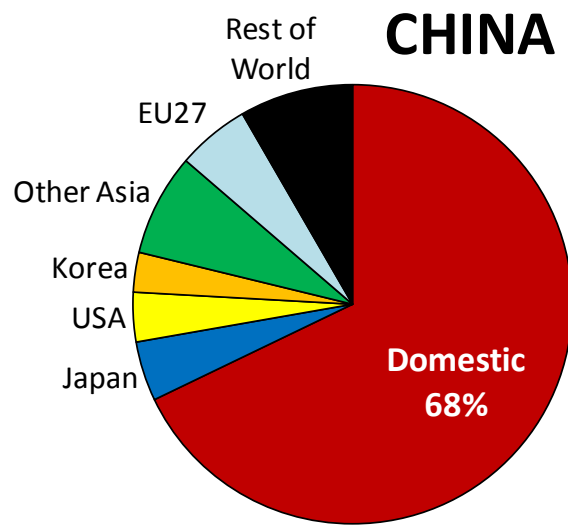
[http://stats.oecd.org/Index.aspx?DataSetCode=TIVA\\_OECD\\_WTO](http://stats.oecd.org/Index.aspx?DataSetCode=TIVA_OECD_WTO)

Reference years: 1995, 2000, 2005, 2009, 2009

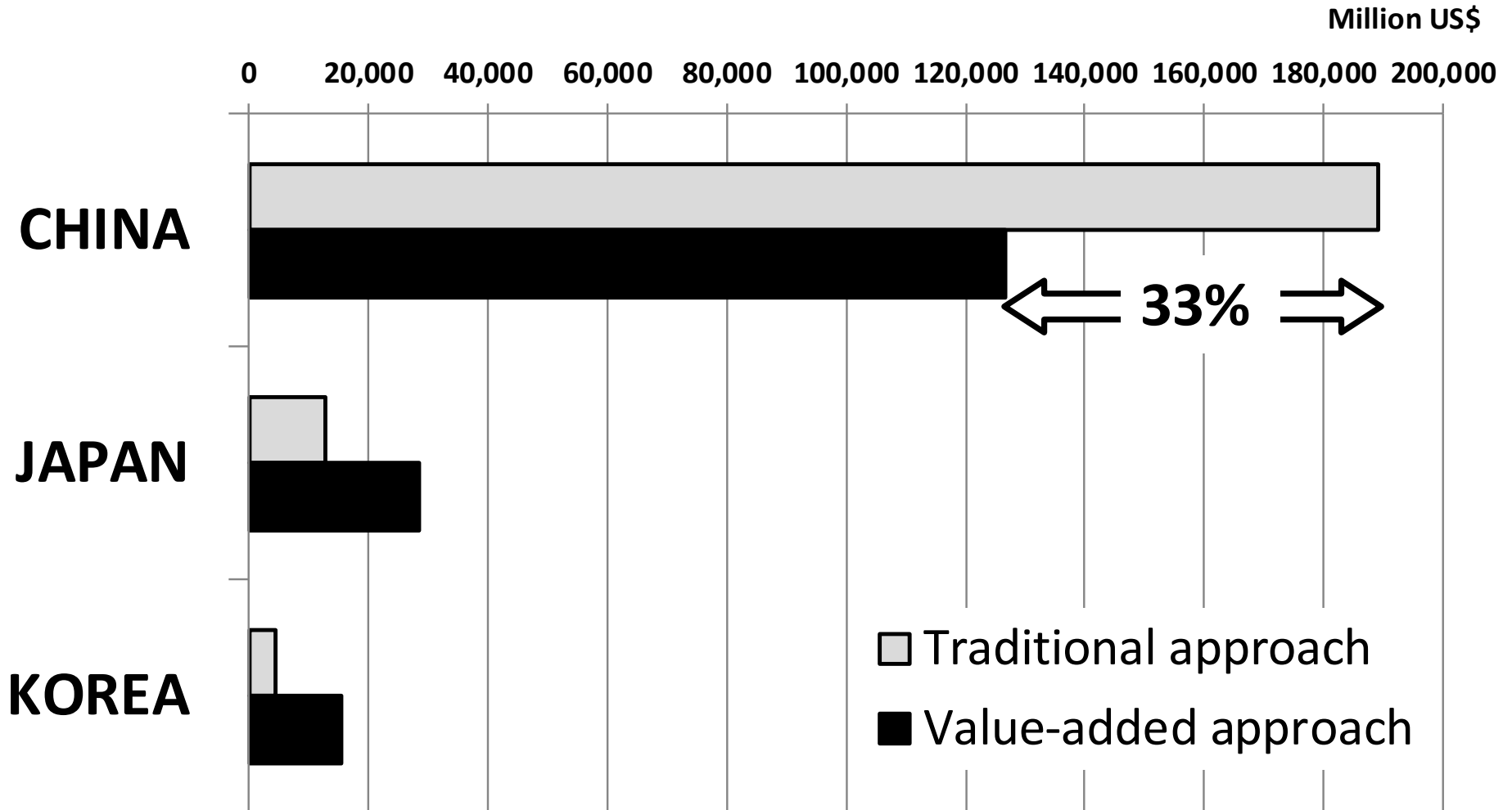
Country/regional coverage: 58 countries (including “The Rest of the World”) + 7 regions (including the world total)

Industrial sector classification: 18 sectors

# The origins of value-added embodied in gross export (2009)



# US trade deficits with selected Asian countries (2009)



**Trade in Value-added  
measures**

**international trade as**

**a flow of values**

**rather than of products.**

# **Measuring trade in terms of value-added allows us:**

- To provide a more realistic view about bilateral trade in the light of international production sharing;**
- To link trade policies to crosscutting economic/social issues, thus drawing a comprehensive roadmap for international trade as a main driver of economic development.**



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# Trade patterns and global value chains in East Asia:

From trade in goods to trade in tasks



# Thank you !!





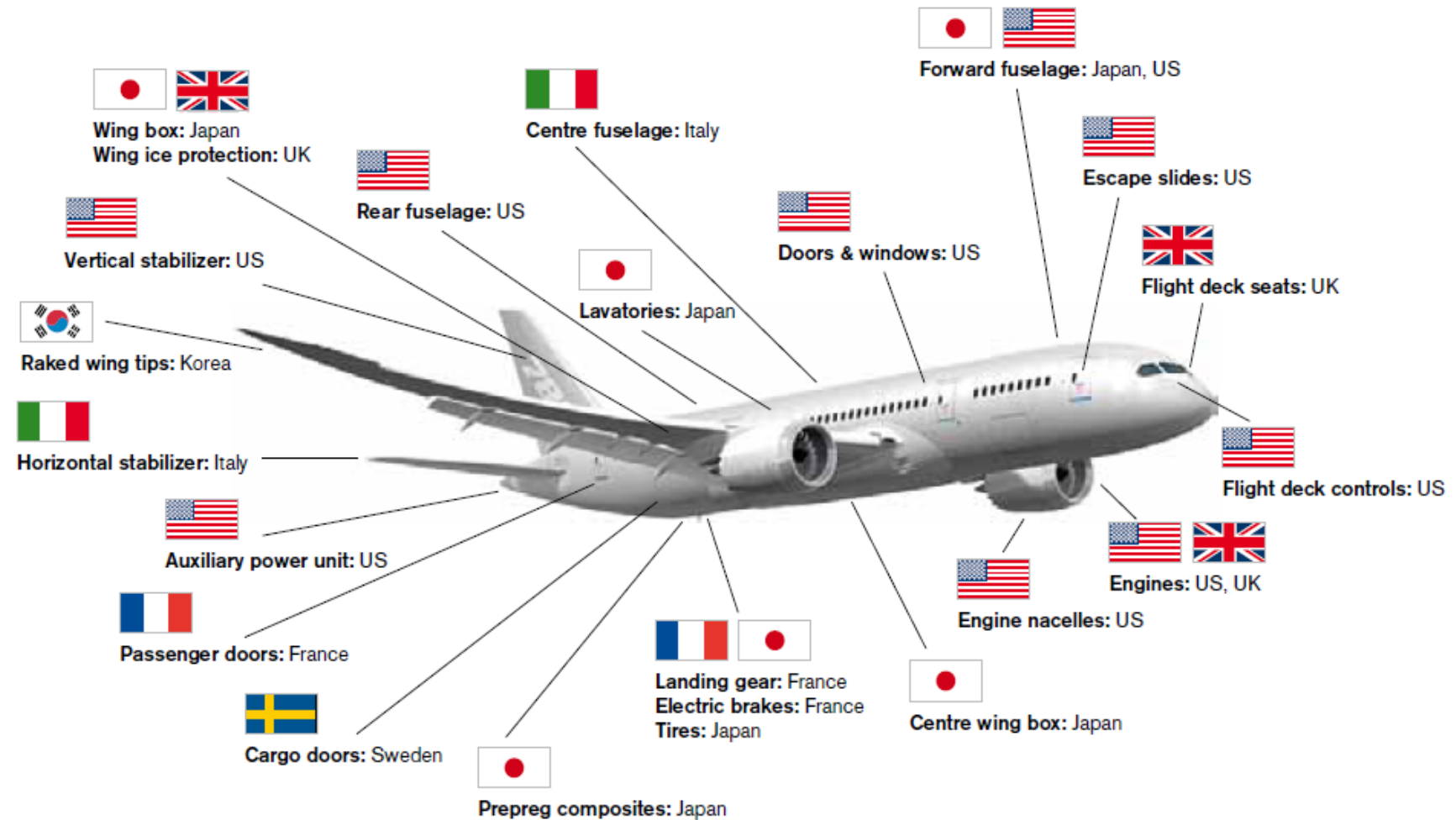
# Fragmentation: A definition

*Deardorff (1998)*

The splitting of a production process into two or more steps that can be undertaken in different locations but that lead to the same final product.



# Boeing 787 is made in ???

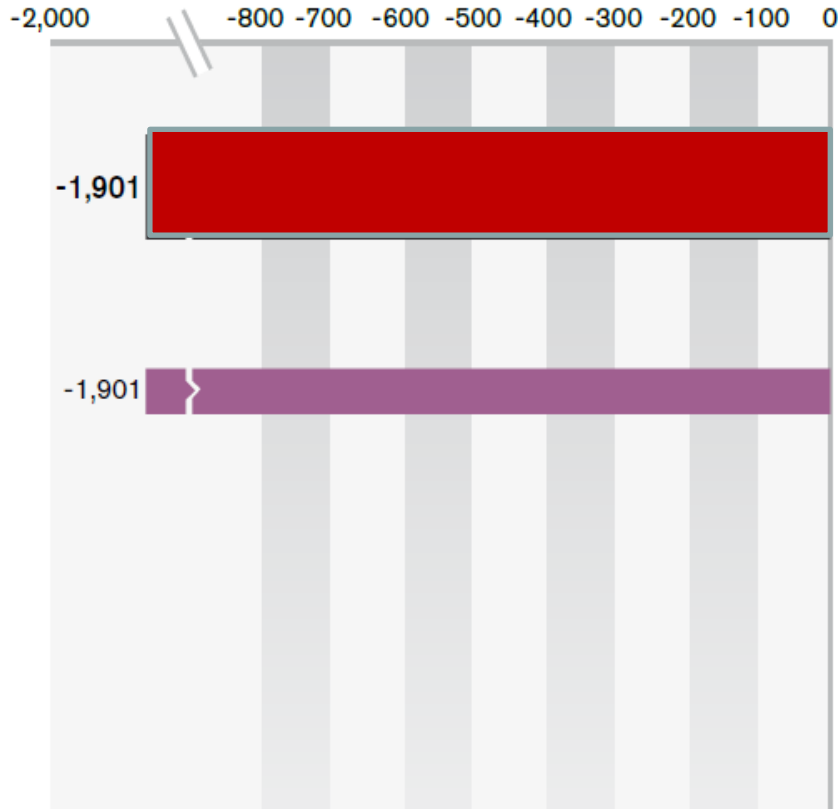


  
Tools/Software: France  
Navigation: US  
Pilot control system: US  
Wiring: France

  
Final assembly: Boeing  
Commercial Airplanes, US

# 2009 US trade balance in iPhones

(million US\$)



Traditional measurement

World

*Of which:*

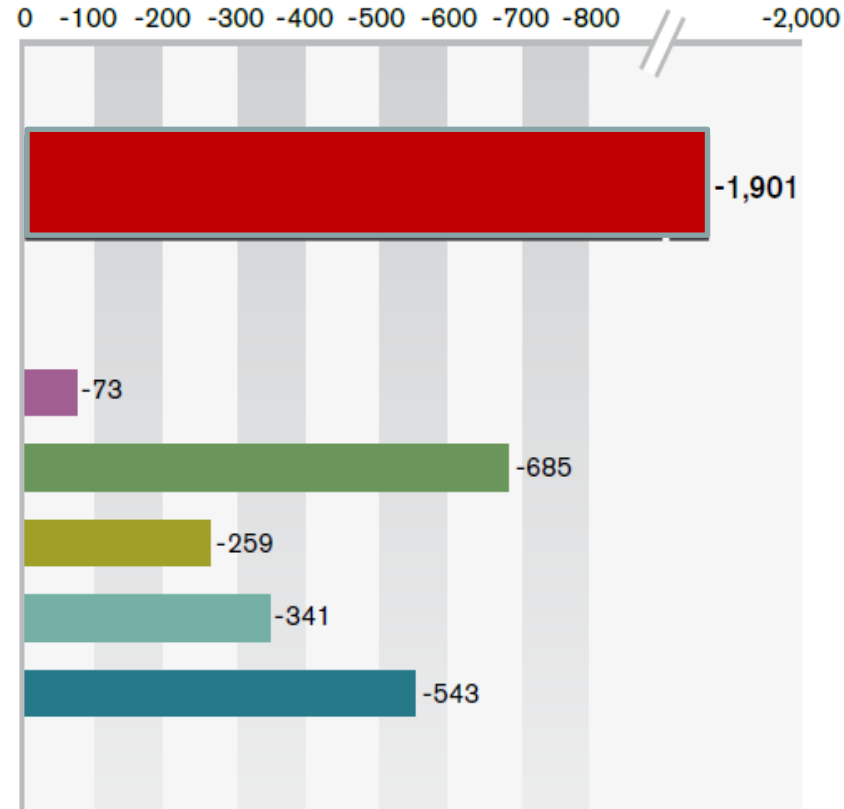
China

Japan

Korea

Germany

Rest of  
World



Value-added measurement

# A schematic image of the Asian International Input-Output Table

		Intermediate Demand (A)										Final Demand (F)										Export (L)					Statistical Discrepancy (Q <sup>X</sup> )	Total Outputs (X <sup>X</sup> )
		Indonesia (AI)	Malaysia (AM)	Philippines (AP)	Singapore (AS)	Thailand (AT)	China (AC)	Taiwan (AN)	Korea (AK)	Japan (AJ)	U.S.A. (AU)	Indonesia (FI)	Malaysia (FM)	Philippines (FP)	Singapore (FS)	Thailand (FT)	China (FC)	Taiwan (FN)	Korea (FK)	Japan (FJ)	U.S.A. (FU)	Export to India (LG)	Export to Hong Kong (LH)	Export to EU (LO)	Export to R.O.W. (LW)			
Indonesia	(AI)	A <sup>II</sup>	A <sup>IM</sup>	A <sup>IP</sup>	A <sup>IS</sup>	A <sup>IT</sup>	A <sup>IC</sup>	A <sup>IN</sup>	A <sup>IK</sup>	A <sup>IJ</sup>	A <sup>IU</sup>	F <sup>II</sup>	F <sup>IM</sup>	F <sup>IP</sup>	F <sup>IS</sup>	F <sup>IT</sup>	F <sup>IC</sup>	F <sup>IN</sup>	F <sup>IK</sup>	F <sup>IJ</sup>	F <sup>IU</sup>	L <sup>IG</sup>	L <sup>IH</sup>	L <sup>IO</sup>	L <sup>IW</sup>	Q <sup>I</sup>	X <sup>I</sup>	
Malaysia	(AM)	A <sup>MI</sup>	A <sup>MM</sup>	A <sup>MP</sup>	A <sup>MS</sup>	A <sup>MT</sup>	A <sup>MC</sup>	A <sup>MN</sup>	A <sup>MK</sup>	A <sup>MJ</sup>	A <sup>MU</sup>	F <sup>MI</sup>	F <sup>MM</sup>	F <sup>MP</sup>	F <sup>MS</sup>	F <sup>MT</sup>	F <sup>MC</sup>	F <sup>MN</sup>	F <sup>MK</sup>	F <sup>MJ</sup>	F <sup>MU</sup>	L <sup>MG</sup>	L <sup>MH</sup>	L <sup>MO</sup>	L <sup>MW</sup>	Q <sup>M</sup>	X <sup>M</sup>	
Philippines	(AP)	A <sup>PI</sup>	A <sup>PM</sup>	A <sup>PP</sup>	A <sup>PS</sup>	A <sup>PT</sup>	A <sup>PC</sup>	A <sup>PN</sup>	A <sup>PK</sup>	A <sup>PJ</sup>	A <sup>PU</sup>	F <sup>PI</sup>	F <sup>PM</sup>	F <sup>PP</sup>	F <sup>PS</sup>	F <sup>PT</sup>	F <sup>PC</sup>	F <sup>PN</sup>	F <sup>PK</sup>	F <sup>PJ</sup>	F <sup>PU</sup>	L <sup>PG</sup>	L <sup>PH</sup>	L <sup>PO</sup>	L <sup>PW</sup>	Q <sup>P</sup>	X <sup>P</sup>	
Singapore	(AS)	A <sup>SI</sup>	A <sup>SM</sup>	A <sup>SP</sup>	A <sup>SS</sup>	A <sup>ST</sup>	A <sup>SC</sup>	A <sup>SN</sup>	A <sup>SK</sup>	A <sup>SJ</sup>	A <sup>SU</sup>	F <sup>SI</sup>	F <sup>SM</sup>	F <sup>SP</sup>	F <sup>SS</sup>	F <sup>ST</sup>	F <sup>SC</sup>	F <sup>SN</sup>	F <sup>SK</sup>	F <sup>SJ</sup>	F <sup>SU</sup>	L <sup>SG</sup>	L <sup>SH</sup>	L <sup>SO</sup>	L <sup>SW</sup>	Q <sup>S</sup>	X <sup>S</sup>	
Thailand	(AT)	A <sup>TI</sup>	A <sup>TM</sup>	A <sup>TP</sup>	A <sup>TS</sup>	A <sup>TT</sup>	A <sup>TC</sup>	A <sup>TN</sup>	A <sup>TK</sup>	A <sup>TJ</sup>	A <sup>TU</sup>	F <sup>TI</sup>	F <sup>TM</sup>	F <sup>TP</sup>	F <sup>TS</sup>	F <sup>TT</sup>	F <sup>TC</sup>	F <sup>TN</sup>	F <sup>TK</sup>	F <sup>TJ</sup>	F <sup>TU</sup>	L <sup>TG</sup>	L <sup>TH</sup>	L <sup>TO</sup>	L <sup>TW</sup>	Q <sup>T</sup>	X <sup>T</sup>	
China	(AC)	A <sup>CI</sup>	A <sup>CM</sup>	A <sup>CP</sup>	A <sup>CS</sup>	A <sup>CT</sup>	A <sup>CC</sup>	A <sup>CN</sup>	A <sup>CK</sup>	A <sup>CJ</sup>	A <sup>CU</sup>	F <sup>CI</sup>	F <sup>CM</sup>	F <sup>CP</sup>	F <sup>CS</sup>	F <sup>CT</sup>	F <sup>CC</sup>	F <sup>CN</sup>	F <sup>CK</sup>	F <sup>CJ</sup>	F <sup>CU</sup>	L <sup>CG</sup>	L <sup>CH</sup>	L <sup>CO</sup>	L <sup>CW</sup>	Q <sup>C</sup>	X <sup>C</sup>	
Taiwan	(AN)	A <sup>NI</sup>	A <sup>NM</sup>	A <sup>NP</sup>	A <sup>NS</sup>	A <sup>NT</sup>	A <sup>NC</sup>	A <sup>NN</sup>	A <sup>NK</sup>	A <sup>NJ</sup>	A <sup>NU</sup>	F <sup>NI</sup>	F <sup>NM</sup>	F <sup>NP</sup>	F <sup>NS</sup>	F <sup>NT</sup>	F <sup>NC</sup>	F <sup>NN</sup>	F <sup>NK</sup>	F <sup>NJ</sup>	F <sup>NU</sup>	L <sup>NG</sup>	L <sup>NH</sup>	L <sup>NO</sup>	L <sup>NW</sup>	Q <sup>N</sup>	X <sup>N</sup>	
Korea	(AK)	A <sup>KI</sup>	A <sup>KM</sup>	A <sup>KP</sup>	A <sup>KS</sup>	A <sup>KT</sup>	A <sup>KC</sup>	A <sup>KN</sup>	A <sup>KK</sup>	A <sup>KJ</sup>	A <sup>KU</sup>	F <sup>KI</sup>	F <sup>KM</sup>	F <sup>KP</sup>	F <sup>KS</sup>	F <sup>KT</sup>	F <sup>KC</sup>	F <sup>KN</sup>	F <sup>KK</sup>	F <sup>KJ</sup>	F <sup>KU</sup>	L <sup>KG</sup>	L <sup>KH</sup>	L <sup>KO</sup>	L <sup>KW</sup>	Q <sup>K</sup>	X <sup>K</sup>	
Japan	(AJ)	A <sup>JI</sup>	A <sup>JM</sup>	A <sup>JP</sup>	A <sup>JS</sup>	A <sup>JT</sup>	A <sup>JC</sup>	A <sup>JN</sup>	A <sup>JK</sup>	A <sup>JJ</sup>	A <sup>JU</sup>	F <sup>JI</sup>	F <sup>JM</sup>	F <sup>JP</sup>	F <sup>JS</sup>	F <sup>JT</sup>	F <sup>JC</sup>	F <sup>JN</sup>	F <sup>JK</sup>	F <sup>JJ</sup>	F <sup>JU</sup>	L <sup>JG</sup>	L <sup>JH</sup>	L <sup>JO</sup>	L <sup>JW</sup>	Q <sup>J</sup>	X <sup>J</sup>	
U.S.A.	(AU)	A <sup>UI</sup>	A <sup>UM</sup>	A <sup>UP</sup>	A <sup>US</sup>	A <sup>UT</sup>	A <sup>UC</sup>	A <sup>UN</sup>	A <sup>UK</sup>	A <sup>UJ</sup>	A <sup>UU</sup>	F <sup>UI</sup>	F <sup>UM</sup>	F <sup>UP</sup>	F <sup>US</sup>	F <sup>UT</sup>	F <sup>UC</sup>	F <sup>UN</sup>	F <sup>UK</sup>	F <sup>UJ</sup>	F <sup>UU</sup>	L <sup>UG</sup>	L <sup>UH</sup>	L <sup>UO</sup>	L <sup>UW</sup>	Q <sup>U</sup>	X <sup>U</sup>	
Freight and Insurance	(BF)	BA <sup>I</sup>	BA <sup>M</sup>	BA <sup>P</sup>	BA <sup>S</sup>	BA <sup>T</sup>	BA <sup>C</sup>	BA <sup>N</sup>	BA <sup>K</sup>	BA <sup>J</sup>	BA <sup>U</sup>	BF <sup>I</sup>	BF <sup>M</sup>	BF <sup>P</sup>	BF <sup>S</sup>	BF <sup>T</sup>	BF <sup>C</sup>	BF <sup>N</sup>	BF <sup>K</sup>	BF <sup>J</sup>	BF <sup>U</sup>							
Import from India	(CG)	A <sup>GI</sup>	A <sup>GM</sup>	A <sup>GP</sup>	A <sup>GS</sup>	A <sup>GT</sup>	A <sup>GC</sup>	A <sup>GN</sup>	A <sup>GK</sup>	A <sup>GJ</sup>	A <sup>GU</sup>	F <sup>GI</sup>	F <sup>GM</sup>	F <sup>GP</sup>	F <sup>GS</sup>	F <sup>GT</sup>	F <sup>GC</sup>	F <sup>GN</sup>	F <sup>GK</sup>	F <sup>GJ</sup>	F <sup>GU</sup>							
Import from Hong Kong	(CH)	A <sup>HI</sup>	A <sup>HM</sup>	A <sup>HP</sup>	A <sup>HS</sup>	A <sup>HT</sup>	A <sup>HC</sup>	A <sup>HN</sup>	A <sup>HK</sup>	A <sup>HJ</sup>	A <sup>HU</sup>	F <sup>HI</sup>	F <sup>HM</sup>	F <sup>HP</sup>	F <sup>HS</sup>	F <sup>HT</sup>	F <sup>HC</sup>	F <sup>HN</sup>	F <sup>HK</sup>	F <sup>HJ</sup>	F <sup>HU</sup>							
Import from EU	(CO)	A <sup>OI</sup>	A <sup>OM</sup>	A <sup>OP</sup>	A <sup>OS</sup>	A <sup>OT</sup>	A <sup>OC</sup>	A <sup>ON</sup>	A <sup>OK</sup>	A <sup>OJ</sup>	A <sup>OU</sup>	F <sup>OI</sup>	F <sup>OM</sup>	F <sup>OP</sup>	F <sup>OS</sup>	F <sup>OT</sup>	F <sup>OC</sup>	F <sup>ON</sup>	F <sup>OK</sup>	F <sup>OJ</sup>	F <sup>OU</sup>							
Import from the R.O.W.	(CW)	A <sup>WI</sup>	A <sup>WM</sup>	A <sup>WP</sup>	A <sup>WS</sup>	A <sup>WT</sup>	A <sup>WC</sup>	A <sup>WN</sup>	A <sup>WK</sup>	A <sup>WJ</sup>	A <sup>WU</sup>	F <sup>WI</sup>	F <sup>WM</sup>	F <sup>WP</sup>	F <sup>WS</sup>	F <sup>WT</sup>	F <sup>WC</sup>	F <sup>WN</sup>	F <sup>WK</sup>	F <sup>WJ</sup>	F <sup>WU</sup>							
Duties and Import Commodity Taxes	(DT)	DA <sup>I</sup>	DA <sup>M</sup>	DA <sup>P</sup>	DA <sup>S</sup>	DA <sup>T</sup>	DA <sup>C</sup>	DA <sup>N</sup>	DA <sup>K</sup>	DA <sup>J</sup>	DA <sup>U</sup>	DF <sup>I</sup>	DF <sup>M</sup>	DF <sup>P</sup>	DF <sup>S</sup>	DF <sup>T</sup>	DF <sup>C</sup>	DF <sup>N</sup>	DF <sup>K</sup>	DF <sup>J</sup>	DF <sup>U</sup>							
Value Added	(VV)	V <sup>I</sup>	V <sup>M</sup>	V <sup>P</sup>	V <sup>S</sup>	V <sup>T</sup>	V <sup>C</sup>	V <sup>N</sup>	V <sup>K</sup>	V <sup>J</sup>	V <sup>U</sup>																	
Total Inputs	(XX)	X <sup>I</sup>	X <sup>M</sup>	X <sup>P</sup>	X <sup>S</sup>	X <sup>T</sup>	X <sup>C</sup>	X <sup>N</sup>	X <sup>K</sup>	X <sup>J</sup>	X <sup>U</sup>																	

\* Each cell of A\*\* and F\*\* represents a matrix of 76 x 76 and 76 x 4 dimension, respectively.

# The share of processing trade in China's total gross export: 1987-2011

Year	1987	1992	1997	2002
Share (%)	22.34	46.64	54.52	55.27

Year	2007	2010	2011
Share (%)	50.71	46.92	44.00