

# USING GVC-SPECIFIC PRODUCT GROUPINGS TO EXAMINE TRENDS IN INTERNATIONAL TRADE

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Timothy J. Sturgeon  
Senior Researcher  
MIT Industrial Performance Center

Stacey Frederick  
Research Scientist  
Duke Center on Globalization, Governance & Competitiveness

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# First Question: What are GVC?

- *Coordinated* international trade, *not* arms-length trade
- Commonly proxied by *specified* intermediates and *complex* final products
- Why?
  - **Complex** final goods and services require a **large number and wide variety of inputs** and thus more likely to have **complex industry and trade structures**
  - Specific requirements set by buyers for suppliers open pathways for **upgrading**
  - Incomplete contracts require interaction (trust?) between buyers and sellers that fosters **learning**
  - At the high end of complexity, lack of codifiability renders value chain stages **spatially sticky** (bundling of value chain stages in sub-national clusters)

# Are GVCs Dead?

Looking at GVCs Trends in Gross Trade Statistics with the World Bank's MC-GVC database

- Builds on earlier framework (Sturgeon & Memedovic for UNIDO, 2010)
- Identifies **complementary groupings** for three(+) archetypical GVC industries
  - Electronic hardware
  - Motor vehicles
  - Textiles, apparel and footwear
- Identifies final and intermediate goods in each industry
- Uses COMTRADE mirror statistics
- Uses consistent panel of 175 countries (95-98% of world trade)
- Makes adjustments across HS revisions (1,050 products in HS 2007)
- 1988 – 2015
- Newly available on WITS

# These 3 industry GVCs are increasingly important... ...but vary significantly by industry and value chain stage

Export shares in three “GVC Industries”, 1988-2014

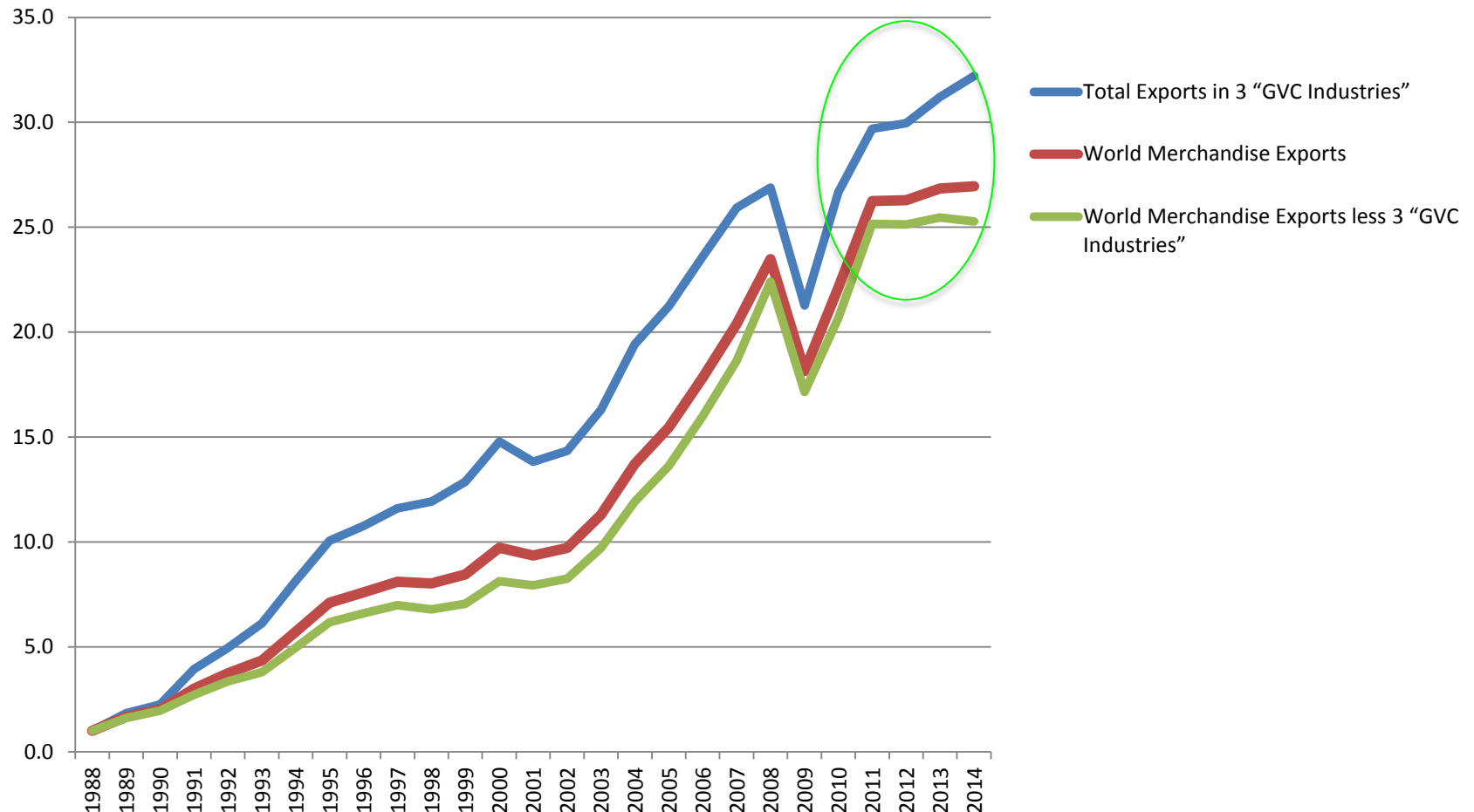
	1988	2011	2014
<b>Share of World Merchandise Exports</b>			
<b>Total Exports in 3 “GVC Industries”</b>	24%	27%	29%
<b>Electronic Hardware</b>	11%	15%	16%
<b>Motor Vehicles</b>	6%	8%	9%
<b>Textile, Apparel, and Footwear</b>	7%	4%	4%
<b>World Merchandise Exports Less 3 Industries</b>	76%	73%	71%
<b>Share of 3 “GVC Industries”</b>			
<b>Final Goods</b>	64%	58%	59%
<b>Intermediate Goods</b>	36%	42%	41%
<b>Share by Value Chain Stage in Each Industry</b>			
<b>Electronic Hardware Final Goods</b>	59%	52%	52%
<b>Electronic Hardware Intermediates</b>	41%	48%	48%
<b>Motor Vehicle Final Goods</b>	63%	58%	59%
<b>Motor Vehicle Intermediates</b>	37%	42%	41%
<b>Textile, Apparel, and Footwear Final Goods</b>	73%	81%	82%
<b>Textile, Apparel, and Footwear Intermediates</b>	27%	19%	18%

Source: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade,  
<http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefination.aspx?Page=GVCIndicator>

# So, are GVCs dead?

...probably not

Index of World Merchandise Exports and exports in three “GVC Industries”, 1988-2014



Source: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade, <http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefination.aspx?Page=GVCIndicator>

# GVCs are increasingly important...

...but expansion has slowed since 2011, and domestic value added is rising in key producing countries

Exports in three “GVC Industries”, 1988-2014, current US\$ millions

	1988	2011	2014	CAGR 1988-2011	CAGR 2011-2014	CAGR 1988-2014
World GDP	18,042	68,009	72,680	5.9%	2.2%	5.5%
World Merchandise Exports	627	16,472	16,910	15.3%	0.9%	13.5%
<b>Total Exports in 3 “GVC Industries”</b>	151	4,485	4,864	15.9%	2.7%	14.3%
Electronic Hardware	69	2,487	2,690	16.8%	2.7%	15.1%
Motor Vehicles	37	1,309	1,449	16.8%	3.4%	15.2%
Textile, Apparel, and Footwear	45	688	724	12.6%	1.7%	11.3%
World Merchandise Exports Less 3 Industries	476	11,988	12,047	15.1%	0.2%	13.2%
<b>Exports by Value Chain Stage in 3 “GVC Industries”</b>						
Final Goods	<b>← IMPORT CONTENT</b>		2,857	15.4%	3.0%	13.9%
Intermediate Goods	<b>← DOUBLE COUNTING</b>		2,007	16.7%	2.3%	14.9%
<b>Exports by Value Chain Stage and Industry</b>						
Electronic Hardware Final Goods	41	1,291	1,410	16.2%	3.0%	14.6%
Electronic Hardware Intermediates	28	1,196	1,280	17.7%	2.3%	15.8%
Motor Vehicle Final Goods	23	765	852	16.4%	3.6%	14.9%
Motor Vehicle Intermediates	14	544	597	17.4%	3.2%	15.6%
Textile, Apparel, and Footwear Final Goods	33	556	595	13.1%	2.3%	11.8%
Textile, Apparel, and Footwear Intermediates	12	132	129	10.9%	-0.7%	9.5%

Note: all values in US dollars at current prices and exchange rates.

Sources: 3 Industries: Source: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade, <http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefination.aspx?Page=GVCIndicator>;

World GDP: World Bank World Development Indicators, <http://data.worldbank.org/data-catalog/world-development-indicators>

# China's Role

# China's is consolidating and strengthening its role in GVCs

Electronic (ICT) Hardware, 1988-2014, US\$TH

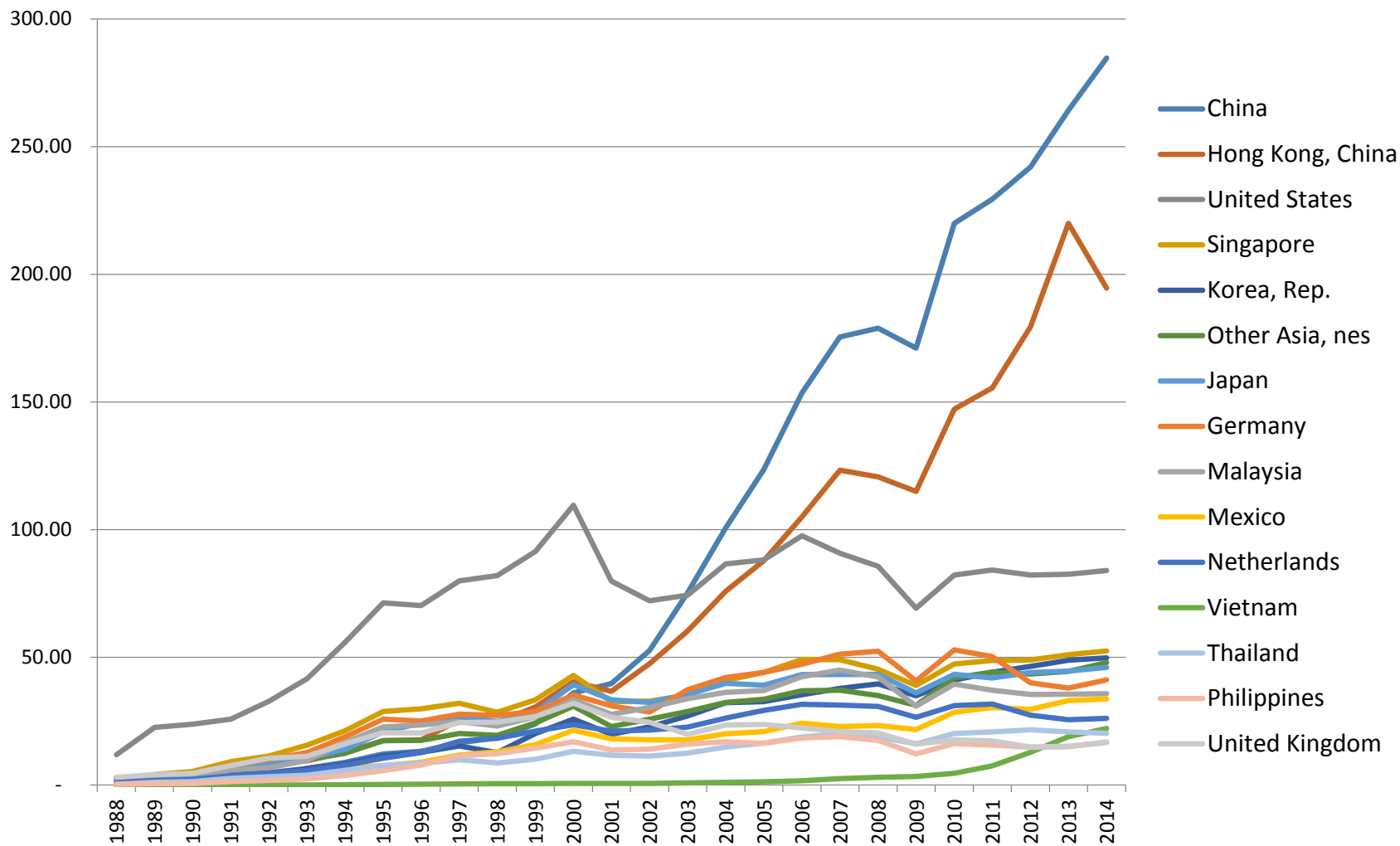
	1988	2011	2014	CAGR 1988-2011	CAGR 2011-2014	CAGR 1988-2014
<b>Electronic Hardware Final Good Exports</b>	41,151,832	1,291,191,048	1,410,108,388	16.2%	3.0%	14.6%
<i>China</i>	294,281	453,316,448	580,494,528	37.6%	8.6%	33.9%
<i>China share</i>	1%	35%	41%			
<b>Electronic Hardware Final Good Imports</b>	86,866,215	1,207,667,328	1,338,708,782	12.1%	3.5%	11.1%
<i>China</i>	1,621,470	89,607,104	78,395,352	19.1%	-4.4%	16.1%
<i>China share</i>	2%	7%	6%			
<b>Electronic Hardware Intermediate Exports</b>	28,213,566	1,195,654,609	1,280,359,842	17.7%	2.3%	15.8%
<i>China</i>	16,625	315,589,536	360,440,928	53.5%	4.5%	46.8%
<i>China share</i>	0%	26%	28%			
<b>Electronic Hardware Intermediate Imports</b>	43,467,296	1,051,138,505	1,133,415,255	14.9%	2.5%	13.4%
<i>China</i>	680,097	229,371,808	284,643,232	28.8%	7.5%	26.1%
<i>China share</i>	2%	22%	25%			

Source: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade, <http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefination.aspx?Page=GVCIndicator>



# Is China's local content increasing in ICT goods?

Top 15 Importers of Intermediate ICT Goods, 1988-2014, current US\$ Billions



Source: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade, <http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefinition.aspx?Page=GVCIndicator>

# China's is the world's dominant apparel producer ...but may be getting a bit more competition lately

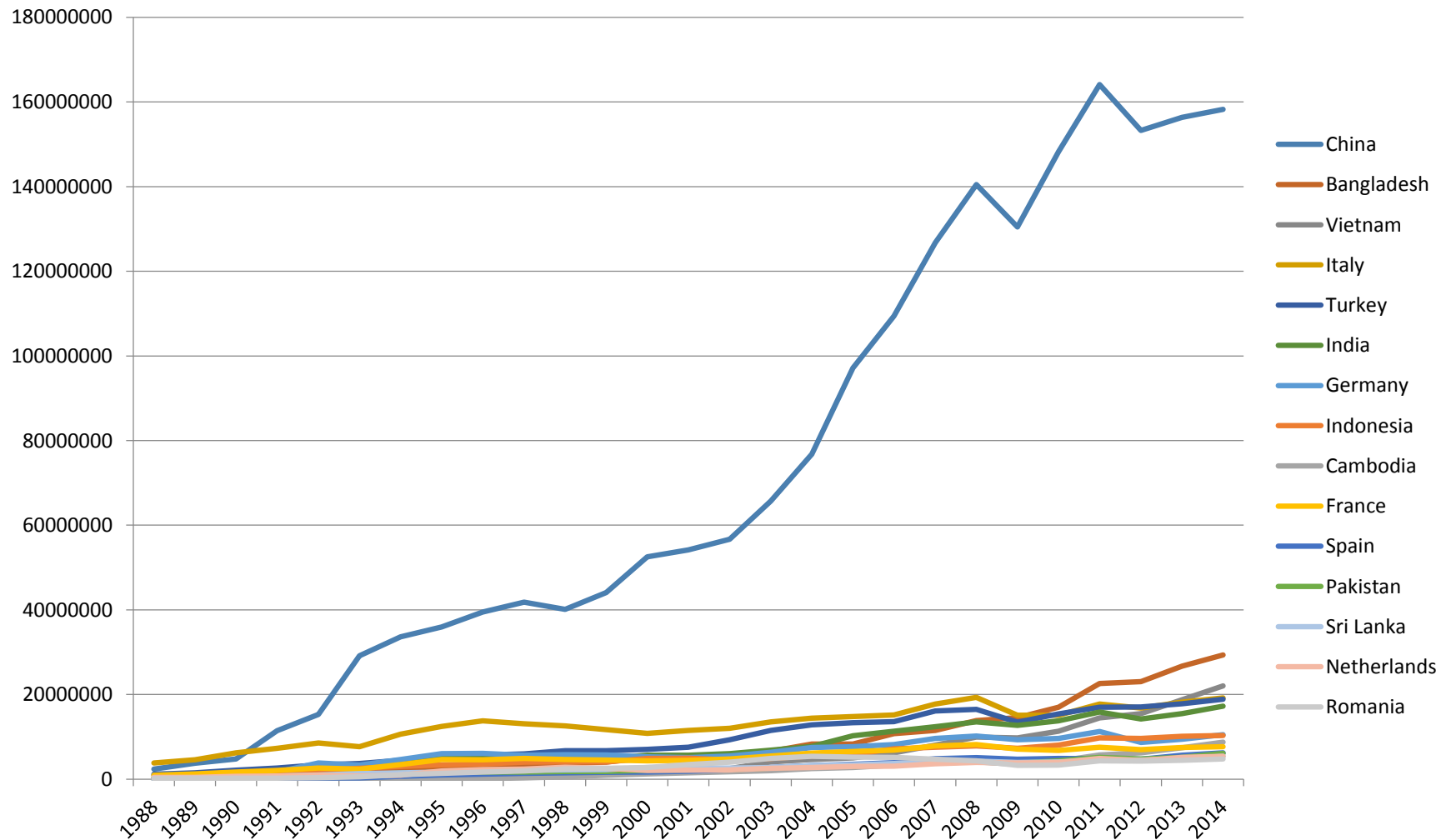
## Textiles, Apparel, and Footwear, 1988-2014, US\$TH

	1988	2011	2014	CAGR 1988-2011	CAGR 2011-2014	CAGR 1988-2014
<b>Textile, Apparel, and Footwear Final Goods Exports</b>	32,668,039	556,452,493	595,099,117	13.1%	2.3%	11.8%
<i>China</i>	3,024,735	242,193,404	240,623,064	21.0%	-0.2%	18.3%
<i>China share</i>	9%	44%	40%			
<b>Textile, Apparel, and Footwear Final Goods Imports</b>	28,127,510	550,170,950	608,472,321	13.8%	3.4%	12.6%
<i>China</i>	34,090	5,775,594	7,385,833	25.0%	8.5%	23.0%
<i>China share</i>	0%	1%	1%			
<b>Textile, Apparel, and Footwear Intermediate Exports</b>	12,272,352	131,888,190	128,955,961	10.9%	-0.7%	9.5%
<i>China</i>	960,571	37,359,805	42,444,966	17.3%	4.3%	15.7%
<i>China share</i>	8%	28%	33%			
<b>Textile, Apparel, and Footwear Intermediate Imports</b>	16,797,110	151,660,805	157,785,588	10.0%	1.3%	9.0%
<i>China</i>	331,835	16,471,788	15,771,482	18.5%	-1.4%	16.0%
<i>China share</i>	2%	11%	10%			

Source: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade, <http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefination.aspx?Page=GVCIndicator>

# How much competition is China getting as an apparel exporter?

Top 15 Exporters of Apparel Goods, 1988-2014, current US\$ TH



Source: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade, <http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefination.aspx?Page=GVCIndicator>

# China's auto industry is largely domestic

...except in terms of ownership

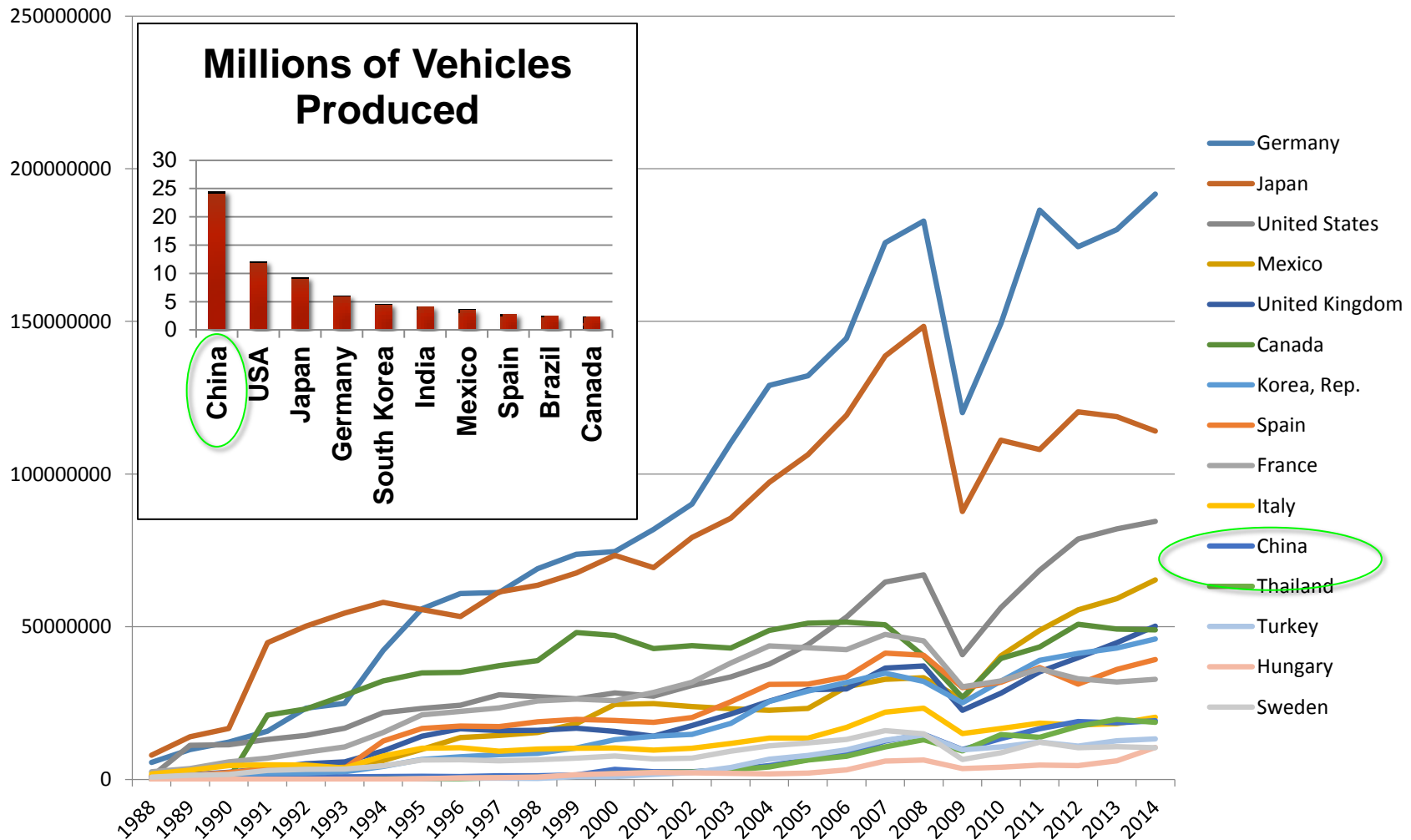
## Motor Vehicles, 1988-2014, US\$TH

	1988	2011	2014	CAGR 1988-2011	CAGR 2011-2014	CAGR 1988-2014
<b>Motor Vehicle Final Good Exports</b>	23,054,418	765,109,198	851,807,246	16.4%	3.6%	14.9%
<i>China</i>	8,603	16,584,255	19,211,186	38.9%	5.0%	34.5%
<i>China share</i>	0%	2%	2%			
<b>Motor Vehicle Final Goods Imports</b>	91,297,229	781,453,619	877,108,738	9.8%	3.9%	9.1%
<i>China</i>	468,931	42,115,380	55,131,424	21.6%	9.4%	20.1%
<i>China share</i>	1%	5%	6%			
<b>Motor Vehicle Intermediate Exports</b>	13,648,581	544,213,472	597,314,076	17.4%	3.2%	15.6%
<i>China</i>	8,706	37,055,784	46,929,100	43.8%	8.2%	39.2%
<i>China share</i>	0%	7%	8%			
<b>Motor Vehicle Intermediate Imports</b>	30,719,185	532,428,095	588,189,488	13.2%	3.4%	12.0%
<i>China</i>	193,382	32,561,992	39,308,784	25.0%	6.5%	22.7%
<i>China share</i>	1%	6%	7%			

Source: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade, <http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefination.aspx?Page=GVCIndicator>

# China is world's largest vehicle producer, but ranks 11<sup>th</sup> in exports

Top 15 Exporters of Final Motor Vehicles, 1988-2014, current US\$ TH



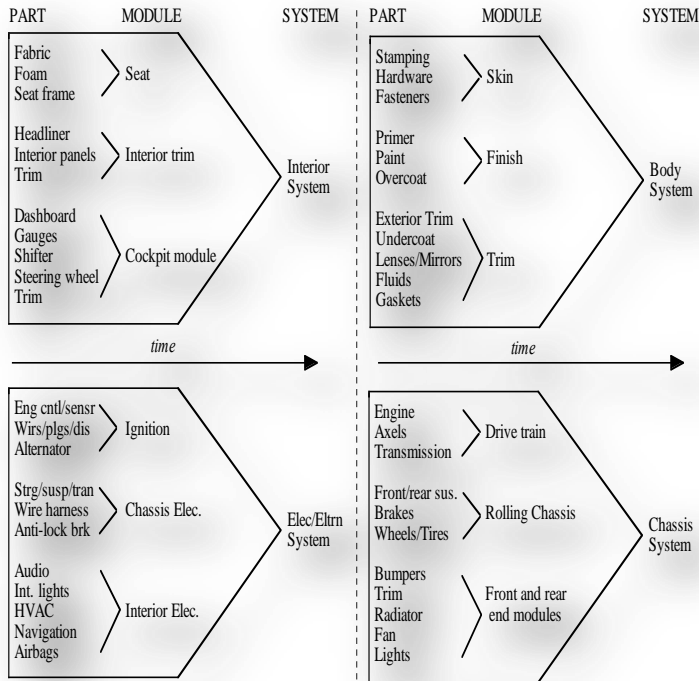
Sources: World Bank MC-GVC Database using a consistent 175 country panel that accounts for 95-98% of world trade, <http://wits.worldbank.org/WITS/WITS/AdvanceQuery/GVC/GVCQueryDefinition.aspx?Page=GVCIndicator>  
 Vehicle Production: OICA, <http://www.oica.net/category/production-statistics/2015-statistics/>

The World Bank's MC-GVC database is part of a long and fruitful search for useful analytical categories in international trade

# Various efforts to isolate coordinated trade from arms length trade

- Yeats (1998) “Just How Big is Global Production Sharing” used SITC 7 “**parts and components of machinery**” - 73 intermediate product codes
- Rauch index of product differentiation (1999) three product classes in SITC Rev.2:
  - (i) homogeneous goods, which are traded on an organized exchange
  - (ii) reference priced goods with published prices, and
  - (iii) **differentiated goods without published prices.**
- Athukorala (2010) list of commodities in HS with “**parts and components**” in the description - 525 six-digit HS commodities across a variety of industries
- Sturgeon & Memedovic (UNIDO 2010) final and “**specified intermediate goods**” in three industries: electronics, motor vehicles, and textiles, apparel & footwear – 432 five-digit SITC products
  - World Bank MC-GVC database – adapted Sturgeon & Memedovic to various HS revisions and developed a consistent panel of 175 countries and broke out footwear and final textiles from the textile/apparel category – 1,050 six-digit HS 2007 products
  - CGGC developing sub-classification of intermediates **for various supply chain levels in specific industries**

# Further elaborated GVC categories from CGGC



Source: Sturgeon and Florida, 2004

BEC 4 (SNA)	Value Chain Stage	Total Motor Vehicle Exports 2014, \$B	% Total Motor Vehicle Exports 2014	Value chain actor
<b>BEC 53 Parts and accessories (Intermediate)</b>		<b>609</b>	<b>46.9</b>	<b>Supplier</b>
	<b>Components</b>	<b>535</b>	<b>41.2</b>	<b>Supplier</b>
	Of the Body System	262	20.2	Supplier
	Of the Drive train	159	12.3	Supplier
	Electrical Systems	114	8.8	Supplier
	Of the Body System or Drive train	103	7.9	Supplier
	<b>Subassemblies</b>	<b>74</b>	<b>5.7</b>	<b>Automaker</b>
	Body System	3	0.3	Automaker
	Drive train	70	5.4	Automaker
<b>BEC 51 Passenger motor vehicle (unclassified)</b>	<b>Final Products</b>	<b>688</b>	<b>53.1</b>	<b>Automaker</b>
<b>BEC 5 Transportation equipment and parts and accessories thereof</b>	<b>Total</b>	<b>1,297</b>	<b>100</b>	

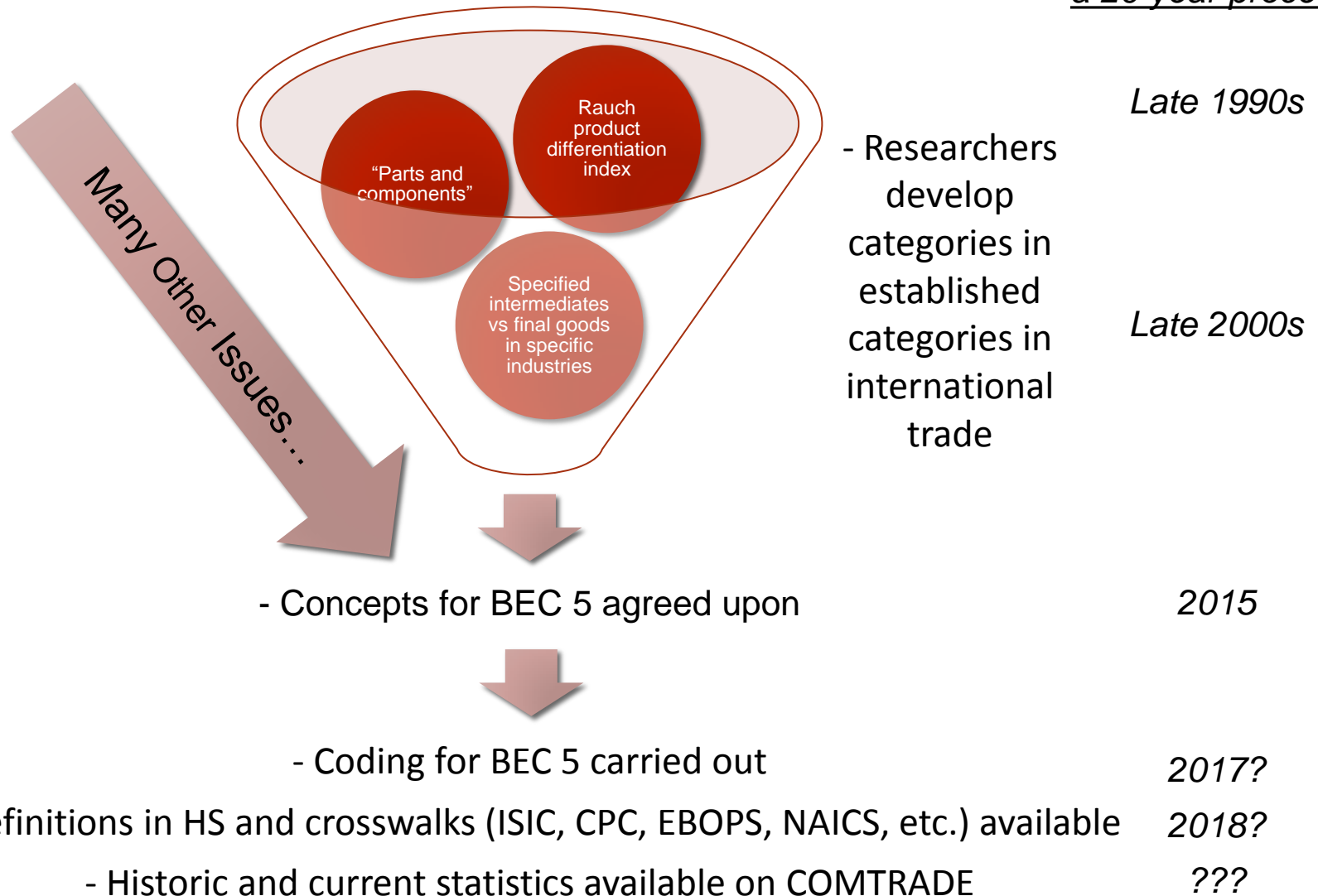
Red arrows in the table indicate the flow of value chain stages: Components to Subassemblies, Subassemblies to Final Products, and Final Products to Total. A large red arrow points from the 'Total' row to the '1,297' value, labeled 'Triple counting?'.

Source: CGGC



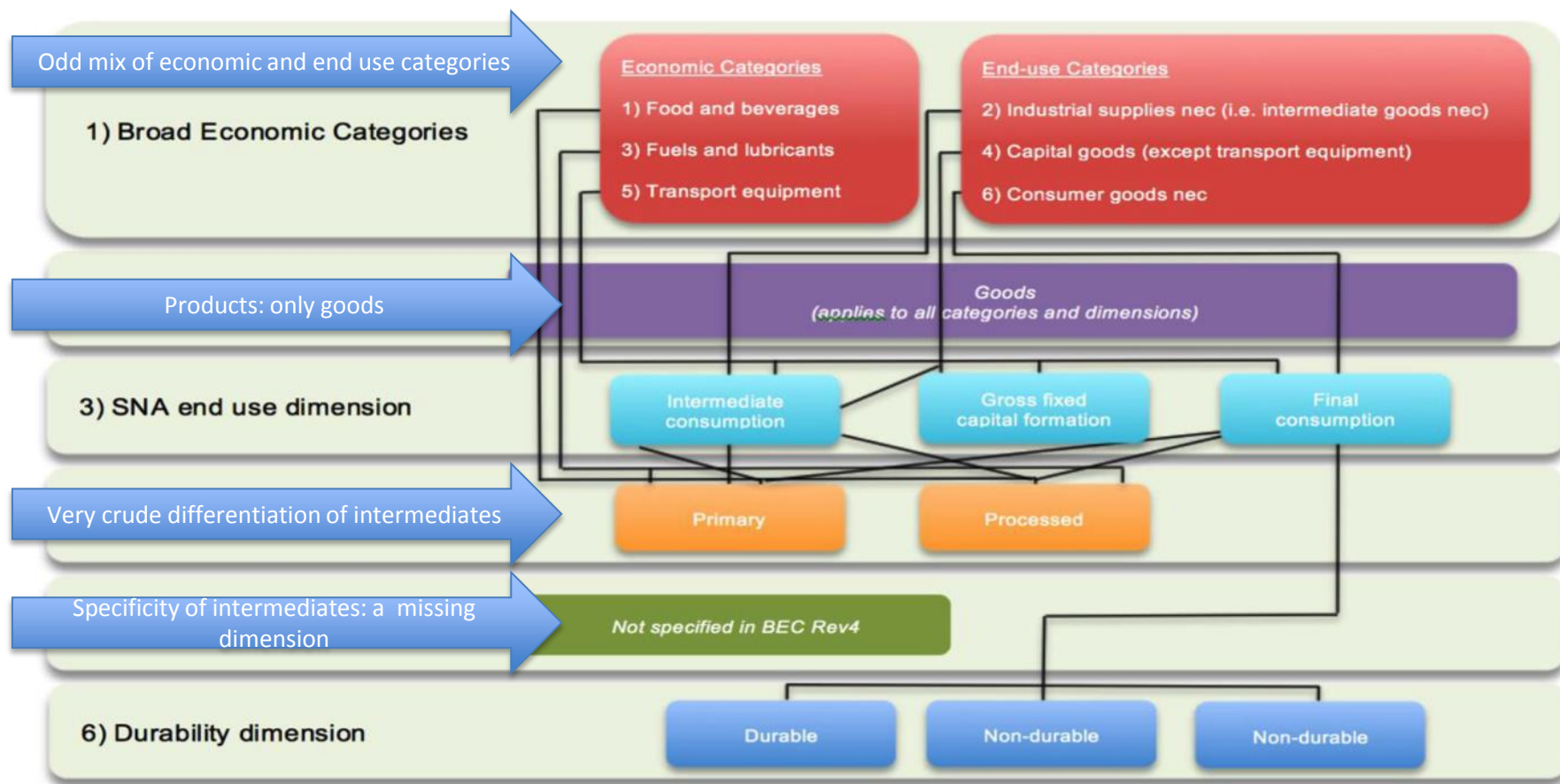
# Implementation of refined GVC categories in BEC 5

a 20 year process:



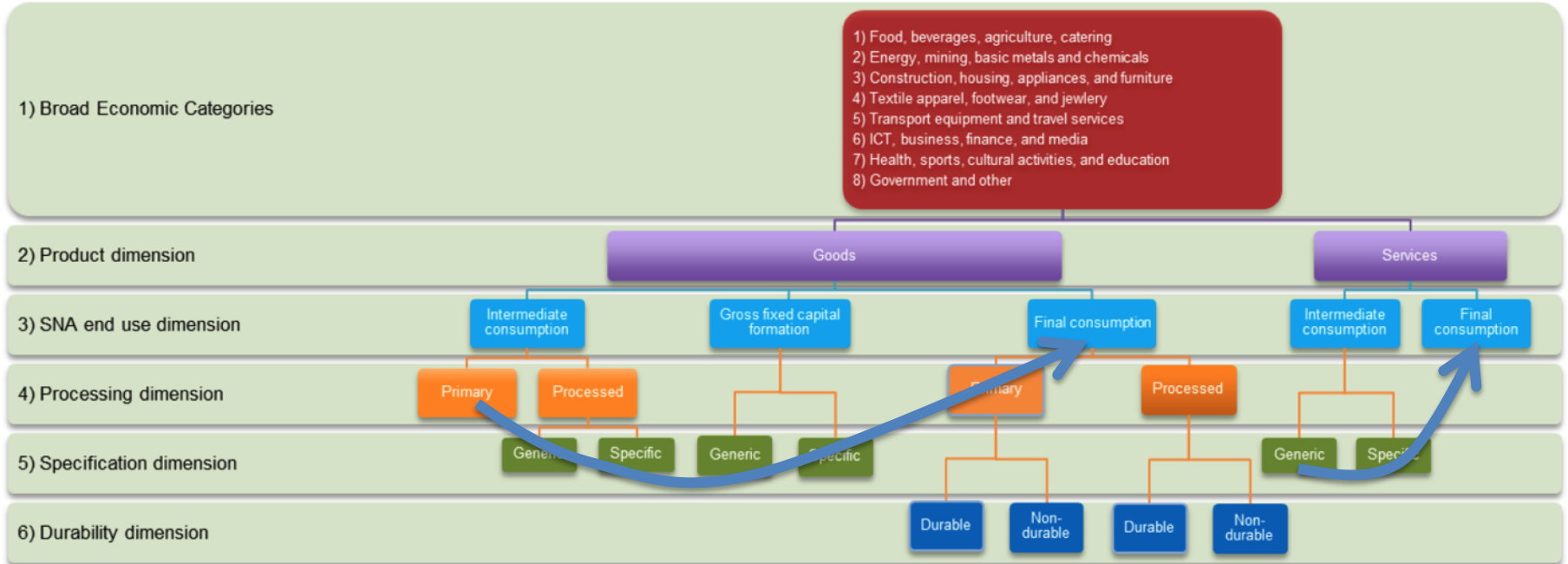
# BEC 4's "Hierarchical" Structure

(1971 original and Revisions 2-4)

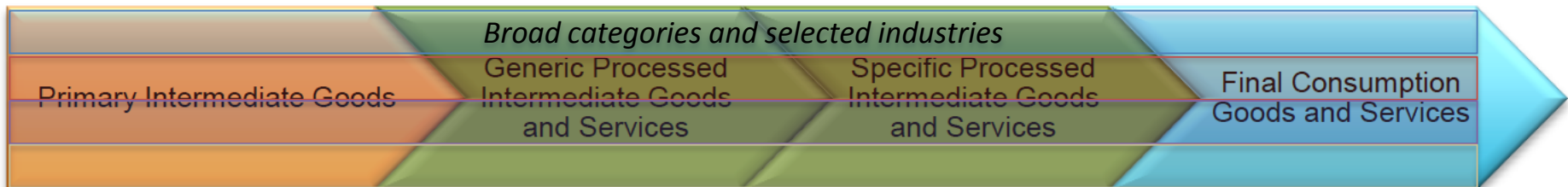


Source: Classification by Broad Economic Categories, Revision 5 (UNSD, 2016)

# BEC Rev 5 Hierarchical Structure

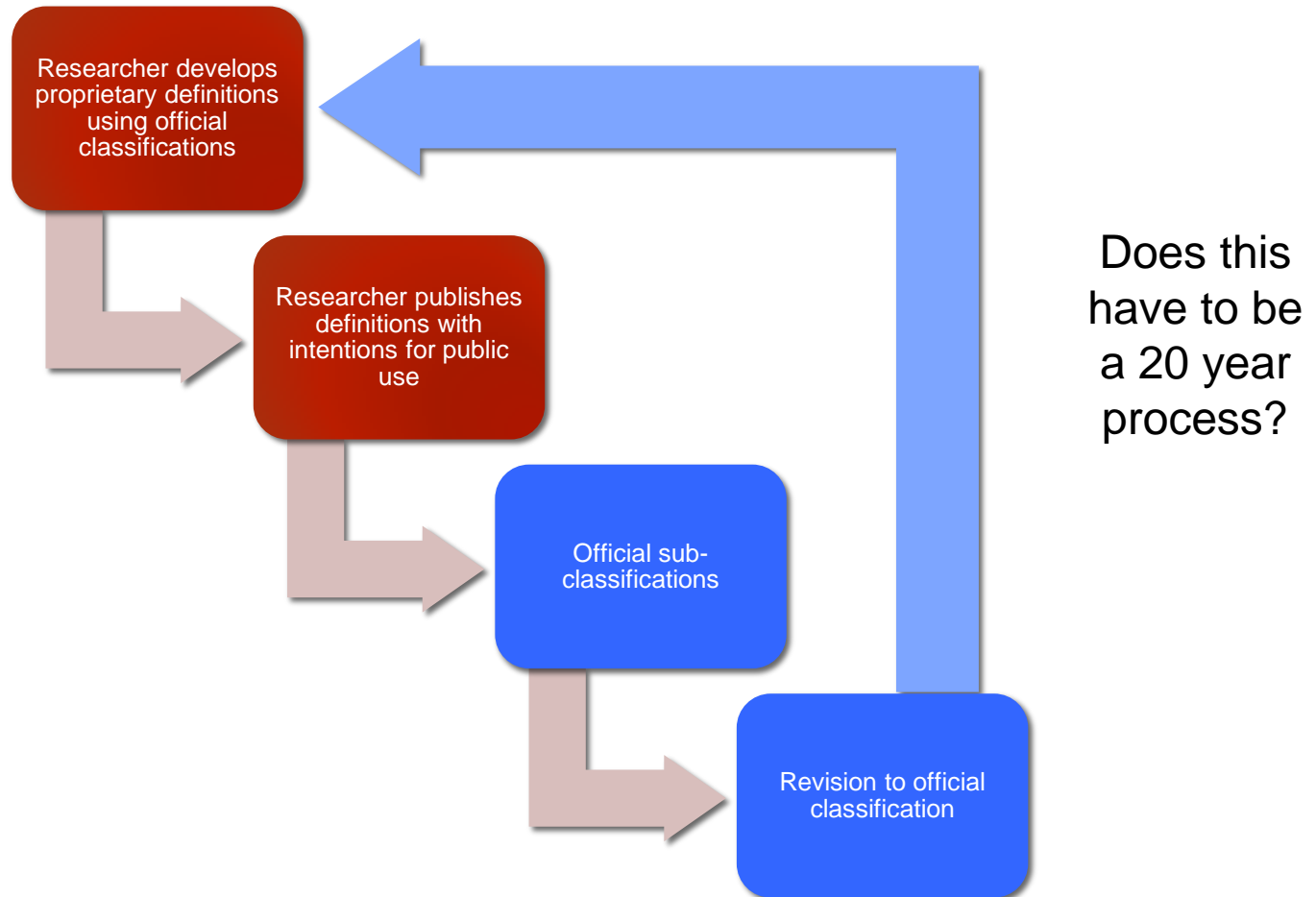


## BEC Rev 5 Simplified Value Added Chain



Source: Classification by Broad Economic Categories, Revision 5 (UNSD, 2016)

Interaction between the statistical and research communities can help drive the creation of more relevant and useful statistics



# Other areas of improvement

- TiVA (OECD/WTO)
  - Combining I-O with international trade
  - Extended IIOs
- Business functions (Eurostat, UN)
  - Tradable business services plus a primary function
- ICT-enabled services (UNCTAD)
  - Tradable services that can be delivered electronically
- Gaps?
  - Price and volume indices (getting the accounts right)
  - Global KLEMS (measuring productivity)
  - Global business register (measuring control, concentration, and value capture)

***ALIGNMENT OF CONCEPTS AND CATEGORIES? WHO'S RUNNING THE SHOW?***

***Thank you!***