New Trends in Value Chain Upgrading:

Lessons from Large and Small Countries

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Agenda

1. Global Value Chains & Development
2. Industrial Upgrading in GVCs: Trends & New Realities
   A. Mexico & China
   B. Costa Rica & Brazil
3. Implications for “Inclusive” Value Chain Development

Global Value Chains and Development

DUKE UNIVERSITY, CENTER ON GLOBALIZATION, GOVERNANCE & COMPETITIVENESS

CENTER ON GLOBALIZATION Governance & Competitiveness

The Center on Globalization, Governance & Competitiveness (CGGC) is dedicated to carrying out innovative and interdisciplinary research that has an impact on corporations, social institutions, and public policy.

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Global Value Chains
NC in the Global Economy
Engineering & Entrepreneurship
Environment
Global Health
Nanotechnology

CGGC News

The Development and Diffusion of Powder Coatings in the US and Europe

December 8, 2009 - A new report sponsored by EDF's Corporate Partnerships Program on the development and diffusion of powder coatings has been released by CGGC. The report traces the development of powder coatings into different product markets, the factors that lead to their adoption in the US and Europe, and the key 'leverage points' of actors in the power coating value chain to further diffuse the technology. Market developments in China are also discussed. The report and follow-on industry trade journal articles in the *European Coatings Journal* and *Powder Coating* [forthcoming Feb. 2010] can be found here. Powder Coatings Report ■ ECJ Article

The Offshore Services Industry: A New Opportunity for Latin America (La Industria de Servicios Offshoring: Una Oportunidad para América Latina)

October 21-23, 2009 - Gary Gereffi, Mario Castillo and Karina Fernandez-Stark presented the paper "La Industria de Servicios Offshoring: Una oportunidad para America Latina" in the annual REDIBERO meeting, with the title, "La Promoción del Comercio y la Inversión en Iberoamérica ¿Podemos avanzar hacia la promoción regional?" Presentation (in Spanish) ■ IADB Policy Brief

Hybrid Trucks: Strategic Win for Economy and Environment

June 11, 2009 - A high-tech truck convoy pulled up at Capitol Hill to showcase the emergence of fuel-and-emissions-saving hybrid technology for the nation's biggest vehicles. The event, organized by clean transportation group CALSTART, unveiled a new CGGC study that highlights jobs created in truck manufacturing as well as other areas crucial to building the green economy: advanced energy storage, power electronics and control systems. More

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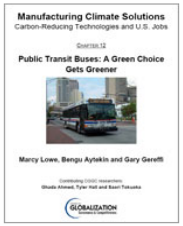

CGGC value chain analysis finds U.S. job opportunities in manufacturing low-carbon technologies. more >>

View 2008 Report
Green Jobs Webinar (11/19/09)
Hybrid Trucks Conference (10/28/09)
Hybrid Trucks on Capitol Hill (06/11/09)

Work Opportunities

Associate in Research - Value Chain Analysis of U.S. Rail Vehicle Manufacturing, 1/11/10 More Info

Associate in Research - Value Chain Analysis of U.S. Advanced Battery Development & Manufacturing, 1/11/10 More Info

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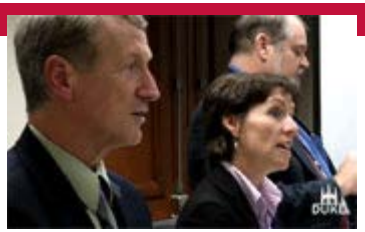
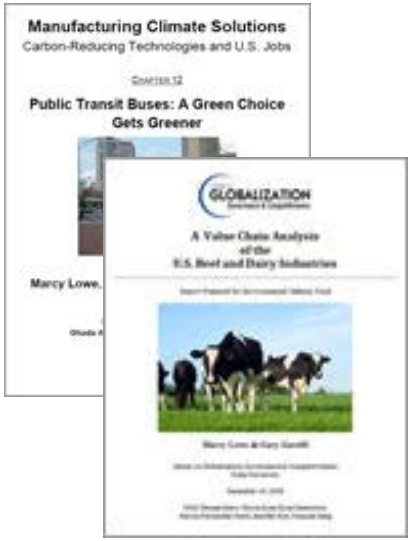




Source: http://cggc.duke.edu/

Globalization & Development – Key Trends

- Post-Washington Consensus world – Global economic recession of 2008-09 and rise of "middle powers" has changed export-oriented model
- Large emerging economies like China, India and Brazil are both export platforms and turning inward
- Small economies are seeking specialized niches in the global economy and regional economic blocs
- Lead firms in global value chains are streamlining and consolidating their sourcing and production networks

The Global Value Chain Approach

Global value chain framework developed over the past decade by a diverse interdisciplinary and international group of researchers who have tracked the global spread of industries and their implications for both corporations and countries

- Global value chain analysis provides both conceptual and methodological tools for looking at the global economy
  - **Top down** – a focus on lead firms and inter-firm networks, using varied typologies of industrial "governance"
  - **Bottom up** – a focus on countries and regions, which are analyzed in terms of various trajectories of economic and social "upgrading" or "downgrading"

Key GVC Research Objectives

1. A detailed mapping of the actors in specific value chains in particular countries or regions

2. An assessment of the upgrading (or downgrading) trajectories in the value chain with regard to multiple analytical dimensions

3. The identification of constraints and opportunities for value chain development leading to strategies to drive industry growth

Value Chain Development: An Integrated Diagnostic Tool

5 Development Goals

1. Poverty Reduction
2. Employment Creation and Income Generation
3. Economic Growth
4. Firm Development
5. Environmental Stability and Cleaner Production

7 Dimensions of Value Chain Analysis

1. Sourcing of inputs and supplies
2. Production capacity and technology
3. End markets and trade
4. Governance
5. Value chain finance
6. Sustainable production and energy use
7. Business environment and socio-political context

Source: *UNIDO, Diagnostics for Value Chain Development* (2011).

Relationship Between Value Chain Dimensions and Development Goals

(data are hypothetical)

	DEVELOPMENT GOALS				
Value Chain Development Dimensions	**Poverty Reduction**	**Employment and Income**	**Economic Growth**	**Firm Development**	**Cleaner Production & Environmental Sustainability**
Improving sourcing of inputs and supplies	+++	++	+++	++	-
Improved production capacity and technology	+	++	+	++	++
End-markets and trade	--		+	+	
Improved governance of value chain	++	+	+	++	
Improved sustainable production and energy use	-	+	++	-	++
Value chain finance	++	++	++	+++	+
Improved business environment and socio-political context	+	+	+++	+	++
TOTAL	++	+	++	++	+

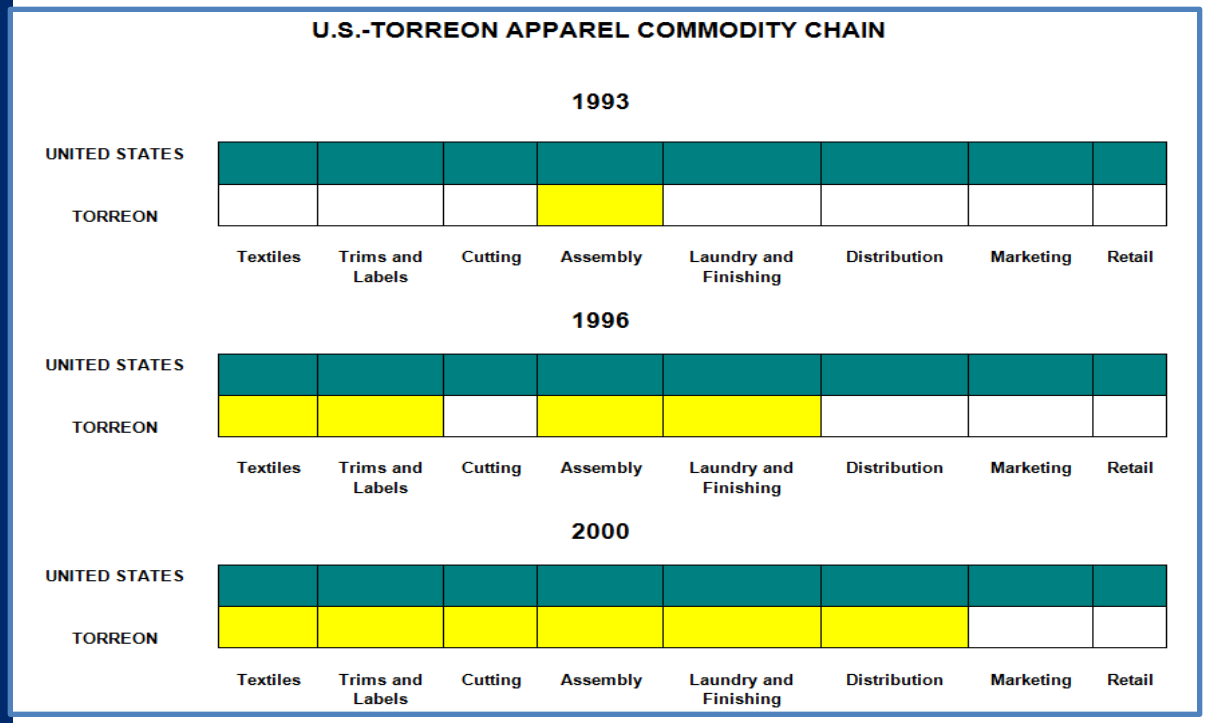
+ Slight positive	++ Positive	+++ Very Positive
- Slight negative	-- Negative	--- Very Negative

Source: UNIDO, *Diagnostics for Value Chain Development: An Integrated Tool* (2011), p. 10.

Industrial Upgrading:

Cases of Mexico and China

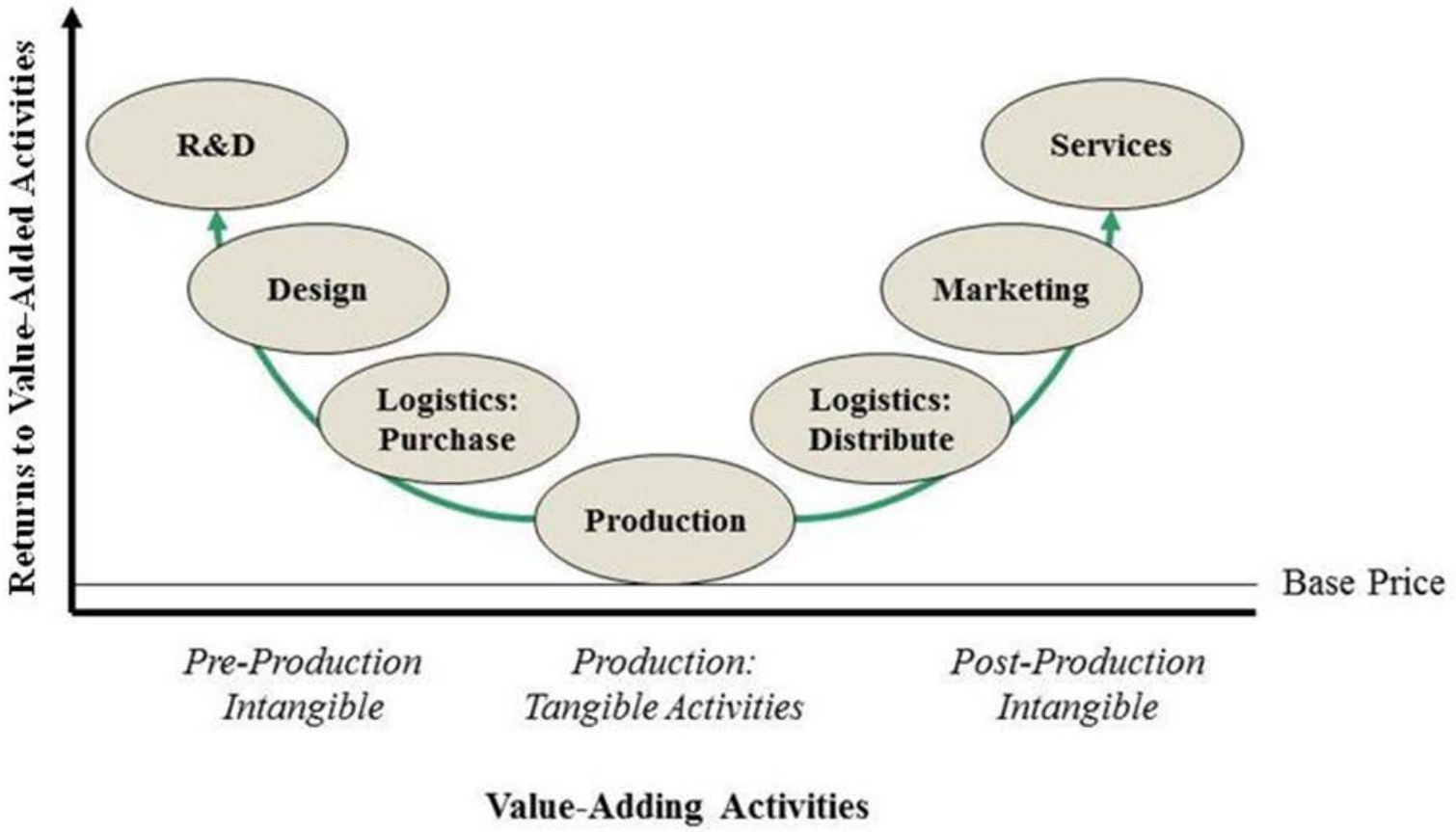
Functional Upgrading in GVCs



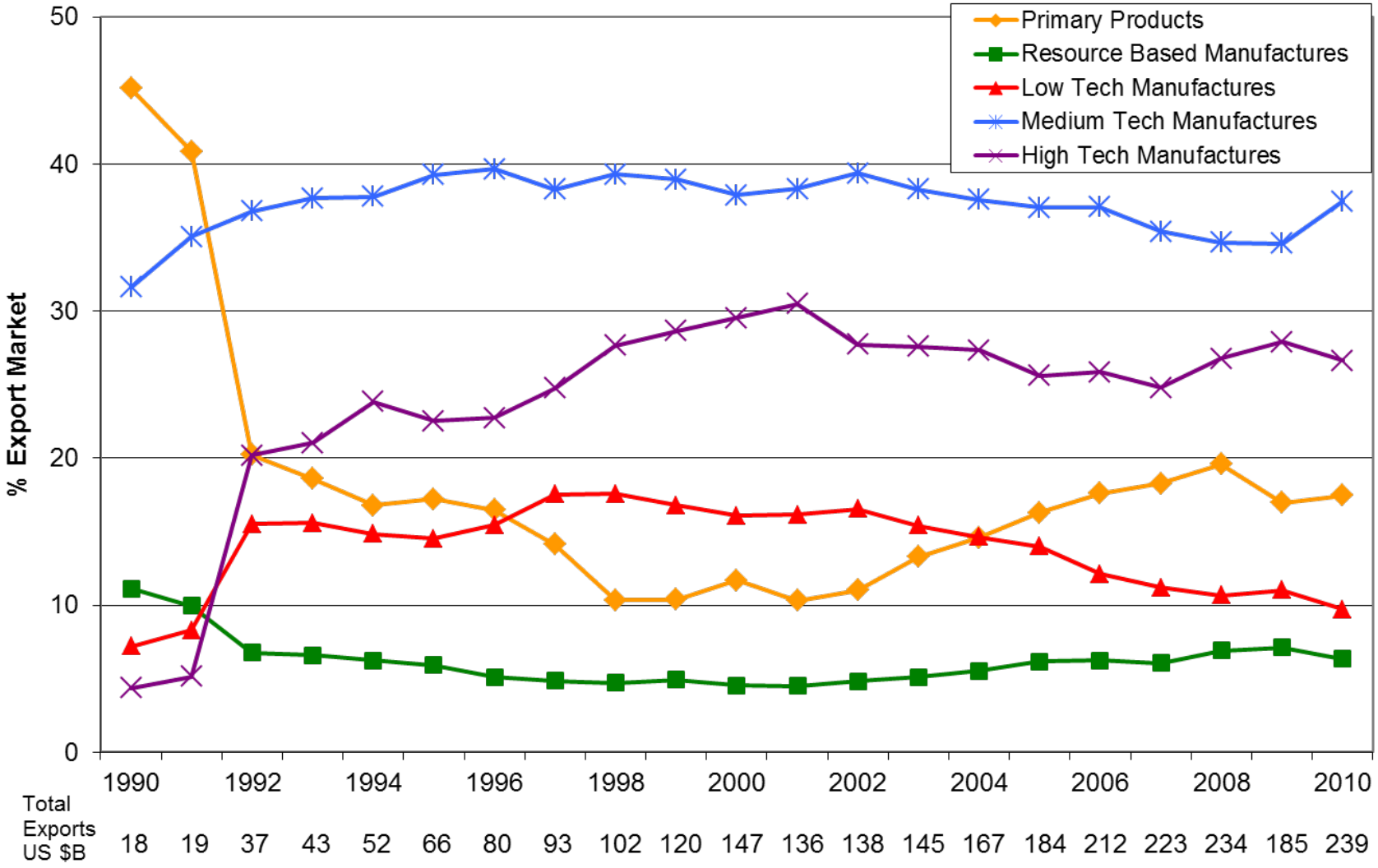
Upgrading refers to the strategies that stakeholders (countries, regions and firms) can take to improve their position within the global economy.

Gereffi, Gary and Jennifer Bair. 2001. "Local Clusters in Global Chains: The Causes and Consequences of Export Dynamism in Torreon's Blue Jeans Industry". *World Development.* Vol. 29 No. 11

Where Are the High-Value Activities in GVCs?

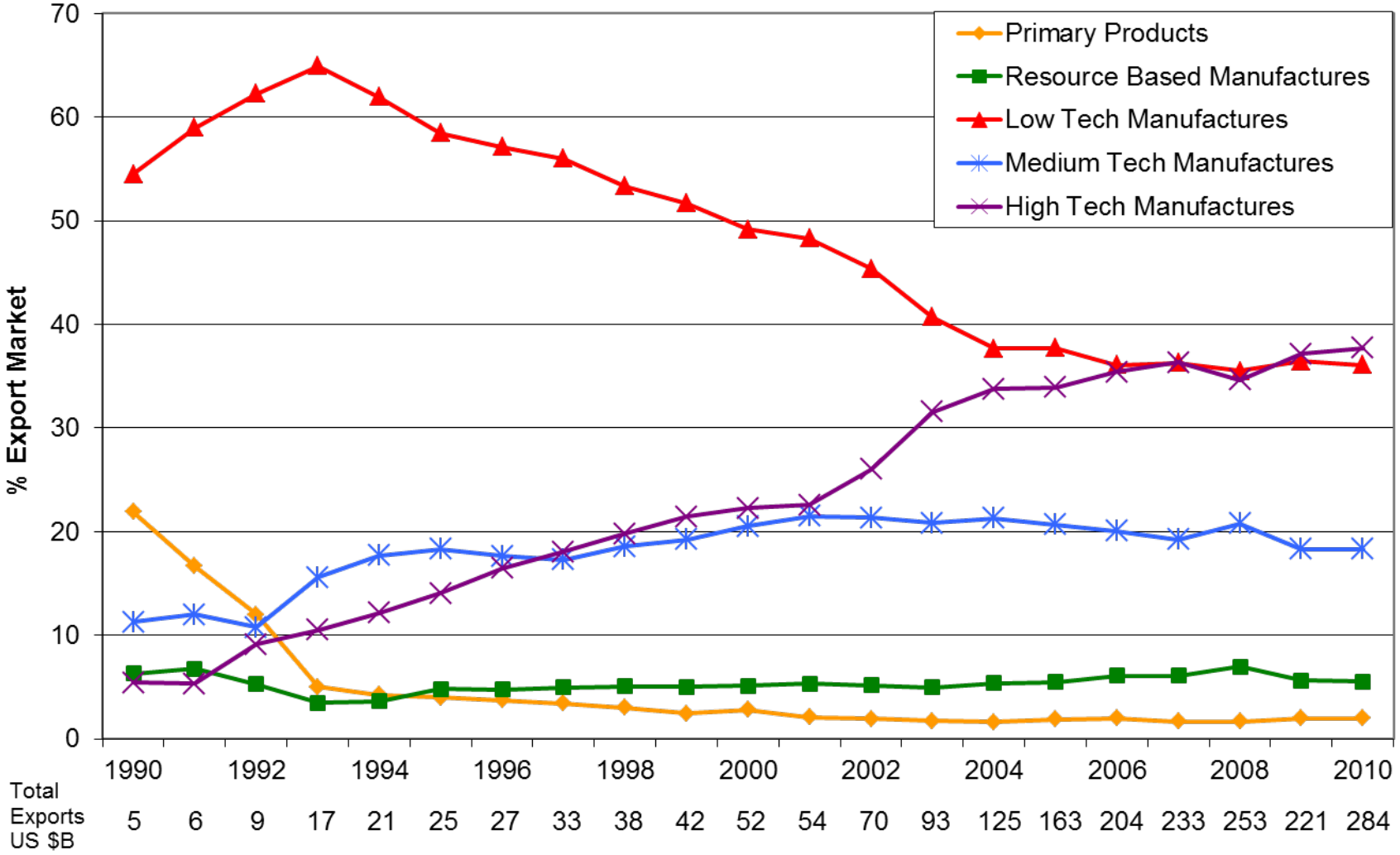


Composition of Mexico's Exports to the U.S. Market, 1990-2010



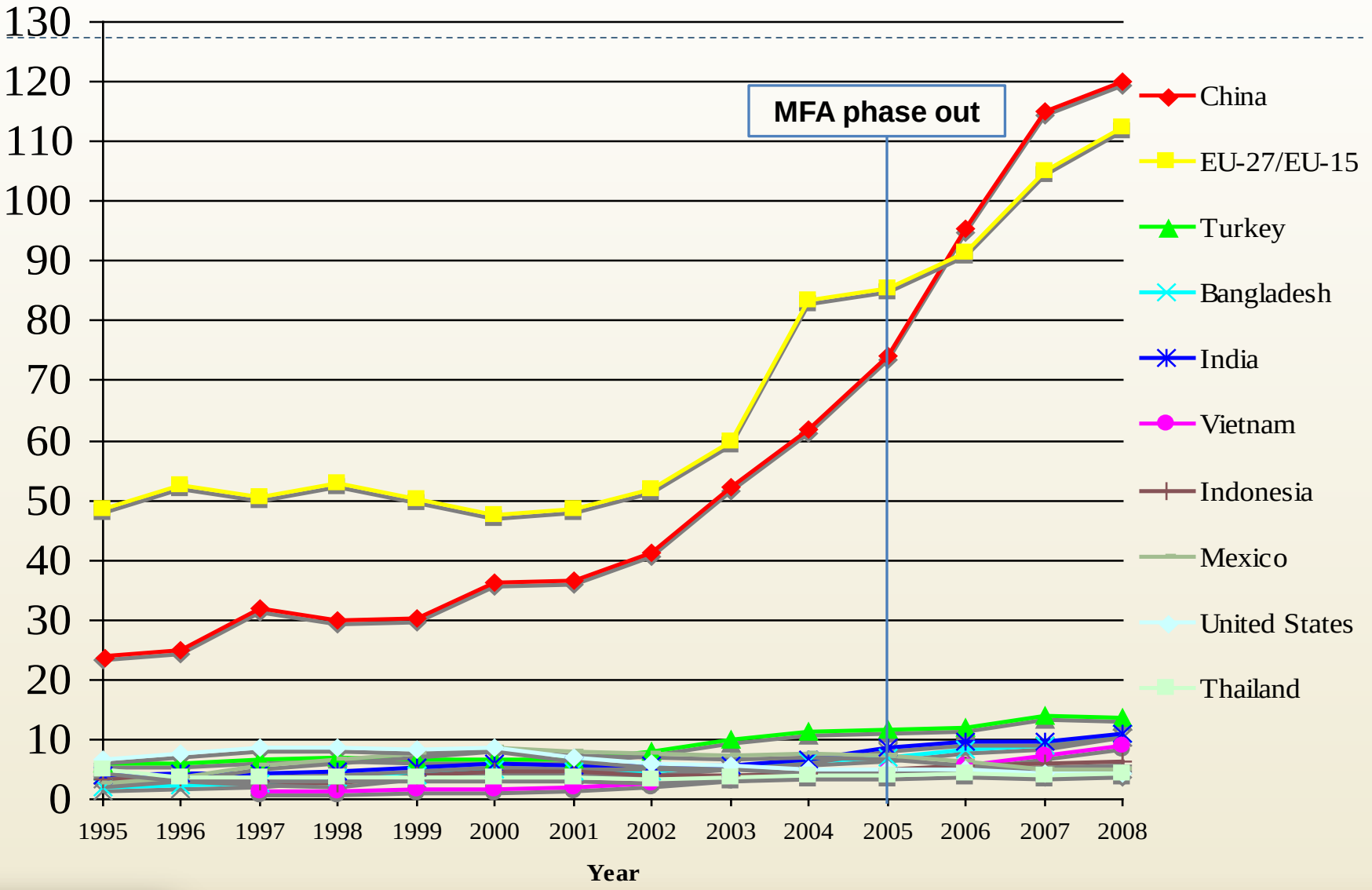
Source: UN Comtrade (http://comtrade.un.org/db/dqBasicQuery.aspx), Feb 2012

Composition of China's Exports to the U.S. Market, 1990-2010



Source: UN Comtrade (http://comtrade.un.org/db/dqBasicQuery.aspx), Feb 2012

Shifts in Top 10 Apparel Exporters: 1995-2008



Source: WTO Interactive International Trade Statistics; Top 10 based on 2008 statistics (US$ billions).

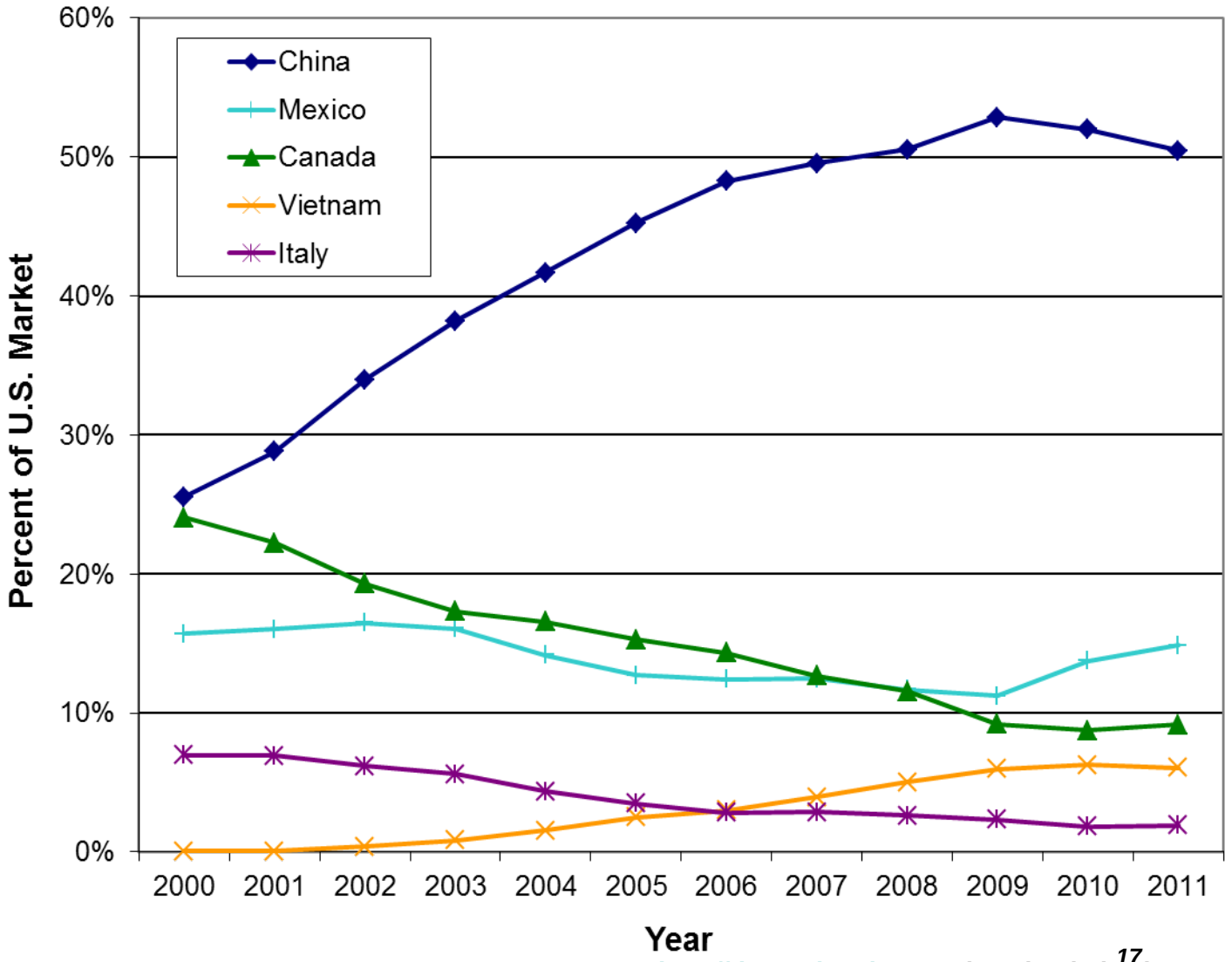
EU values represent EU-15: 1995-2003; EU-27: 2004-08

Mexico's and China's Leading Exports to the United States, 2000-2011

SITC	Product		2000 Value (billions)	2000 Share of US market	2011 Value (billions)	2011 Share of US market	Change in Market Share 2000-2011
752	Automatic Data Processing Machines and Units	Mexico	6.4	11.2	13.8	17.0	5.8
		China	6.5	11.4	54.2	66.7	55.4
		US Total	57.1		81.2		
764	Telecommunications Equipments and Parts	Mexico	9.2	20.4	13.0	12.9	-7.5
		China	4.8	10.6	46.2	45.9	35.3
		US Total	45.1		100.6		
778	Electrical Machinery and Apparatus	Mexico	3.2	18.2	5.3	18.0	-0.2
		China	2.1	11.9	10.9	36.9	25.0
		US Total	17.6		29.5		
784	Auto Parts and Accessories	Mexico	4.7	16.1	14.0	27.5	11.4
		China	0.5	1.7	5.9	11.6	9.9
		US Total	29.2		51.0		
821	Furniture	Mexico	3.2	15.5	5.2	14.8	-0.8
		China	5.3	25.7	17.8	50.6	24.8
		US Total	20.6		35.2		
84	Articles of Apparel and Cothing	Mexico	8.8	13.1	4.1	4.6	-8.5
		China	8.9	13.3	34.9	39.4	26.1
		US Total	67.1		88.6		

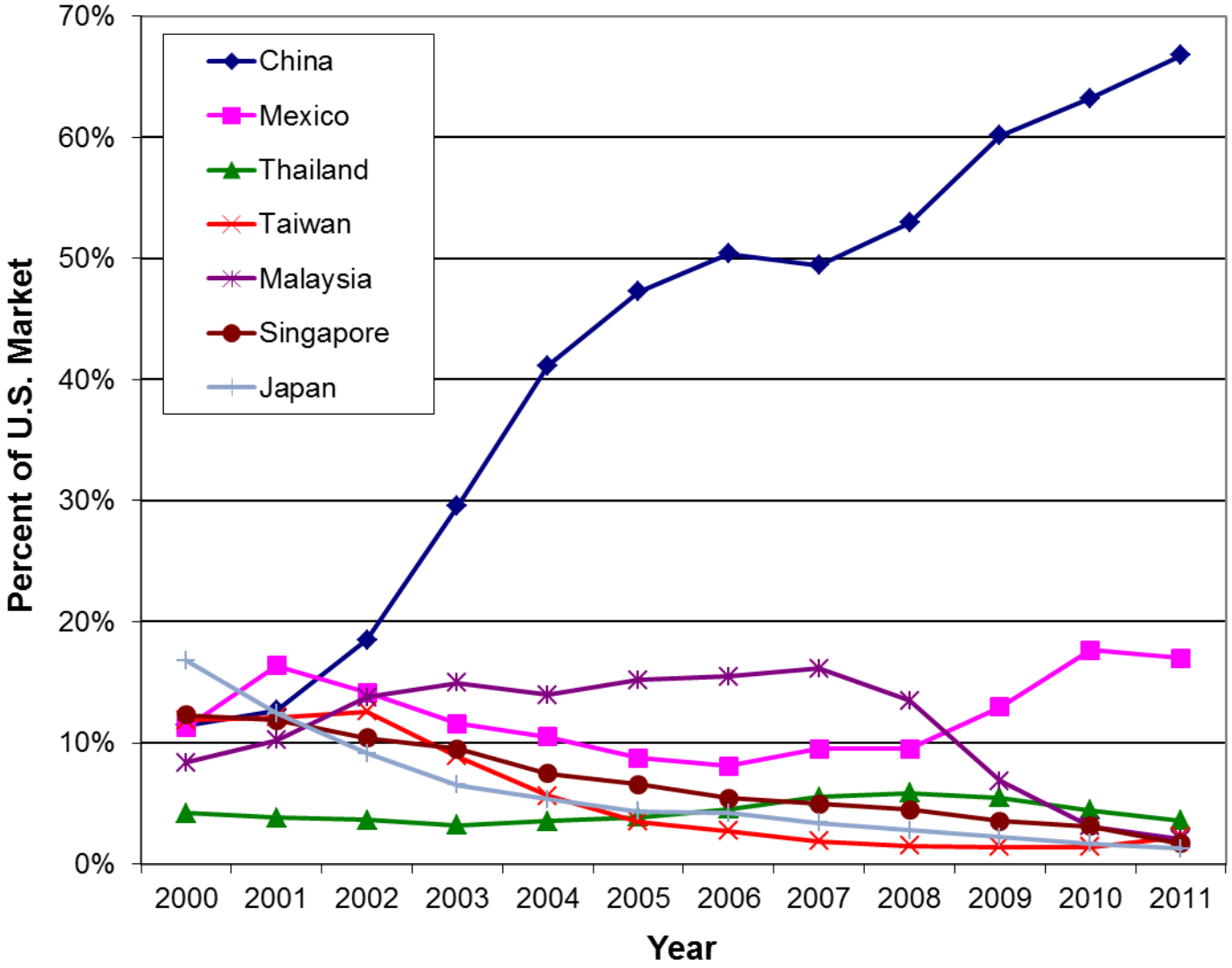
Source: U.S. Department of Commerce (http://dataweb.usitc.gov), Downloaded Feb 13, 2012
U.S. General Imports, CIF Value

Main Competitors in the U.S. Market for Furniture and Parts (SITC 821)



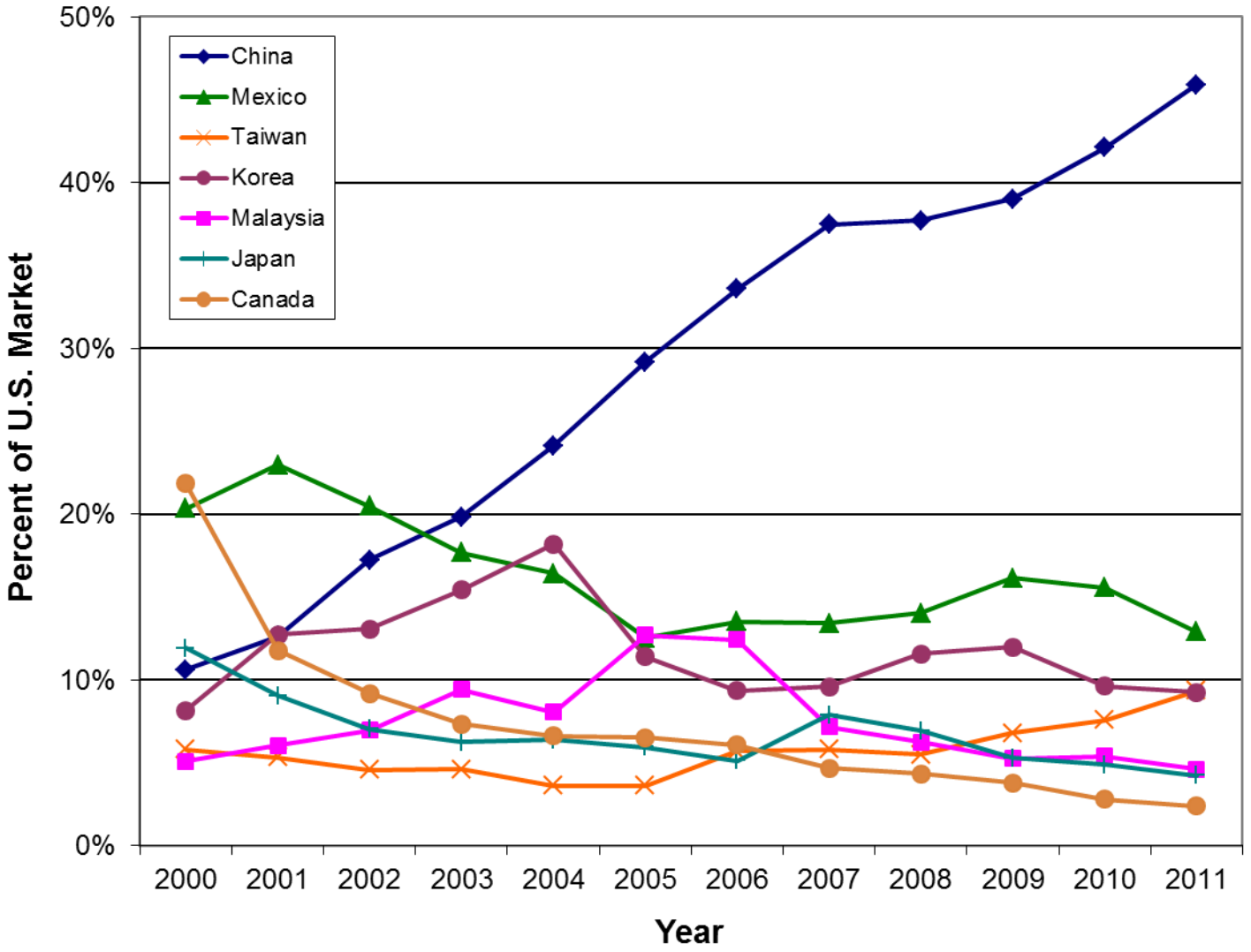
Source: USITC http://dataweb.usitc.gov downloaded Feb 14, 2012
U.S. General Imports, CIF Import Values

Main Competitors in the U.S. Market for Automatic Data Processing Machines and Data (SITC 752)



Source: USITC http://dataweb.usitc.gov downloaded Feb 14, 2012
U.S. General Imports, CIF Import Values

Main Competitors in the U.S. Market for Telecommunication Equipment and Parts (SITC 764)

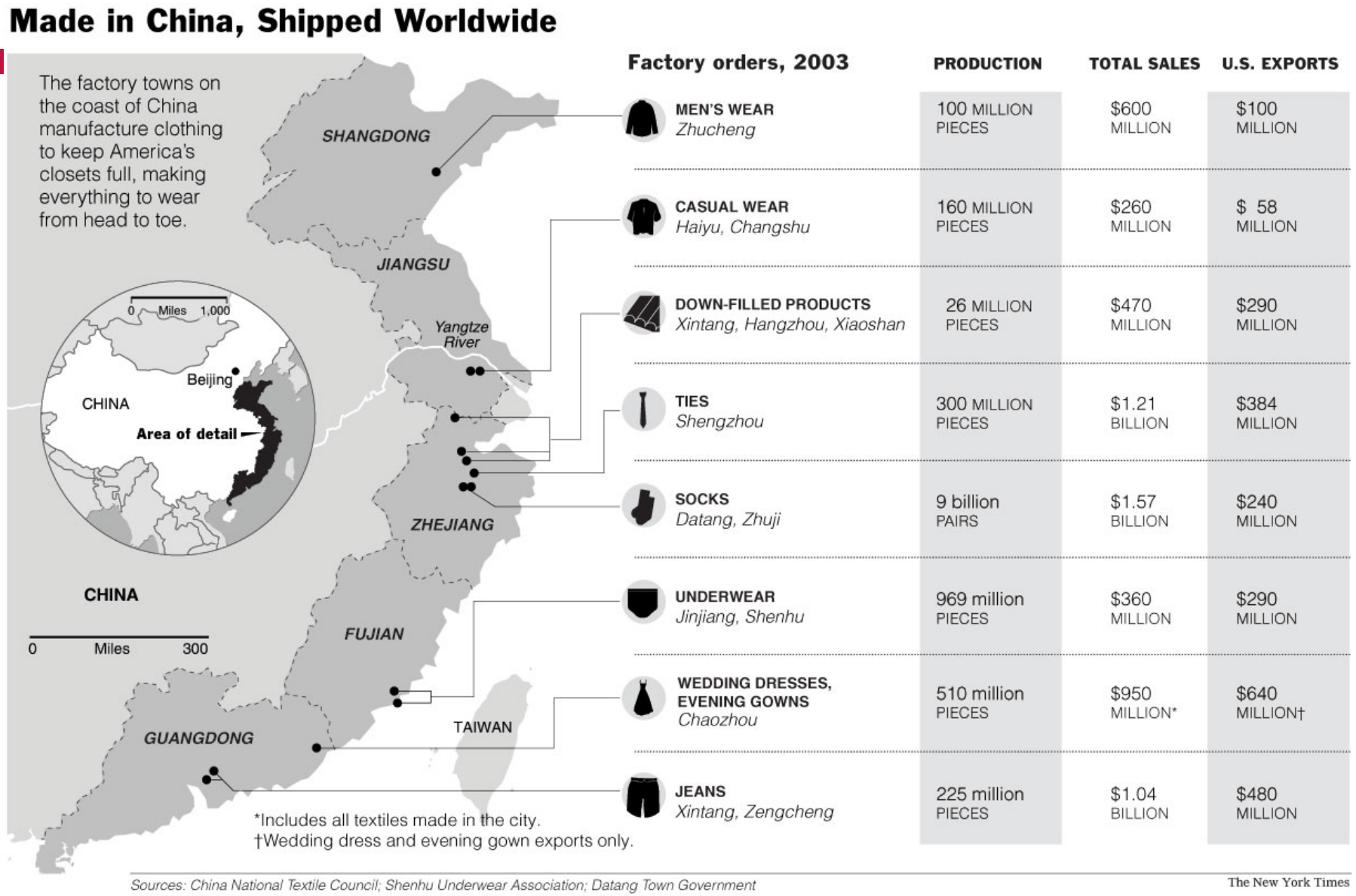


Source: USITC http://dataweb.usitc.gov downloaded Feb 14, 2012
U.S. General Imports, CIF Import Values

Why is China gaining U.S. market share over Mexico?

- China is a lower-cost producer overall (labor costs lower, but not transport & tariffs)
- China has huge scale and scope economies (supply-chain cities)
- China has a coherent and multidimensional upgrading strategy – diversify and add high value activities
- China is using direct foreign investment to promote “fast learning” in new industries
- China uses access to its domestic market to attract TNCs and promote knowledge spillovers

China's Supply Chain Cities in Apparel

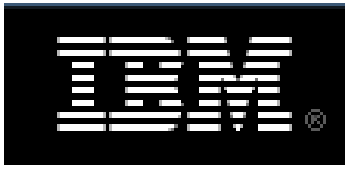


Factory orders, 2003	PRODUCTION	TOTAL SALES	U.S. EXPORTS
MEN'S WEAR *Zhucheng*	100 MILLION PIECES	$600 MILLION	$100 MILLION
CASUAL WEAR *Haiyu, Changshu*	160 MILLION PIECES	$260 MILLION	$ 58 MILLION
DOWN-FILLED PRODUCTS *Xintang, Hangzhou, Xiaoshan*	26 MILLION PIECES	$470 MILLION	$290 MILLION
TIES *Shengzhou*	300 MILLION PIECES	$1.21 BILLION	$384 MILLION
SOCKS *Datang, Zhuji*	9 billion PAIRS	$1.57 BILLION	$240 MILLION
UNDERWEAR *Jinjiang, Shenhu*	969 million PIECES	$360 MILLION	$290 MILLION
WEDDING DRESSES, EVENING GOWNS *Chaozhou*	510 million PIECES	$950 MILLION*	$640 MILLION†
JEANS *Xintang, Zengcheng*	225 million PIECES	$1.04 BILLION	$480 MILLION

Source: David Barboza, "In roaring China, sweaters are west of socks city," New York Times, Dec. 24, 2004.

MNC R&D Centers in China

- What kinds of work are Chinese, Indian, and American engineers actually doing?
  - Answer: Not just product adaptation, but cutting-edge research & commercialization
- China: More than 1,000 MNC R&D Centers
  - GE's China Technology Center: Advanced research in energy storage, environmental management
  - Microsoft Research Asia: Cutting-edge graphics & multimedia research



China Is Climbing the Value Chain

- Moving from low-technology to high-technology manufactured goods
- Moving from manufacturing to high value services
  - R&D, design, marketing of national brands (autos, appliances, telecom), logistics, finance
- Moving from inward FDI (joint ventures & technology transfer) to outward FDI (primary commodities, computers, shipping)

But Beware…

- High tech exports don’t necessarily mean high value added production
  - CASE: China and the iPod
- Export dependence has economic growth and employment risks

China assembles all iPods, but it only gets about $4 per unit -or just over 1% of the US retail price of $300

451 parts that go into the iPod

Hard Drive by Toshiba → Japanese company, most of its hard drives made in the Philippines and China; it costs about $73 - $54 in parts and labor -- so the value that Toshiba added to the hard drive was $19 plus its own direct labor costs

Video/multimedia processor chip by Broadcom→ American company with manufactures facilities in Taiwan. This component costs $8.

Controller chip by Portal Player→ American company with manufactures .This component costs $5 .

-Final assembly→ done in China, costs only about $4 a unit

The unaccounted-for parts and labor costs involved in making the iPod came to about $110

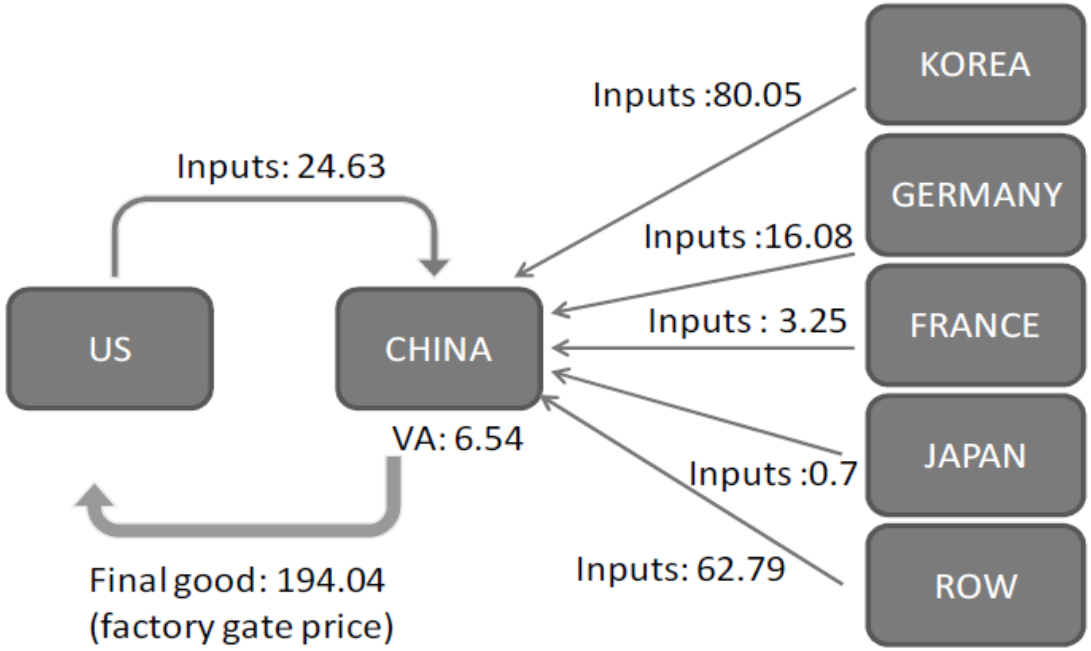
The largest share of the value added in the iPod goes to enterprises in the United States→ $163 of the iPod's $299 retail value in the United States was captured by American companies and workers, breaking it down to $75 for distribution and retail costs, $80 to Apple, and $8 to various domestic component makers.

The retail value of the 30-gigabyte video iPod that the authors examined was $299 in June, 2007

The bulk of the iPod's value is in the conception and design of the iPod. That is why Apple gets $80 for each of these video iPods it sells, which is by far the largest piece of value added in the entire supply chain. Apple figured out how to combine 451 mostly generic parts into a valuable product.

Source: Varian, Hal R. The New York Times, June 28, 2007. An iPod Has Global Value. Ask the (Many) Countries That Make It.

U.S. Bilateral Trade Balance with China for One Unit of iPhone 4 (US$)



US trade balance with	CHINA	KOREA	GERMANY	FRANCE	JAPAN	ROW	WORLD
Gross	-169.41	0	0	0	0	0	-169.41
Value added	-6.54	-80.05	-16.08	-3.25	-0.7	-62.79	-169.41

Source: OECD (2011: 40)

Manufacturing GVCs in Small and Large Countries:

Costa Rica and Brazil

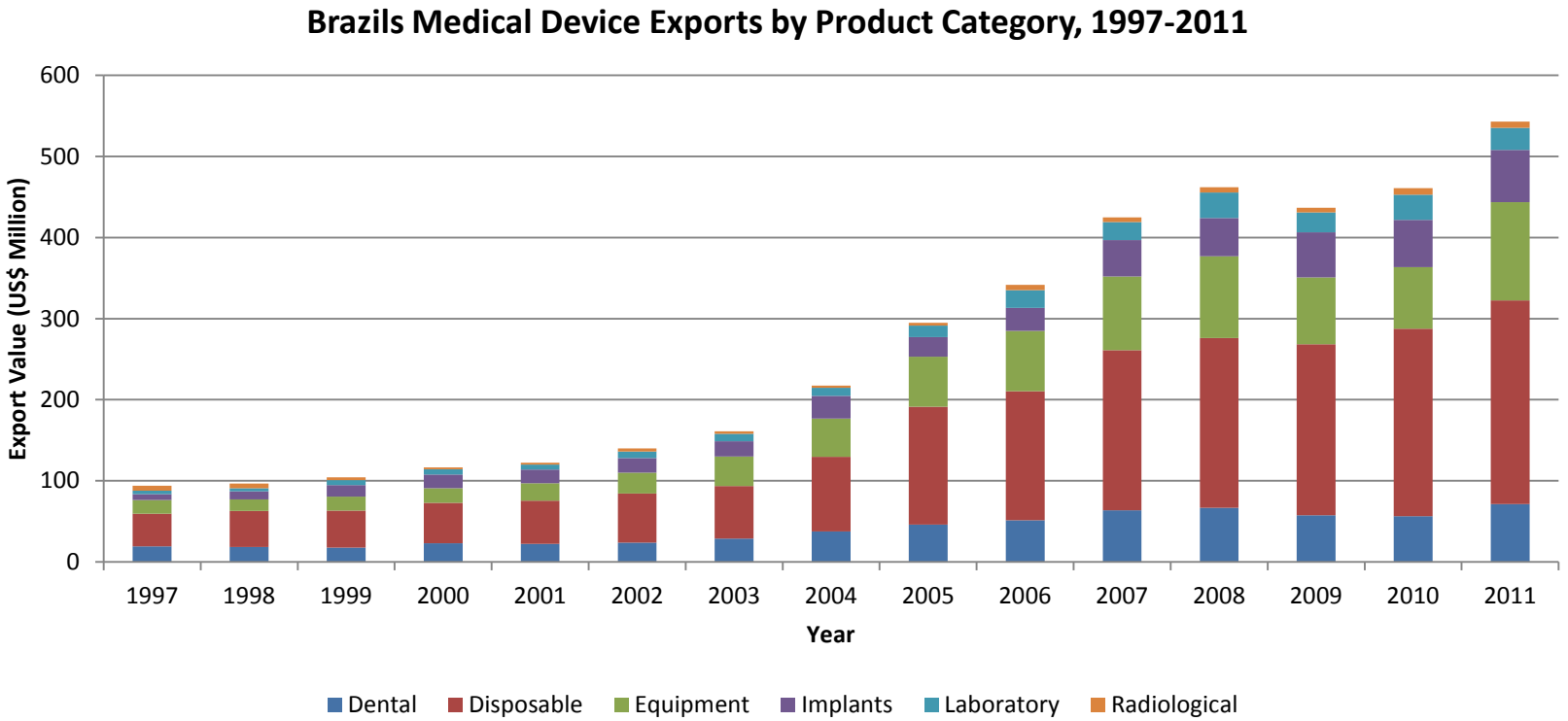
GVCs in Costa Rica and Brazil

- 2 Current Studies: Duke CGGC (Center on Globalization, Governance & Competitiveness)
  - Costa Rica: Ministry of International Trade
  - Brazil: CNI (National Industry Confederation)
- 3 Manufacturing GVCs:
  - Medical devices
  - Electronics
  - Aerospace
- Research questions: How well positioned are Costa Rica and Brazil to upgrade in these GVCs, and what factors contribute to positive or negative outcomes?

Brazil – Regional Power Advantages

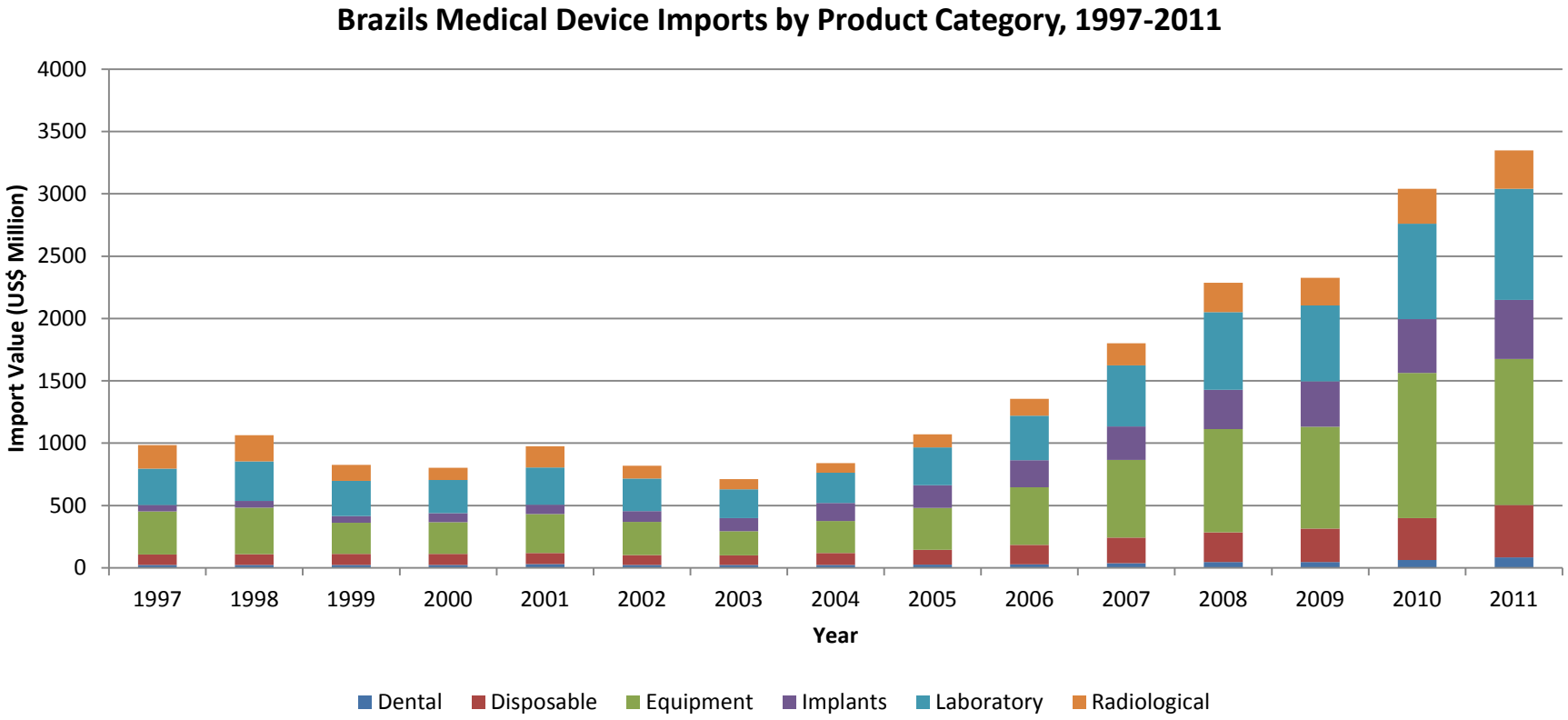
- Brazil is using its large domestic market to "build" global supply chains rather than simply "join" them
- "Back to the future" – Industrial policy is being used to promote MNC entry, with an emphasis on domestic ownership, local linkages and innovation (like autos in 1970s & computers in 1980s)
- Key examples:
  - Medical devices – GE Healthcare seeks to expand
  - Electronics – Foxconn in Brazil
  - Aerospace – Embraer as a magnet

Evolution of Brazilian Medical Device Exports



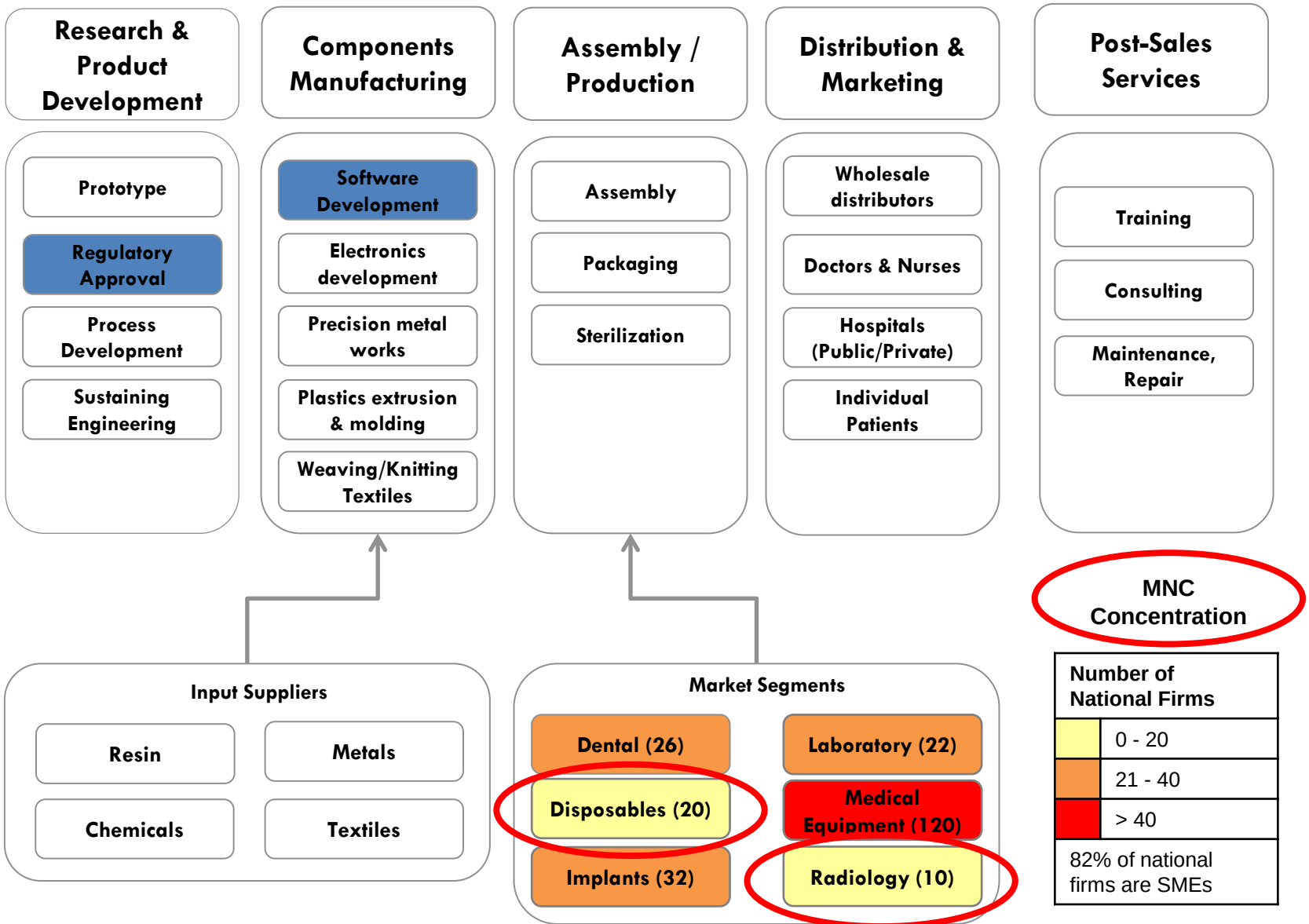
- **Disposables** are both the largest product category exported and an area of growing exports.
- Medical equipment surpassed **dental products** as the second largest export category in 2002.
- Export statistics hide the sectors of greatest importance, since the main export items tend to be low-tech. Brazilian government and private sector actors are working to promote price-competitive, mid-tech exports.

Evolution of Brazilian Medical Device Imports



- Imports exceed exports by factor of about 5.
- Growth in imports across all product categories
- Medical equipment and **laboratory equipment** are two largest categories of imports. These are also main focuses of current industrial policy.
- Private hospitals import more than public hospitals in Brazil. The growth in medical device imports reflects the expansion of the private healthcare system.

Brazil's Position in the Medical Devices GVC



GE Healthcare

2010	2012 April	2012 June	2012 June	2013
GE Healthcare opens first plant in Brazil, manufacturing 3 products	GE fails to receive approval to produce 14 new products in Brazil	GE aquires XPRO, a local x-ray device manufacturer	Brazil approves a 25% preference for locally produced goods for public hospitals	GE plans to open a multi-disciplinary research center in Rio de Janeiro

- GE seeks to gain access to Brazil's rapidly growing healthcare market. Industrial policy tools create further incentives for local production.
  - The Brazilian informatics law creates offers tax incentives for local production and R&D on medical devices and other electronics.
  - The Dilma administration recently approved of a 25% preference for the national healthcare system to purchase locally manufactured medical devices (Law 12349, Decree 7767).
  - Certification by ANVISA, the regulatory arm of the Ministry of Health, is required to distribute medical devices in Brazil. ANVISA certification is very difficult and time-consuming (1 year on average), so MNCs frequently find it easiest to acquire local companies.

- GE is pushing for relaxed ANVISA requirements, but through its control of the largest public healthcare system in the world, the Brazilian government is in a strong bargaining position.

Electronics: Foxconn in Brazil

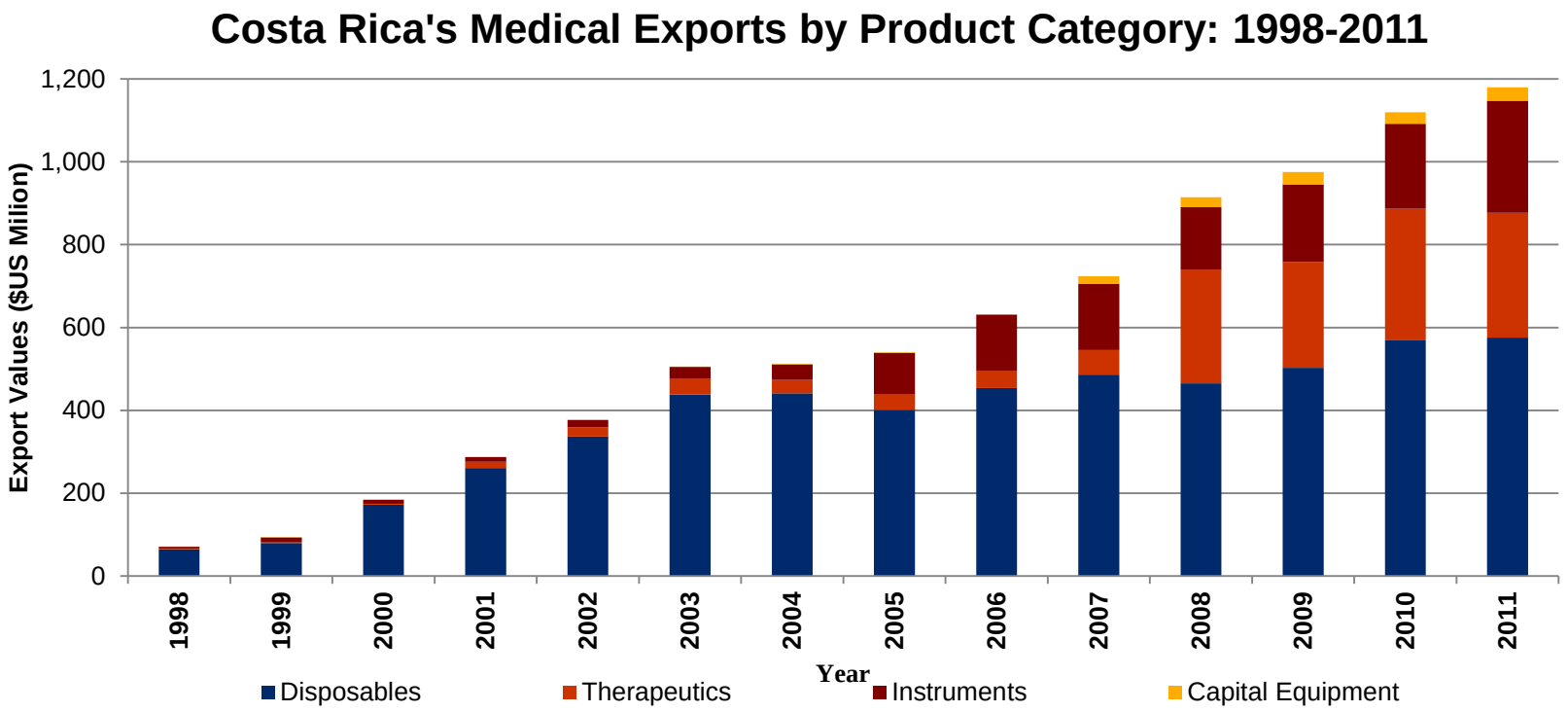
- Both aggressive industrial policy and the large domestic market have lured Foxconn to Brazil.
  - Facing a reduction in cell phone exports from $2.2 billion in 2007 to $1.0 billion in 2010, Brazil initiated direct negotiations with Foxconn to assemble Apple products, including the iPhone and iPad, in Brazil.
  - Through the Program for the Development of the Semiconductor and Display Industry (Padis), Brazil has offered Foxconn several incentives, valid until 2022:
    - Reduce social security contributions from 9.25% to 0%
    - Reduce tax on industrialized products from 15% to 0%
    - Reduce taxes on Foxconn's imported intermediate goods
  - The Brazilian informatics law sets steep tariffs on imported electronics (47% in the case of the iPhone), creating further incentives for local production.

- Foxconn's activities are currently limited to *assembly*, because the company's key component suppliers remain in East Asia. Foxconn announced that it may produce components in Brazil in the future.

Costa Rica: Medical Devices GVC

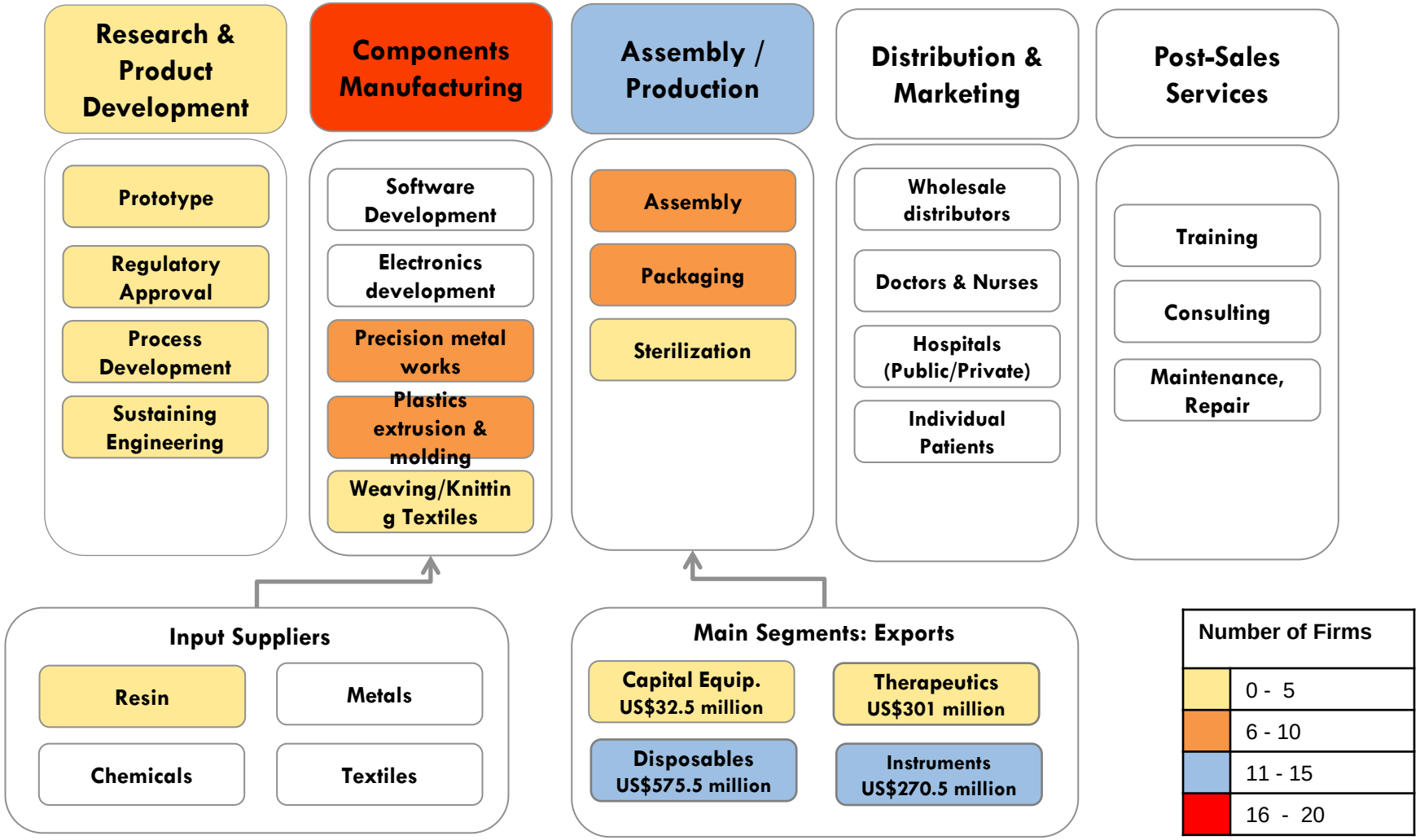
- Exports
- Role of Local and Foreign Firms in GVC
- Success Story – one example
- Challenges

Evolution of Costa Rican Medical Device Exports



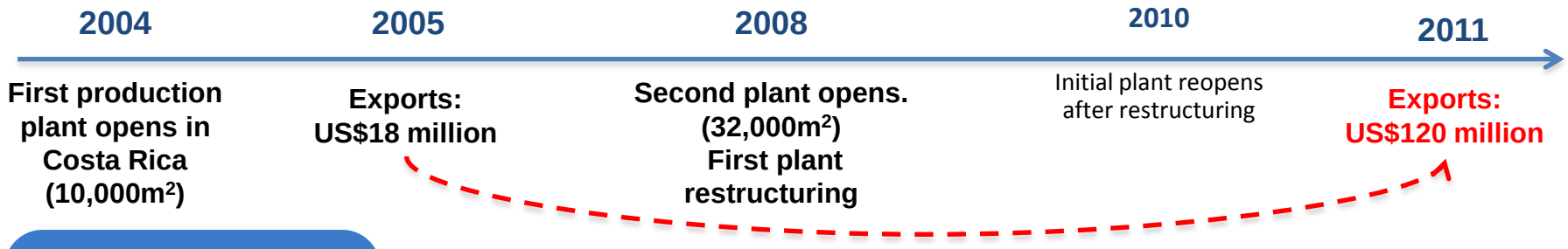
- **Disposables** still the largest product category exported, but no longer a strong growth area.
- Exports in **surgical instruments** have grown steadily since 2005.
- **Therapeutics** has become 2nd largest category since 2008; likely to increase as newly established firms complete transfer of new product lines.
- Limited export of highest value **capital equipment** (eg. Electronic/software devices)

Costa Rica's Position in the Medical Devices GVC



Local firms are mainly in packaging & support services (12 of 19) versus 4 in limited role in plastics molding & metal finishing and 1 OEM with exports under $2 million.

Upgrading Success: A Leading Medical Devices MNC in Costa Rica



Functional Upgrading	• 2004: Manufacturing functions • 2012: Engineering for process improvements ➔Focused on cardiology segment; strategy – to alleviate R&D costs in the US.
Product & Process Upgrading	• Biopsy forceps➔ Labor intensive, basic metal works & extrusion. • Urethral stent➔ Thermoforming, laser marking, coating capabilities. • Guide Wires ➔ Sophisticated Laser cutting & welding. • Today – CR facilities cover 42 manufacturing processes.
Market Diversification	• Gastroenterology segment ➔ Urology ➔ Cardiovascular
Forward Linkages	• Recent co-location of sterilization vendors will allow the firm to export directly to global distribution centers

Implications for “Inclusive” Value Chain Development

- Costa Rica
  - Exports in manufacturing GVCs to climb “technology” value chain
  - Limited to parts supply only; related global services
  - Skills shortages
- Brazil
  - MNC investments to create local linkages
  - Protectionist policies favoring domestic producers
  - Innovation emphasis
- Role of SMEs in GVC internationalization
  - High value niches (e.g., software)
  - Support & service activities at lower levels of the value chain

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THANK YOU!

Questions?