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New Trends in Value Chain Upgrading: Lessons from Large and Small Countries

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Gary Gereffi is Professor of Sociology and Director of the Center on Globalization, Governance & Competitiveness at Duke University. Gereffi's research on value chains articulated the role of value chain governance and upgrading in transforming emerging market economies like China, India and Brazil. Within USAID and other donors, his work has inspired a whole body of new programming focused on value chain development with ideas about trajectories of change, power dynamics within value chains, and strategies for taking advantage of opportunities in the global marketplace. Gereffi received his B.A. degree from the University of Notre Dame and his M.Phil. and PhD degrees from Yale University.

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

Global Value Chains – Why They're Useful

- **GVCs** allow us to show how trade, production, money, skills and jobs flow across global, regional, national and local levels of analysis
- Lead firms in GVCs (buyer-driven and producer-driven) control critical sources of market power that define global industries and growth opportunities in developing economies (“**governance structures**”)
- Developing countries seek strategies to enter and move up GVCs in those industries (resource-based, manufacturing & services) where they have comparative and competitive advantages (“**upgrading trajectories**”)

GVCs in Costa Rica and Brazil

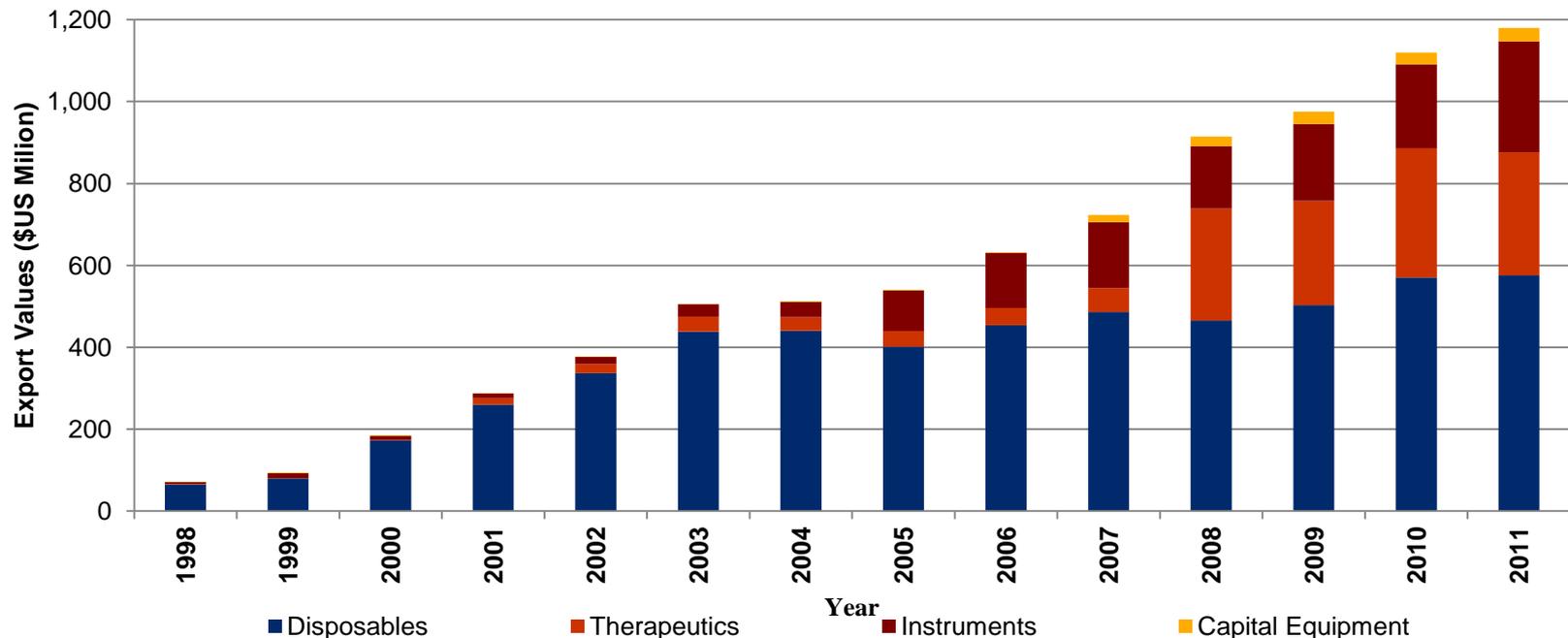
- 2 Current Studies: Duke CGGC (Center on Globalization, Governance & Competitiveness)
 - Costa Rica: Ministry of International Trade
 - Brazil: CNI (National Industry Confederation)
- 3 Manufacturing GVCs:
 - Medical devices
 - Electronics
 - Aerospace
- **Research questions:** How well positioned are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

Costa Rica: Medical Devices GVC

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

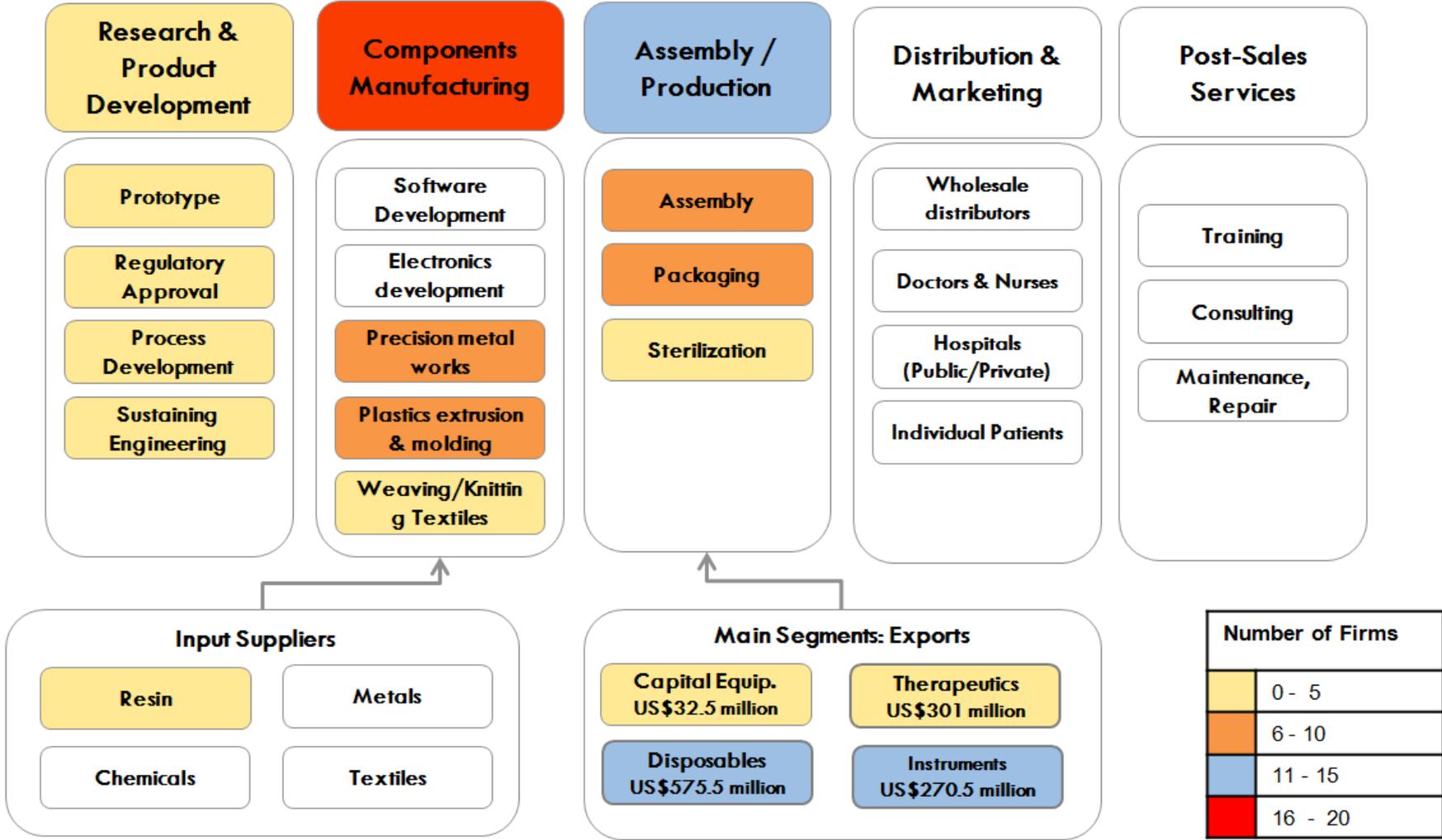
Evolution of Costa Rican Medical Device Exports

Costa Rica's Medical Exports by Product Category: 1998-2011



- **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



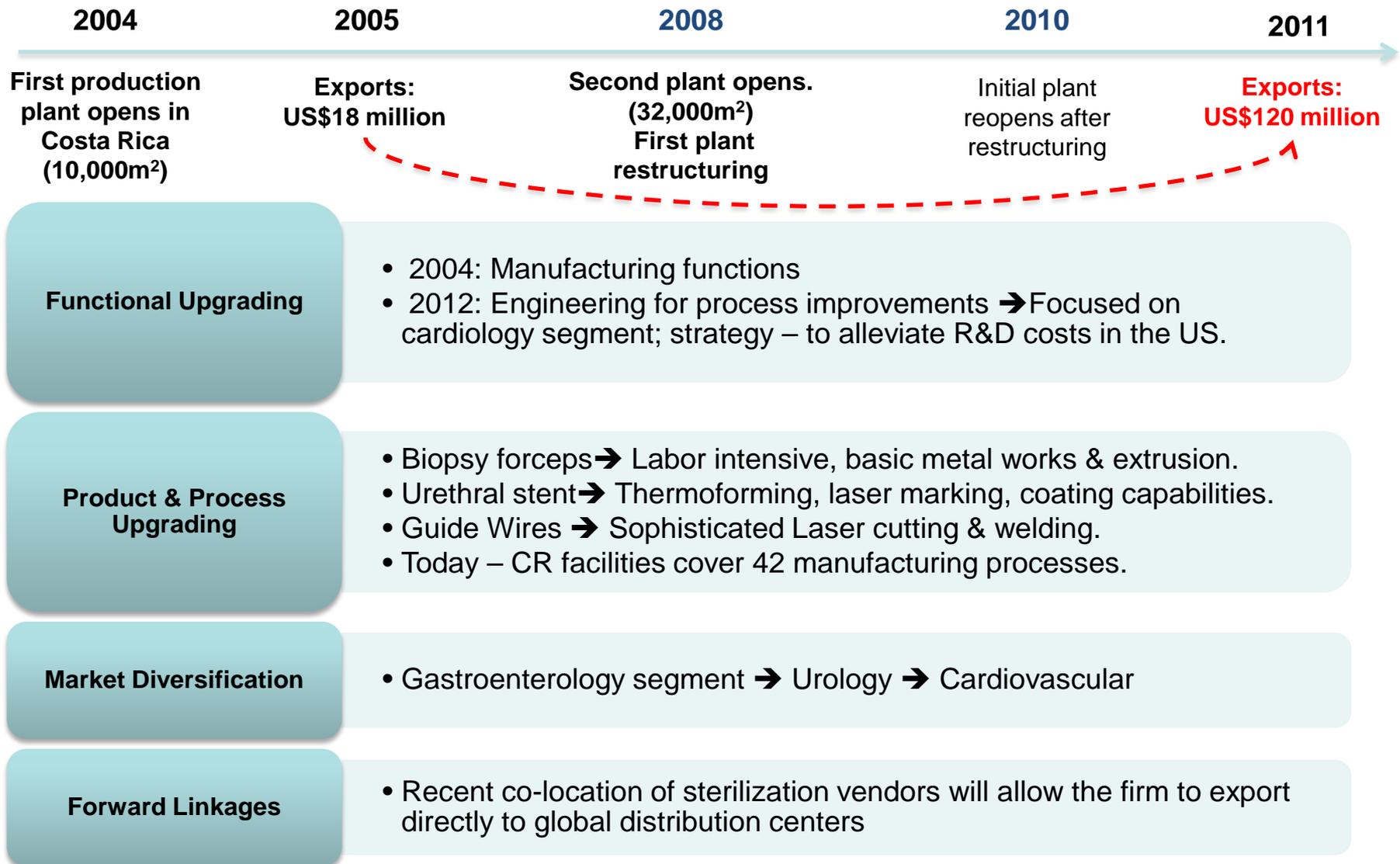
Local firms are mainly in packaging & support services (12 of 19) versus 4 in limited role in plastics molding & metal finishing and 1 OEM with exports under \$2 million.

Firms in Costa Rica Medical Device Sector

Entry Year	Firm Characteristics	Main Product Export Category	Core Market Segments	Product Examples	Select Firms
1998-2004 13 firms 10 US 2 CR	8 component manufacturers 5 OEMS	1. Disposables 2. Instruments	Drug Delivery Endoscopic Surgery	Intravenous tubing Biopsy Forceps	Hospira Arthrocare Boston Scientific Ober Industries
2005-2008 8 firms: 7 US	2 OEM 4 component manufacturers 1 finishing	1. Instruments 2. Therapeutics	Cosmetic Surgery Women's Health & Urology	Breast implants Minimally invasive devices for uterine surgery	Allergan Tegra Medical Specialty Coating Systems
2009-2012 18 firms: 16 US 1 CR	5 OEMS 4 component manufacturers 1 Input Distributor 2 Sterilization 2 Packaging	1. Therapeutics 2. Instruments	Cardiovascular Drug Delivery	Heart valves Dialysis catheters Guide wires Compression Socks	St. Jude Medical Covidien Moog Synergy Health

- **Product upgrading:** General increase in complexity of products, increase in number of Class 3 products. Shift towards emphasis on higher value therapeutic products.
- **Market segment diversification:** Early firms focused on drug delivery, recent firms focus on cardiovascular segment.
- **Forward and backward linkages:** In 2009-12, upstream (inputs) and downstream (sterilization) firms established in country; increase in country-capabilities.
- Disposables, Instruments & Therapeutics categories are **highly concentrated despite large number of entrants**; the two leading firms in each category accounted for 87% or more of exports. These six firms together exported 85% of the medical devices from Costa Rica.

Upgrading Success: A Leading Medical Devices MNC in Costa Rica



Challenges for Costa Rica's MD Sector: Expansion & Upgrading

- **Expansion of manufacturing segments -- constrained**
 - Shortage of human capital, increased attrition & wage inflation.
 - All levels: Direct labor, technicians and especially engineering staff.
 - Sector competes with other priority sectors such as offshore services firms for engineering talent.
 - Uncertainty about EPZ regime; potential increase in taxes and costs.
 - Transportation infrastructure is inadequate for continued growth, particularly outside of the Central Valley
- **Functional upgrading into R&D**
 - Efficiency seeking rather than market seeking due to limited CR domestic market & EPZ incentives.
 - Limited potential for R&D -- lack of academic strengths in cutting edge technology

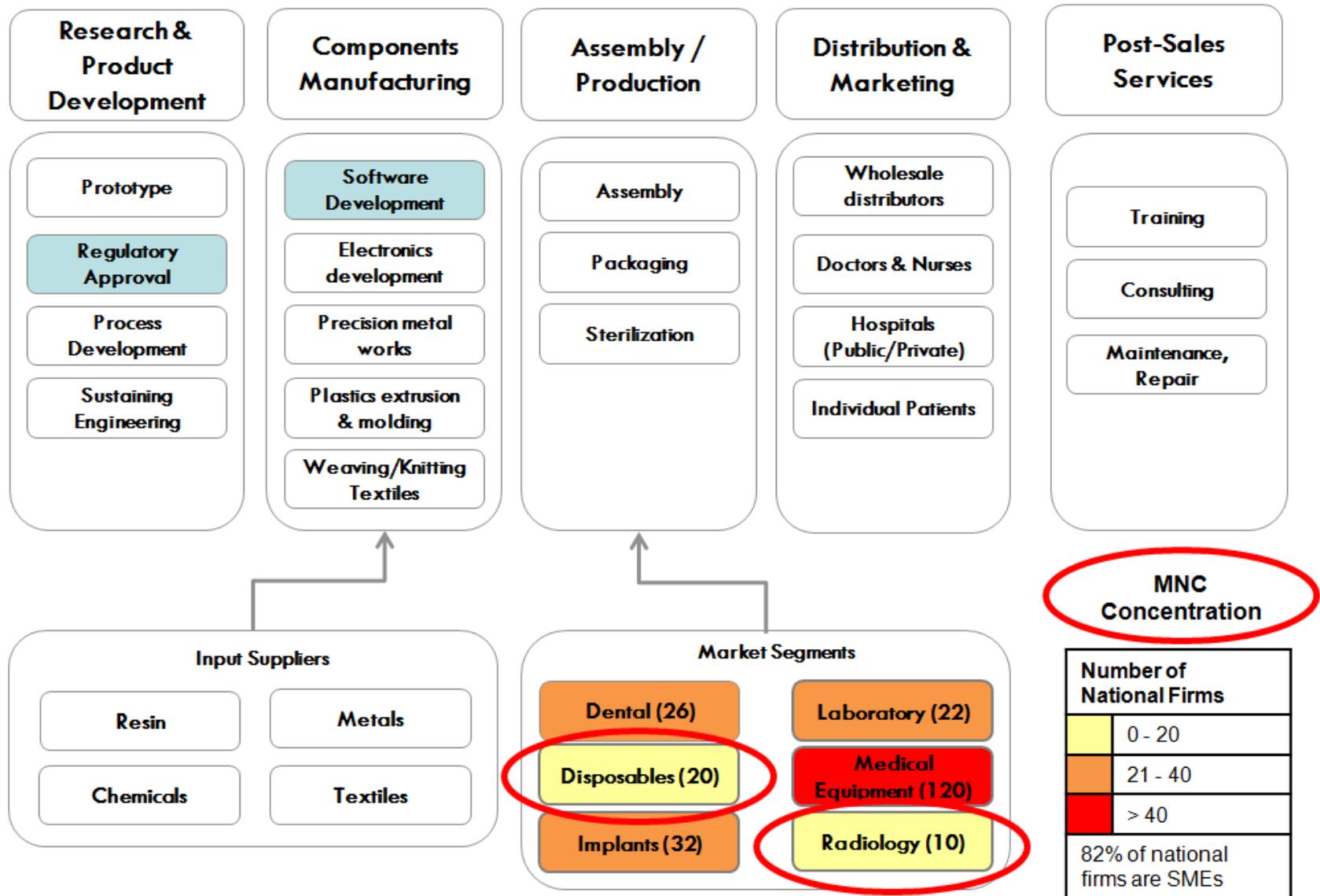
Challenges for Costa Rica's MD Sector: Expansion & Upgrading (cont'd)

- **Product & process upgrading**
 - Strong potential; reputation for quickly acquiring new competencies.
 - Favorable tax incentives for re-investment in operations.
- **Insertion of local firms**
 - MD firms are isolated in EPZ with follow sourcing MNC partners
 - No change in position of local firms in the GVC since 2000, despite MD being a priority sector.
 - Chain governance → Sourcing decisions made globally.
 - Limited scale, access to finance & technological expertise prevent local firms from becoming reliable suppliers of critical inputs & services.

Brazil – Regional Power Advantages

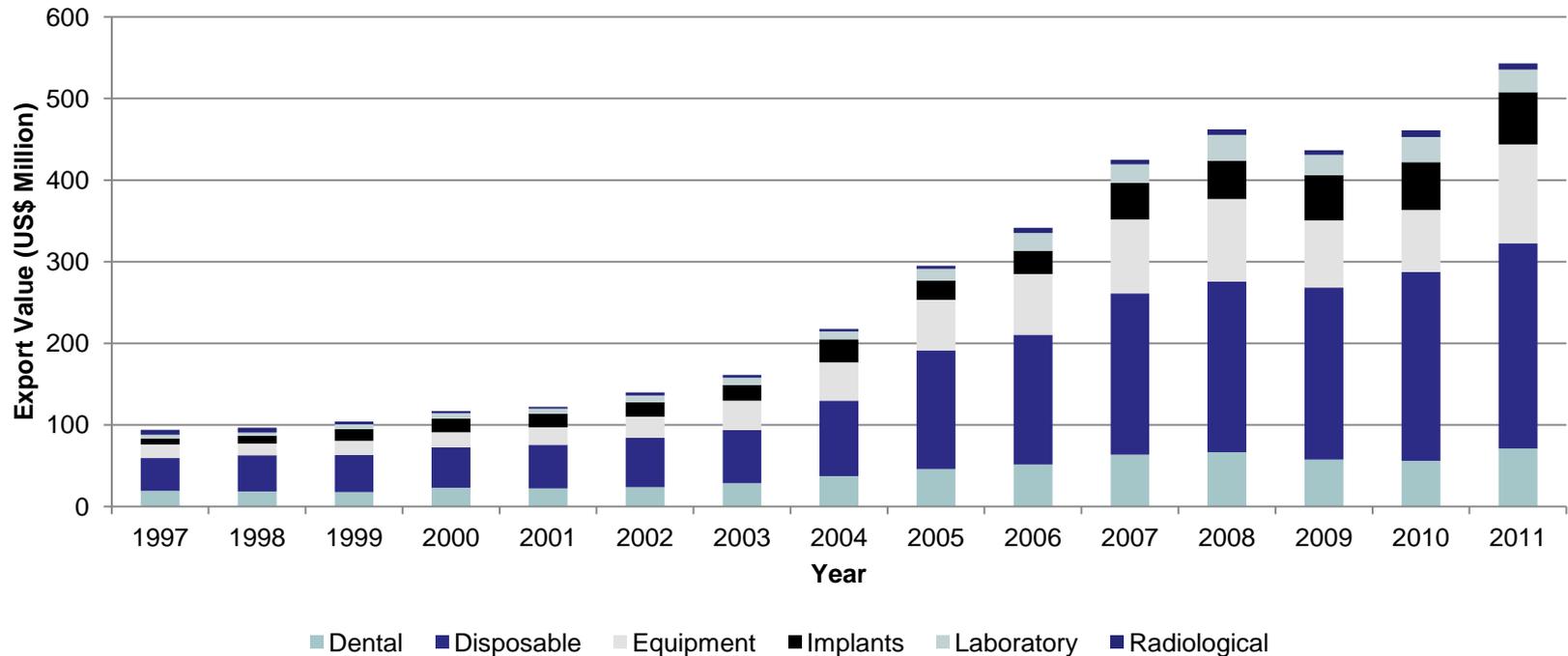
- Brazil is using its **large domestic market** to “build” global supply chains rather than simply “join” them
- **“Back to the future”** – Industrial policy is being used to promote MNC entry, with an emphasis on domestic ownership, local linkages and innovation (like autos in 1970s & computers in 1980s)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

Brazil's Position in the Medical Devices GVC



Evolution of Brazilian Medical Device Exports

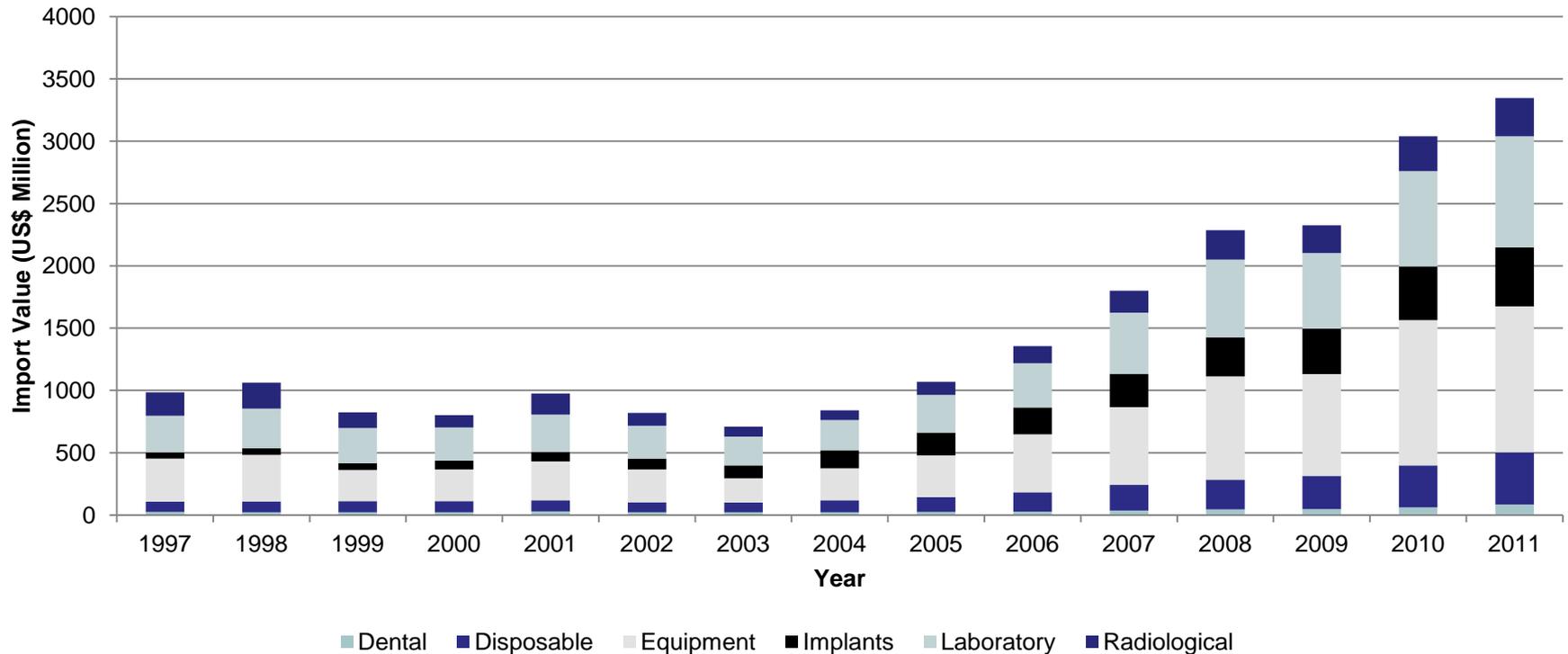
Brazils Medical Device Exports by Product Category, 1997-2011



- **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

Brazils Medical Device Imports by Product Category, 1997-2011



- 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.

GE Healthcare



- 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.

Aerospace: GE Celma and Garuna

- The presence of Embraer creates direct and indirect opportunities for local firms.
 - **GE Celma** – from MRO (maintenance, repair & overhaul operations) to full turbojet assembly
 - Founded 1996 from assets privatized by Brazilian government.
 - 2010: Largest exporter of services in Brazil
 - 2012: Celma is set to begin turbine assembly for Embraer
 - **Grauna**
 - Established in 1990 by ex-Embraer employees
 - Embraer and BNDES pushed for higher local content among Embraer's top-tier suppliers for the Phenom project in 2004
 - Grauna became a direct supplier to Pratt & Whitney and restructured in order to achieve greater scale
 - Grauna now supplies to Airbus, Boeing, Cessna and other MNCs

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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