Global Value Chain measurement

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Ronald Jansen
Chief of the Trade Statistics Branch
United Nations Statistics Division / DESA
E-mail: Jansen1@un.org
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.
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)
<table>
<thead>
<tr>
<th>Entry Year</th>
<th>Firm Characteristics</th>
<th>Main Product Export Category</th>
<th>Core Market Segments</th>
<th>Product Examples</th>
<th>Select Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Up to 2000</strong></td>
<td>4 OEMs</td>
<td>Disposables</td>
<td>Drug delivery; Women’s health</td>
<td><strong>Intravenous tubing (I)</strong>  <strong>Mastectomy bra (I)</strong></td>
<td><strong>Hospira</strong>; <strong>Baxter</strong>; <strong>Amoena</strong>; <strong>Corbel</strong></td>
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<tr>
<td>24 firms:</td>
<td>8 Components</td>
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<tr>
<td>8 US</td>
<td>1 Input distributor</td>
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<tr>
<td>15 CR</td>
<td>7 Packaging</td>
<td></td>
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<tr>
<td>1 German</td>
<td>1 Finishing</td>
<td></td>
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<td></td>
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<tr>
<td>3 Support services</td>
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<tr>
<td><strong>2001–2004</strong></td>
<td>3 OEMS</td>
<td>Instruments</td>
<td>Endoscopic surgery</td>
<td><strong>Biopsy forceps (II)</strong></td>
<td><strong>Arthrocare</strong>; <strong>Boston Scientific</strong>; <strong>Oberg Industries</strong></td>
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<tr>
<td>13 firms:</td>
<td>6 Components</td>
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<td></td>
<td></td>
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<tr>
<td>9 US</td>
<td>1 Finishing</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>3 CR</td>
<td>1 Logistics provider</td>
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<tr>
<td>1 Colombian</td>
<td>2 Support services</td>
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<td><strong>2005–2008</strong></td>
<td>2 OEM</td>
<td>Therapeutics</td>
<td>Cosmetic surgery; Women’s health &amp; urology</td>
<td><strong>Breast implants (III)</strong>  <strong>Minimally invasive devices for uterine surgery (II)</strong></td>
<td><strong>Allergan</strong>; <strong>Tegra Medical</strong>; <strong>Specialty Coating Systems</strong></td>
</tr>
<tr>
<td>8 firms:</td>
<td>4 Components</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>7 US</td>
<td>1 Packaging</td>
<td></td>
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<tr>
<td>1 Puerto Rico</td>
<td>1 Finishing</td>
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<td><strong>2009–2012</strong></td>
<td>5 OEMS</td>
<td>Therapeutics</td>
<td>Cardiovascular Drug delivery</td>
<td><strong>Heart valves (III)</strong>  <strong>Dialysis catheters (III)</strong>  <strong>Guide wires (III)</strong>  <strong>Compression socks (I)</strong></td>
<td><strong>Abbott Vascular</strong>; <strong>St. Jude Medical</strong>; <strong>Covidien</strong>; <strong>Moog</strong>; <strong>Synergy Health</strong>; <strong>Volcano Corp.</strong></td>
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<td>21 firms:</td>
<td>7 Components</td>
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<td>16 US</td>
<td>2 Non-OEM assemblers</td>
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<tr>
<td>1 CR</td>
<td>1 Input Distributor</td>
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<tr>
<td>1 Japan</td>
<td>2 Sterilization</td>
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<tr>
<td>2 Joint ventures (US-CR)</td>
<td>2 Packaging</td>
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2004: Manufacturing functions
2012: Engineering for process improvements ➔ Focused on cardiology segment; strategy – to alleviate R&D costs in the US.

- Biopsy forceps ➔ Labor intensive, basic metal works & extrusion.
- Urethral stent ➔ Thermoforming, laser marking, coating capabilities.
- Today – CR facilities cover 42 manufacturing processes.

- Gastroenterology segment ➔ Urology ➔ Cardiovascular

- Recent co-location of sterilization vendors will allow the firm to export directly to global distribution centers
IRELAND AND MEXICO: MEDICAL DEVICE EXPORTS
1998-2011

IRELAND

- Most mature of the three locations
- 2005 shock forced upgrading strategy
- Significant growth in therapeutics & entry into capital equipment production

MEXICO

- Stabilizing disposables exports
- Strong focus in instruments
- Growing gains in capital equipment ➔ participation in electronics value chains
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.
Brazil’s Position in the Medical Devices GVC

Research & Product Development
- Prototype
- Regulatory Approval
- Process Development
- Sustaining Engineering

Components Manufacturing
- Software Development
- Electronics development
- Precision metal works
- Plastics extrusion & molding
- Weaving/Knitting Textiles

Assembly / Production
- Assembly
- Packaging
- Sterilization

Distribution & Marketing
- Wholesale distributors
- Doctors & Nurses
- Hospitals (Public/Private)
- Individual Patients

Post-Sales Services
- Training
- Consulting
- Maintenance, Repair

Input Suppliers
- Resin
- Metals
- Textiles

Market Segments
- Dental (26)
- Disposables (20)
- Implants (32)
- Laboratory (22)
- Medical Equipment (120)
- Radiology (10)

MNC Concentration

<table>
<thead>
<tr>
<th>Number of National Firms</th>
<th>0 - 20</th>
<th>21 - 40</th>
<th>&gt; 40</th>
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<tbody>
<tr>
<td>Brazilian Firms</td>
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<td>82% of national firms are SMEs</td>
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