Measuring Global Value Chains

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Key principles

• National perspective to measuring GVCs
• GVC Satellite accounts of the SNA
• Based on integrated business statistics
• Consistent framework across territories
• Multi-partner country GVC Satellite Account with shared national data compiler ownership
• Built on the work done by OECD, UNECE, WTO, IMF and others
• The template is described in Chapters 9 and 10 of the *Handbook Accounting for Global Value Chains*

• Empirical applications of the template: automotive GVC in North America (and others in the making)
A **Global Value Chain** is a set of interrelated activities (from conception to its end use) that cross economic territories which are coordinated by lead firms for the production of a product (good or service), its delivery to market(s), supports its uses, and recycling.

- The GVC framework include 4 dimensions that describe the structure, dynamics and relationships among stakeholders in GVCs:
  - Business functions
  - Geographical scope
  - Governance
  - Institutional context
Source: Frederick (2010)
How to translate this into an accounting framework?

- Define and classify the **relevant actors** in the GVC, e.g. lead firms, suppliers, (affiliated and non-affiliated suppliers)
- Define and classify the **products** relevant for the GVC
- Define and classify the **business functions** relevant for the GVC
- Identify the main (partner) **countries** in the GVC [perspective of national data compiler]
- **Collect** relevant information
- Build the accounts in cooperation with partners
Automotive GVC

Source: Timothy Sturgeon, Jack Daly, Stacey Frederick, Penny Bamber and Gary Gereffi (2016) *The Philippines in the Automotive Global Value Chain*
Morocco in the automotive GVC

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Vehicle Design & Development
  - Vehicle development
  - System design

Parts & Components
  - Electronic components
  - Mechanical components
  - Composite components
  - Wiring
  - Aluminum components
  - Rubber components
  - Software

Systems: Modules
  - Interior System: Seat, interior trim, cockpit module
  - Body System: Skin, finish, trim, doors
  - Electrical & Electronics System: Ignition, chassis electronics, interior electronics
  - Chassis System: Drive train, rolling chassis, front and rear end modules

Systems Integration & Final Assembly
  - Final Products
    - Automobiles
    - Trucks
    - Buses
    - Trailers
    - Motorcycles
    - Electric Vehicles

Marketing & Sales
  - Market Segments
    - Passenger
    - Commercial
    - Industrial
    - Buses
    - Motorcycles

Replacement Parts & Recycling
  - Maintenance & Repair
  - Recycling
  - Technical training, and customer support
Methods for constructing a GVC

- Select of the type of GVC (e.g. automotive, apparel, electronics, etc.)
- Establishing the GVC geographical boundary (what partner countries are involved in this GVC?)
- Product mapping of intermediate and capital products used in production and production of GVC products
- Identification and development of the business frame of GVC participating firms in terms of lead firms and specialised suppliers of intermediate products and capital goods used for the production of GVC products
- Application of the GVC classification, concepts and methods to the participating firms
- Data collection for GVC related firms
- Compilation of the GVC accounts
Some challenges

Identification (and measurement) of the governance structure of the GVC

Lead firm

Controlled firm

Non-controlled firm

Importance of business registers, large case units to focus on lead firms and supplying firms
### Example: Automotive GVC HS codes in Morocco

<table>
<thead>
<tr>
<th>Value Chain Stage/ Subassembly</th>
<th>HS Codes (2002)</th>
<th>HS Code Descriptions</th>
<th>Producer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger vehicles</td>
<td>8703</td>
<td>Passenger vehicles</td>
<td><strong>Lead Firms</strong></td>
</tr>
<tr>
<td>Body system</td>
<td>870600</td>
<td>Chassis fitted with engines</td>
<td><strong>Lead Firms</strong></td>
</tr>
<tr>
<td>Drive train</td>
<td>840733 840734 840820</td>
<td>Reciprocating piston engines used for the propulsion of vehicles of Chapter 87</td>
<td><strong>Lead Firms</strong></td>
</tr>
<tr>
<td>Body system (suspension, panels front &amp; rear end modules, interiors)</td>
<td>401110 401211 8708 8707 7007</td>
<td>Tires, Brakes, Road wheels and parts, Suspension systems, Steering wheels, columns and boxes, Bodies, Laminated safety glass, Bumpers, Radiators, Silencers and exhaust pipes, Sealed beam lamp units, Seats, Safety seat belts, Instrument panel</td>
<td><strong>Suppliers</strong></td>
</tr>
<tr>
<td>Drive train / Electrical Equipment</td>
<td>8708 854430 8512</td>
<td>Parts/accessories of motor vehicles of headings 87.01-05; Gear boxes, Drive-axles with differential, Clutches, Ignition wiring sets, : Electrical lighting, windscreen wipers, defrosters, Air conditioning</td>
<td></td>
</tr>
</tbody>
</table>

Where

**ISIC 72** - Scientific research and development

**ISIC 293** - Manufacture of parts and accessories for motor vehicles

**ISIC 292** - Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers

**ISIC 291** - Manufacture of motor vehicles

...
Accounting for GVC

- The compilation of the full set of accounts (production, generation of income, etc.) for the firms participating in the GVC

- Compilation of a GVC-specific multi-partner country SUTs
  Where, for example, the relevant business functions are explicitly identified as well as the governance structure and relevant products
### Extended Supply Table at basic prices

<table>
<thead>
<tr>
<th>INDUSTRIES</th>
<th>Output</th>
<th>Total</th>
<th>Imports</th>
<th>Total supply at basic prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td></td>
<td></td>
<td>from Country A</td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
<td></td>
<td>from Country B</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ISIC 291 - Manufacture of motor vehicles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead firms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>foreign owned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nationally owned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
<td>Input products - CPC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Components - CPC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final products - CPC code</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services of R&amp;D - CPC code</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services of Design - CPC code</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIF/FOB adjustments on imports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct purchases abroad by res</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Extended Use Table

<table>
<thead>
<tr>
<th></th>
<th>INDUSTRIES</th>
<th>FINAL USE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agriculture</td>
<td></td>
</tr>
<tr>
<td>Input products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead firms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services of R&amp;D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIF/FOB adjustments on exports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total at purchasers' prices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensation of employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other taxes less subsidies on production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption of fixed capital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net operating surplus/net mixed income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross operating surplus/gross mixed income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total input at basic prices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>to Country A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

**Legend:**
- **ISIC** = International Standard Industrial Classification
- **CPC-BEC codes** = Common Product Classification - Broad Economic Classification
- **CPC code** = Common Product Classification
- **Business functions - ISIC**
- **Lead firms**
- **Output products**
- **Input products**
- **CIF/FOB adjustments on exports**
- **Compensation of employees**
- **Other taxes less subsidies on production**
- **Consumption of fixed capital**
- **Net operating surplus/net mixed income**
- **Gross operating surplus/gross mixed income**
- **GVA**
- **Total use**

*Note: The table above is a representation of the extended use table provided in the document.*
Some challenges

Country coverage

A GVC can involve a large number of countries

- It may not be practical to aim for a full coverage of the countries involved in the specific GVC, rather focus on the major firms in partner countries based on significant shares in exports and imports.

- In the North American Automotive GVC the focus on Canada-Mexico-United States and the rest is treated as RoW.

- In the Moroccan Automotive GVC the main players are Morocco, France and Spain.

[Morocco perspective]
From **Draft Handbook on Supply and Use and Input-Output Tables with Extensions and Applications** UN forthcoming
Some challenges

Cooperation among countries

- Resolving trade asymmetries
- Data sharing
- Coordinating the statistical programmes

Importance of establishing agreements and appropriate governance structure to undertake international data compilation projects
Data Sources

The compilation of GVC satellite accounts is data intensive

However

- There is often a limited number of large firms that are involved in a GVC
- Generally a lot of the information already exists in the Statistical Offices

Possible development of a GVC questionnaire

Importance of integrated business statistics, large case unit, micro-macro data linkages
Accounting for GVC using a national perspective provides a macro approach to the measurement of GVC and national accounts and prices

- it focuses the national accounts compilation on capturing more precisely the dominant interlinkages between firms and countries involved in the GVC

- It promotes the micro-macro linkages and integrated business statistics by taking a lead firm based approach

- It provides a venues for countries to resolve asymmetries

- National ownership

- Needs to be established as a regular statistical office activity and not as a one-time exercise
Thank you!