De- vs re-industrialisation – is structural change reversible?

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Outline

- Data and **main trends**
  - UNIDO – manufacturing share in GDP
  - WIOD – manufacturing share in demand and production
- **Drivers** of structural change
  - Induced Value Added (IVA)
  - IVA-chains (MIVAS, DIVAS and TEVAS)
- Conclusions
  - Industrial Policy Paradox
**Manufacturing share in GDP**

**Triade, 1970-2012**

![Graph showing manufacturing share in GDP for Triade, 1970-2012.](image)

*Source: UN National Accounts Main Aggregates Database*

NB: EU 28: Aggregate without LUX, CYP, MLT; EU North West: AUT, BEL, GER, DEN, FIN, FRA, GBR, IRE, NLD, SWE; EU East: BGR, CZE, EST, HUN, LTU, LVA, POL, ROM, SVN, SVE; EU South: HRV, ESP, GRE, PRT, ITA*

**Manufacturing share in GDP**

**Emerging countries, 1970-2012**

![Graph showing manufacturing share in GDP for Emerging countries, 1970-2012.](image)

*Source: UN National Accounts Main Aggregates Database*
The WIOD database

- World Input Output Tables
  - compiled within EU-framework project
  - 40 countries:
    EU27 + AUS, BRA, CAN, CHN, IDN, IND, JPN, KOR, MEX, RUS, TUR, TWN, USA
    ~85% of World GDP
  - 58 commodities, 35 sectors (NACE Rev.1)
  - Supply- and Use Tables, trade matrices, IO-Tables,
    Prices (Output, Value Added)

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Demand
EU – share of manufacturing in …

![Graph showing demand in EU from 1995 to 2011]

Source: WIOD, WIFO calculations
**Production**

EU – share of manufacturing in ...

Source: WIOD, WIFO calculations

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**Relative price changes**

Ratio of indices (manuf & non-manuf / total)

Source: WIOD, WIFO calculations
Drivers of structural change

- Income (and price) elasticity of demand
- Productivity growth & relative prices
- Comparative advantage (global value chains)
  - Relative factor endowments
  - Dynamic specialisation (economies of scale, learning, etc.)
  - Rising incomes have an ambivalent impact
    - Increased wage pressure on labour intensive production
    - Better support of knowledge-intensive, complex production (demand, education, complementary services and institutions, etc.)

Comparative Advantage
Induced Value Added (IVA)

\[ IVA_{ij}^{k} = \text{value added in sector } i \text{ and country } k \text{ induced by final demand from sector } j \text{ in country } l \]

- \( k \) and \( l = d \) or \( f \), i.e. domestic or foreign
- \( i \) and \( j = m \) or \( n \), i.e. manufacturing or non-manufacturing

<table>
<thead>
<tr>
<th>Value Added</th>
<th>Domestic</th>
<th>Foreign</th>
<th>Total</th>
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<td>( \ldots ) generated in</td>
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<td>Domestic</td>
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<td>Non-manufacturing</td>
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<tr>
<td>Total</td>
<td>( IVA_{i,m}^{d,f} )</td>
<td>( IVA_{i,n}^{d,f} )</td>
<td>( IVA_{j,m}^{d,f} )</td>
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</tbody>
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IVA chains
decomposed by 2 countries & 2 sectors

- **VAS** (value added share)
  \[ VAS^{\text{c}} = \frac{IVA^{c}_{\text{avo}} + IVA^{c}_{\text{invo}}}{IVA^{\text{c}}_{\text{avo}} + IVA^{\text{c}}_{\text{invo}} + IVA^{\text{c}}_{\text{cvo}} + IVA^{\text{c}}_{\text{cinvo}} + IVA^{\text{c}}_{\text{mvo}} + IVA^{\text{c}}_{\text{mivo}} + IVA^{\text{c}}_{\text{avo}} + IVA^{\text{c}}_{\text{invo}}} \]

- **DIVAS** (domestically induced value added share)
  \[ DIVAS^{\text{c}} = \frac{IVA^{c}_{\text{avo}} + IVA^{c}_{\text{invo}}}{IVA^{\text{c}}_{\text{avo}} + IVA^{\text{c}}_{\text{invo}} + IVA^{\text{c}}_{\text{cvo}} + IVA^{\text{c}}_{\text{cinvo}} + IVA^{\text{c}}_{\text{mvo}} + IVA^{\text{c}}_{\text{mivo}} + IVA^{\text{c}}_{\text{avo}} + IVA^{\text{c}}_{\text{invo}}} \]

- **TEVAS** (trade effect on value added share)
  \[ TEVAS^{\text{c}} = \frac{(IVA^{c}_{\text{avo}} + IVA^{c}_{\text{invo}})(IVA^{c}_{\text{cvo}} + IVA^{c}_{\text{cinvo}} + IVA^{c}_{\text{mvo}} + IVA^{c}_{\text{mivo}})}{(IVA^{c}_{\text{avo}} + IVA^{c}_{\text{invo}} + IVA^{c}_{\text{cvo}} + IVA^{c}_{\text{cinvo}} + IVA^{c}_{\text{mvo}} + IVA^{c}_{\text{mivo}} + IVA^{c}_{\text{avo}} + IVA^{c}_{\text{invo}})} \]

- **MIVAS** (manufacturing induced value added share)
  \[ MIVAS^{\text{c}} = \frac{IVA^{c}_{\text{avo}} + IVA^{c}_{\text{invo}} + IVA^{c}_{\text{cvo}} + IVA^{c}_{\text{cinvo}} + IVA^{c}_{\text{mvo}} + IVA^{c}_{\text{mivo}}}{IVA^{\text{c}}_{\text{avo}} + IVA^{\text{c}}_{\text{invo}} + IVA^{\text{c}}_{\text{cvo}} + IVA^{\text{c}}_{\text{cinvo}} + IVA^{\text{c}}_{\text{mvo}} + IVA^{\text{c}}_{\text{mivo}} + IVA^{\text{c}}_{\text{avo}} + IVA^{\text{c}}_{\text{invo}}} \]

GDP pc and VAS
Manufacturing, 2010

Source: WIOD, WIFO calculations
GDP pc and DIVAS
Manufacturing, 2010

Source: WIOD, WIFO calculations

TEVAS
Non EU – 2010 and change since 1995

Source: WIOD, WIFO calculations
Conclusions

Structural change

- De-industrialisation is not a phenomenon of real production, but of declining nominal income shares
- Powerful non-reversible causes
  - Lower demand growth (income elasticity), especially in the foods, beverages & tobacco industry, and
  - Differential price changes, reflecting higher productivity growth together with intense competition.
- Trade effects are heterogenous and policy can shape competitive advantages
  - Complex products may eschew declining relative prices
  - New needs may generate new industries (e.g. green tech), but quantitative impact relative to services is doubtful.
Conclusions

Industrial Policy

- **Prisoner’s dilemma**
  - If all aim for it, Industrial Policy becomes **necessary** just not to fall behind
  - Need for international **coordination** to avoid, e.g., the escalation of state aid!

- **Industrial Policy Paradox**
  - If successful, Industrial Policy raises productivity growth and **real income**, but overall **accelerates de-industrialisation**!
  - To raise the income share of manufacturing, one must seek to enhance productivity growth (and competition) in **services**.

Thank you for the attention!