The Structural Dynamics of Deindustrialisation and the Effect of Accelerated Globalisation on Manufacturing

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Acknowledgement

Disclaimer

- Presentation based on two ongoing projects.
- Some results still tentative.
Manufacturing, ...

- **... an engine of growth ...**
  - **Kaldor (1967):** economic growth typically accompanied by the process of industrialisation.
  - **Lewis (1954):** (faster) capital accumulation and productivity growth in manufacturing.
  - **Cornwall (1977):** economies of scale; specialisation drives down fixed costs.
  - **Thirlwall (2002); Arrow (1962); Dalum et al. (1992):** dynamic scales; faster skill and technology diffusion even outside of the immediate production process (R&D, marketing etc.)
  - **Rodrik (2013):** strong convergence in labour productivity within manufacturing (as opposed to aggregated economy as a whole)

- **... running out of steam?**
  - **Palma (2014); Haraguchi (2015); Rodrik (2016)**
  - **Tregenna (2009); Felipe et al. (2018)**
  - **Acemoglu et al. (2016); Autor et al. (2018)**
Manufacturing, ...

► ... changing its face?
  ► Qualitative characteristics: Szirmai and Verspagen (2015, a.o.)
  ► Composition effect: Haraguchi et al. (2017); (Felipe et al., 2018)

► Heterogeneous dynamics within manufacturing: this project.
  ► Provide most up-to-date account of structural change within manufacturing.
  ► Analysis of patterns of real value added and employment.
  ► Retain methodological consistency with previous studies (Haraguchi, 2015; Palma, 2014; Rodrik, 2016; IDR, 2013, 2016).
  ► Identification of inter-temporal dynamics.
Heterogeneous dynamics within manufacturing

- The norm rather than the exception?
- Some manufacturing industries are vastly different ...
  - ... structurally (e.g. textiles vs. electrical machinery).
  - ... and offer changing opportunities at varying income levels.
  - ... now than in the past.
Figure 1: Structural change in aggregated shares.
Figure 2: Structural change in aggregated shares over time.
Figure 3: Desegregating sector dynamics in shares.
About this paper: How?

Aim & scope of the study

- Understand and quantify industry-level heterogeneities.
- Highlight dynamics of patterns of structural transformation.

Contribution

- Methodologically
  - Analysis of heterogeneities of industry-level dynamics by extending the work of the earlier literature, i.e. by ‘Chenery et al.’
  - Emphasis on the inter-temporal dimension (Rodrik, 2016, a.o.).

- New data
  - Extensive industry-level data set based on INDSTAT Rev. 3 (Haraguchi and Amann, 2019)
  - Improved data coverage:
    - Goes beyond high(er) income countries.
    - Easier to reconcile with story of ‘changing dynamics’.
Heterogeneous dynamics within manufacturing are the norm rather than the exception.

- Significant differences across industries and over time.
- We identify a particular set of industries that are most affected by (inter-temporal) changes.
- IOW, many industries remain highly important ...
  - ... at early(ier) and late(r) income stages.
  - ... for different periods of time.
Early work on structural change

- At broadly aggregated (sector) level.
- Changes in sector shares as a country’s income level increases.
- Among others in Clark (1957); Hoffmann (1959); Kuznets et al. (1966).
'Chenery et al.'

Relevance

▷ Analysis of manufacturing growth patterns at industry level.
▷ Mainly based on cross-country analyses of shares.
▷ Provides foundation for empirical motivation of later analysis.

Insights

▷ Identification of differences among manufacturing industries. 
  (Chenery, 1960, \(N = 38; T = 7\))
▷ Importance of country-specific endowments (size, resources). 
  (Chenery and Taylor, 1968, \(N = 54; T = 14\))
▷ Emphasis on country-average patterns (recognising country typologies) and time trends. 
  (Syrquin and Chenery, 1975, 1989, \(N = 101, 108; T = 21, 33\))
'Chenery et al.'

**Results**

- INDSTAT data at 2-digit level for $N = 135$; $T = 44$.
- More concave patterns, i.e. more pronounced dynamics.
- Relative importance across sectors quite similar.
- Estimated shares are lower on average.
  - ‘Cross-sectional’ argument:
    More low(er) income countries with low(er) initial shares present.
  - ‘Time-series’ argument:
    Longer time dimension may capture earlier and more recent de-industrialisation patterns.
- Implications
  - Biased assessment because of sample?
  - Are (premature) de-industrialisation patterns uniformly observable across industries?
Empirical specification

Specification follows literature (Syrquin and Chenery, 1989; Haraguchi, 2015; Rodrik, 2016, a.o.) for country $i$, industry $j$, $y = \{rvA, emp\}$:

$$y_{ijt} = \beta_1 GDP_{it} + \beta_2 GDP_{it}^2 + \beta_3 GDP_{it}^3 + x_{ijt} + e_{ijt} \quad (1)$$

Estimator(s)

- Two-way fixed effects (FE)
  - Account for country-level heterogeneity and common time trend.
  - $e_{ijt} = \theta_i + \tau_t + \epsilon_{ijt}$

- Common correlated effects (CCE) (Chudik and Pesaran, 2015)
  - Accounts for $m$ strong factors such as common shocks etc.
  - If true country slopes and variances are homogeneous with a single unobserved factor $m$ that has an identical influence on each $i$, FE is unbiased and efficient.

- Results are robust over different specifications; we illustrate FE here.
Figure 5: Visual comparison of estimators

- rVA, sector 18A
- EMP, sector 18A
Figure 6: Patterns in real value added.
Figure 7: Patterns in employment.
Aggregated Analysis

▶ Industries offer different trajectories along the income trajectory.
▶ Some industries remain important (in terms of value added and employment contribution) as economies grow richer, e.g.
  ▶ food and beverages,
  ▶ chemicals.
▶ Other industries become more (or less) relevant for higher income levels, e.g.
  ▶ electrical machinery,
  ▶ textiles and/or wearing apparel.
The structural dynamics of deindustrialisation

- Snippet of book chapter and ongoing research.
- Some new elements: dynamic income groups, CCE.
- Untouched material:
  - Particularly country characteristics.
  - Resource endowment: better initial performance but lower growth dynamics.
  - Country size: Large countries with advantages in some areas such as motor vehicles and machinery.
  - Findings in line with previous studies (Haraguchi, 2015; IDR, 2013).
  - Work on inference.
Deindustrialisation and globalisation (Haraguchi et al., 2018)

- Extensive discussion of this paper not feasible.
- Basic idea:
  - What are effects of accelerated globalisation for manufacturing industries of high income countries?
  - Not about the (social) consequences (Acemoglu et al., 2016; Autor et al., 2018) but rather the (industry-related) characteristics.
- Setup:
  - Drop in employment shares and growth rates after mid-1990s.
  - Coincides with increase in trade agreements, drop in relative prices of labour-intensive goods.
  - Globalisation as an accelerating force?
- Findings
  - Link between manufacturing productivity and restructuring accelerated in the post-1995 era.
  - Low-technology industries in manufacturing and net-importing countries are most severely affected.
Thank you
Additional material
Results comparison study

Figure 1: Changes in manufacturing share in GDP at the selected per capita income levels. Comparison between the S-C and UNIDO calculations.

Source: Created by authors based on the regression results using equation 3 (the S-C methodology).


