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.
    - ▶ Verspagen, Haraguchi and Amann: Sectoral Dynamics. In *New Perspectives on Structural Change: Causes and Consequences of Structural Change in the Global Economy*. forthcoming.
    - ▶ Haraguchi et al. (2018): Accelerated Globalization and the Dynamics of Deindustrialization.
- ▶ Some results still tentative.

About this paper: What?

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)

About this paper: What?

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.

About this paper: Why?

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.

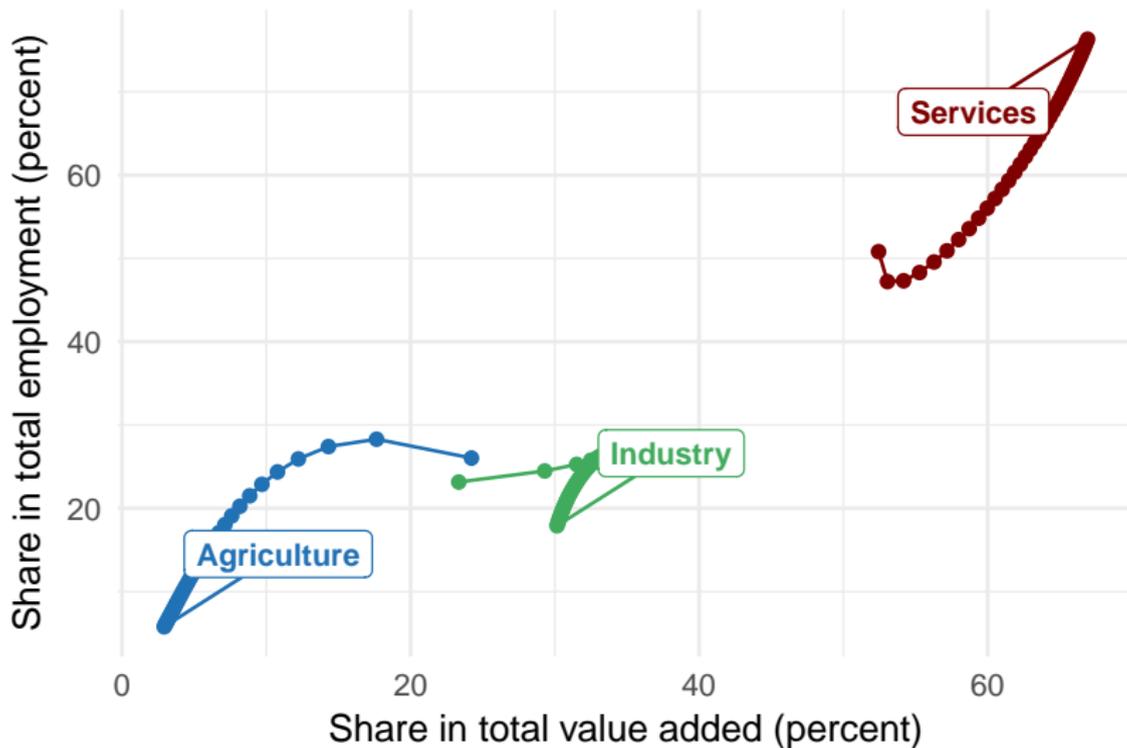**Figure 1: Structural change in aggregated shares.**

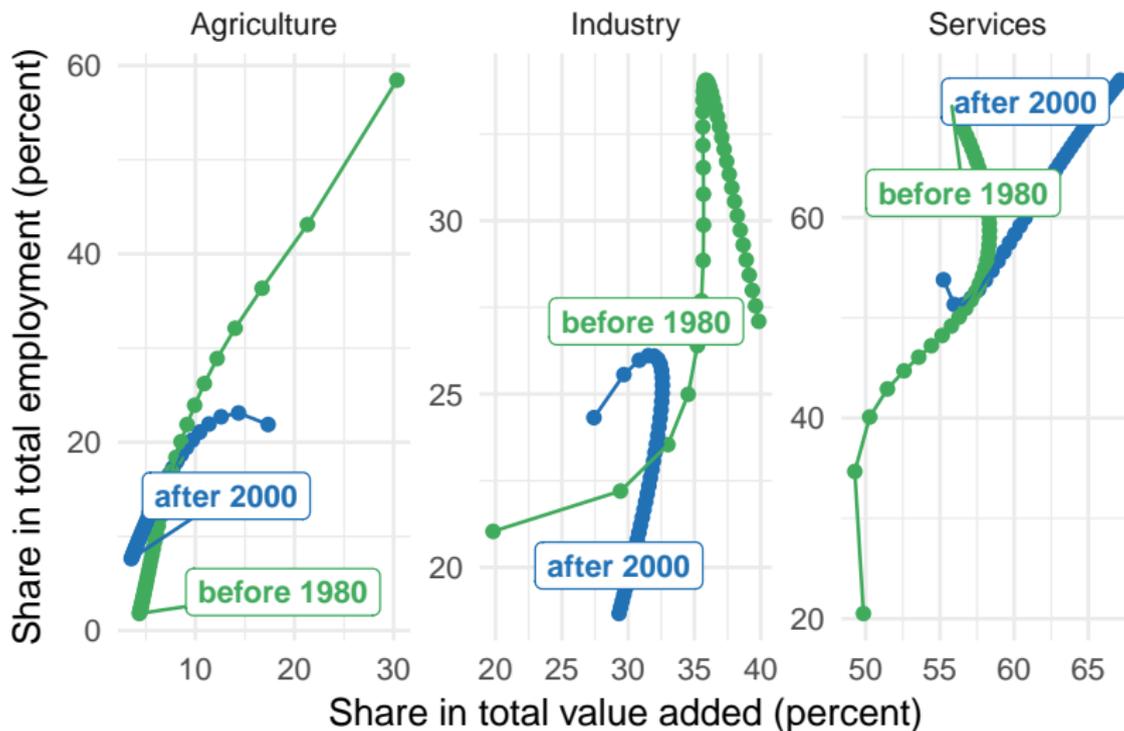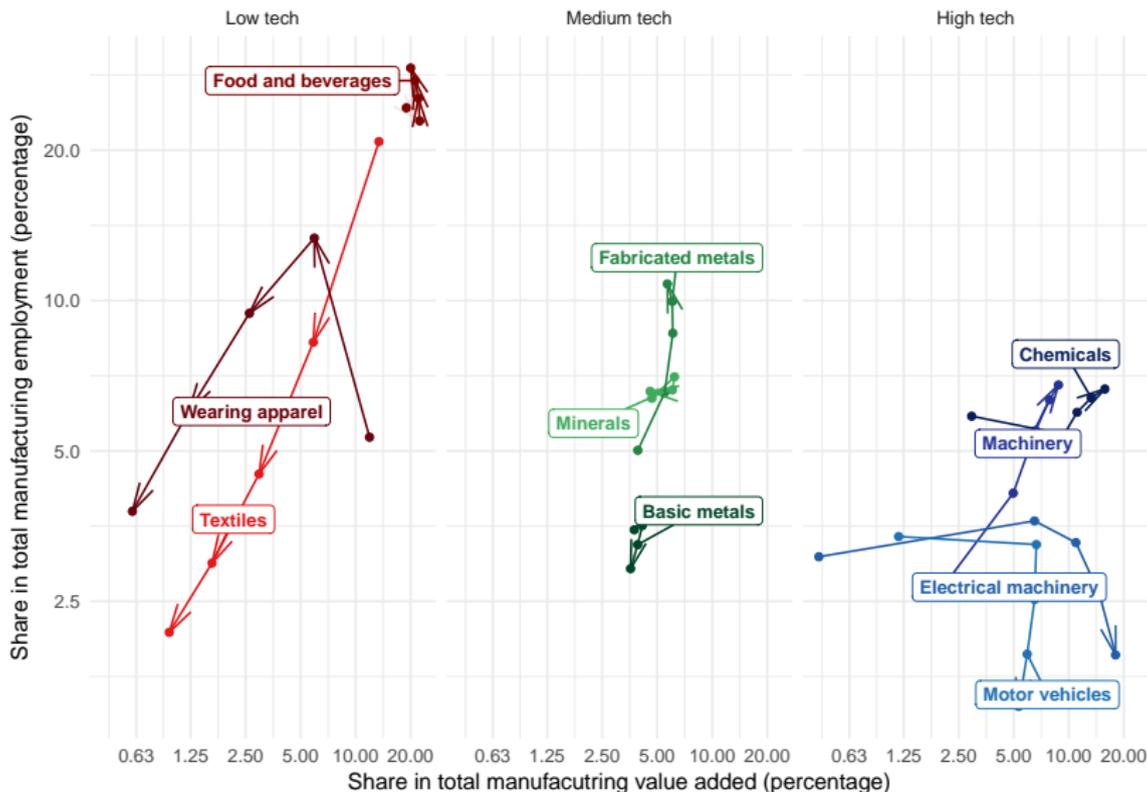## Figure 2: Structural change in aggregated shares over time.

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'.

About this paper: What we find.

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).
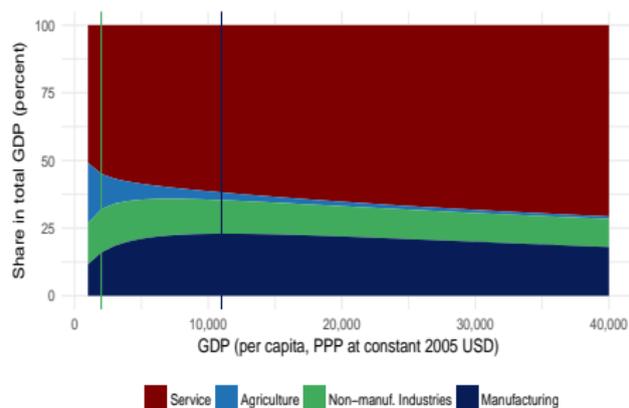
'Chenery et al.'

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.'

Link to this paper

- ▶ 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. (▶ Results)
  - ▶ '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, $y = \{rvA, emp\}$:

$$y_{ijt} = \beta_1 GDP_{it} + \beta_2 GDP_{it}^2 + \beta_3 GDP_{it}^3 + \mathbf{x}_{ijt} + e_{ijt} \qquad (1)$$

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.
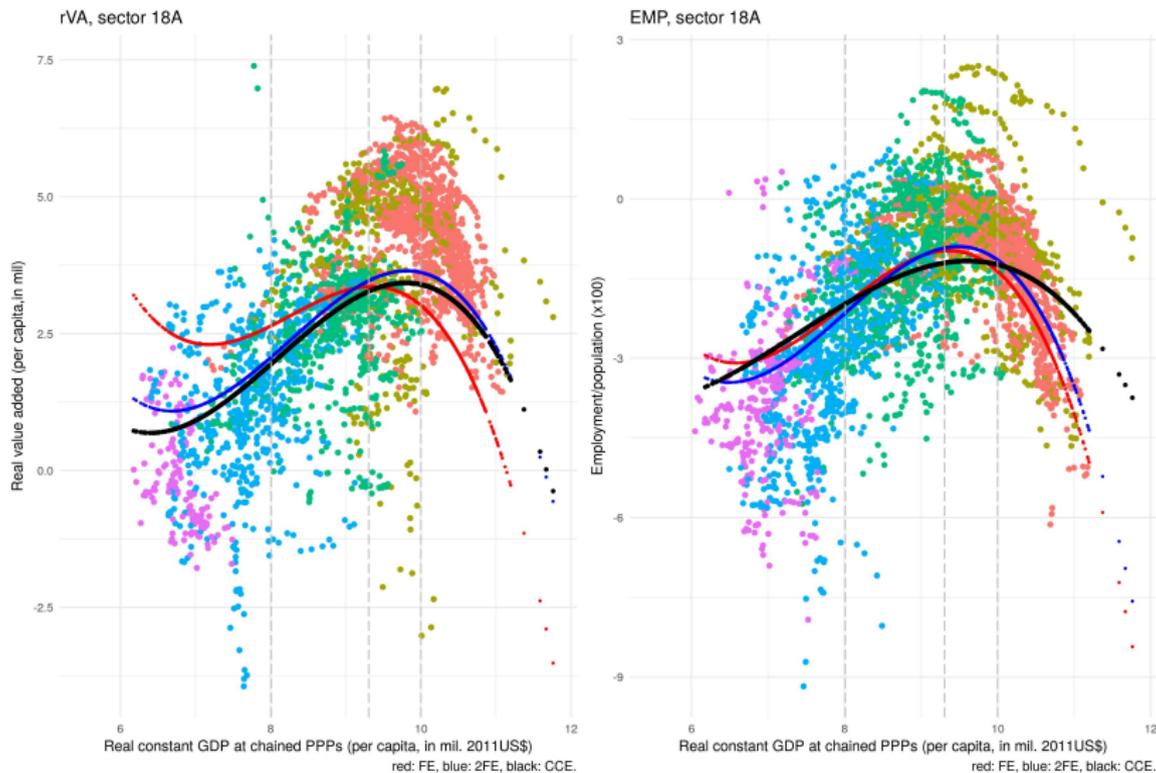
Figure 5: Visual comparison of estimators
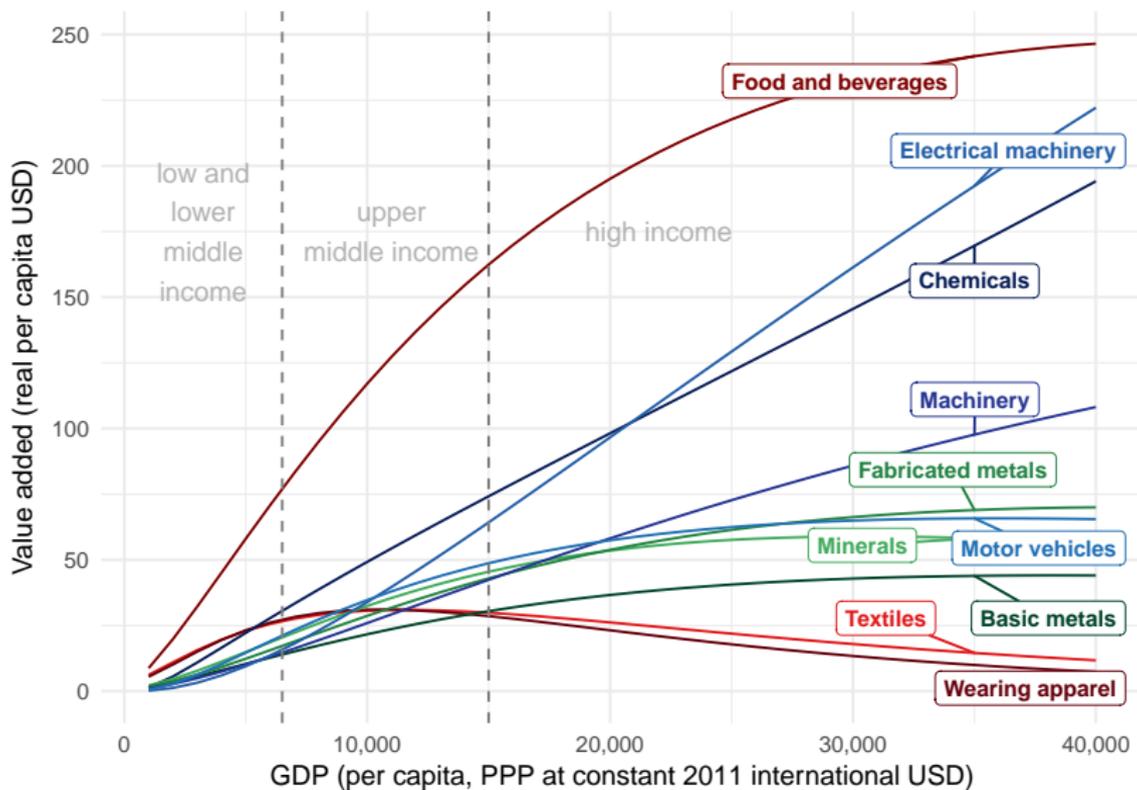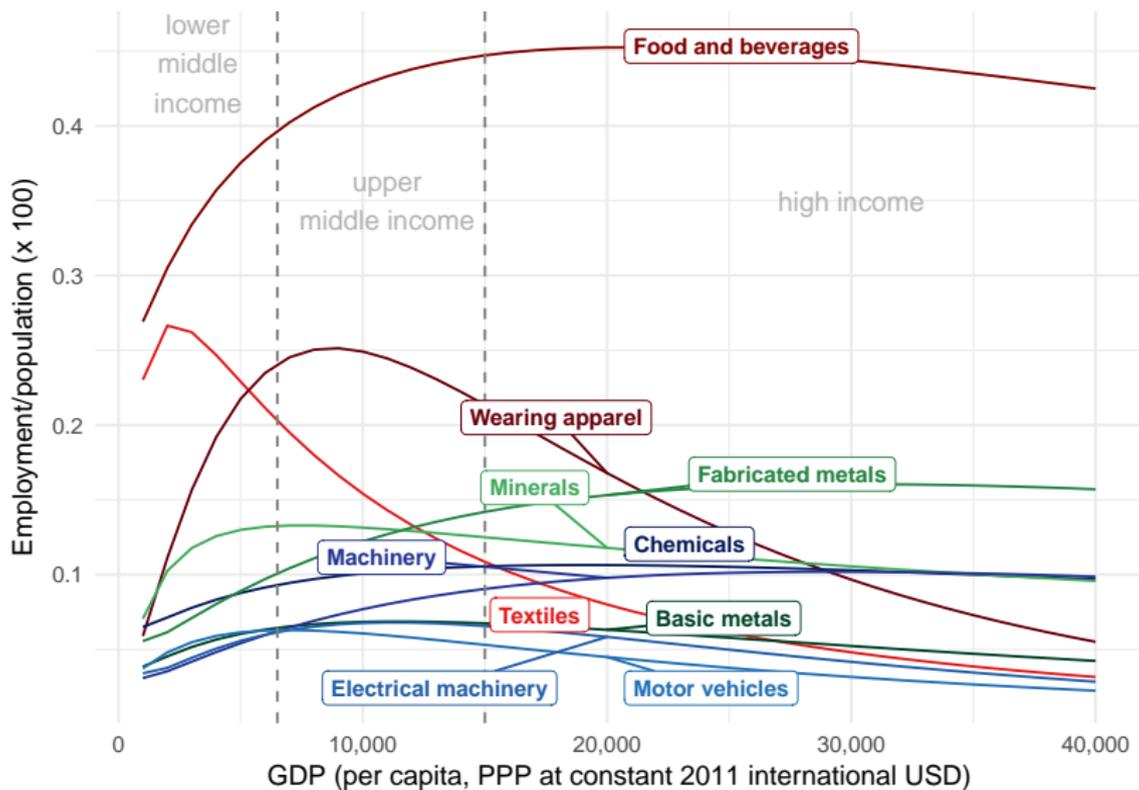
Figure 6: Patterns in real value added.

Figure 7: Patterns in employment.

Results i

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.

Concluding remarks i

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.

Concluding remarks ii

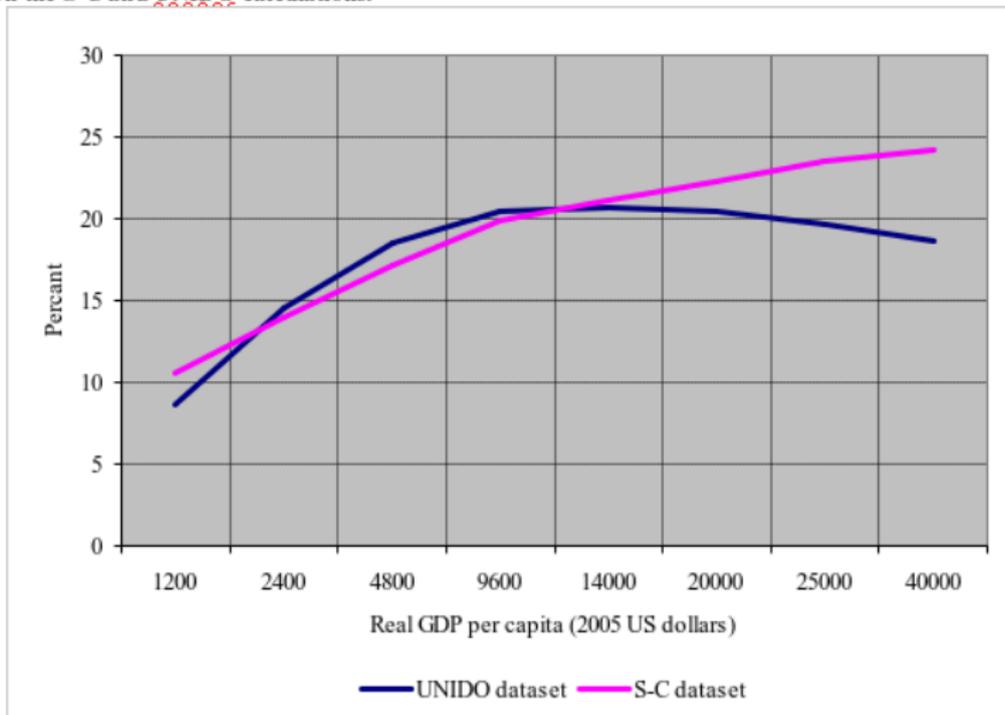**Deindustrialisation and globalisation** (Haraguchi et al., 2018)

- ▶ 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:
    - ▶ T= 12 advanced economies, N=1970-2015.
    - ▶ 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 ◂ go back

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).

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