

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

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FIW Workshop

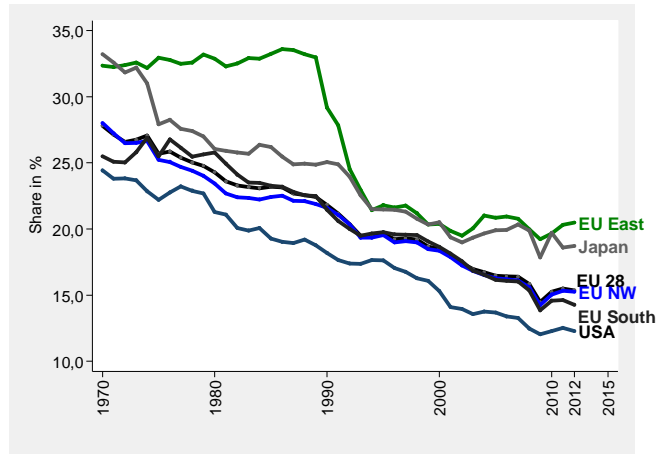
Federation of Austrian Industries, Vienna 2014-06-06

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- **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**

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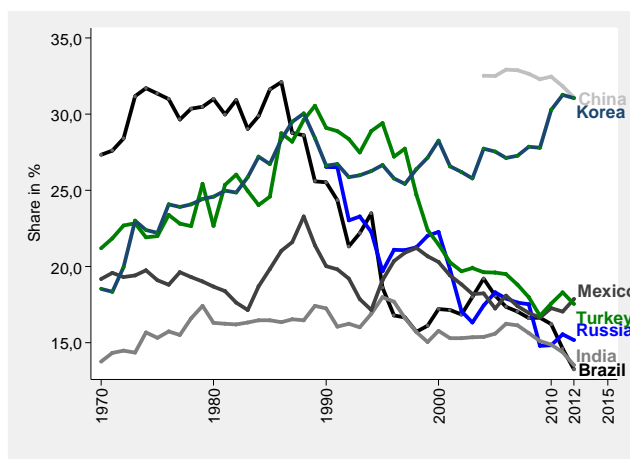
Manufacturing share in GDP Triade, 1970-2012



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, NDL, SWE; EU East: BGR, CZE, EST, HUN, LTU, LVA, POL, ROM, SVN, SVK; EU South: HRV, ESP, GRC, PRT, ITA

Manufacturing share in GDP Emerging countries, 1970-2012



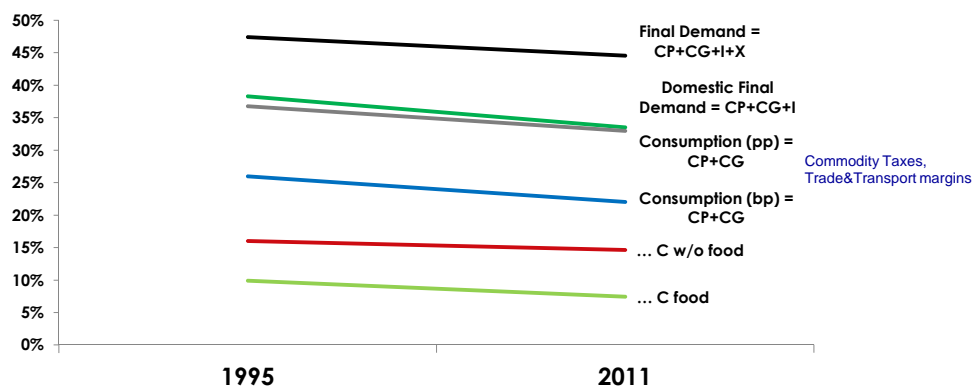
Source: UN National Accounts Main Aggregates Database

■ 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)
- 1995-2009(2011)
- Supply- and Use Tables, trade matrices, IO-Tables,
Prices (Output, Value Added)

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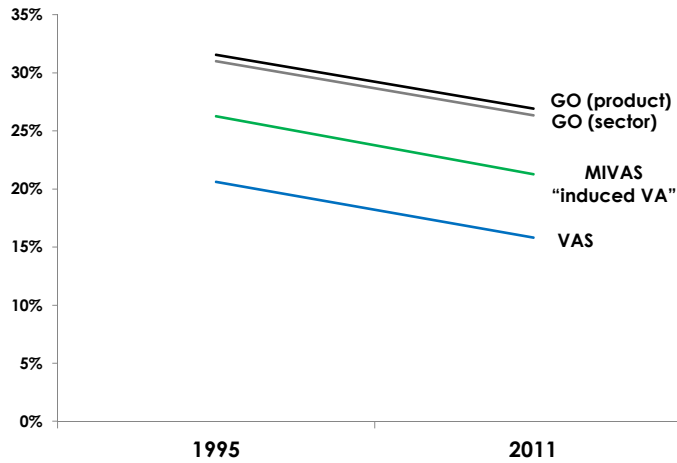
EU – share of manufacturing in ...



Source: WIOD, WIFO calculations

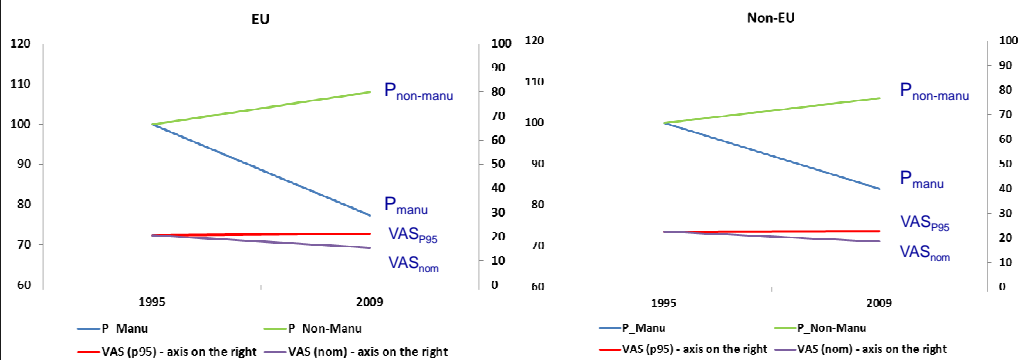
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EU – share of manufacturing in ...



Source: WIOD, WIFO calculations

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



Source: WIOD, WIFO calculations

- 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.)

- IVA_{ij}^{kl} = value added in sector i and country k induced by final demand from sector j 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

| Value Added | ... induced by | | | | Total |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------------------|
| | Domestic | | Foreign | | |
| ... generated in | Manufacturing | Non-manufacturing | Manufacturing | Non-manufacturing | |
| Domestic | | | | | |
| Manufacturing | $IVA_{m,m}^{d,d}$ | $IVA_{m,n}^{d,d}$ | $IVA_{m,m}^{d,f}$ | $IVA_{m,n}^{d,f}$ | $IVA_{m,m+n}^{d,d+f} = VA_m^d$ |
| Non-manufacturing | $IVA_{n,m}^{d,d}$ | $IVA_{n,n}^{d,d}$ | $IVA_{n,m}^{d,f}$ | $IVA_{n,n}^{d,f}$ | $IVA_{n,m+n}^{d,d+f} = VA_n^d$ |
| Foreign | | | | | |
| Manufacturing | $IVA_{m,m}^{f,d}$ | $IVA_{m,n}^{f,d}$ | $IVA_{m,m}^{f,f}$ | $IVA_{m,n}^{f,f}$ | $IVA_{m,m+n}^{f,d+f} = VA_m^f$ |
| Non-manufacturing | $IVA_{n,m}^{f,d}$ | $IVA_{n,n}^{f,d}$ | $IVA_{n,m}^{f,f}$ | $IVA_{n,n}^{f,f}$ | $IVA_{n,m+n}^{f,d+f} = VA_n^f$ |
| Total | $IVA_{m+n,m}^{d+f,d}$ | $IVA_{m+n,n}^{d+f,d}$ | $IVA_{m+n,m}^{d+f,f}$ | $IVA_{m+n,n}^{d+f,f}$ | $\sum_k \sum_i VA_k^i$ |

- **VAS** (value added share)

$$VAS_m^d = \frac{IVA_{m,m}^{d,d} + IVA_{m,n}^{d,d} + IVA_{m,m}^{d,f} + IVA_{m,n}^{d,f}}{IVA_{m,m}^{d,d} + IVA_{m,n}^{d,d} + IVA_{m,m}^{d,f} + IVA_{m,n}^{d,f} + IVA_{n,m}^{d,d} + IVA_{n,n}^{d,d} + IVA_{n,m}^{d,f} + IVA_{n,n}^{d,f}}$$

- **DIVAS** (domestically induced value added share)

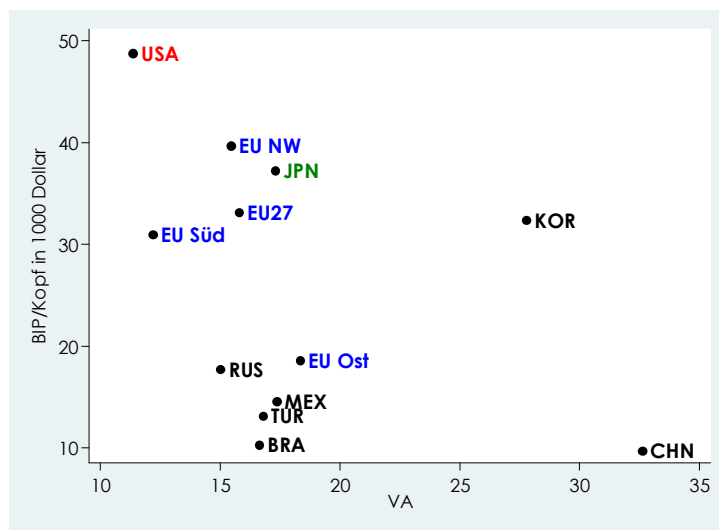
$$DIVAS_{m,m+n}^{d+f,d} = \frac{IVA_{m,m}^{d,d} + IVA_{m,n}^{d,d} + IVA_{m,m}^{f,d} + IVA_{m,n}^{f,d}}{IVA_{m,m}^{d,d} + IVA_{m,n}^{d,d} + IVA_{m,m}^{d,d} + IVA_{m,n}^{d,d} + IVA_{m,m}^{f,d} + IVA_{m,n}^{f,d} + IVA_{n,m}^{f,d} + IVA_{n,n}^{f,d}}$$

- **TEVAS** (trade effect on value added share)

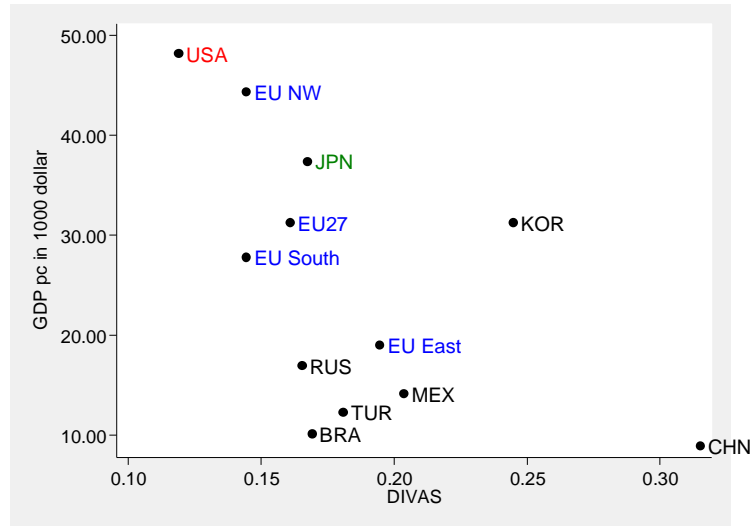
$$TEVAS_{m,m+n}^{d+f,d+f} = \frac{(IVA_{m,m+n}^{d,d} + IVA_{m,n}^{d,f})(IVA_{m,m+n}^{d,d} + IVA_{m,m+n}^{f,d} + IVA_{n,m+n}^{d,d} + IVA_{n,m+n}^{f,d})}{(IVA_{m,m+n}^{d,d} + IVA_{m,m+n}^{f,d})(IVA_{m,m+n}^{d,d} + IVA_{m,m+n}^{d,f} + IVA_{n,m+n}^{d,d} + IVA_{n,m+n}^{d,f})}$$

- **MIVAS** (manufacturing induced value added share)

$$MIVAS_{(m+n),m}^{(d+f),d} = \frac{IVA_{m,m}^{d,d} + IVA_{m,n}^{d,d} + IVA_{m,m}^{f,d} + IVA_{m,n}^{f,d}}{IVA_{m,m}^{d,d} + IVA_{m,n}^{d,d} + IVA_{n,m}^{d,d} + IVA_{n,n}^{d,d} + IVA_{m,m}^{f,d} + IVA_{m,n}^{f,d} + IVA_{n,m}^{f,d} + IVA_{n,n}^{f,d}}$$



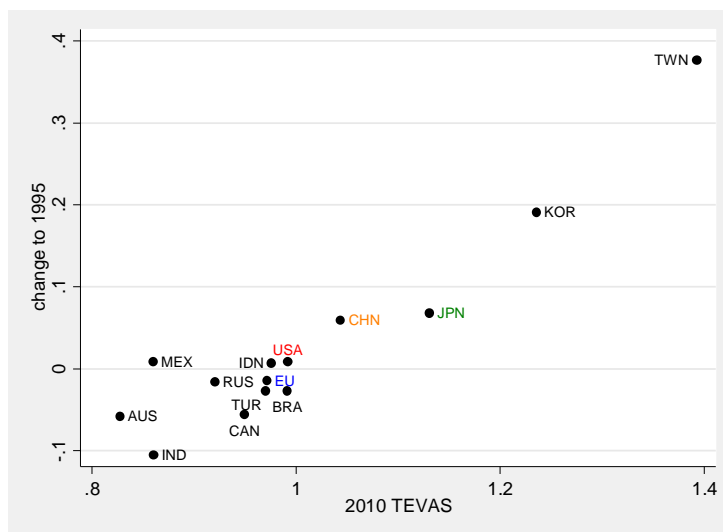
GDP pc and DIVAS Manufacturing, 2010



Source: WIOD, WIFO calculations

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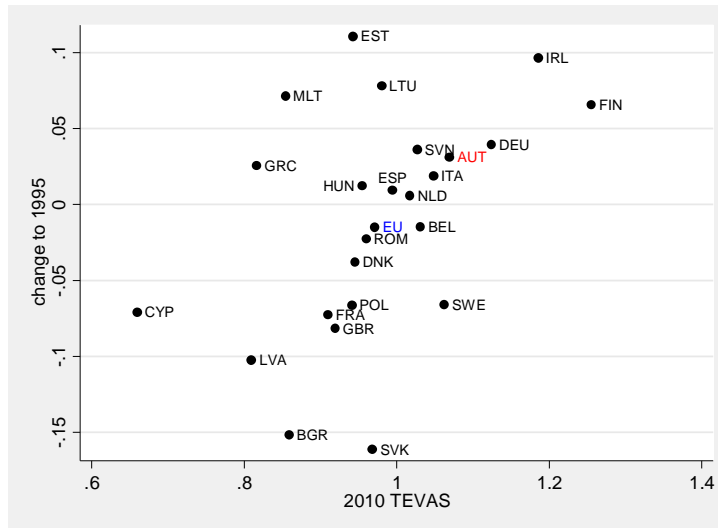
TEVAS Non EU – 2010 and change since 1995



Source: WIOD, WIFO calculations

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EU – 2010 and change since 1995



Source: WIOD, WIFO calculations

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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.

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- **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!