

Revealed Comparative Advantage at the Task Level: A Global Value Chain Perspective

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Vertical fragmentation expands competition beyond final products to tasks that can be offshored (Baldwin, 2006)

Firms in countries may specialize in particular activities

Traditional measures of revealed comparative advantage based on gross exports do not capture this

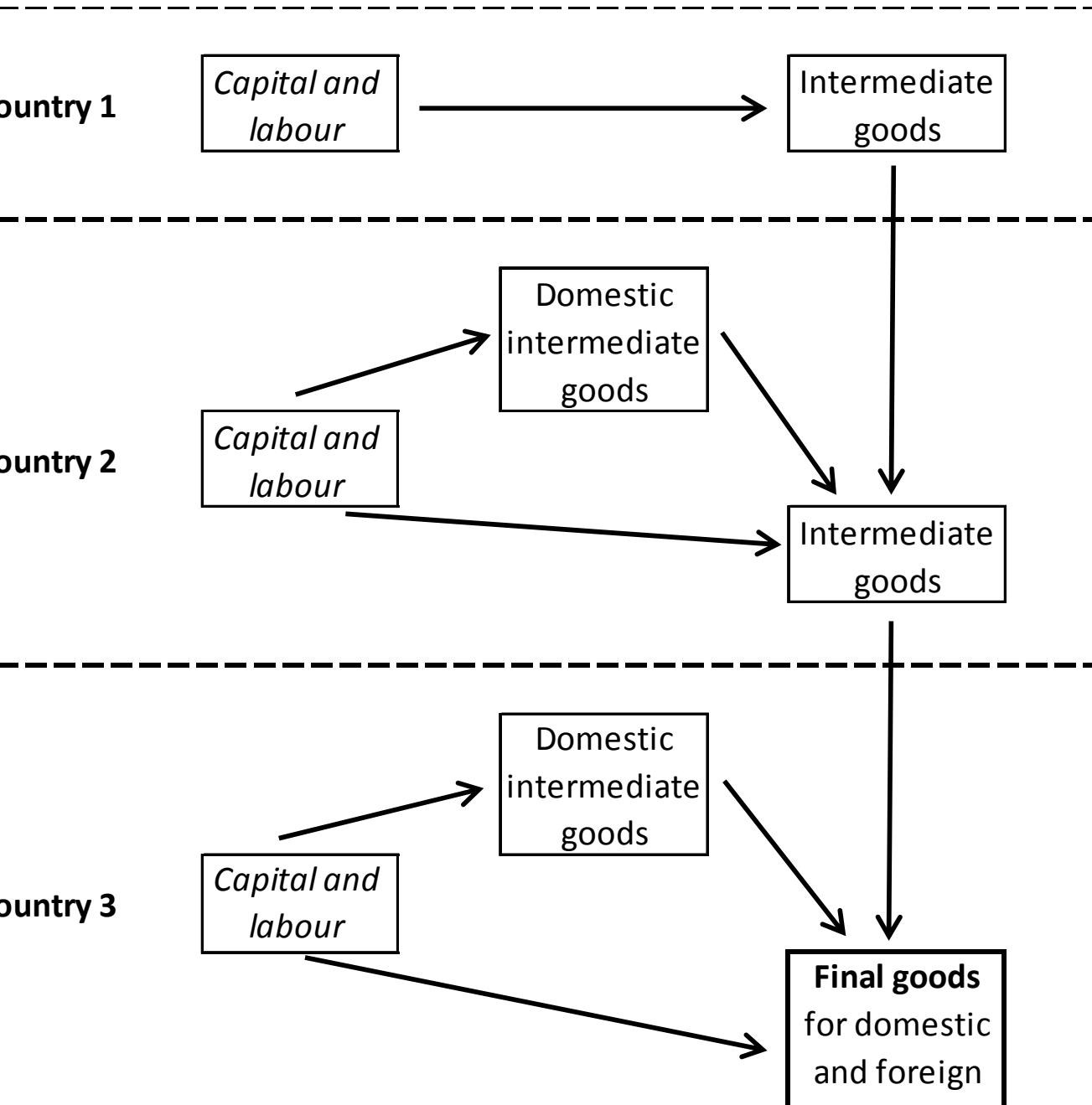
Important statistical efforts are underway to track these specialization patterns (e.g. Eurostat International Sourcing Survey; BLS MLS for US)

akes a global value chain perspective, following:

Timmer, Erumban, Los, Stehrer, de Vries (2014) "Slicing Up Global Value Chains" spring issue *Journal of Economic Perspectives* (paper and replication package will appear soon at www.wiod.org)

Matches occupations data to activities, organizing them by production stages

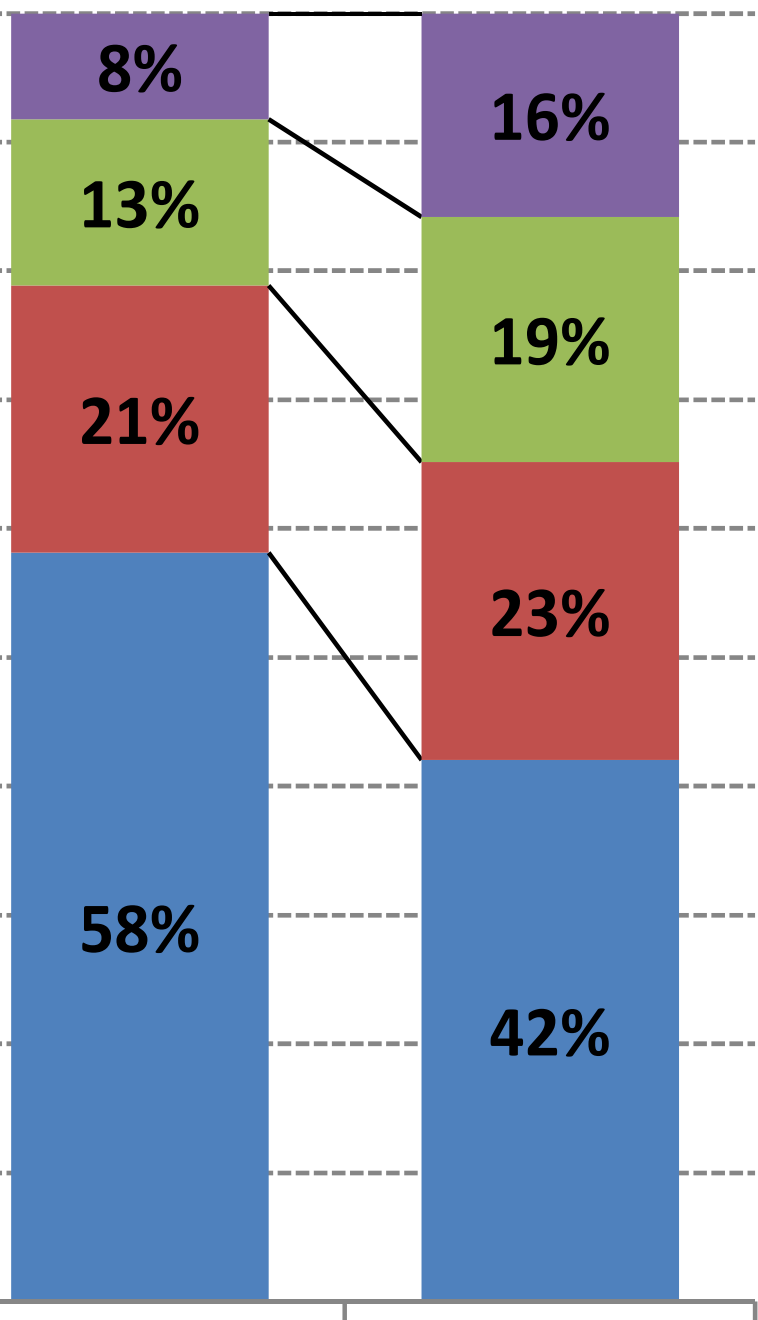
examines revealed comparative advantage in tasks in Europe



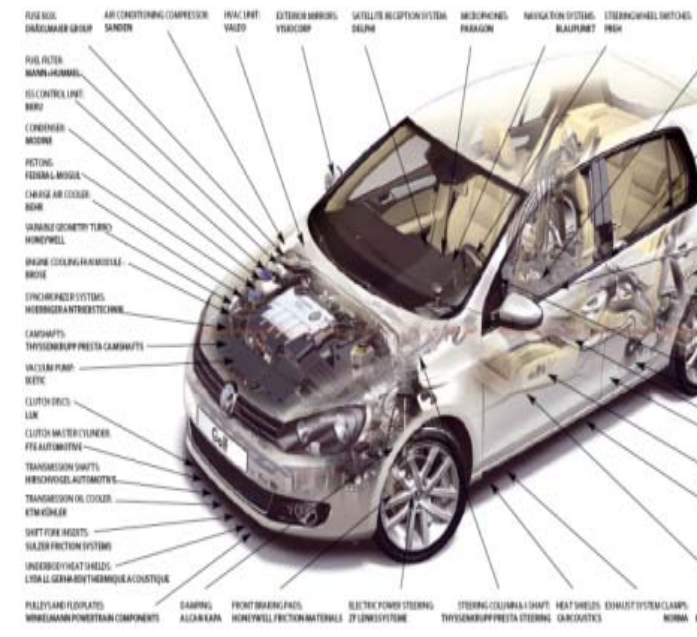
Identify GVC by country and industry where last stage of production takes

VA b	L1
VA b	K1
VA b	L2
VA b	K2
VA b	L3
VA b	K3

Value added distribution of final output from German transport equipment manufacturing GVC

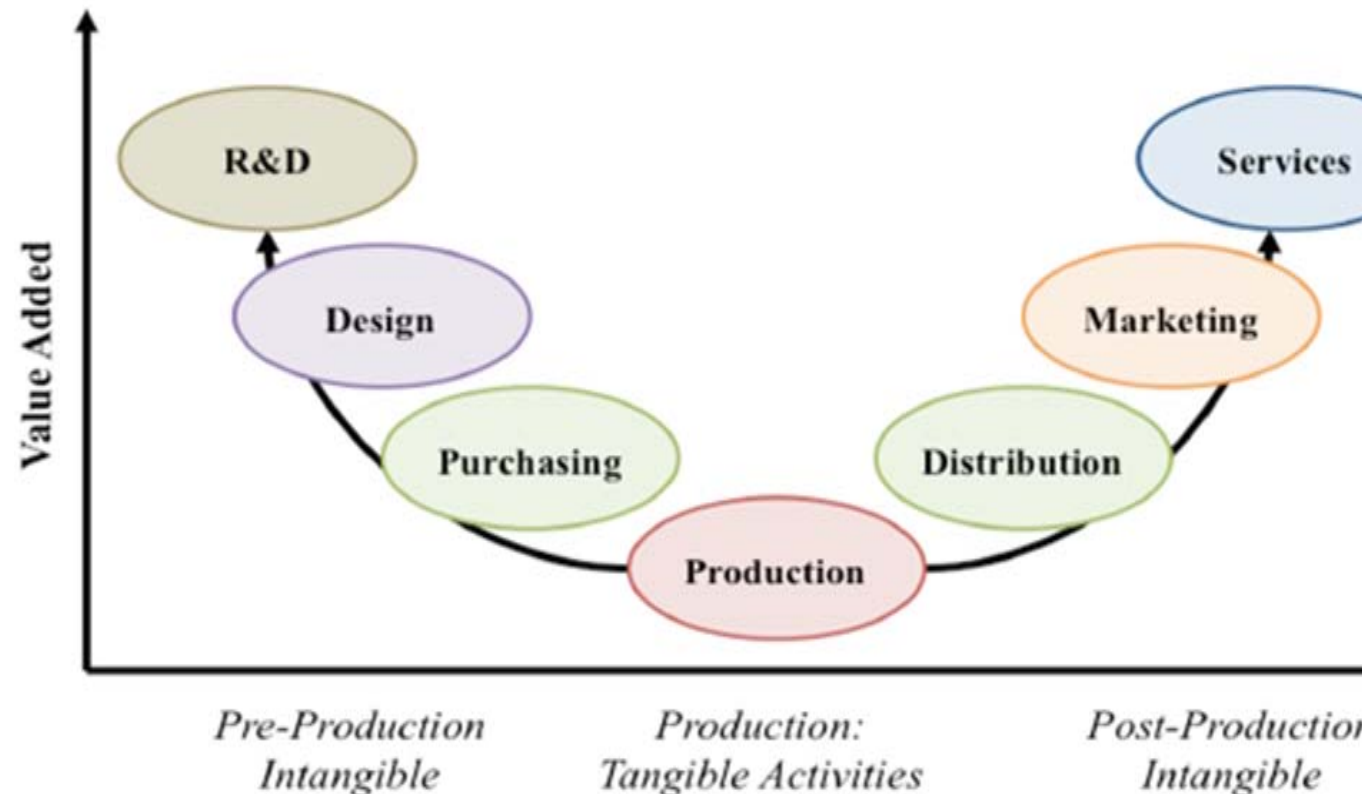


- Capital elsewhere
- Labour elsewhere
- Capital in Germany
- Labour in Germany



What type of activities in the global value chain add value?
Distinction between so-called production stages (*smile curve*)

pre-production;
production and
post-production activities



preliminary results, only EU

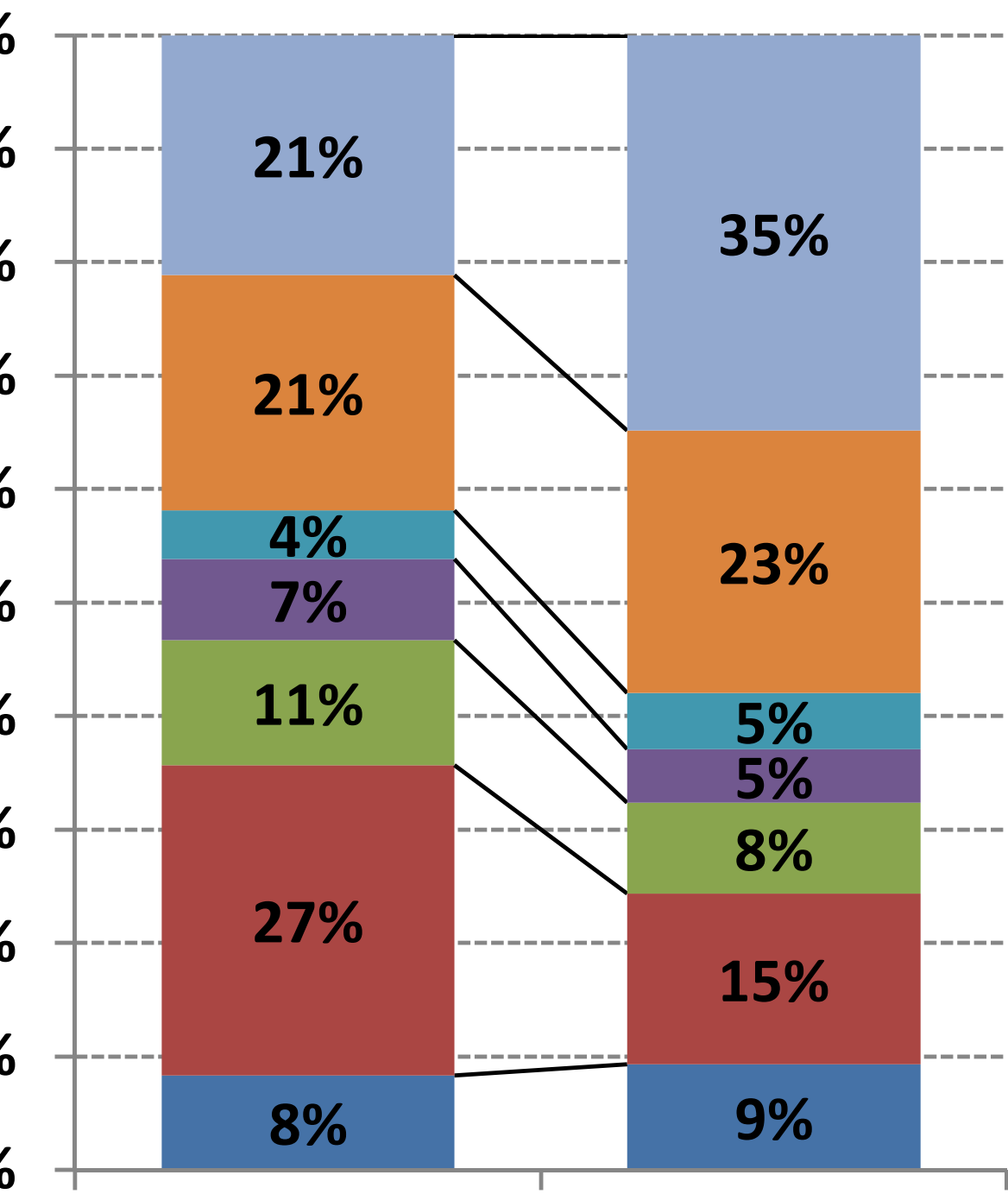
Proxy value added of production stages by the wages of workers, classified by occupation.

Need mapping activities to occupations

Occupations (2-digit ISCO88) by country and industry from EU labor force surveys (tabulations by Eurostat).

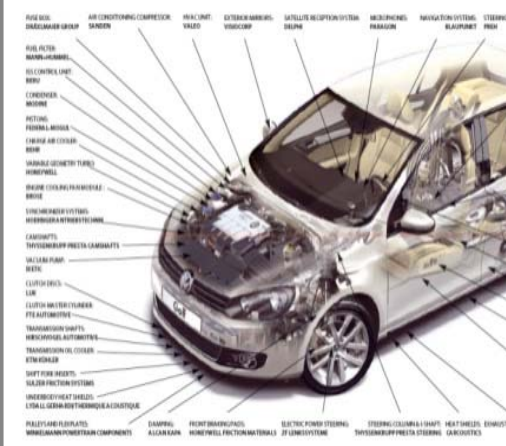
Wage data by occupation from the structure and earnings survey 2002

<p>pre-production</p>	<p>Basic R&D, Design, Commercialization</p> <p>Occupations: Professionals</p>
<p>production</p> <p>prod (low)</p> <p>prod (high)</p>	<p>Manufacturing, standardized services</p> <p>Occupations (production-low skilled): Service workers and and market sales workers. Craft and related trades workers and machine operators and assemblers, Elementary occupa</p> <p>Occupations (production-high skilled): Technicians and asso professionals</p>
<p>post-production</p> <p>post (low)</p> <p>post (high)</p>	<p>Marketing, advertising and brand management, specialized logistics, after-sales services</p> <p>Occupations (post-production-low skilled): Clerks</p> <p>Occupations (post-production-high skilled): Legislators, ser officials and managers</p>

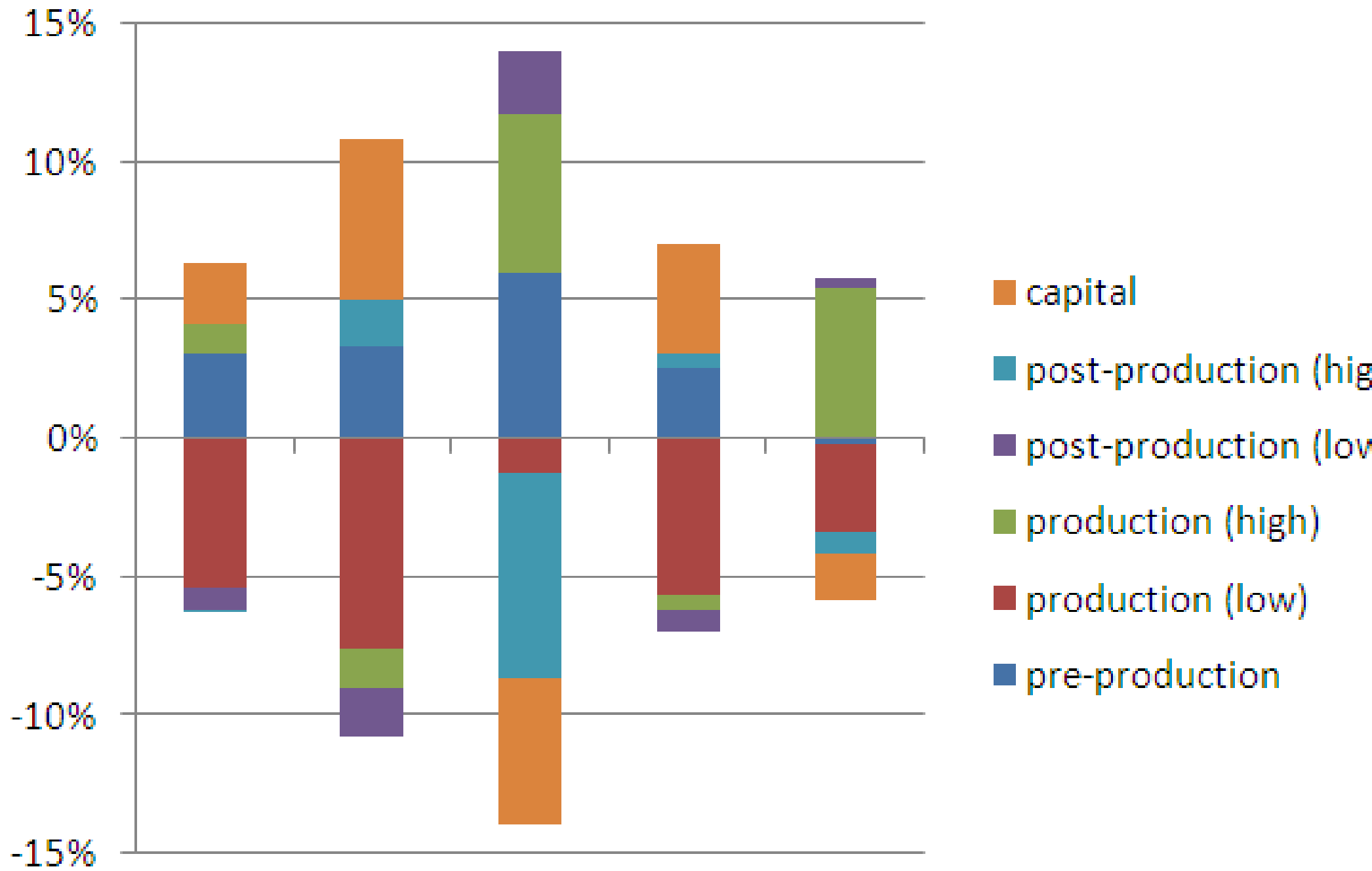


- Elsewhere
- Capital
- post (high)
- post (low)
- prod (high)
- prod (low)
- pre

Value added distribution in the final output of German transportation equipment manufacturing GVC



change in GVC share, 1995 to 2011



Revealed Comparative Advantage (RCA) defined as: share of activity x in GVC income for country c relative to same share EU 27

$$RCA = \frac{\left(GVC I_x^c / \sum_x GVC I_x^c \right)}{GVC I_x^{EU 27} / \sum_x GVC I_x^{EU 27}}$$

RCA bigger than 1 reveals a comparative advantage in that activity (Note: Compared to EU 27 as a whole, not globally)

	pre- production	production (low)	production (high)	post- production (low)	post- production (high)	cap
1995	1.26	1.06	1.36	1.33	0.56	0.
2011	1.19	1.00	1.11	1.26	0.70	0.
1995	0.50	0.92	0.83	0.85	1.78	1.
2011	0.89	1.08	1.25	1.32	1.15	0.
1995	1.22	0.88	0.96	0.94	1.00	1.
2011	1.09	0.85	0.82	0.95	1.05	1.
1996	0.61	1.04	0.93	0.51	0.62	1.
2011	0.42	1.13	1.31	0.63	0.56	1.

new measure based on value added of activities: GVC
income (JEP spring issue!)

functional specialization within Europe

policy implications: focus on activities (e.g. R&D, design,
logistics, finance, branding, market exploration) in
stead of sectors? Schooling? Implications for returns to
skills?

further progress:

Expand country coverage, link to task surveys

endices

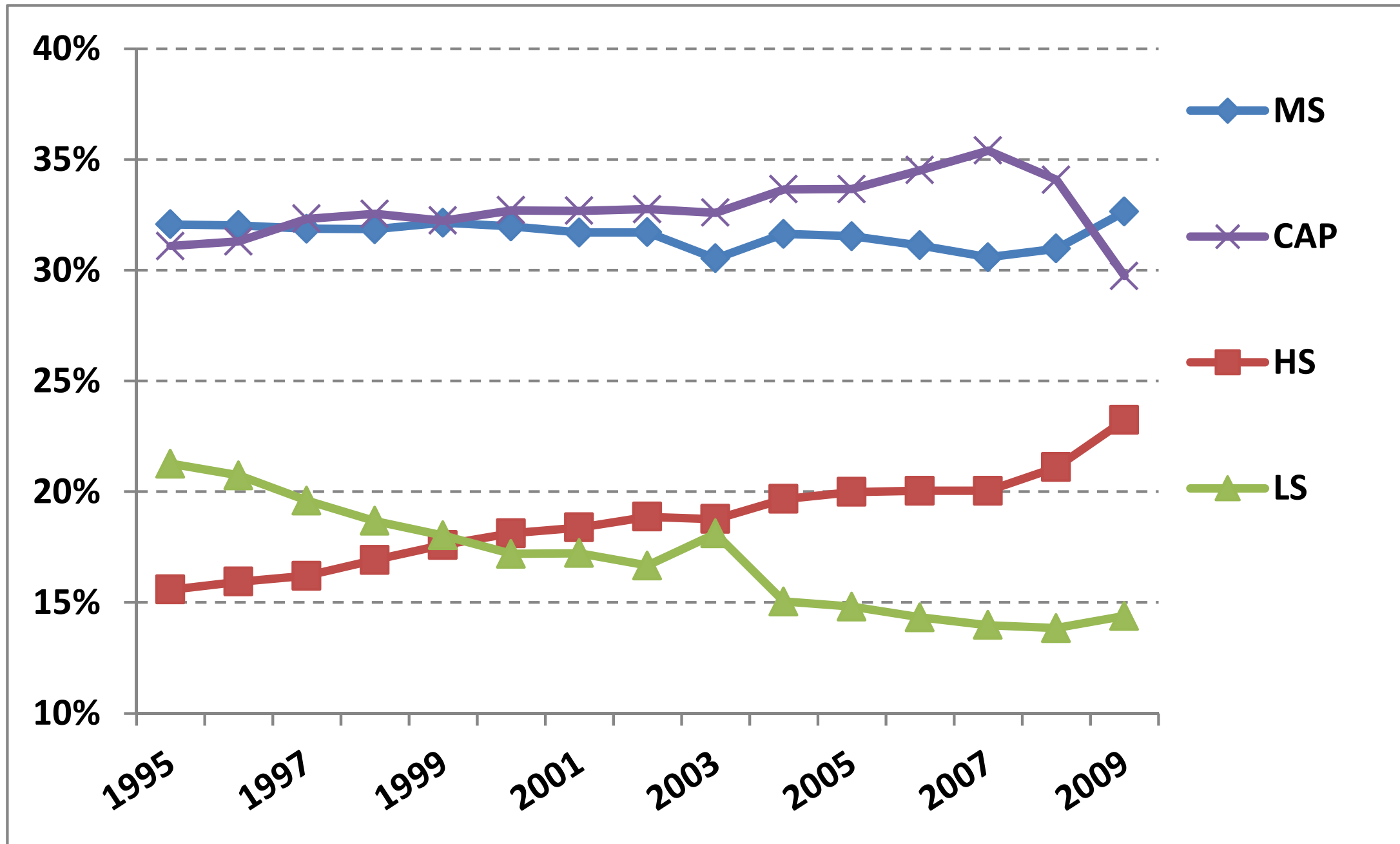
decomposition method based on mathematical input-output technique involving the "Leontief-inverse"

The value added contributions (\mathbf{v}) of factors in industry i in country j are given by

$$\mathbf{v} = \mathbf{P}(\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}$$

\mathbf{P} diagonal matrix of value-added as ratio of gross-output ($ij \times ij$),
 \mathbf{A} matrix of intermediate input use (foreign and domestic) ($ij \times ij$),
 \mathbf{I} the identity matrix; and $(\mathbf{I} - \mathbf{A})^{-1}$ the so-called Leontief inverse ($ij \times ij$),
 \mathbf{f} output of final manufactures (for consumption and investment demand) ($ij \times 1$)

Note: Use of Leontief inverse ensures that all stages of production are taken into account



Note: The graph shows value added by factors in EIU 27 in