Global value chain analysis of the automotive and garment sectors

A study of Germany, Spain, Romania, Indonesia and Mexico for 2000-2014

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Understanding Automation in the Apparel and Automotive Sectors
12th May 2022

Motivation

- Institutional and technological changes drive production fragmentation in the world economy.
- The way these factors interact may have a different effect and lead to alternative supply chain organisations.
- We focus on the automotive and garment supply chains of five different countries to grasp potential differences.
- We consider the cases of Germany, Spain, Romania, Indonesia and Mexico and analyse the trends in employment, value-added and functional income distribution.

Methodology

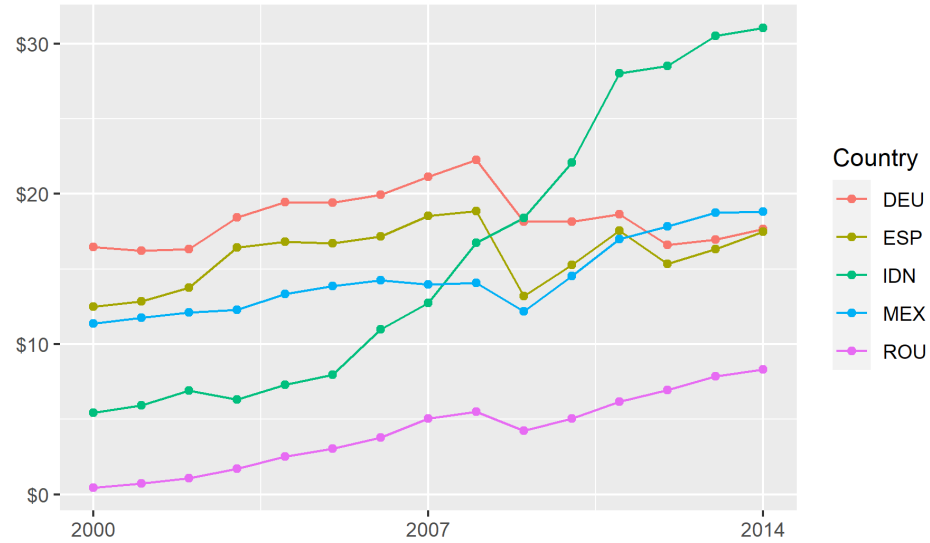
- The empirical framework is the multi-regional input-output accounting system.
- We use the notion of vertically integrated sector or 'subsystem' to operationalise the idea of global value chain.
- A subsystem is a 'smaller' productive system that considers the net output (final demand) of one commodity.
- Based on an 'open' Leontief model, we can compute the global total output required to obtain this net output.

Methodology

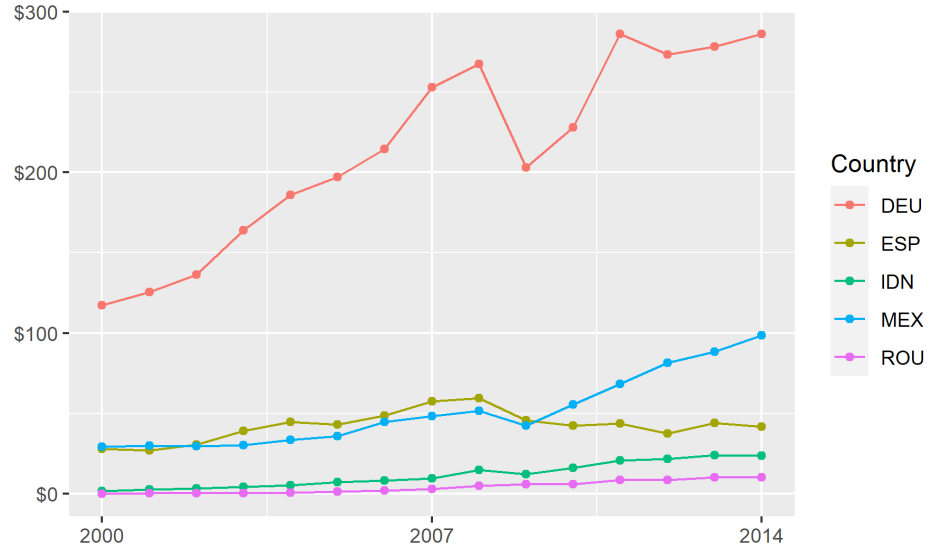
- We compute value-added and employment induced in all countries and industries by the value of final demand of the automotive and garment sectors.
- We consider the sectors of five countries: Germany, Spain, Romania, Indonesia and Mexico.
- The data source employed is the World Input-Output Database, Release 2016.
- This database presents global input-output tables for 2000-2014 with a dimension of 44 countries (43 plus an estimation of the 'Rest of the World') and 56 sectors (based on UN's ISIC rev. 4).

Final Output and Exports

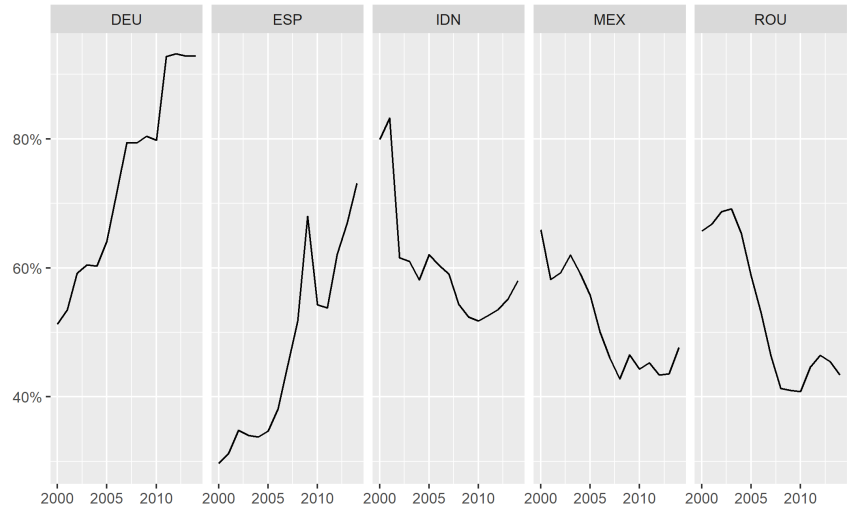
Final output in the garment sector (in bn of constant 2010 US$)



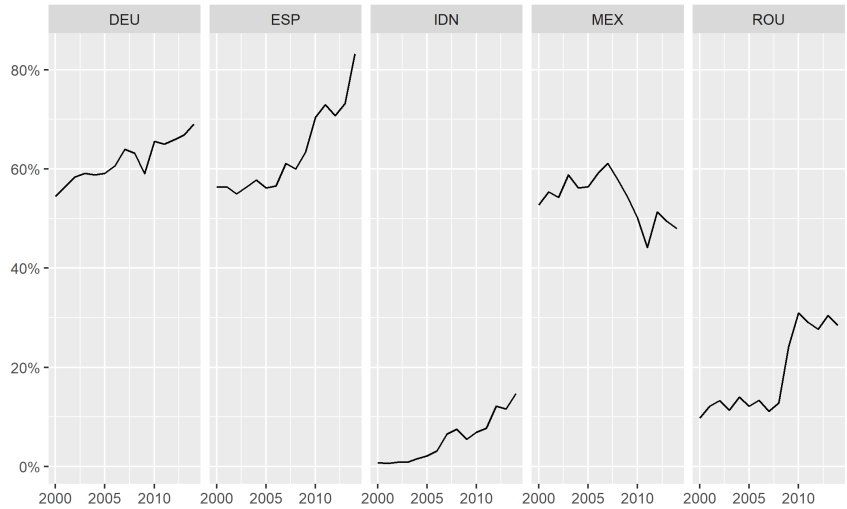
Final output in the automotive sector (in bn of constant 2010 US$)



Final exports of garment (in % of final output)



Final exports of automotive (in % of final output)



Foreign Employment and Value Added

Foreing ***Employment*** *(in % of Total Employment)*

	Garment		Automotive	
	2000	2014	2000	2014
Germany	48.7%	48.9%	44.8%	48.8%
Spain	33.8%	50.5%	50.3%	61.1%
Indonesia	12.1%	7.9%	19.1%	12.5%
Mexico	19.4%	17.1%	46.5%	43.1%
Romania	4.7%	7.1%	9.2%	26.0%

Foreign ***Value Added*** *(in % of Total Value Added)*

	Garment		Automotive	
	2000	2014	2000	2014
Germany	29.9%	37.4%	22.4%	32.9%
Spain	21.9%	34.7%	33.9%	42.3%
Indonesia	28.4%	41.5%	35.5%	31.4%
Mexico	28.4%	34.1%	36.0%	40.6%
Romania	30.5%	30.7%	33.0%	36.7%

Changes in Foreign Employment and Value Added by Regions

*Foreign **Employment** by Region (in % of Foreign Employment)*

	Garment		Automotive	
	2000	2014	2000	2014
Germany				
Central Europe	13.3%	10.2%	16.6%	14.5%
Southern Europe	8.2%	7.0%	5.8%	6.8%
Eastern Europe	14.2%	12.5%	17.7%	24.2%
China	3.8%	9.5%	5.0%	9.3%
NAFTA	1.9%	2.2%	3.0%	3.0%
Rest of World	58.6%	58.6%	51.9%	42.1%
Spain				
Central Europe	15.5%	8.2%	31.9%	24.9%
Southern Europe	6.2%	7.9%	5.5%	7.5%
Eastern Europe	2.9%	3.1%	4.7%	11.8%
China	3.1%	9.9%	3.6%	8.9%
NAFTA	1.7%	1.1%	2.0%	2.0%
Rest of World	70.7%	69.8%	52.4%	44.9%
Mexico				
Central Europe	3.8%	3.2%	7.1%	6.0%
Southern Europe	2.0%	1.7%	1.6%	2.0%
Eastern Europe	0.7%	0.9%	1.3%	2.2%
China	5.8%	16.3%	6.0%	17.8%
NAFTA	26.5%	19.2%	27.1%	23.0%
Rest of World	61.2%	58.7%	56.9%	49.0%
Indonesia				
Central Europe	2.3%	1.7%	2.6%	3.1%
Southern Europe	0.6%	0.6%	0.5%	0.7%
Eastern Europe	0.4%	0.5%	0.5%	0.9%
China	7.4%	21.8%	7.8%	16.0%
NAFTA	1.4%	1.1%	1.6%	1.6%
Rest of World	87.9%	74.3%	86.9%	77.7%
Romania				
Central Europe	16.9%	15.3%	14.0%	17.8%
Southern Europe	9.8%	14.5%	5.3%	7.6%
Eastern Europe	8.1%	12.0%	10.2%	15.1%
China	2.6%	5.6%	3.4%	6.9%
NAFTA	1.2%	1.3%	1.2%	1.6%
Rest of World	61.4%	51.3%	66.0%	50.9%

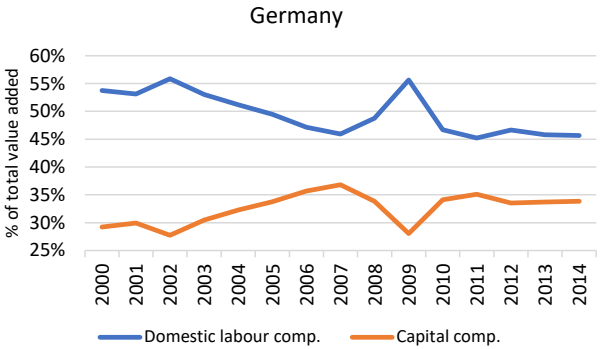
*Foreign **Value Added** by Region (in % of Foreign Value Added)*

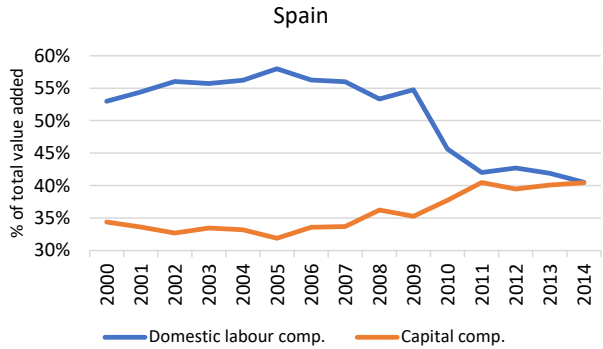
	Garment		Automotive	
	2000	2014	2000	2014
Germany				
Central Europe	40.0%	27.6%	42.9%	29.3%
Southern Europe	22.1%	15.2%	14.6%	12.8%
Eastern Europe	6.2%	8.4%	12.9%	21.0%
China	2.8%	14.6%	2.1%	9.6%
NAFTA	5.4%	4.2%	7.2%	4.1%
Rest of World	23.6%	30.1%	20.2%	23.2%
Spain				
Central Europe	45.6%	21.4%	65.6%	42.9%
Southern Europe	19.3%	16.2%	11.8%	12.0%
Eastern Europe	1.6%	2.4%	2.4%	9.7%
China	2.3%	19.2%	1.2%	8.5%
NAFTA	5.3%	2.4%	3.8%	2.8%
Rest of World	25.9%	38.3%	15.2%	24.1%
Mexico				
Central Europe	7.4%	6.6%	11.7%	8.7%
Southern Europe	3.6%	3.1%	2.5%	3.1%
Eastern Europe	0.3%	0.6%	0.5%	1.5%
China	2.9%	21.9%	1.7%	16.1%
NAFTA	60.7%	40.1%	59.1%	40.1%
Rest of World	25.0%	27.7%	24.6%	30.5%
Indonesia				
Central Europe	9.3%	3.9%	7.3%	5.8%
Southern Europe	2.4%	1.3%	1.4%	1.4%
Eastern Europe	0.3%	0.4%	0.3%	0.6%
China	6.8%	33.4%	3.8%	18.9%
NAFTA	6.5%	2.5%	4.8%	2.7%
Rest of World	74.7%	58.6%	82.5%	70.5%
Romania				
Central Europe	39.6%	27.4%	39.1%	32.2%
Southern Europe	28.6%	26.7%	17.6%	15.1%
Eastern Europe	5.4%	8.6%	8.4%	12.7%
China	1.4%	7.1%	1.6%	7.3%
NAFTA	3.0%	2.1%	3.3%	2.4%
Rest of World	22.0%	28.0%	30.0%	30.2%

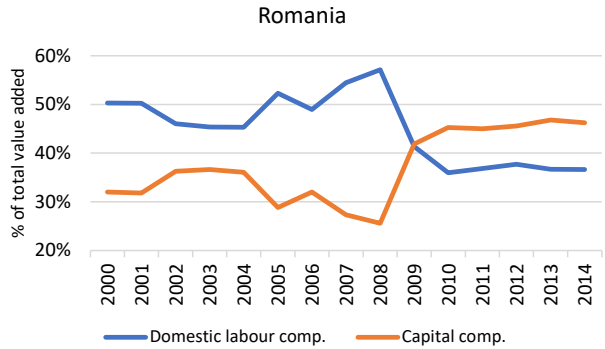
Legend:
- Regional
- Extra-regional
- China

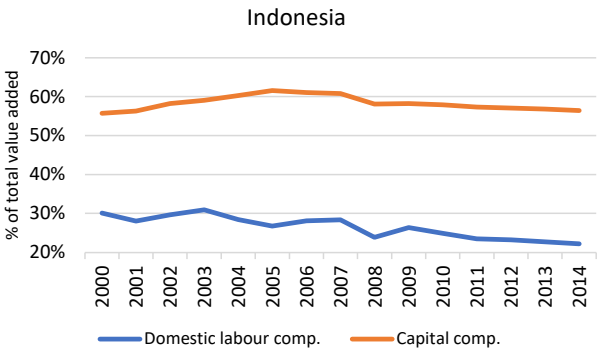
Income Distribution

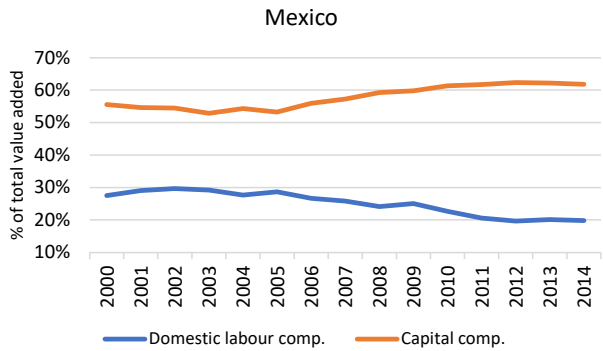
Garment





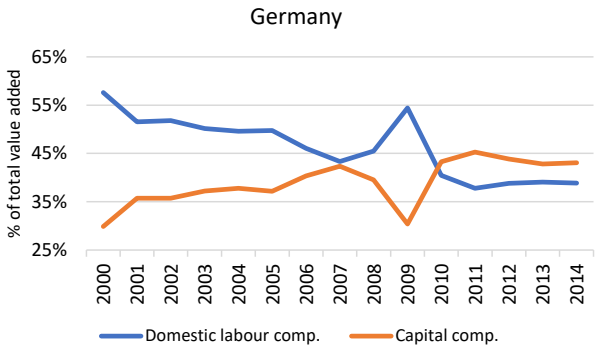


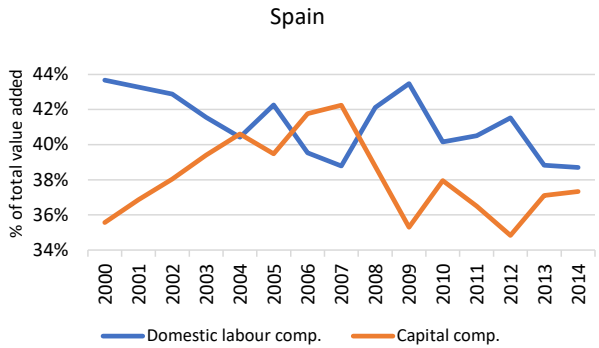


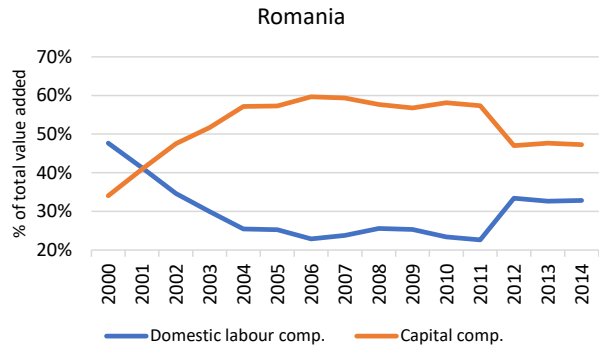


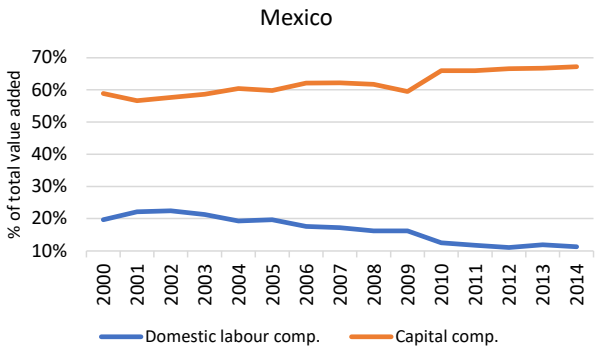
Income Distribution

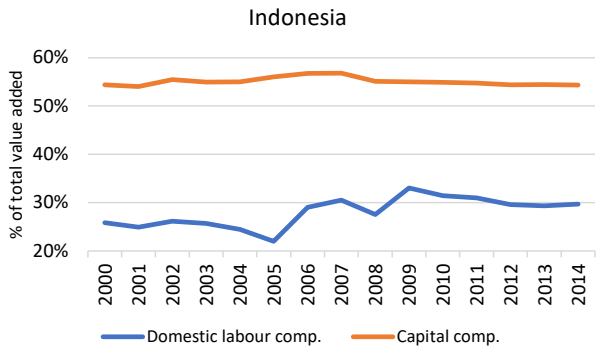
Automotive











Conclusions

- There is a trend toward internationalisation in the sectors considered (with some exceptions).
- Regional partners are relevant in supply chains, and in some cases there is tendency toward 'regionalisation'. However, the general trend is toward internationalisation (growing participation by China).
- The changes in the organisation of supply chains have affected income distribution. The domestic labour compensation share decreases vis-a-vis an increase in the total capital compensation share.