

Manufacturing Europe's Future

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See also Bruegel Blueprint on www.bruegel.org

Manufacturing Europe's future

The scene

- **Industrial policy is back on the table in Europe:**

DG ENTR Industrial Policy (2012) starts from the premise that “Europe needs industry” and sets out a roadmap for reindustrializing Europe, with the aim to ..”**raising the share of industry in GDP from the current level of around 16% to as much as 20% in 2020**” following up with action plans for specific sectors.

- **An assessment of what kind of EU industrial policy is needed requires an understanding of the changing role of manufacturing for Europe's growth**

Trends and evidence

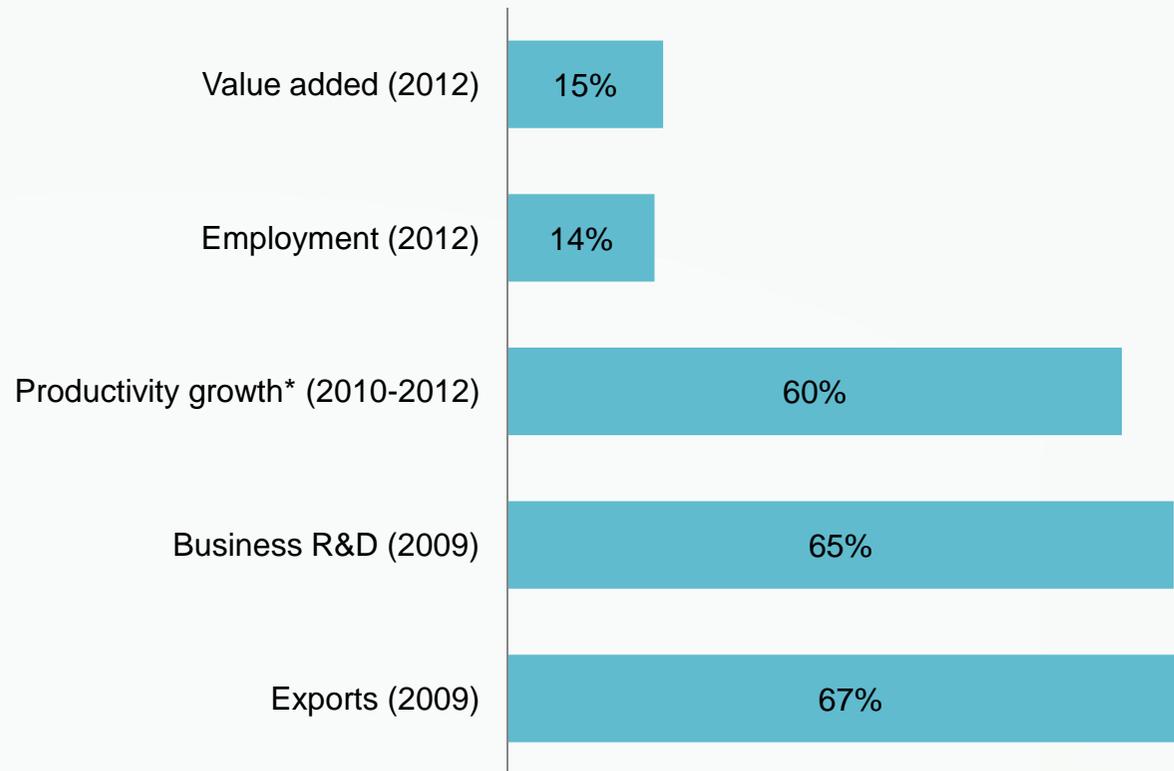
- 1) Manufacturing still matters for EU economies, but its contribution is changing
- 2) Manufacturing production continues to become more integrated within Global and European Value Chains

Policies for manufacturing/servicing Europe's growth

1) Manufacturing's contribution in Europe is changing

Trends and evidence

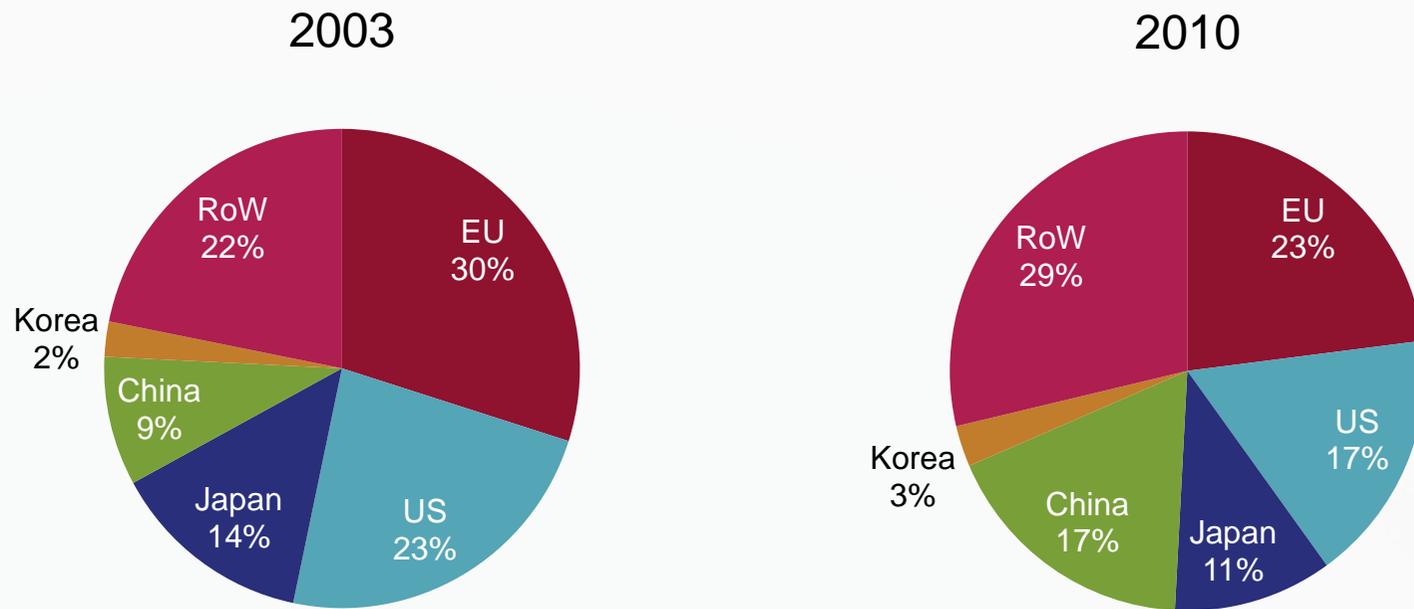
Manufacturing contribution to...



*Manufacturing contribution to productivity growth in the total economy, ex. agriculture.
Source: Bruegel based on Eurostat and OECD.

The EU's share of World's manufacturing value added has decreased over time

Countries' share of World's manufacturing Value added



Source: World Bank data.

1) Manufacturing's contribution to European economy is changing

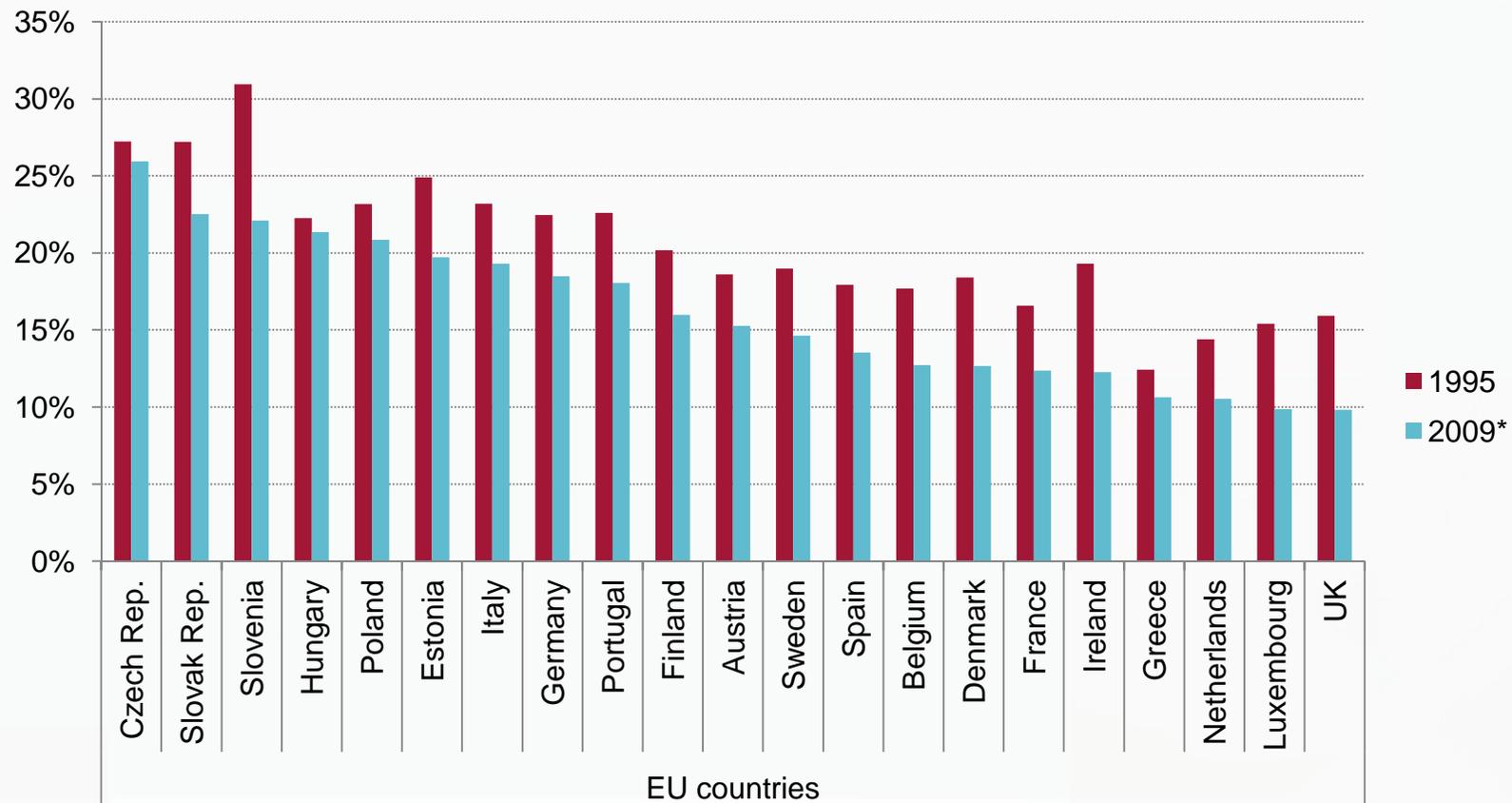
Trends and evidence

Despite the loss of manufacturing jobs, manufacturing still matters for EU economies, **but its contribution is changing:**

- A continued decline of manufacturing share in value added and employment in Europe, caused by:
 - ✓ *Decline in demand for manufactured goods relative to services*
 - ✓ *Labour saving productivity improvements*
 - ✓ *Trade effects*
- The decline holds across almost all manufacturing sectors (crossing the high-tech/low-tech divide) and all EU countries, although with different intensities and with a different weight on what causes the decline.

The share of manufacturing in employment has decreased in all European countries

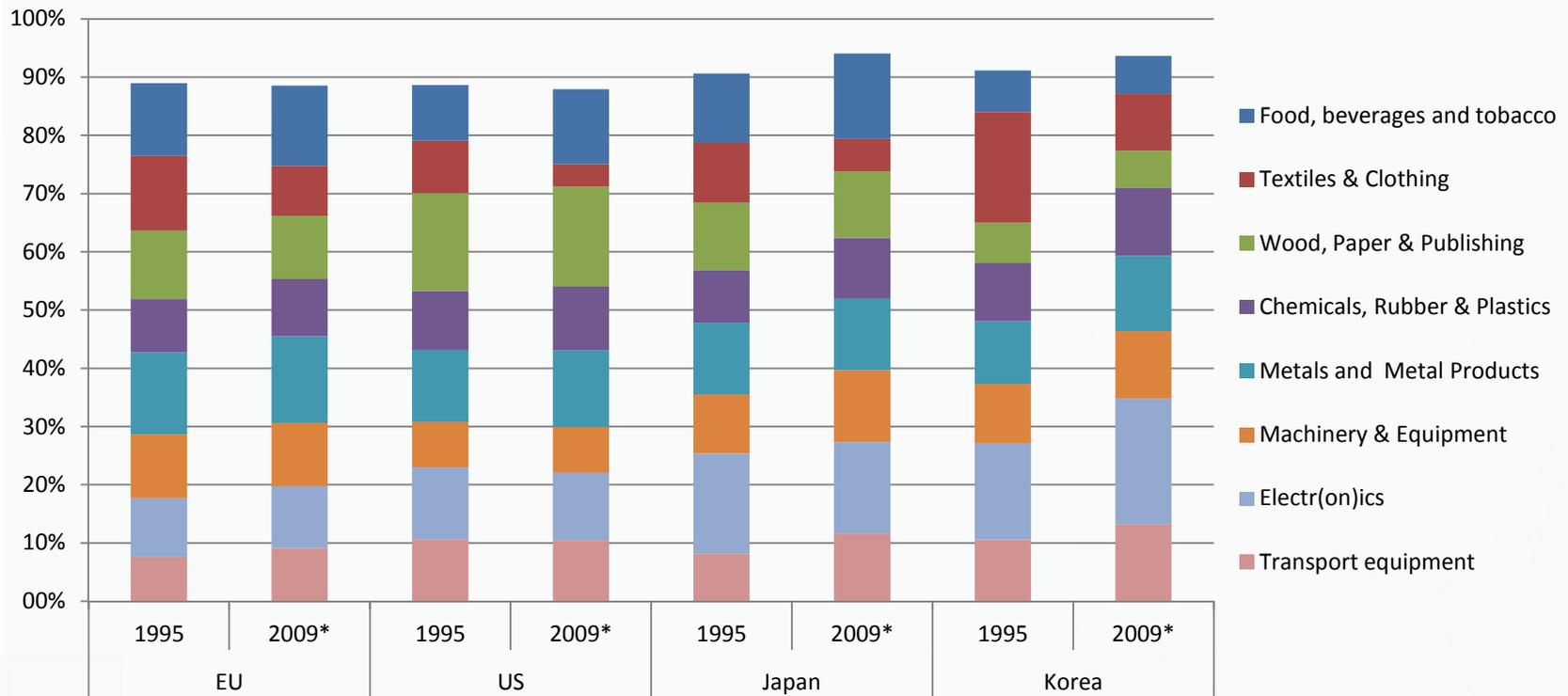
Manufacturing employment as a share of total employment



Source: OECD Statistics, 2009 or most recent year

Although all manufacturing sectors have witnessed drops in their shares of total employment, the drop is most notable in textiles and clothing

Share of sectors in manufacturing employment, 1995 and 2009



Source: Bruegel based on EUROSTAT and OECD STAN.
 Note: not available for China; * 2009 or most recent year.

1) Manufacturing's contribution to European economy is changing

Trends and evidence

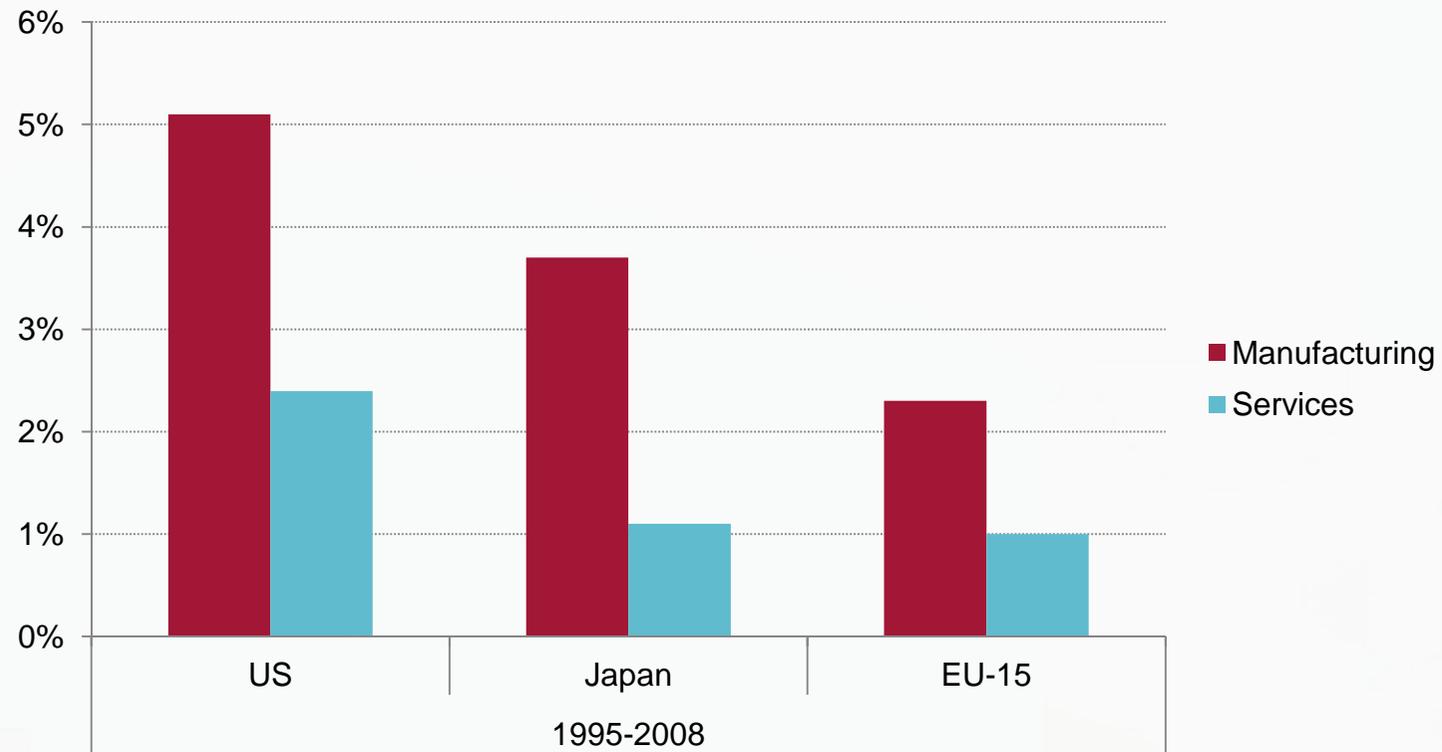
Manufacturing major contribution to European economies is through **productivity growth** and **external competitiveness**:

- A shift towards high value added activities
- Growing “servitisation” of manufacturing activities
- A greater importance of innovative capacity, requiring a high quality human capital base with a well educated and trained workforce.

This shift towards more skill-, value- and service-intensive jobs holds across all manufacturing sectors, not only for the high-tech sectors.

Manufacturing displays higher productivity growth compared to the services sector

Labour productivity growth of the manufacturing and the services sectors



Source: Bruegel based on Uppenberg (2011)

The loss of manufacturing jobs has been mostly the loss of low-skilled jobs, while the number of high-skilled jobs is increasing

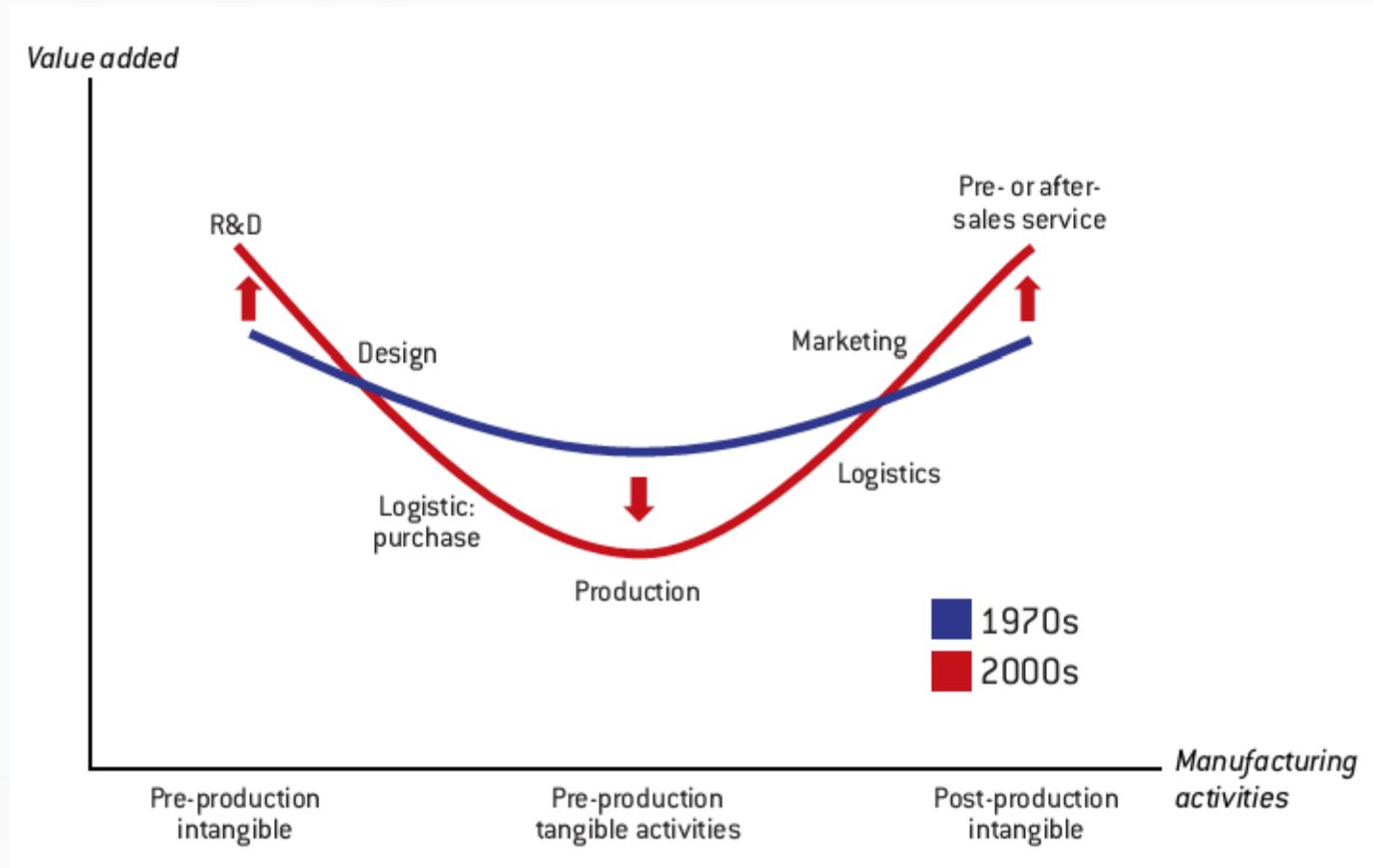
High vs low-skilled labour shedding in manufacturing,
average 1995-2007 indices (1995=100)

	High Skilled Labour	Low Skilled Labour	Ratio High/Low
Electr(on)ics	122	98	125
Transport Eq	129	97	133
Chemicals	122	94	130
Paper&Publish	120	92	130
Metals	127	100	127
Food	135	94	143
Textiles	111	75	148

Source: Strauss and Samkharadze (2011) on the basis of EU KLEMS.

The boundaries between manufacturing and services are blurring

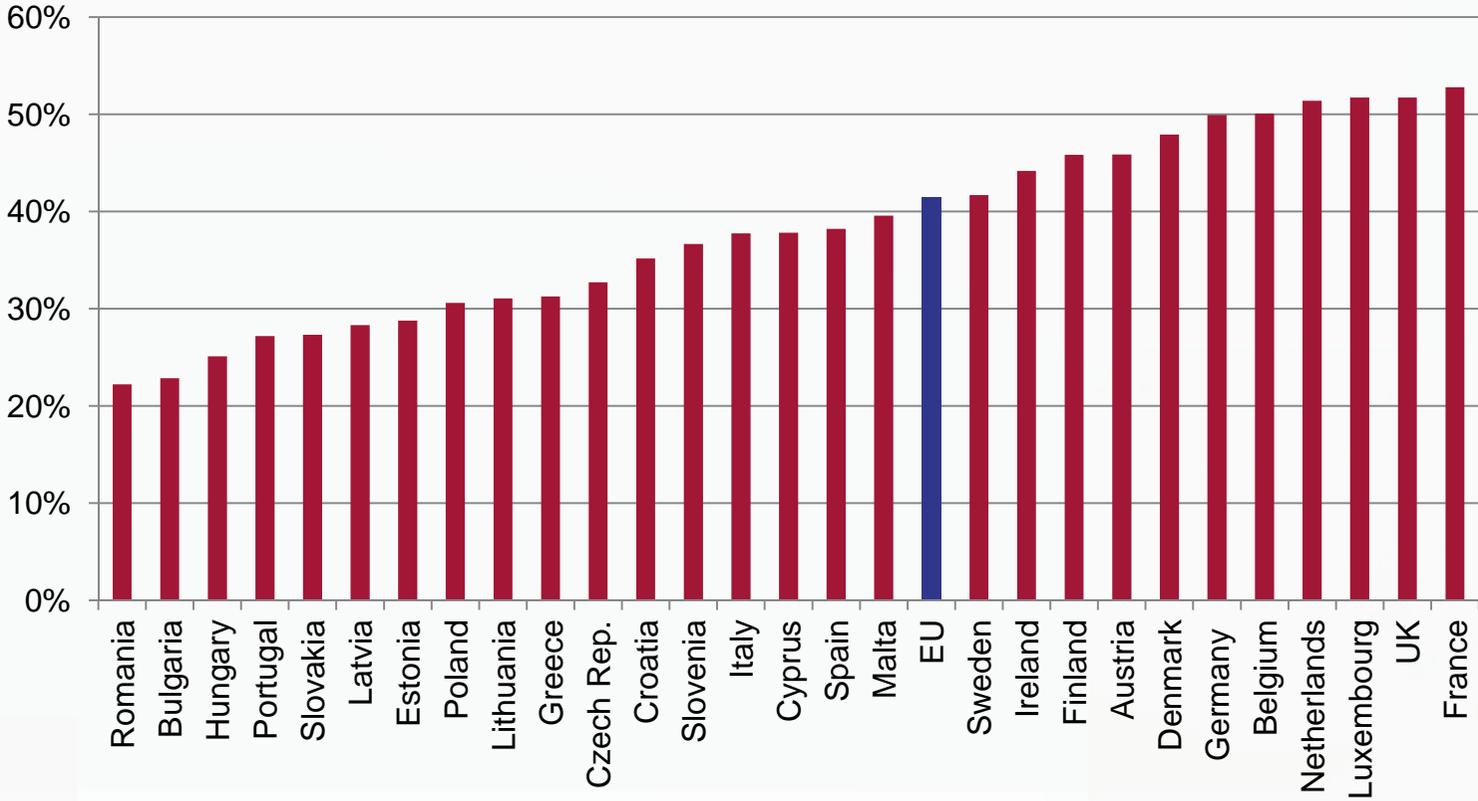
Manufacturing's "servitisation": the Smile curve



Source: Bruegel based on OECD

In 2012, the share of service-related jobs in the manufacturing sector was 42% for the EU as a whole

Share of service-related jobs in the manufacturing sector



Source: Bruegel based on EU Labour Force Survey

2) Manufacturing production and GVCs

Trends and evidence

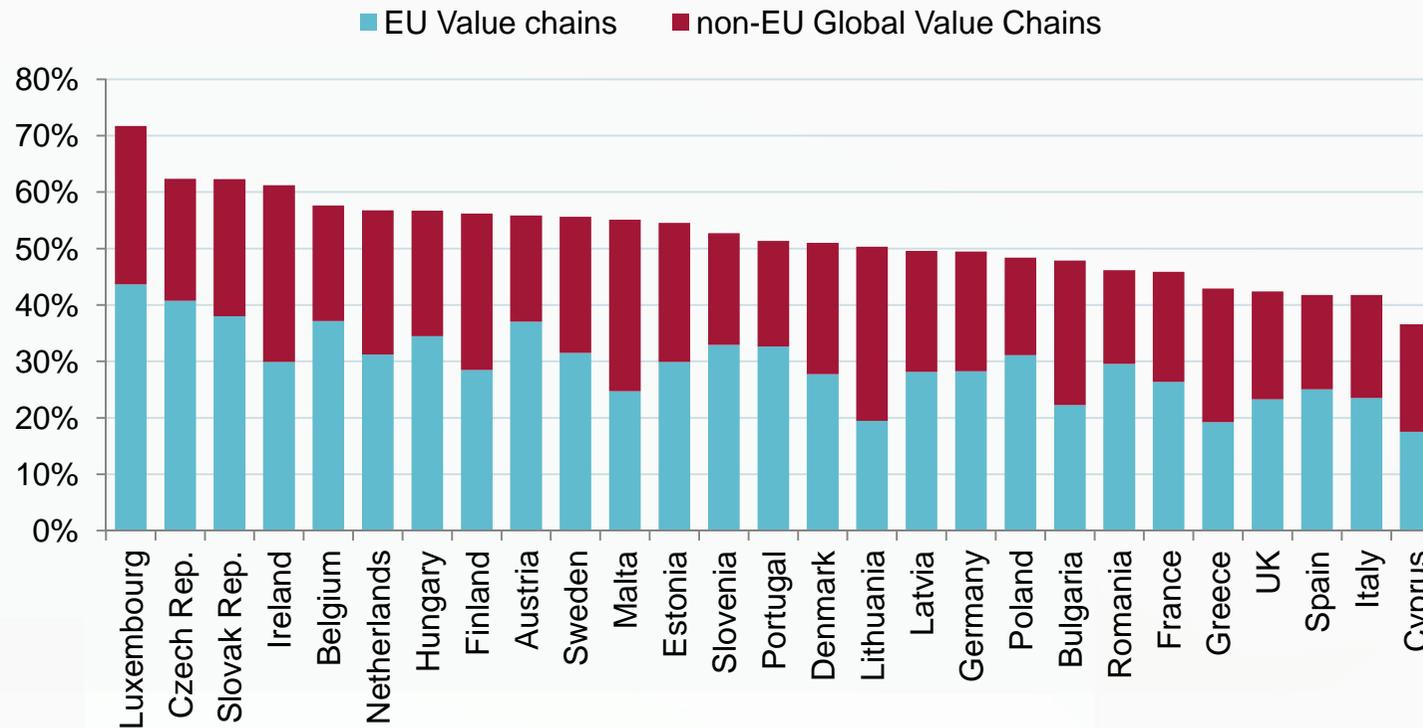
Manufacturing production continues to become more integrated within “Global” and “European value chains”:

- **Participation in Global Value Chains (GVCs)** allows firms and countries to build sustainable competitive positions, even more so if accompanied with innovative capacity
- **Only a few firms are intensively involved in GVCs**, but these few firms matter for Europe’s knowledge based growth and competitiveness performance, as these firms are large, trade-intensive, more innovative, with a high skilled workforce and a higher productivity profile
- Also firms that take an **intermediate position in global value chain** producing specific components for other firms in the chain, command higher productivity premia, particularly when they can exploit unique innovative capacities
- European firms participation in GVCs is **strongly EU oriented**:
 - *These European Value Chains (EVC) have resulted in a deeper integration of EU manufacturing and has significantly benefitted the competitiveness of the EU and individual member states in a global perspective.*
 - *Firms involved in EVC are not disadvantaged relative to firms that develop more global value chains.*

Participation in Global and European value chains

In 2009, (on average) **53%** of EU countries' exports were involved in Global value chains

...of which (on average) **56%** in European value chains.



Source: OECD Chapter 4 of the Report.

Participation in GVC is measured as the share of foreign inputs embedded in a country's exports (backward participation) plus the share of domestic inputs of that country embedded in other countries' exports (forward participation).

Participation in Global and European Value Chains: some firm level evidence

GVC Involvement and Multiple Modes: Mutually exclusive categories			
	Nr of firms	Detailed categories	Nr of firms
NO Zero moders	4232	Firms without substantial imports, exports, international production	4232
LOW Single moders	4742	Pure importers of components/services	1630
		Pure exporters	3072
		Pure international producers (through FDI or international outsourcing)	40
MEDIUM Dual moders	4999	Importers and exporters	4738
		Importers and international producers	96
		Exporters and international producers	165
HIGH Triple moders	786	Importers, exporters and international producers (through FDI or international outsourcing)	786

Number of firms by country and multiple mode internationalization

	Zero	Single	Dual	Triple
Total	28.7%	32.1%	33.9%	5.3%
AT	17.6%	30.5%	42.7%	9.3%
HU	27.1%	30.7%	35.3%	6.9%
FR	31.9%	31.6%	29.4%	7.1%
DE	23.2%	32.2%	42.6%	2.0%
IT	28.0%	34.4%	33.1%	4.6%
SP	33.9%	32.7%	30.6%	2.7%
UK	23.9%	31.2%	39.8%	5.1%

Source: Bruegel calculations on the basis of EFIGE

IIR and multiple mode internationalization

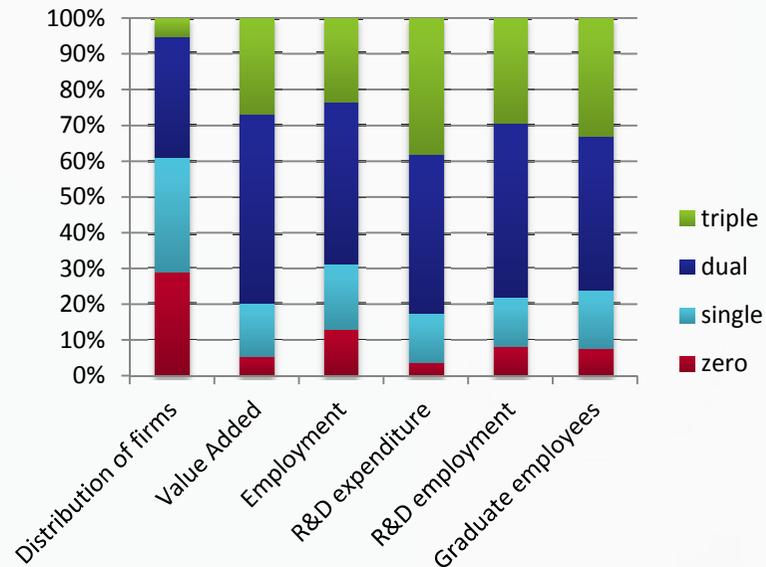
		Single	Dual	Triple
Intermediate Import	Average	21%	32%	38%
	Ratio	10%	20%	30%
Materials	Observations	1407	3027	548
Intermediate Import	Average	14%	22%	27%
	Ratio	5%	10%	20%
Services	Observations	271	797	260

Source: Bruegel calculations on the basis of EFIGE

Firm-level analysis of GVCs

Just few firms are involved in complex international strategies and GVCs and they substantially drive trade, value added, employment...

% of firms simultaneously involved in import, export and production abroad (Triple mode)		
Total manufacturing		5%
Low-tech	Food & Tobacco	2%
	Textile	12%
Medium-high-tech	Chemical & Pharma	8%
	Electrical equipment	10%



Firms can be involved in: import, export, production abroad activities (FDI or Outsourcing)

Zero mode = firms not substantially involved in internationalization activities

Single mode = firms involved in the simplest strategy: only 1 activity (IMP, EXP, FDI/OS)

Dual mode = firms involved in a combination of at least 2 activities (IMP, EXP, FDI/OS)

Triple mode = firms involved in a combination of the 3 activities (IMP, EXP, FDI/OS)

Source: Bruegel based on EFIGE Dataset

Firm level analysis of GVCs

....and they substantially drive trade flows

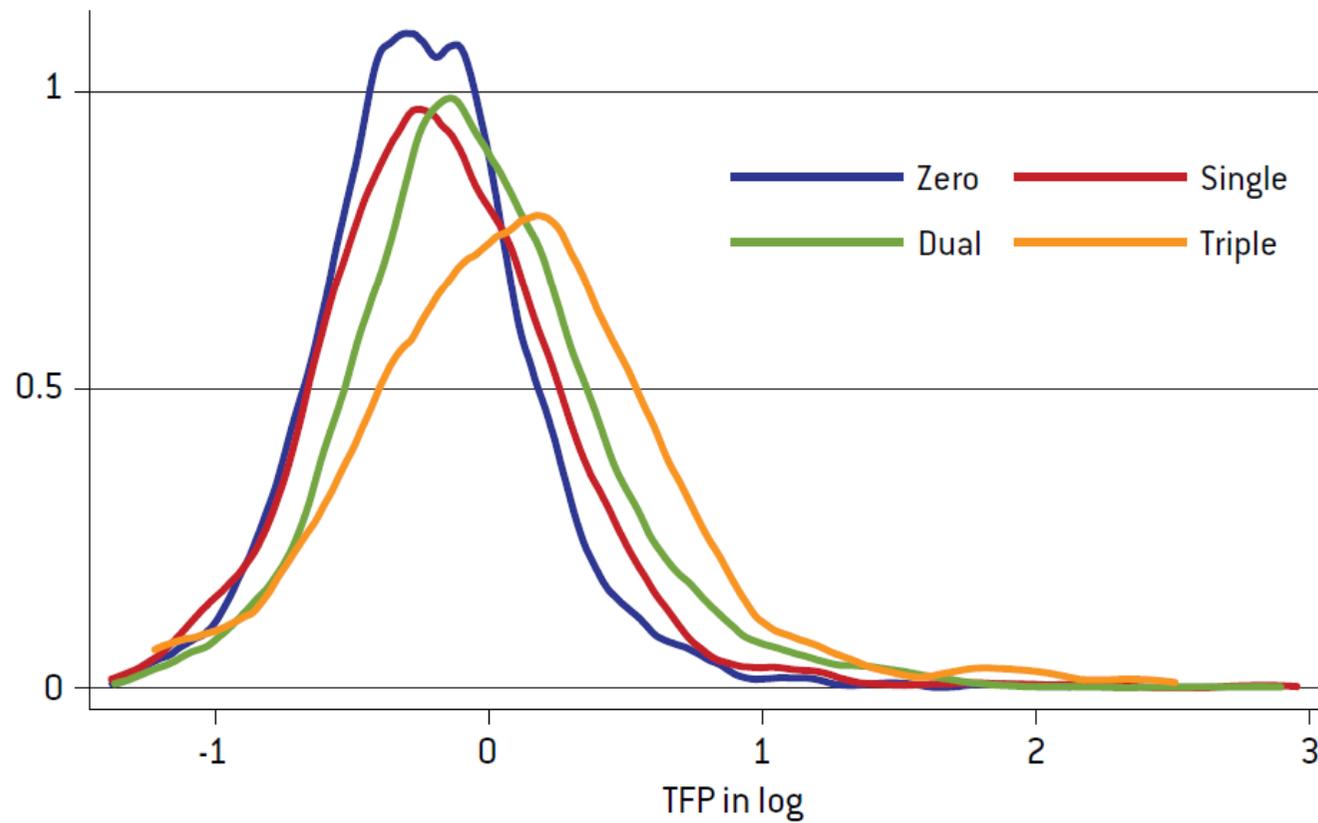
Import and Export turnover by sector and multiple mode internationalisation

	Import turnover			Export turnover		
	Single	Dual	Triple	Single	Dual	Triple
Total	4%	75%	21%	9%	58%	33%
Food & Tobacco	18%	64%	18%	18%	45%	37%
Textile	4%	55%	42%	13%	55%	32%
Wood, Paper, Printing, Furniture	7%	71%	22%	19%	62%	19%
Chemical and Pharma	1%	76%	23%	11%	62%	28%
Rubber and Plastic	4%	42%	54%	13%	56%	31%
Metal, Machinery and Equipment	9%	68%	23%	9%	53%	37%
Electrical and Optical equipment	9%	55%	37%	5%	54%	41%
Transport Equipment	6%	61%	33%	1%	51%	48%

Source: Bruegel calculations on the basis of EFIGE

Firm-level analysis of GVCs

...and productivity



Source: Bruegel based on EFIGE Dataset

A closer look at TFP performance, multi-moding and intermediate producers

OLS estimates of multiple moding on TFP

Dep. Variable: TFP		
	Model 1	Model 2
Single Mode	0.012 (0.01)	0.010 (0.01)
Dual Mode	0.056*** (0.02)	0.053*** (0.02)
Triple Mode	0.071** (0.03)	0.071** (0.03)
Intermediate home		0.016 (0.02)
Intermediate abroad		0.035** (0.02)
Firm age, fixed firm size effects, country, sector dummies, foreign group and foreign competition included; Dependent variable is log(TFP)		
Obs	7312	7312
R-square	0.283	0.284

* p<0.10, ** p<0.05, *** p<0.01

	Single	Dual	Triple
Intra-EU exports as share of total exports	71%	69%	64%
Intra-EU FDI as share of total FDI			50%
Intra-EU outsourcing as share of total outsourcing			46%

		Single		Dual		Triple	
		Non-EVC	EVC	Non-EVC	EVC	Non-EVC	EVC
TFP	Average	0.98	0.96	1.08	1.12	1.34	1.29
	Median	0.82	0.81	0.90	0.95	1.08	1.11
	<i>Observations</i>	756	748	1649	944	256	165
<i>Share of firms</i>			49%		37%		36%

Note: Firms are EVCs if the international activities in which they are engaged are predominantly (>50 percent) within the EU.

Opportunities for growth

Views from Manufacturing CEOs

- **On the manufacturing demand side: the new consumers who will enter the consumer class for manufactured goods. These will mostly be coming from the growing middle class in emerging markets.**
- **On the manufacturing supply side, a pipeline of innovations from new technologies provide further opportunities to bring new kinds of manufactured products on the market, reinvent existing products and improve the efficiency of manufacturing processes. Examples include 3D-printing, big data...**

Opportunities for growth

Views from Manufacturing CEOs

*Most important country for growth prospects of your company;
% of respondents (N=1258) mentioning country*

CN	US	Brazil	India	Germany	Russia	UK	France	Japan	Australia
30	22	15	14	12	8	6	5	5	4

Source: PWC-CEO survey 2012

*Reasons for importance of countries for growth prospects of your company
% of respondents mentioning reason*

	All location countries (weighted average)	EU countries (Germany, UK, France) (weighted average)	US	China
Grow customer base	78	75	71	79
Access local talent base	51	38	46	55
Build internal service delivery capacity	42	34	30	46
Build R&D capacity	25	21	26	27
Build Manufacturing capacity	24	11	17	30
Access raw material & components	24	10	19	34
Access local sources of capital	15	13	23	14

Source: PWC-CEO survey 2012

Policies for growth

Manufacturing Europe's future

- Manufacturing still matters for EU economies, but its nature is changing: *higher skills, value creation and increased 'servitisation'*
 - With this new profile, manufacturing remains a major contributor to productivity growth, innovation performance and Europe's external competitiveness.
- Manufacturing production continues to be more and more integrated within 'Global' and 'European value chains' ...through a few leading firms that are the engine of Europe's knowledge based growth and competitiveness.
 - The direct influence of policy on growth and job creation within national borders is limited.

Providing the framework conditions

Policies for manufacturing Europe's growth

- The target should be making Europe an attractive place for productive firms with unique innovative capabilities in efficient GVCs. These firms can be found in all sectors and activities within the value chain for products
 - 1) Provide the framework conditions to support these firms' GVC innovation-based growth path
 - 2) As these firms can be found in all sectors and activities, policies should be horizontal.
 - 3) Effective labour market policies are needed to reduce the adjustment costs borne by displaced workers.

- This is a shared policy agenda:
 - EU instruments together with national/regional specific policy agenda (see eg Southern Europe)

- Single market and competition policy are major EU instruments

The EU policy agenda

- Access to large, open and interconnected product markets
- Access to efficient supporting-services
 - Furthering the single market for transport, communications and telecommunications, business services
 - Interconnecting infrastructure for transport, telecommunications
- Access to specific skills and innovative capacity
 - Furthering the European Research and Innovation Area, eliminating barriers to the cross-border and cross-sector transfer of skills, knowledge and ideas.
 - Furthering the European Higher Education Area for (post-)graduate education
- Access to (cheap) energy by a fully efficient internal market for energy
- Access to finance for small and new firms that want to develop on world markets their ideas for new innovative products.
 - Addressing the fragility and the fragmentation of the financial sector in Europe, especially the risk-capital segments

Policies for Europe's growth

continued

- **Trade policy in a GVC environment should be about removing barriers multilaterally**
 - Trade policy instruments such as import tariffs may directly hurt the competitiveness of domestic firms.
 - Magnification effect of tariffs and non-tariff barriers along the value chain
 - Barriers between third countries upward or downward in the value chain matter as much as the barriers put in place by direct trade partners

- **The jobs agenda:**
 - Facilitating the structural shift between skills
 - Make Globalisation fund GVC compatible
 - Improve functioning of labour markets, training and education

Policies for Europe's growth

continued

- **Policy should be to allow firms to join GVCs/EVCs**

Cf EU's target of increasing the number of SMES to export to third countries

- Includes beyond exporting: importing of components, supplying components to local suppliers who are in GVCs...

- **Policy should be to allow firms to capture value in these GVCs/EVCs)**

- Value capture from owning critical unique know-how assets that cannot easily be imitated

Cf Innovation, IPR agenda

Policies for Europe's growth

Some pertinent questions

- **Do you need a (minimum) manufacturing base to capture value in GVCs? Danger of offshoring manufacturing? Reshoring?**
 - Depends on how critical manufacturing capacity is as unique complementary asset that needs to be tightly held/controlled versus contracting out to efficient markets

- **Who captures GVC value? A happy few with big financial pockets?**
 - Conditional on well functioning product, financial, labour, technology markets and IPR
 - Holders of unique skills, knowledge and complementary assets

New Industrial Policy: Beyond Manufacturing Sectors;

- **A horizontal policy agenda**

Nevertheless needed:

- **Market monitoring to assess (potential) barriers**

- Markets rather than classic sectors or technologies
- Including new emerging markets: prospective analysis
- Esp pivotal markets for growth:
 - digital,
 - finance,
 - energy,
 - biopharma...

- **If targetted support, then**

- Temporary: to leverage market forces
- Addressing market failures: esp initial eco-systems failures *cf Rodrick*
- Open: supporting multiple avenues, supporting (not preempting) next avenues
- Evaluate whether efficient, effective
- Internationally coordinated

SIMPATIC

SIMPATIC is a EC-FP7 project coordinated by Bruegel (Belgium) and involves the following partner organisations:

KU Leuven (Belgium), UNU-Merit (Netherlands), SEURECO (France), E3MLab (Greece), Universidad Complutense de Madrid (Spain), Federal Planning Bureau (Belgium), Imperial College (United Kingdom), Institut za ekonomska raziskovanja (Slovenia).

Project website: <http://simpatic.eu/>

SIMPATIC

SIMPATIC represents a unique bottom-up project proposal, bringing together, for the first time, a wide variety of top class micro and macro researchers with expertise in evidence based policy analysis, impact assessment, and the scope and nature of research and innovation policies. Doing so will enable us to use the best possible approach to simulate the impact of a number of research and innovation policy alternatives, providing new insights into the potential impact of various policy alternatives, thus contributing to advancing impact assessment and evidence based innovation policies in support of Europe's 2020 strategy.

- SIMPATIC's Micro-work:
 - ex post impact analysis of R&D subsidies and tax credits, green policies, social innovations
- SIMPATIC's Link: Own and other micro-insights will be used as input in SIMPATIC's Macro-work to improve additionality and spillover modelling of R&D
- SIMPATIC's Macro-work:
 - EU sectoral macro models, DEMETER and GEM-G3 will be upgraded to include the insights from micro-models

Are public R&D expenditures on R&D an area of smart fiscal consolidation?

**Effectiveness of Public R&D budgets:
what can be learned from
SIMPATIC micro and macro-analysis ?**

Effectiveness of Public R&D Interventions

- **SIMPATIC micro work uses structural econometric models for evaluation of R&D policy.**
 - SIMPATIC's approach allows to estimate the values of key parameters which describe
 - the costs of applying for a subsidy,
 - the benefits the agency derives from a given project (including the spillovers generated), and
 - the determinants of private R&D investment.
 - The model and the estimated parameters can then be used in counterfactual analysis to assess the costs and benefits of existing policies and analyse how new policies would work.
- **SIMPATIC offers the first systematic cross-country view on how firms apply for subsidies in different EU countries.** Belgium (Flanders), Finland, Germany, The Netherlands, and Spain.

The impact of R&D (policies) in applied macro-models

QUEST III (Roeger et al (2008)); Roeger et al (2013)

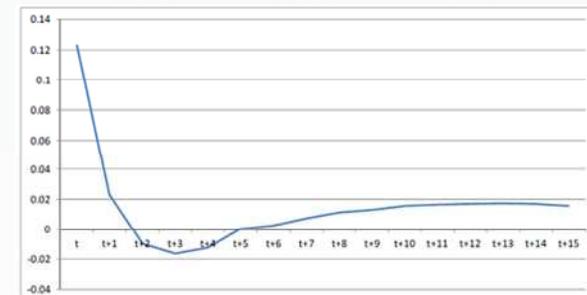
- **Effects from R&D tax credit of 0.1% of GDP (financed through an increase in lump-sum taxes to households)**
 - The results for the EU show a 0.31 percent increase in GDP in the long run.
 - Initial short run output losses due to the reallocation of high skilled workers from production to research.
 - Positive effects on GDP only start occurring after 10 years,
 - For employment, no significant long-run effect.
 - In the long-run R&D intensity rises by 0.08 percentage points. About 25% of the total increase in R&D spending is due to higher wages in these simulations.
- **A subsidy on the wages of researchers in the R&D sector is somewhat more effective**
- **In Spain, Portugal, Italy, Greece: catching up gives much bigger effects for structural reforms (esp educational reform reducing the share of low skilled) than for R&D tax credits**

The impact of R&D (policies) in applied macro-models

- **NEMESIS model's exercise to assess the impact of the European Commission's FP7 2013 budget allocation of Euro 8 billion (SIMPATIC WP no 10).**
- **Using the international and intersectoral spillover matrix and a calibrated leverage effect of 0.74 yields 13.9 billion of extra R&D from the Euro 8 billion of FP7-2013.**
- **The total cumulative extra GDP estimated from the Euro 8 billion shock amounts to Euro 75 billion after 15 years, 86 billion after 20 years. This would imply a multiplier of around 6 from the extra 12,9 billion R&D, a multiplier of around 10 from the extra 8 billion of FP7 funds.**

- **The extra jobs estimated in the EU after 15 years is 38.000 jobs.**

Impact on EU employment from the FP7 2013 budget; Simulations from DEMETER
Employment trends (% gap from central account).



Source: SIMPATIC WP n°10 (SEURECO, FPB and ICCS (2013).