

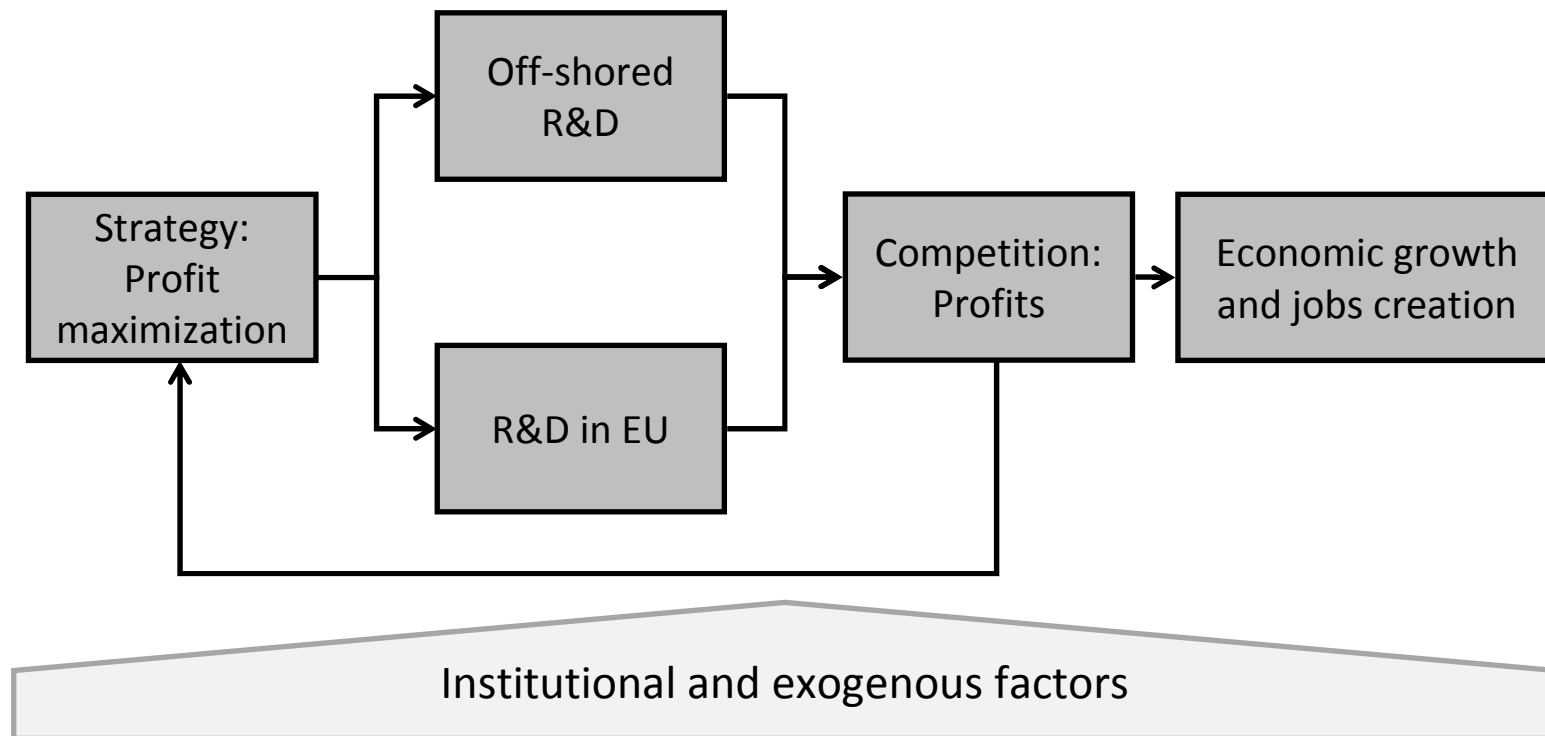
Discussion session on WP5

Objectives

- The evolution of global production networks (GPNs) into global innovation networks (GINs).
- The impact on the knowledge intensive activities in the EU.
- To understand the contribution of fragmentation of production to the creation of GINs from a firm perspective, by exploring:
 - The role played by the stages of the production processes offshored.
 - The role of the adoption of ICTs in determining different firms' internationalization modes.
 - How different innovation strategies interact with the internationalization ones.
 - MNC's views and needs regarding institutional frameworks.

Micro-macro perspective

- What are the strategic drivers of off-shoring?
- What type of R&D is off-shored?
- Is there Complementarity/Substitution (C/S) with R&D in the EU?
- How GINs are managed?



Micro-macro perspective

Decision	C/S	Market outcome
R&D in Europe	Complementarity	• Long-term competition – Loss in EU/world market share? – Loss in profits? • Maintaining production and jobs in the EU?
	Substitution	• Long-term competition – Loss in EU/world market share? – Loss in profits? • Maintaining production and jobs in the EU?
R&D off-shored	Complementarity	• Maintaining/increasing EU/world market share • Maintaining/increasing profits • Maintaining/increasing production and jobs in the EU
	Substitution	• Maintaining/increasing profits • Loss in production and jobs in the EU

Specific questions in the paper

Institutional dynamics driving the specific R&D strategy	Organisational mechanisms for the coordination of widely dispersed R&D units	Knowledge management
• availability of skills (C/S) • the location of world class centres of technology excellence (C/S) • market competition (C/S) • the quality of local institutions such as IP regulations (C/S) • R&D tax incentives etc. (C/S)	• strategic control at the HQ locations versus autonomy in decision making at dispersed R&D locations is done (C/S) • how R&D tasks are assigned to various locations (C/S)	• integration of globally sourced knowledge from both within the enterprise and from external sources • intra-organisational and external collaborations • the upgrading of the technological capabilities • managerial skills at its overseas locations etc.

(C/S) Complementarity / Substitution

Answers to specific questions

		ICT	Automotive	Agro-processing
Institutional dynamics driving the specific R&D strategy	1.			
	2.			
	3.			
Organisational mechanisms for the coordination of widely dispersed R&D units	1.			
	2.			
	3.			
Knowledge management	1.			
	2.			
	3.			

ICT industry

	R&D organisation	R&D strategies	Conclusions
firm 1	Four legs: firm 1 Research, Applied Technologies, Philip's incubators, and IP & Standards with centres worldwide	- The location of 6 research labs was driven by supply factors - Since 1990s market driven R&D - Open innovation strategy - Products developed for world market - In Bangalore (India): consolidation of software operations in single location outside Eindhoven	Complementarity / Substitution
firm 2	25 R&D centres	- The location is driven by factors: innovation capability, flexibility of workforce, legal framework and costs - Close to key markets - Products are developed for world market	Complementarity / Substitution
firm 3	25 R&D centres worldwide	- The location is driven by access to competencies and markets - Products are developed for world market - Open innovation strategy	Complementarity / Substitution

Automotive industry

MNE	R&D organisation	R&D strategies	Conclusions
firm 4	• 117 R&D centres research or development focused • 48 centres in home country, 33 in other regions in Europe, 15 in North America, 10 in Mercosur, 11 in the rest of the world	• Key activities are based in HQ location due to high investment costs • Location drivers are closeness to the markets and access to competencies and knowledge • Quicker response to market needs • Local centres mainly customize basic technologies to local needs, occasionally developing specific capabilities	Complementarity
firm 5	• 50% of R&D is performed in Sweden, the rest in Europe, USA, Asia and South America	• Strategic development is centralised and based mainly in Europe, and some in the US and Japan • New solutions and products are developed mainly in Europe • Applied research and applications are carried out in Europe, US, Japan, India, and to smaller extent in Australia and Brazil • Centres in Brazil and India mainly customize to local needs • Location in Bangalore primarily due to cost factor and skills, but recently also market	Complementarity

Agro-processing industry

	R&D organisation	R&D strategies	Conclusions
Company I	5 R&D centres in Europe, US and China	- Internationalize to seek supplementary skills, specialists input - The presence of customers, and whether the company already has some production in the location and on a sound legal system - Product development for local markets engaging with supplies and customers	Complementarity
Company II	10 R&D locations on 5 continent	- Some R&D sites evolved from their existing global production network (China) while others are part of a strategy of accessing supplementary knowledge capacities new research areas (India) - center for excellence for the global R&D operations	Complementarity

Table II Cases and the Typology of Global Innovation Networks

	Global (G / g)	Innovation (I / i)	Network (N / n)
Company I GIN	-5 large R&D platforms in Europe, US, R&D satellite in set up in	-Future oriented, new to the world innovation. 6 % of turnover into R&D	Development: customers 10% of R&D spending outside the company (universities)
Company II GIN	R&D projects managed globally 10 R&D locations spanning 5 continents	14 % of turnover into R&D Bio-tech	Collaborations: - with firms in , - universities in - universities in
Company III giN	Sample collections globally R&D at HQ in	Marketing driven research Focus on end-customer	University Collaborations, A high number of co- sponsored professors, PhDs and post docs in
Company IV gi/IN	6 R&D centres in	R&D is predominantly market oriented Some research into milk- genome	Public research funding University partners 10-15% of R&D budget is spent externally

Table III R&D Organisation, R&D Management and R&D Strategies in MNEs in the Agro-Food Sector

	Company I	Company II
Global R&D structure and organization	Less than 20% of research team in the same location as the project leader. Customer collaboration in development as problem solving and knowledge provider. Centrally coordinated R&D, Innovation Committee.	R&D in specialised centers of excellence. Exploitation: developed from global production to global innovation in . Exploration: innovation in new fields in by acquiring a firm. Some outsourcing of codified tasks to experts.
Mechanisms for global integration	Emphasis on culture, designed for innovation. CreActors harvesting good ideas in the company. Project teams of experts in each site	Effort into exporting the Scandinavian model. Emphasis on the movement of people and communication tools.
Enhance learning and knowledge integration	Collaborations with partners in many new areas in the sector (tyres, pharma related). Virtual centers of excellence. Tracking new technology developments in universities through award program.	No geographical limitations for knowledge and learning! Physical centers of excellence Recruitment into new networks at new locations.

Drivers of R&D internationalisation

- These listed drivers of R&D internationalisation somewhat differ from the ones stated before.
- MNE's R&D internationalisation is driven by various pull and push factors that are both external and internal (within the MNEs) – the meaning is not clear (endogenous & exogenous factors vs. cost & demand factors)?

Internal factors	External factors
need to increase R&D productivity	the presence of specialised suppliers
need to ensure greater returns from R&D investments, in order to stay competitive	the technical expertise in the region
	the unique knowledge inflow from the market that is indispensable for innovation in order to enable greater responsiveness
	the industry characteristics such as the extent of the fragmentation of the value chain and vertical specialisation
	the extent of advanced technology utilised to ensure flexibility in the innovation process, are certain other factors explaining dispersion of the MNE's innovation process.

Internationalisation strategies

- Developing specialised functional expertise at offshore R&D locations to:
 - build greater innovation capability
 - reduce duplication of functions in various locations
 - increase flexibility to shorten product development and serve fragmented markets faster
- Developing local purchasing and sourcing as an inroad to important high-growth markets
- Developing low-cost products and solutions by cheaper design implementations that are very different from that in high-end markets in advanced countries but do not compromise on quality
- Undertaking the development of standardised products/technologies in leading markets which can be later rolled out globally
- → **Complementarity rather than Substitution**

Internationalisation vs. innovation

	Innovation strategies
Internationalisation strategies	

Externalisation of R&D

- Partnering with universities globally on basic and fundamental research
- Outsourcing of non-core development and support functions to specialised technology suppliers and service providers overseas as a cost-effective strategy
- In-licensing and acquisition of external technological assets to develop differentiated innovative products and to cater for the local market
- Out-licensing and the option of spin-off ventures by MNEs to help develop and commercialise technology outside its core area

Conclusion in the report

- This report does not suggest that there is a relocation of R&D from Europe to other markets → Complementarity which varies by industry
- The strategic R&D that requires specialised know how and high investments are centralised, mainly at HQ locations, some in European location outside the HQ and in the US.
- The applied research and application, and engineering are dispersed and are located near their important markets.
- Globalization of innovation is due to the distributed nature of scientific and technical knowledge, to allow MNEs to become embedded in regional innovation hubs and to be present in some of the most important markets.

Summary of objectives

	ICT	Automobiles	Agro-Food
The role played by the stages of the production processes offshored.	(+)	(+)	(+)
The role of the adoption of ICTs in determining different firms' internationalization modes.	(+)	(+)	(+)
How different innovation strategies interact with the internationalization ones.	(+)	(+)	(+)
MNC's views and needs regarding institutional frameworks.	(-)	(-)	(-)

Questions

Questions

Are there fundamental differences between centres of the same firm located in developed and developing countries?

Extent to which R&D is driven by production for global market or adaptation to local market by industry?

Substitution between work force in different countries – does upgrading reduce jobs elsewhere or is there new products/market development ?

What is the learning curve for R&D centres located in developing countries in different industries?

Are there spill-overs between MNEs and local firms?

How to measure the significance and contribution of research centres in different countries ?