MNEs, innovation and geography

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LSE

General aims of this presentation

1. Looking for geography (the *L*!) in the theory of MNE: the (still present) 'national bias' of economic/IB literature
2. Shedding light on the sub-national dimension of (innovation) activities by MNEs, overcoming
3. Providing some evidence on the organisation of intra-firm and inter-firm networks for technology creation and capability upgrading

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Outline of the presentation

- Basic definitions and stylised facts
- The background: the eclectic OLI paradigm and the weakness of the L
- From the hierarchical to the heterarchical MNE: MNE networks for innovation, technology and learning
- Evidence 1: MNE technological activities in the European regions
- Evidence 2: MNE role in upgrading Technological Capabilities (TC): the case of 2 Mexican regions
- Some interesting new directions in the study of MNEs, geography and innovation

Some basic definitions

- **Multinational Enterprises** (MNE) or the '**Global**': key actor in international production and globalisation of economic and innovation activity
- The '**Local**': the 'places, i.e. the sub-national regions which host MNE production and innovation investment
- **Innovation** & **Technology**: the main engines of growth, the interface between the 'global' and the 'local'
- **Globalisation of innovation**: strengthening of intra-firm coordination and inter-firm linkages for MNEs' creation of new (technical and non) knowledge across national boundaries. It refers to a high degree of interdependence among geographical dispersed actors and processes. Note: in principle, a higher interrelatedness among geographically dispersed units is possible even with the same level of internationalisation of production and technology

Why MNEs are the 'global'? Some stylised facts

FDI outward stock as a percentage of GDP, 1990-2009

(Per cent)

Region / economy	1990	1995	2000	2005	2009
World	10.0	12.2	25.2	27.6	33.2
Developed economies	11.2	14.0	28.8	32.7	40.8
Europe	11.8	15.5	42.4	43.6	57.8
European Union	11.3	14.5	41.4	41.9	55.0
Other developed Europe	21.4	35.1	62.7	78.2	110.2
North America	12.8	18.7	27.9	29.8	31.2
Other developed countries	6.9	5.2	7.5	11.4	18.2
Developing economies	4.1	5.9	12.9	12.5	16.5
Africa	4.6	6.8	8.3	5.9	7.9
North Africa	1.0	0.9	1.3	1.2	3.9
Other Africa	7.1	11.0	14.4	8.8	10.5
Latin America and the Caribbean	5.4	5.1	10.2	13.3	16.4
South and Central America	5.3	4.3	5.9	7.4	9.0
Caribbean	11.5	67.8	293.9	371.6	564.2
Asia	3.3	6.1	14.8	13.1	17.6
West Asia	2.1	1.9	2.5	4.2	9.7
South, East and South-East Asia	3.6	6.8	17.1	14.9	19.0
East Asia	5.4	8.8	22.9	18.5	22.2
South Asia	0.1	0.1	0.4	1.0	4.3
South-East Asia	2.8	7.7	15.1	19.7	25.2
Oceania	6.4	7.4	10.1	5.6	5.2
South-East Europe and the CIS	..	0.9	6.0	14.6	16.1

Source: UNCTAD, FDI/TNC database (www.unctad.org/fdistatistics).

FDI inward stock as a percentage of GDP, 1990-2009

(Per cent)

Region / economy	1990	1995	2000	2005	2009
World	9.8	11.4	23.3	25.4	30.7
Developed economies	9.0	10.8	23.0	25.5	31.5
Europe	10.7	12.7	27.5	34.2	46.5
European Union	10.6	12.5	27.5	34.1	45.5
Other developed Europe	13.0	16.1	27.6	36.7	66.4
North America	10.2	14.2	28.6	23.4	23.4
Other developed countries	2.8	2.9	4.1	7.8	10.5
Developing economies	13.6	14.6	25.0	25.2	29.1
Africa	12.1	17.0	26.0	27.3	34.6
North Africa	12.6	16.2	17.4	22.9	32.5
Other Africa	11.8	17.5	32.7	29.8	36.0
Latin America and the Caribbean	9.9	10.5	24.3	29.7	36.5
South and Central America	9.7	10.3	21.5	26.2	29.8
Caribbean	13.4	14.2	81.5	99.8	187.5
Asia	15.8	16.3	25.2	23.1	25.7
West Asia	8.8	8.5	8.8	15.6	25.6
South, East and South-East Asia	17.4	17.6	28.4	24.7	25.8
East Asia	25.9	21.0	31.7	26.0	25.4
South Asia	1.3	2.6	4.2	6.1	11.2
South-East Asia	18.2	22.6	44.5	44.7	46.3
Oceania	24.9	22.5	29.9	26.3	44.1
South-East Europe and the CIS	..	2.1	15.6	25.3	27.5

Source: UNCTAD, FDI/TNC database (www.unctad.org/fdistatistics).

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Table 1.3 The world's top 20 non-financial TNCs, ranked by Transnationality Index, 2008 [a]

Ranking by: Foreign assets	TNI b	Corporation	Home economy	Industry [c]	TNI [b] (Per cent)
37	1	Xstrata PLC	United Kingdom	Mining & quarrying	93.2
87	2	ABB Ltd.	Switzerland	Engineerig services	90.4
40	3	Nokia	Finland	Electrical & electronic equipment	90.3
66	4	Pernod Ricard SA	France	Food, beverages and tobacco	89.1
67	5	WPP Group Plc	United Kingdom	Business services	88.9
3	6	Vodafone Group Plc	United Kingdom	Telecommunications	88.6
72	7	Linde AG	Germany	Chemicals	88.3
13	8	Anheuser-Busch Inbev SA	Netherlands	Food, beverages and tobacco	87.9
46	9	Anglo American	United Kingdom	Mining & quarrying	87.6
10	10	ArcelorMittal	Luxembourg	Metal and metal products	87.2
27	11	Nestlé SA	Switzerland	Food, beverages and tobacco	87.1
88	12	Air Liquide	France	Chemical/Non-metallic mineral products	86.9
61	13	Liberty Global Inc	United States	Telecommunications	86.2
58	14	Astrazeneca Plc	United Kingdom	Pharmaceuticals	85.4
100	15	Teva Pharmaceutical Industries Limited	Israel	Pharmaceuticals	84.4
41	16	Lafarge SA	France	Non-metallic mineral products	84.2
57	17	Volvo AB	Sweden	Motor vehicles	82.3
25	18	Hutchison Whampoa Limited	Hong Kong, China	Diversified	82.0
55	19	Cemex S.A.	Mexico	Non-metallic mineral products	81.6
4	20	BP PLC	United Kingdom	Petroleum expl./ref./distr.	81.0

Source: UNCTAD/Erasmus University database.

[a] All data are based on the companies' annual reports unless otherwise stated.

[b] TNI is calculated as the average of the following three ratios: foreign assets to total assets, foreign sales to total sales, foreign employment to total employment.

[c] Industry classification for companies follows the United States Standard Industrial Classification Commission (SEC).

[d] In some cases foreign employment was calculated as the share of foreign employment in total employment of the previous year to total employment of 2008.

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Table 1.4 The top 20 non-financial TNCs from developing and transition economies, ranked by Transnationality Index, 2008[a]

Ranking by: Foreign assets	Ranking by: TNI[b]	Corporation	Home economy	Industry[c]	TNI[b] (Per cent)
39	1	First Pacific Company Limited	Hong Kong, China	Electrical & electronic equipment	99.0
35	2	China Merchants Holdings International	Hong Kong, China	Diversified	96.8
73	3	Guangdong Investment Limited	Hong Kong, China	Diversified	95.1
93	4	Road King Infrastructure Limited	Hong Kong, China	Transport and storage	90.4
60	5	Li & Fung Limited	Hong Kong, China	Wholesale trade	90.3
87	6	Shougang Concord International	Hong Kong, China	Metal and metal products	89.1
34	7	China Resources Enterprises	Hong Kong, China	Petroleum expl./ref./distr.	89.0
49	8	Sappi Limited	South Africa	Wood and paper products	85.2
1	9	Hutchison Whampoa Limited	Hong Kong, China	Diversified	82.0
95	10	Techtronic Industries Company Limited	Hong Kong, China	Other equipments goods	81.8
3	11	Cemex S.A.	Mexico	Non-metalic mineral products	81.6
63	12	Acer Inc.	Taiwan Province of China	Electrical & electronic equipment	79.9
60	13	Medi Clinic Corp. Limited	South Africa	Other consumer services	78.7
75	14	Beijing Enterprises Holdings Ltd.	China	Diversified	77.0
54	15	Suzlon Energy Limited	India	Diversified	75.7
62	16	Pou Chen Corp.	Taiwan Province of China	Other consumer goods	71.6
29	17	Hindalco Industries Limited	India	Diversified	71.6
15	18	Tata Steel Ltd.	India	Metal and metal products	69.8
98	19	TPV Technology Limited	China	Wholesale trade	69.8
24	20	Qatar Telecom	Qatar	Telecommunications	69.7

Source: UNCTAD/Erasmus University database.

[a] All data are based on the companies' annual reports unless otherwise stated.

[b] TNI is calculated as the average of the following three ratios: foreign assets to total assets, foreign sales to total sales, foreign employment to total employment.

[c] Industry classification for companies follows the United States Standard Industrial Classification Commission (SEC).

[d] In some cases foreign employment was calculated as the share of foreign employment in total employment of the previous year to total employment of 2008.

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The Top 20 financial TNCs ranked by Geographical Spread Index (GSI), 2009 [a]

Rank 2009	GSI[b]	Financial TNCs	Home economy	Affiliates: Total	Affiliates: Number of foreign affiliates	Affiliates: I.I.[c]	Affiliates: Number of host countries
1	75.3	Citigroup Inc	United States	796	601	75.5	75
2	69.4	BNP Paribas	France	755	596	78.9	61
3	68.7	Allianz SE	Germany	546	444	81.3	58
4	65.0	Generali Spa	Italy	278	261	93.9	45
5	64.5	Societe Generale	France	380	277	72.9	57
6	61.0	UBS AG	Switzerland	615	602	97.9	38
7	60.8	Unicredito Italiano Spa	Italy	853	829	97.2	38
8	59.5	HSBC Holdings PLC	United Kingdom	741	485	65.5	54
9	58.3	Axa	France	542	485	89.5	38
10	57.5	Deutsche Bank AG	Germany	949	804	84.7	39
11	53.2	Zurich Financial Services	Switzerland	265	259	97.7	29
12	53.1	Credit Agricole SA	France	312	191	61.2	46
13	51.5	Credit Suisse Group AG	Switzerland	209	179	85.6	31
14	50.8	ING Groep NV	Netherlands	884	506	57.2	45
15	48.2	Morgan Stanley	United States	147	118	80.3	29
16	47.9	Swiss Reinsurance Company	Switzerland	91	87	95.6	24
17	47.4	The Bank Of Nova Scotia	Canada	118	106	89.8	25
18	47.0	Banco Santander SA	Spain	390	308	79.0	28
19	47.0	Natixis	France	217	137	63.1	35
20	46.4	Nomura Holdings Inc	Japan	104	86	82.7	26

Source: UNCTAD/HEC Montréal.

[a] Data on affiliates is based on the Dun and Bradstreets 'Who owns Whom' database.

[b] GSI, the "Geographical Spread Index", is calculated as the square root of the Internationalization Index multiplied by the number of host countries

[c] II, the"Internationalization Index", is calculated as the number of foreign affiliates divided the number of all affiliates

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CITIES WITH 5 OR MORE FORTUNE GLOBAL 500 COMPANIES' HEADQUARTERS (WORLD'S LARGEST CORPORATIONS)							
City Rank 2009	**City**	**No. of Global 500 Companies**		**City Rank 2006**	**City**	**No. of Global 500 Companies**
1	Tokyo	51		1	Tokyo	52
2	Paris	27		2	Paris	27
3	Beijing	26		3	New York	24
4	New York	18		4	London	23
5	London	15		5	Beijing	15
6	Seoul	11		6	Seoul	9
7	Madrid	9		7	Toronto	8
8	Toronto	7		8	Madrid	7
8	Zurich	7		8	Zürich	7
8	Osaka	7		9	Houston	6
8	Moscow	7		9	Osaka	6
8	Munich	7		9	Munich	6
9	Houston	6		9	Atlanta	6
10	Mumbai	5		10	Rome	5
10	Atlanta	5		10	Düsseldorf	5
10	Amsterdam	5				
Total		213				206

Source: http://money.cnn.com/magazines/fortune/global500/2011/

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UNCTAD database

- http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en
- http://unctad.org/en/Pages/DIAE/World%20Investment%20Report/Annex-Tables.aspx
- http://unctad.org/en/Pages/DIAE/World%20Investment%20Report/Regional-FDI-at-a-glance.aspx

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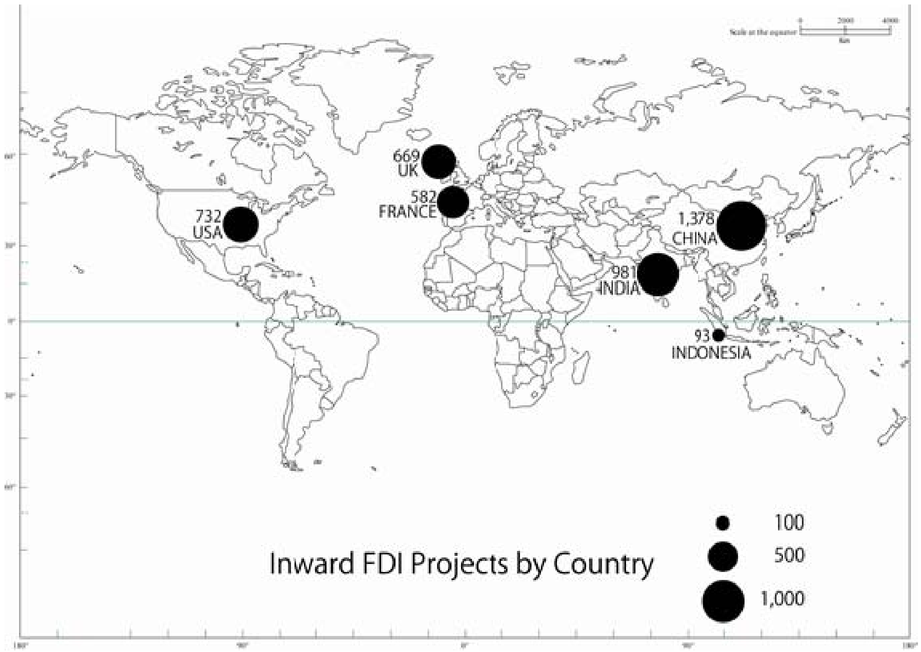

Fig. 8.1 The Number of Greenfield Inward FDI Projects by Country in 2005 . Source: Iammarino & McCann, 2013., chapter 8. 11

BUT.....

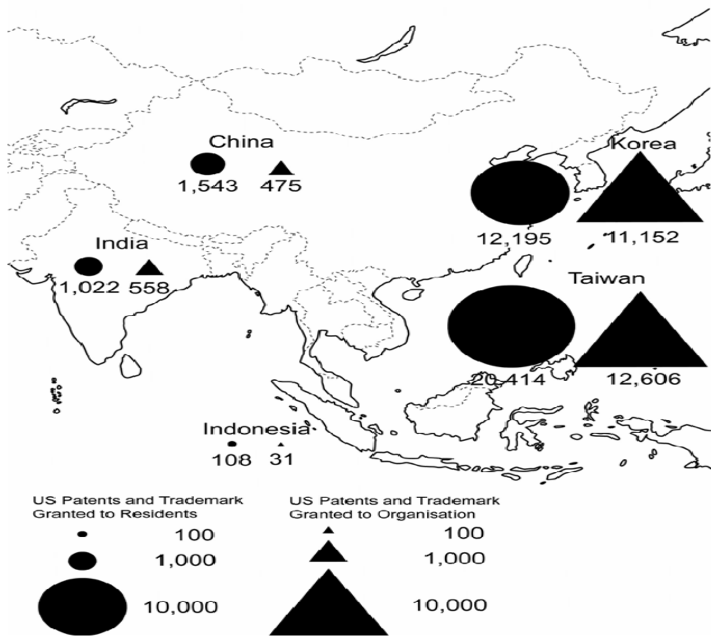

Fig. 8.2 Asian Knowledge Indicators: Patents (Source: Arita et al. 2010)

MNEs in the literature

In contrast to the IB&M literatures:

- Innovation studies and economics of technological change focus on uni-national, uni-located, mono-activity *firm*
- Traditional economic geography and location theory + most recent developments in both NTT and NEG concentrate on *activities* of MNEs (FDI)
- Clustering and network (i.e. new value-chain divisions of labour) literature focus primarily on *linkages,* both spatial and non-spatial

But the PLACES of MNEs operations and involvement largely neglected by the theory: L advantages essentially attributed to either countries or firms

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Short theoretical background: the eclectic OLI paradigm (Dunning)

Ownership Advantages: ***Why*** do firms go international?

A unique competitive asset owned by firms vis à vis their major rivals (key role of technology and other immaterial assets)

Localisation Advantages: ***Where*** do firms internationalise?

Benefits from carrying out economic and innovative activities in a given location (e.g. market size, cost differentials, agglomeration economies, localised technological capabilities)

Internalisation advantages: ***How*** do firms internationalise?

Benefits from controlling over the assets needed for international operation, instead of coordinating them via "external modes"

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The eclectic OLI paradigm (*cont.*)

The eclectic approach is useful:

- Simple, general, different aspects, different levels of analysis, accommodates all major pre-existing and newer theories of international production

Key theories in the OLI (important for MNE geography):

- ***'correspondence principle' and locational pyramid*** (Hymer)
- ***product life cycle and comparative advantages of nations (and the metropolis)*** (Vernon)
- ***vertical and horizontal integration*** (Caves)
- ***knowledge-capital model*** (e.g. Ethier, Helpman, Krugman, Horstmann, Markusen, Venables)
- ***transaction costs*** (e.g. Buckley, Casson, Hennart, Rugman, Teece)
- ***dispersion versus concentration (NEG)*** (e.g. Fujita, Krugman, Venables)
- ***resources, technological competence and capabilities*** (e.g. Birkinshaw, Chesnais, Cantwell, Dunning, Kogut, Zander)

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John Dunning (1998 and 2009, p. 5): "The OLI triad of variables [....] may be likened to a three-legged stool: each leg is supportive of the other, and the stool is only functional if the three legs are evenly balanced"

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Going back to Hymer (1970, 1972) and the *L*

- **'Law of increasing firm size'**
- **'Correspondence principle'**
- **'Law of uneven development'**

The 'spatial dimension of the corporate hierarchy':

The pyramidal structure of corporate control centralisation translates directly into a *hierarchical structure of geographical locations*. Some of these locations are heavily dependent on others and it is this dependence relation which underlies the uneven spatial structure of economic development

The highest level functions of the MNEs will almost all be located in the world's major *global cities*, which themselves will be 'surrounded by regional subcapitals' (Hymer 1970, 446)

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The evolution of OLI

International environment in the 1960's and 70's:

- Mass production and large scale technologies (Fordism)
- R&D concentration
- Fewer global actors and technology producers

The international environment since late 1980s

- Major institutional changes: e.g. regionalism, proliferation of global actors, emergence of new technology producers
- Changing nature of technologies: e.g. trasport technologies, shift of technological paradigm (ICT)
- Major organisational changes:e.g. increasing innovation-based competition driven by networks for value creation
- Rising role of local contexts: e.g. 'soft (human/relational) factors', quality, capabilities, "concentrated dispersion" of global activities

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The evolution of OLI (cont.)

- Change in MNEs faster and deeper than in other firm types - SMEs or large multi-plant uni-national firms: more intense interaction with global institutional, organizational and technological changes
- Causality nexus between MNE evolution and globalization processes not straightforward (non-solvable endogeneity)
- Crucial aspect of the current phase of economic globalization lies in new modes of creating and diffusing new knowledge
- Central role played by contemporary multinational corporations in such new modes calls for a re-thinking of the L: ***innovation as the pivot in the relationship MNE-geography***

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The evolution of OLI (*cont.*)

Implications for OLI:

- for ***O advantages***: advantages relative to other MNEs (rather than uni-national firms); organisational capabilities and network capital; heterogeneity of advantages across and within MNEs; absorptive capacity
- for ***L advantages:*** complex location decisions, location of *activities* and *functions*; dependence on *quality* of local assets; L advantages endogenous to the MNE; heterogeneity of advantages across locations
- for ***I advantages:*** technologies hardly managed within individual firms; host government push for increase in local content; internalisation vs. externalisation (outsourcing, offshoring)

➔ ***Intra- and inter-firm networks as dominant modes for the creation and diffusion of knowledge***

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MNEs & locational advantages

Behrman (1972), Dunning (1993, 1994)

- **Resource or asset seekers**: access to tangible or intangible resources and assets (e.g. raw materials, labour and skills): **general or specific?**
- **Market seekers**: supply local or adjacent markets via proximity to demand
- **Efficiency seekers**: rationalise and restructure previous investments which are either resource- or market-led: **global value chain or scale and scope economies?**
- **Strategic-asset seekers**: acquisition of assets of local firms, aimed at advancing long-term strategic objectives (i.e. capabilities and competitiveness)

Today: **MNEs increasingly belong simultaneously to all four categories: these overlapping types of firms also imply very different geographies**

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The interaction between O-L-I

1. How O advantages affect I advantages and viceversa (*interactions between* ***O*** *and* ***I***)

   \- mainly: MNE experience, organisational capabilities, intra-firm *networks*, firm growth
2. How O advantages affect L advantages and viceversa (*interactions between* ***O*** *and* ***L***)

   \- mainly: MNE locational choices, inter-firm *networks*, local capabilities, knowledge spillovers
3. How I advantages affect L advantages and viceversa (*interactions between* ***I*** *and* ***L***)

   \- prevailing technological paradigm, local institutional environment (e.g. property rights), inter-organisational *networks*

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MNE networks for innovation and learning

- International networks of technological activity organised by MNEs represent the strategic integration of geographically distinct paths of innovation (e.g. Cantwell & Iammarino, various; Cantwell & Piscitello,2005). Two kinds of networks:
  - Intra-firm networks of international production and R&D facilities
  - Inter-firm networks: variety of local networks that link MNE affiliates with their suppliers, customers and competitors
- Most prominent motive prompting MNEs to enter into them: joint learning processes are believed to be a means of raising the rate of innovation of the MNE, and hence its technological competitiveness

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MNE networks for innovation and learning (*cont.*)

- Old view on the internationalisation of R&D (Cantwell 1989, 1995):
  - R&D as a centrally provided service within the firm (HQs);
  - central R&D facilities of the firm provide knowledge to all affiliates;
  - whether particular affiliates have own local R&D depend on the size of local market and on the extent of its differentiation from the home market;
  - though, early writings on international R&D were also aware that it may have a monitoring function, tapping into local skills and acquiring foreign knowledge
- Understatement of the significance of internationalisation of R&D; rule the bulk of R&D is centralised in the parent company
- Notion of active interchange between parts of a MNE network only been picked up in the 1990s, as MNEs have adopted internationally integrated strategies

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MNE networks for innovation and learning (*cont.*)

Table 4.1 - Share of US patents of the world's largest firms attributable to research in foreign locations, organised by the nationality of the parent firm, 1969-95 (%)

Nationality of the parent firm	1969-1977	1978-1986	1987-1995
US	5.4	6.9	8.3
Japan	2.1	1.2	1.0
Germany	11.7	13.2	19.0
UK	42.1	43.4	53.0
Italy	14.9	13.3	13.5
France	7.9	8.1	26.9
Netherlands	48.6	50.8	54.8
Belgium-Lux.	50.9	53.8	50.2
Switzerland	43.9	42.9	47.7
Sweden	19.1	27.5	36.5
Total European countries*	26.3	25.6	32.5
Total all countries**	10.3	10.7	11.3
Total excluding Japan	11.1	13.0	16.2

* EU15, Norway and Switzerland

** Total includes all the world's largest firms, some not presented separately in this table

Source: Cantwell and Janne (2000).

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The global-local nexus in the internationalisation of technology

- MNE locational choices for technological and research activities depend upon:
  1) number and characteristics of national and regional systems and their relative position in a ***geographical hierarchy (Hymer!)***;
  2) extent to which the MNE has developed a strategy for technological diversification through tapping into specific competences in various regional centres of excellence
- Consistently, the distinction between competence-creating and competence-exploiting subsidiaries depends on both MNE group- and subsidiary- level characteristics and locational factors (Cantwell & Mudambi 2005)
- In the EU, the globalisation of innovation through MNE networks has been stronger than in other economic areas
- Empirical evidence supports the hypothesis of a regional hierarchy ***(Hymer!)*** within and across EU national boundaries

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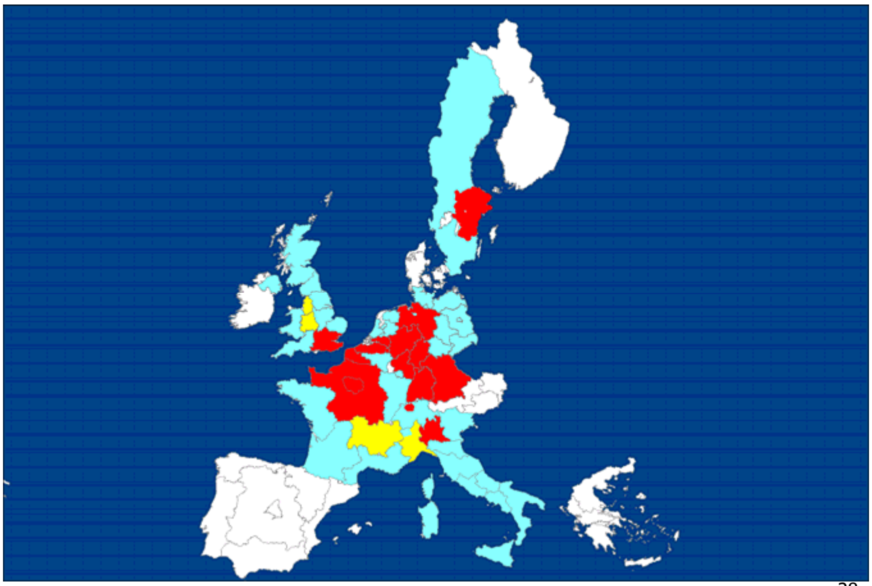
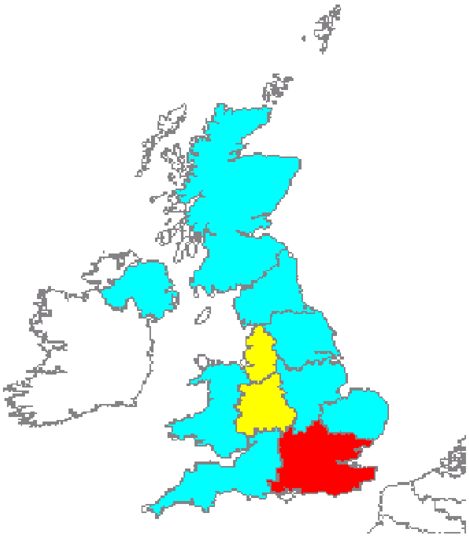
Evidence 1: MNE technological activities in the European regions

- ***Higher order* research locations:** e.g.: South East (UK), Lombardia (Italy), 6 Landers (Germany), Bassin Parisien & Île de France (France). Attract foreign-owned firms not because of existing technological specialisations of local counterparts, but for wider cutting-edge technological competencies, infrastructures, “business climate”, etc.. Technological activity of foreign-owned and indigenous firms is typically broad ranging in nature and extends across a spectrum of sectors
- ***Intermediate* research locations:** e.g. West Midlands & North-west (UK), Piemonte (Italy), Centre-Est (France). Attract innovative activities of foreign-owned firms more for specific set of specialised expertise in which MNEs tap into in order to upgrade their own capabilities (technological profiles of foreign-owned firms closely related to those of local counterparts); technological specialisation of both sectorally concentrated
- ***Lower order* regions:** technologically weak and backward areas, inadequate innovative base in order to compete and be attractive

The European regional hierarchy





UK

Patent granted to large MNEs (% of national total):

1 ***Higher order*** region: South East
40.2% of nationally-owned
60.8% of foreign-owned
47.1% of total

2 ***Intermediate*** regions: West-Midlands+North-West
33.4% of nationally-owned
11.4% of foreign-owned
26% of total

8 ***Lower order*** regions

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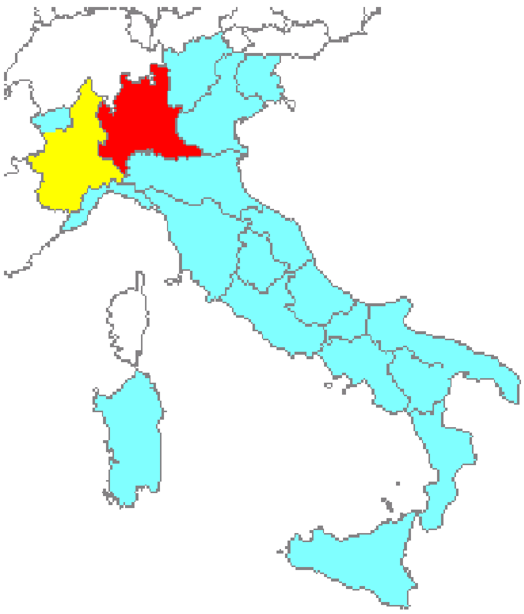

ITALY

Patent granted to large firms (% of national total):

1 ***Higher order*** region: Lombardia
50.3% of nationally-owned
57.1% of foreign-owned
52.8% of total

1 ***Intermediate*** region: Piemonte
31.8% of nationally-owned
11.3% of foreign-owned
24.4% of total

18 ***Lower order*** regions

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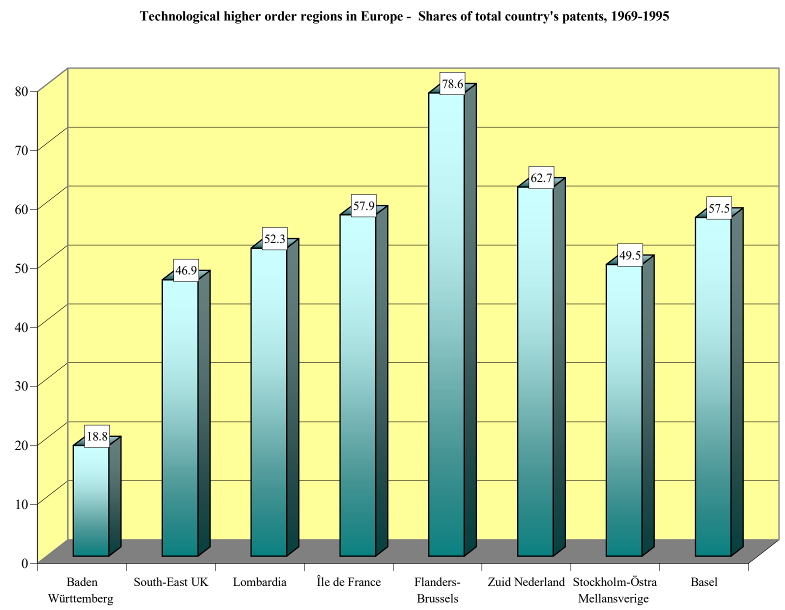
Technological higher order regions in Europe



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Technological Capabilities (TC)

- Micro-level: technological capabilities as the knowledge and skills that the firm needs to acquire, use, adapt, improve and create technology. The firm at the centre of the analysis: one-way knowledge and resources flows
- Meso-level: technological capabilities as knowledge and skills embedded into individuals, organisations and institutions located in a geographically-bounded area and conducive to innovation. The region is at the core: multiple-way interactions among the different components
- TC for long-term, sustainable growth, particularly in less advanced countries: MNEs have played a central role in TC building and upgrading (e.g. Lall 1992, 1993, 1998)

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Technological Capabilities (*cont.*)

- Crucial clarification on the concept of technological capabilities: differentiation between *competences* and *capabilities* (von Tunzelmann & Wang 2003)
  - Competences: inputs to produce goods and services
  - Capabilities: involve learning and accumulation of new knowledge, and integration of behavioural, social and economic factors
- Consequently, capabilities are to be taken as outputs of learning processes
- Implications for empirical analysis:

  outcome-related variables such as the introduction of new products or improvement of existing equipment, are more appropriate than input-related variables

Evidence 2: MNE role in upgrading technological capabilities (the case of 2 Mexican regions)

Firm-level technological capabilities (e.g.)

Level \ Type	Process and production organisation	Product-centred
Basic	- Minor changes to adapt it to the local conditions - Efficiency improvement	- Replication of fixed specifications and designs - Minor adaptations to product technology
Intermediate	- International certifications (ISO 9000) - Modern production organisational technologies - Improvements of layout	- Product design department - Improvement of product quality
Advanced	- Major improvements to machinery - Process and software development - Equipment development	- Product development - R&D into new product generations

Regional capabilities:

Endogenous factors
1. Strong indigenous human capital
2. A group of active local MNE managers/communities of practice
3. Strong innovation-oriented organisations
4. Links and interactions between firms and innovation-oriented organisations
5. Proactive local government

Exogenous factors:
1. Origin of foreign capital
2. Sector (within the electronics industry)
3. Historical paths

MNEs & localised TC

- Different regional trajectories of development and types of global-local interactions in terms of indigenous capability building
  - MNEs in Baja California act mostly as *enclaves*, with weak backward/forward and knowledge linkages
  - MNEs in Jalisco interact actively with other firms and local organisations, and have entered a virtuous circle of increasing technological capabilities
- Critical role of MNEs in upgrading capabilities at both micro and meso level. MNEs can be seen at the same time as 'internal' actors, contributing to the creation and diffusion of new knowledge within the region, and as 'external' players, channelling knowledge created elsewhere (within the firm) into the local system, thereby playing the role of ***technological gatekeepers*** (e.g. Giuliani, various; Marin, various)

E.g. of one interesting research direction CSR of MNEs, geography and innovation

"While companies are increasingly aware of the **social impact of their activities** […] these impacts can be more subtle and variable than many managers realize. For one thing they depend on **location**. The same manufacturing operations will have very different social consequences in **China** than in **the United States**. A company's impact of society also changes over time, as social standards evolve and **science progresses**."

M.E. Porter & M.R. Kramer, 2006, HBR, p. 5

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CSR of MNEs, geography and innovation (cont.)

What is the relationship of **global** and **local** (**country-specific**) corporate social responsibility (CSR) to international organizational strategy? […] These approaches suggest that **distinguishing between global and local CSR is both possible and desirable**.

B.W. Husted & D.B. Allen, 2006, JIBS, p. 838 and p. 840

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