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6

Territorial Dynamics in Europe
Regions and cities in the global economy

The ESPON 2013 Programme

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Europe is strongly integrated in the world as an important economic power. The balance of influence and economic weight of different continents and countries are currently changing rapidly. At the same time the world is connecting swiftly creating a larger market place and space for common policy making and mutual exchange of trade, innovation, culture and languages.

A key policy issue for Europe is to take advantage of the benefits and potentials for economic development of globalisation while mitigating its challenges. The EU 2020 Strategy is an important effort to ensure a future strong position of Europe in the world. Its focus on competitiveness, growth and jobs and outlook towards emerging markets support this aim.

In delivering this contribution both private and public investment in cities and regions will be decisive factors. Their possibilities for success are strongly linked to economic factors such as trade, to the endowment of human resources, global services, networking and innovative capacity.

However, the success and integration of regions and cities in the world economy and global networks is also depending (1) on their global connectivity and their accessibility and infrastructure provisions as well as their attractiveness as places for investment in global products and services, and (2) their access and connectivity to main globally important places within Europe. Connecting Europe should not overlook the global perspective.

The promotion of Europe in the world has a clear territorial dimension that policy makers at different levels should consider when putting the EU 2020 Strategy into practice. It is necessary that the European urban fabric and infrastructures are geared to and efficiently support globally oriented economic activities as well as the necessary interaction and exchange of commodities, people and information.

This ESPON Territorial Observation no. 6 on Territorial Dynamics related to European regions and cities in the global economy uses results from several ESPON projects. Most of the information, maps and data used were based on available results from the ESPON applied projects: “TIGER - Territorial Impact of Globalisation for Europe and its Regions”, “KIT - Knowledge, Innovation, Territory” and “SIESTA - Spatial indicators for a Europe 2020 Strategy Territorial Analysis”. The support provided by the Lead Partners and some of Project Partners of these ESPON projects has been very valuable in communicating key findings.

The messages presented in this Territorial Observation are related to the most recent available dataset. Territorial effects of the economic crisis affecting the world economy, its regions and cities, are reflected as far as possible in this publication. However, the ESPON Programme has commissioned applied research that later will provide more insight on the territorial dimension of the current crisis.

All underlying reports and information are available at www.espon.eu

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Regions and cities in the global economy

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Territorial dimensions of Europe in the global economy

- **What territorial dimensions could benefit Europe as a key economic power in the world?**
- **Which territorial structures would serve Europe's competitiveness and cohesion the best?**
- **What potentials and challenges do the regions and cities have as places for global activity?**

Europe's critical mass at the global scale is strong but needs safeguarding and stimuli to grow further in today's global market with new important economic blocs. Europe is currently losing ground in its global share of trade and services.

Existing markets, predominantly in the European neighbourhood, will remain important but Europe needs to look to expanding to new territories and markets to stay competitive in the long term, also with European public and private spending currently constrained.

Even though being the most important bloc globally, Europe's internal trade is at the highest rate of any bloc. This tells that Europe is relatively a very efficient and integrated internal market.

Compared to the USA or Asia, Europe is more compact as a continent with a more even and more polycentric fabric of cities, a high level of connectivity by roads, railways, air and inland waterways as well as in supporting ICT infrastructure, in particular in the case of ASIA. In addition, Europe occupies fewer time zones and is uniquely positioned that it can make same working-day transactions/contact with both Asia and the US markets.

Being a more compact territory, Europe has here an advantage compared to other global blocs offering shorter distances and a high level of support to the necessary global networking, largely from all corners of the Europe. All these are factors that can benefit both competitiveness in the global market and a territorially balanced internal integration, distribution and support of global activities.

Europe's more balanced urban fabric of cities and finer network of multi modal infrastructures for distribution and interaction with global trade blocs should be maintained, further examined for potential and expanded. Ports such as Rotterdam are today of substantial global importance for Europe. Major airborne hubs with many international destinations play a similar role. In enhancing global connections, both emerging markets and neighbouring territories, such as in the East and South, should be given attention.

Improving many cities and regions' transport and communications links to the reshaping global goods and services markets should be a priority. This could enrich more places, regions and cities to be able to deliver the necessary logistics for increased interaction with new markets as well as European neighbours. One possible way to practically achieve these hard and soft infrastructure improvements may be the Europe 2020 Project Bond Initiative.

The endowment of places with human capital, skills and innovative capacity is increasingly important for their success in attracting new activities and foreign investment. To compete globally, cities need to be places where human capital and skills, as well as hard goods, are exchanged. But increasingly to compete, cities need to be active in the global services economy.

To this end, London and Paris are major global players. Country capitals and a number of larger cities are also important and many less prominent European cities are becoming increasingly globally connected in the servicing of global capital.

The globally connected cities are particularly important in terms of the trade of services. And they will continue to be important places. They rely heavily on their ability to continue attracting human capital and international companies. Their challenges might be overconcentration and overheating which could hamper growth and threaten European recovery. Therefore, relief from small and medium sized cities in the vicinity, based on cooperation on joint global promotion and networking activities should be given consideration where relevant.

All in all, Europe faces win-win opportunities by including the territorial dimension when addressing the global challenge. This could help in ensuring the continuing global relevance of Europe and increase the capacity for European growth.

European and national policies can do so through attention to regions and places and their provisions for necessary flows of people and commodities and for participating in the overall networking between different regions and places in the world.

They can address infrastructure investments with the view of fostering better possibilities for synergy through cooperation of neighbouring territories and second tier cities, making them jointly stronger global players.

Policies at regional and city level could in particular consider promoting the endowment of human capital through support to relevant type of qualifications for global networking and make efforts to create places attractive for mobile Europeans and global citizens.

This mix of policy approaches could contribute to more growth and jobs in Europe and to a more balanced and cohesive growth within the European territory.

Points for policy consideration

- Sufficient infrastructure provision is a precondition for competing at global scale. As example, European ports are specialised in their roles ensuring the flows of trade. For container flows, northern ports seem to be dominant in Europe in terms of exchange with global markets. Growing influence of Asian trade in the configuration of global maritime flows points at opportunities expansion and the capacity in the current system for further trade with emerging markets such as South America and Africa might be able to benefit Southern European ports in particular.
- Europe's territories specialise in a variety of industries from textiles to high technology development and manufacturing. All territories can be globally competitive – even if they are engaged in making and exporting primary goods. Traditional industries cannot compete on cost. Regional success stories from rural regions are often based on innovation in terms of marketing and manufacturing processes resulting in luxury products which are impossible to imitate in terms of heritage.
- Investors and skilled emigrants think about places such as cities and regions, rather than entire countries. They have preferences, one of which is that the infrastructure links efficiently with markets and has long term sustainability in terms of new global markets. High density and wide variety of immigrant populations is today a distinctive characteristic of the largest European cities, notably London, Paris, but also Frankfurt, Rotterdam, Brussels and Stockholm. This cultural vibrancy can be attractive to entrepreneurs and the creative workforce.
- One third of the world's 216m immigrant residents live in Europe. Both Europe and the US are most attractive to their neighbouring countries. However, USA due to high attraction to migrants from Latin America and China which may be seen to give it an edge in their attempts to develop trade relationships with countries while Europe has an edge in Africa and Russia. Especially cities in the core area of Europe have seen a huge flow of non-nationals from outside Europe over the last few years. Around 10% of their residents are non-nationals, mostly (2/3) from outside the EU. In 9 out of 10 European cities, the proportions of non-EU nationals have increased over the last decade.

1 – Executive Summary

- Europe is a strong global player in R&D currently accounting for 24% of global R&D, well behind the US (33%) but ahead of Japan (13%). Geographic concentration of R&D at all scales is a common characteristic when comparing European territories with US and with emerging countries, India and China. In Europe, half of all R&D investment concentrates in one fifth of Europe's regions.
- A European advantage compared to USA is that European R&D 'rich' territories are relatively close to each other. They are also relatively better connected than similar territories in India and China. Many regions have good experiences in importing innovative results of R&D executed in other regions. From a European perspective, promotion of R&D "hotspots", in certain places, with a stronger competitive edge for competing at a world scale might be worth considering.
- Europe, USA, China, and India show no conclusively strong alignment between regions as human capital hotspots and research and development hotspots. Regions with low knowledge endowment may not benefit from R&D investment without the skilled people to capitalise on it making human capital more crucial for weaker regions as a precondition for growth and productivity.
- Europe is world-leader in turning young people into science and technology graduates which are seen as important for knowledge intensive industries in the global market. This type of attainment seems important for raising regional productivity.
- In hosting transnational headquarters, Europe's cities play an important role in global networks to the benefit of growth and development. Most of the largest headquarters in Europe are located in the core area of Europe with London and Paris as the main nodes. Here the concentration of employment in transnational headquarters and critical mass is much higher than in the five main cities in USA. This could reflect a greater attractiveness and efficiency of Europe's smaller 'big' cities compared to the US.
- Networks of cities servicing global capital are more evenly spread and balanced within the European territory than in the USA. London remains Europe's top-ranking centre followed by Paris, Milan and Madrid. Other particular high performer cities are Brussels, Munich and Amsterdam. These services have increased in most of Europe's global and other larger cities since 2000 in marked contrast to the USA. This improvement is benefiting all parts of the European territory, in Eastern Europe particularly cities such as Warsaw and Bucharest.
- The challenge for Europe is to continue to support and safeguard Europe's major global cities while exploiting global second tier city opportunities to both grow and support their larger, possibly overheating, national or international counterparts.
- Overall, Europe has a balanced and more even distribution of small and medium-sized cities than USA and China. And many of these have been growing in global connectivity. Less prominent cities should be encouraged to play a greater supporting role. This approach would foster a win-win for both overall growth of Europe but also encouraging a more balanced growth and territorial cohesion.

2 – Trade between places of the world

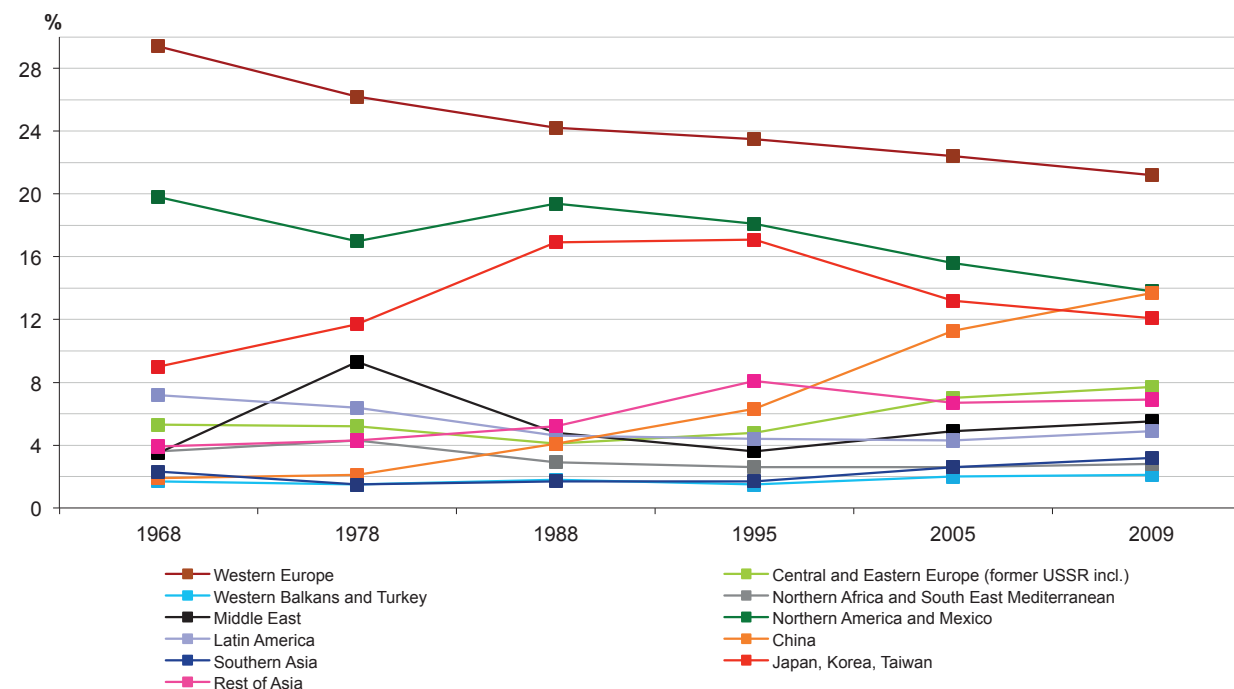
- What is the position of Europe's economy in the world trade flows?

The wider context and linkages of Europe and Europe's places with the world is strongly related to trade. Trade is one of the major drivers of globalisation, facilitated by transport and increasingly communications technology, as it contributes to growth by increased exchanges across economies around the globe and then to create interlinkages and integration between places, regions and countries in the world. International trade is a key part in Europe's strategies for economic growth and competitiveness.

Europe is still a major trade power in the trade of goods and services in the world. In total, trade between European countries and between European countries and the world accounted for 48% of all world trade in 2007. This is important to Europe's GDP – accounting for around one fifth (21%) of all European output in 2007 before the economic downturn, more than 50% higher in 1996 (14%).

Europe remains the most important bloc in terms of global trade in goods. Its share of over one fifth of global trade in goods is ahead of NAFTA and China. And Europe's position is significantly ahead of other blocs as a global trader of services, accounting for nearly half of all global trade. America and Eastern Asia account for much less (21% and 28% respectively). Apart from these major trade regions, the Middle East and Africa appears as a complex patchwork of small economic regions (Southern Africa and Gulf countries). And the trade balance is positive.

Figure 1 Trade blocs' share of world trade, 1968-2009



Source: Chelem, 2011

Note: Trade of goods only. Intra-regional trade is not included

2 – Trade between places of the world

But Europe's relative position in world trade has declined over the last 50 years. Europe's share in the world trade of services has fallen by a sixth in the last 30 years and the trade in goods shows a slightly steeper decline. Since 1968, Europe, the USA and (since the mid 1990s) Japan's share of global trade of goods has dropped (Figure 1). This shift has been to China but notably, Southern Asia has been the most dynamic world region and nearly doubled its share of interregional trade to reach 3.2% in 2009. While the weight of India in world trade has remained relatively quite low, around 1.2% in 2009, the weight of Russia has increased between 1994 and 2009, in parallel with the evolution of gas and oil prices.

The factors behind the drop in Europe's prominence as global trader of services include offshore and outsourcing. A particular feature over the period is rise of transnational firms, which can be seen to represent a virtual economic bloc which is larger than most economic blocs. Transnational firms play a central role for world trade main actors of the integration of value chains at global level. Intra-firm trade is estimated at 30% of total world trade in 2006, larger than the European bloc's share of world trade at almost 27%.

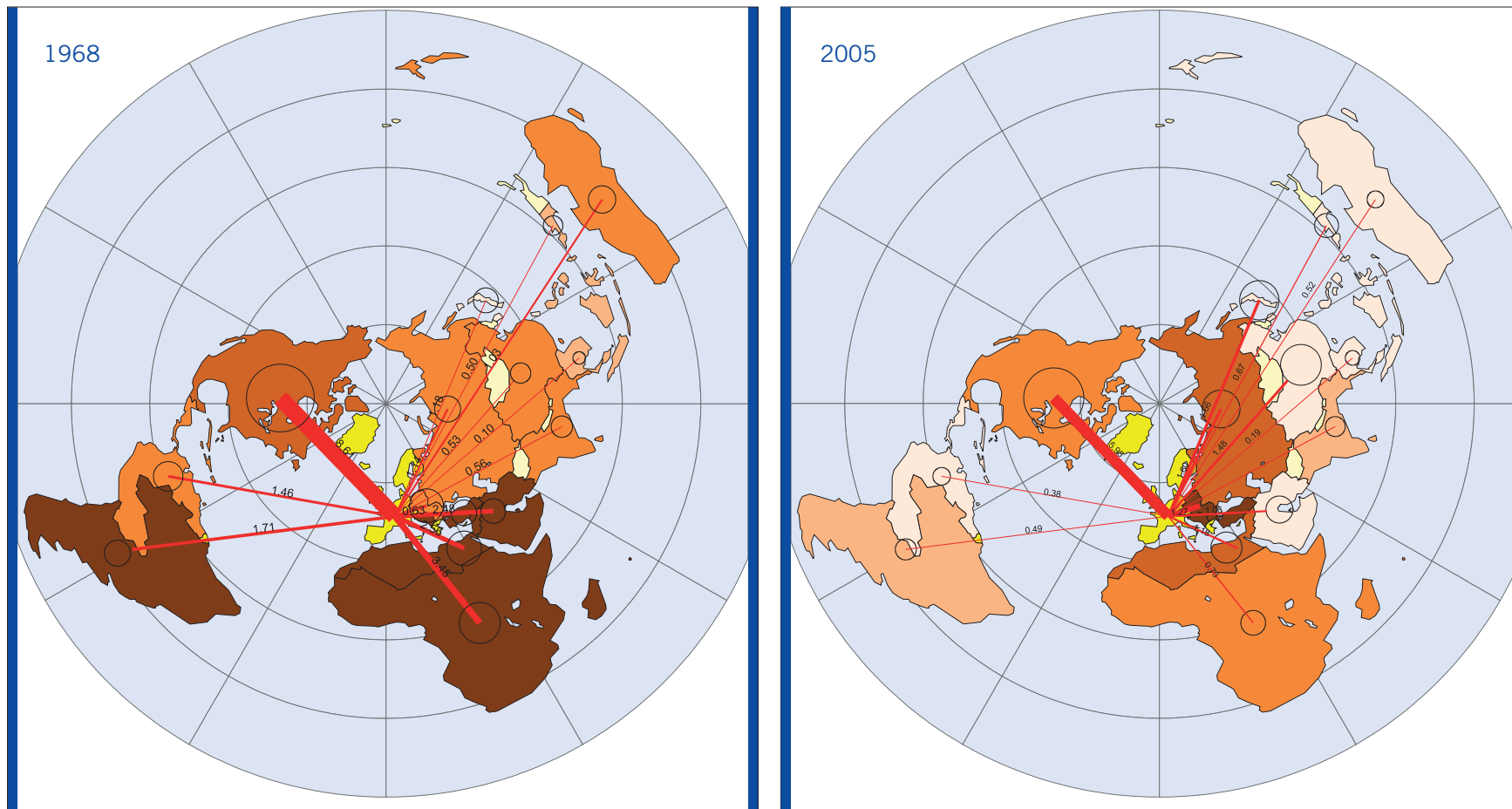
Europe's role as an exporter of goods has fallen in global significance but also it has become a somewhat less global exporter. While in 1968 (Map 1), Europe was the main partner of many countries and blocs; in 2005 the influence of Europe in the world is geographically more limited. Europe's influence has over the years been concentrating to the neighbourhood regions towards South and East (Northern Africa, Eastern European countries and the ex-USSR). Outside of these, the USA and Japan, however, remain important. The declining position of Europe in world trade does disguise some resilient aspects - for example, the decline is much less pronounced in more technological segments of production than in labour intensive industries.

Overall, the current focus of Europe as an exporter does not fully match with the ambitions set down in Europe 2020 for a focus on emerging markets. Clearly, existing markets will remain important but Europe needs to look to expanding to new territories and markets in the long term. Exports to China have grown but exports to other emerging economies, like Latin America or the dynamic South Asia, have so far been largely static.

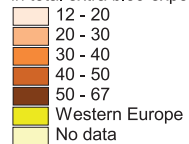
To address this challenge, Europe needs to reposition itself in terms of export orientation and ensure efficient channels and nodes/places of exchange. But it starts from a position of great strength in both internal and external connectivity. It has an enviable level of market integration between countries that other blocs can only aim at having. Market integration is 30% higher than in Asia and almost 50% higher than the Americas. A prime example of Europe's external connectivity and adaptability is the global role of its major ports.

2 – Trade between places of the world

Map 1 European exports of goods to the world, 1968 and 2005



Share of Western Europe in total extra bloc exports (%)



Share of the bloc in extra European exports (%)



Share of World exports (%)



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Source : IGEAT, 2010
Origin of data : CEPII (Chelem data base)

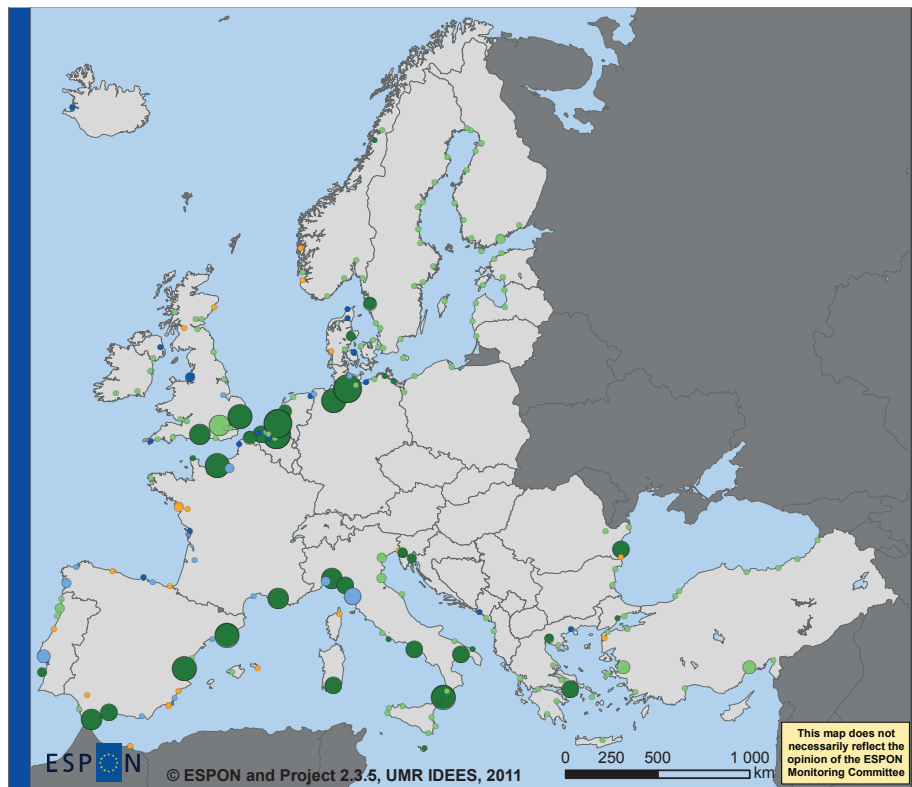
Note: Western Europe includes EU 15 plus Switzerland and Norway

2 – Trade between places of the world

Europe is no longer the biggest maritime player in container shipping, with Asia now the dominant maritime force. In line with the rise of Japan and latterly the rise of China as economic powers, the Asian maritime influence has grown and extended in global dominance. But Europe's much greater internal connectivity in terms of road, rail, air and internal waterways is as much reason for its declining global maritime role as the rise of Asia. Europe has an extensive and perhaps fragmented port network which reflects the territorial specificities of Europe (Map 2). Compared to the USA or Asia, it is relatively compact as a continent with a more even fabric of cities, and high connectivity of railways and roads. In Asia, maritime transport predominates with inland penetration much lower. While Asia may hold an advantage over maritime flows, Europe seems to have the internal territorial integration to make maximum use of it.

For container flows, the top world ports show a high connectivity with other ports but reveal functional differences. Hong Kong and Singapore are the most important ports in the global container network, and their position is explained by the hub functions within East Asia, as well as between East Asia and the rest of the world. In Europe, Rotterdam appears as the third most important port in the world maritime container flows. This situation reflects the dual role of Rotterdam as both maritime hub and load centre (continental gateway). In addition, other northern ports seem to be dominant in Europe in terms of exchange with global markets.

Map 2 Geographical specialisation of European ports in container flows, 2006



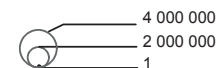
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Source: own elaboration based on Containerisation International data
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Dominant specialisation of maritime forelands

- Africa
- East Asia
- West Asia
- North America
- South America

Volume of flows in thousand tons (GRT)



The geographical specialisation of European ports in container flows shows the overall influence of East Asia, as all largest European ports are dominantly specialized towards this region. Some European medium-sized ports however, particularly in Southern Europe, are more specialized towards Africa or South America due to historical and cultural reasons. This pattern confirms the growing influence of Asian trade in the configuration of global maritime flows. But it also shows there are opportunities and capacity in the current system for further trade with emerging markets such as South America and Africa, particularly in Southern ports. Policymakers in these regions who wish to enhance access to these markets should be considered for support, such as through new infrastructure funding mechanisms like Project Bonds, as this has the potential to benefit all of Europe.

- **How specialised and competitive are European regions in the global competition?**

Europe is a richly diverse set of regions in terms of trade. European regions participate in different ways in the global economy and competitiveness in the global trade, according to their economic specialisation (Map 3). Europe's prominent position is in the most highly technological sectors (such as chemicals, machinery and transport equipment) but regions are also active in exporting primary, textile and technological goods. Nearly all European regions have a negative balance for textile and clothing, except Northern and central Italy, Flanders, Northern Portugal and Galicia, Lithuania, Romania and Bulgarian regions. While Italy and Flanders have been able to move up in the value chain or keep the control of the value chain, only few regions remain competitive in labour intensive productions, mainly located in Romania and Bulgaria.

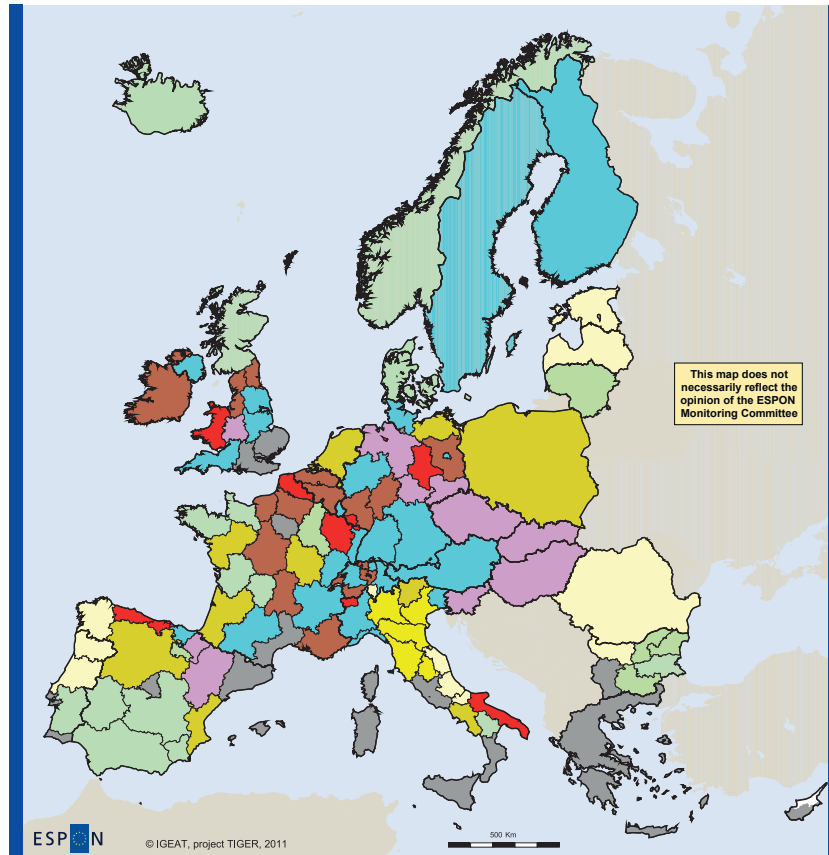
A territorially diverse Europe can be seen both in terms of output but also global integration. Most regions in North-Western Europe are specialised in technological and upmarket sectors (chemical goods, machinery/transport or electronic goods). These are generally oriented towards the most developed or emerging markets. Trade in more peripheral regions, particularly the East and South, are mainly related to less technological products and labour intensive production (textile and primary products). These are likely to be oriented towards the European neighbourhood – Africa and East Europe/Russia.

For high tech regions, the policy challenge is to strive at becoming world leaders in their niches – transport and communication connectivity for people and goods within these regions and between these regions and the wider world have to be world class. For primary and textile orientated regions, these will also be opportunities but a particular challenge is to elevate their products above the much more numerous low cost competitors. This is not only around developing new processes or new uses for their products but also finding a market position that lower cost or scale economies cannot imitate. A good example of this are the Highlands and Islands of Scotland where business structures, products and marketing have been innovative. Several regional products – such as whisky, salmon, tweed and beef - are globally competitive and premium priced, based on both their quality but also marketing which emphasises a heritage that cannot be imitated. Other regions, like Parma have taken this route to increase the value of traditional local products. And many more good examples exist.

Such a 'luxury goods' path may provide inspiration for more European regions in the South and East who wish to grow their markets beyond the European neighbourhood to emerging economies and their growing middle classes in South America and Asia. For example, regions in Spain and Portugal have this opportunity and also have a competitive advantage in South America through linguistic and cultural links.

2 – Trade between places of the world

Map 3 Territorial profiles in trade of goods, 2007-2009



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Source : IGEAT, 2010
Origin of data : Eurostat, national institutes, own calculations.

- Medium and high technological goods
 - Medium and high technological goods (electronic, machinery and /or transport equipment)
 - Chemical goods (with or without diversified medium and high technological goods)
 - Electric, Electronic goods and transport equipment
 - Metal industry
- Primary goods
 - Primary goods, including extraction
 - Primary goods with textile and clothing
 - Primary goods and transport equipment
- Textile
 - Textile and clothing
 - Textile goods with technological goods
- Diversified external trade and very negative balance
- NO DATA

Note: Exports within countries are not included

Many metropolitan regions show in general a diversified external trade of goods as their competitiveness is mainly based on the trade of services (and less relevance in the trade of goods). They are still the main economic drivers for Europe. Many are capital cities with global transport hubs that in particular ensure the flow of people rather than goods. The situation also makes these places interesting and accessible places for tourism.

Some regions in Greece, Italy, Spain and Portugal have their economy mainly centred on the tourism sector. Here it is also a matter of ensuring good accessibility and connections for people but at the same time to safeguard the cultural and natural assets and adapt tourism to climate change. Services connected to tourism and their attractiveness as places are important for these regions when they aim to play an active role in globalisation and wish to attract resources and investments.

3 – Territorial endowments of human mobility, R&D and human capital

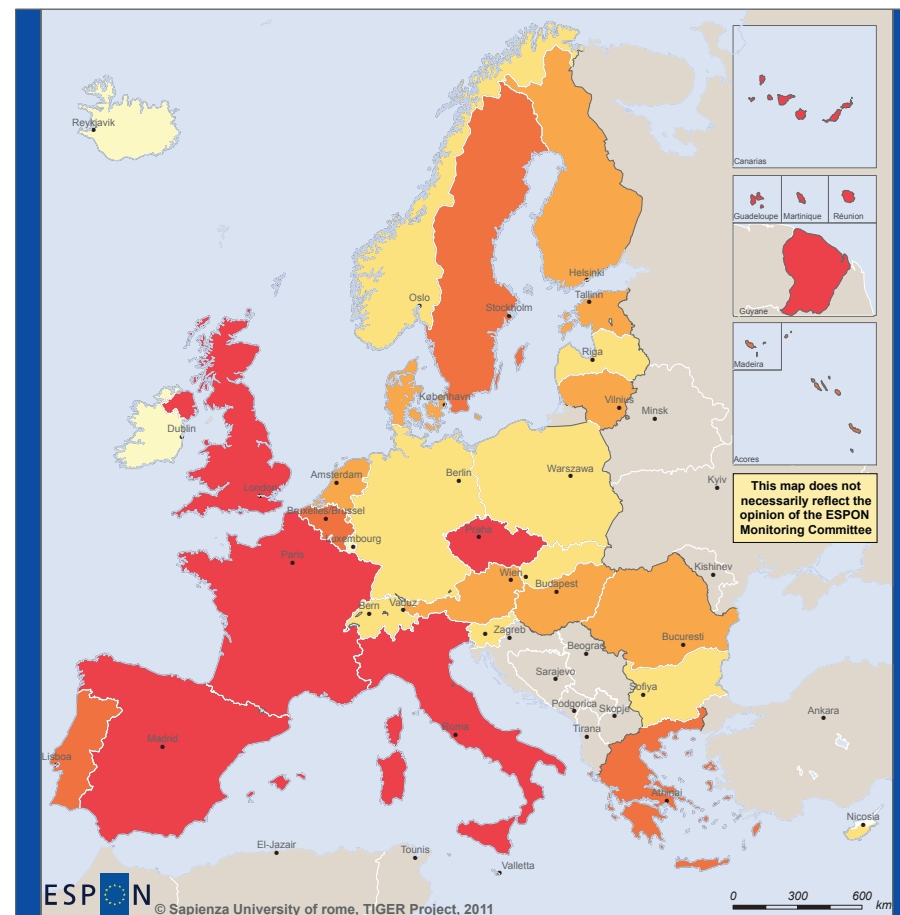
- To which countries in the world are Europe and USA attractive places?
- Which countries and places in Europe seem to attract more international immigrants?

Migration increases disparities at all territorial levels. Immigration flows at world level are directly related to the economic welfare of countries (high GDP per capita, foreign direct investment) and to the quality of life (life expectancy at birth). The same is true for regions – affluent European regions attract immigrants, usually young people, while weaker or lagging regions lose them.

Given the economic prominence and affluence of Europe and the USA, they are attractive destinations to migrants, with their neighbourhood countries finding them most attractive. Around one third of the world's 216m immigrant residents live in Europe and Europe is broadly attracting the same number of migrants year on year from outside as the USA – around 1.6 to 2.2m migrants. Unsurprisingly, in both the USA and Europe, it is to the biggest (state and country) economies, with their wealth and living standards, that the majority of migrants go.

Both Europe and the USA are most attractive to their neighbouring countries. Outmigrants from Turkey, Albania or Ukraine and North Africa prefer Europe. For the USA, outmigrants from Canada, Mexico and South America find this the most attractive destination. In terms of settlement patterns, these neighbourhood migrants often concentrate in areas close to their borders in the USA and Europe.

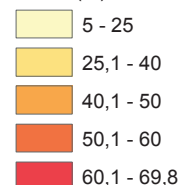
Map 4 Current immigration flows from outside Europe, 2006-2007



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Regional level: NUTS 0
Origin of data: MIMOSA Project, 2009
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Share (%) of total in-migrants coming from a non-ESPON country



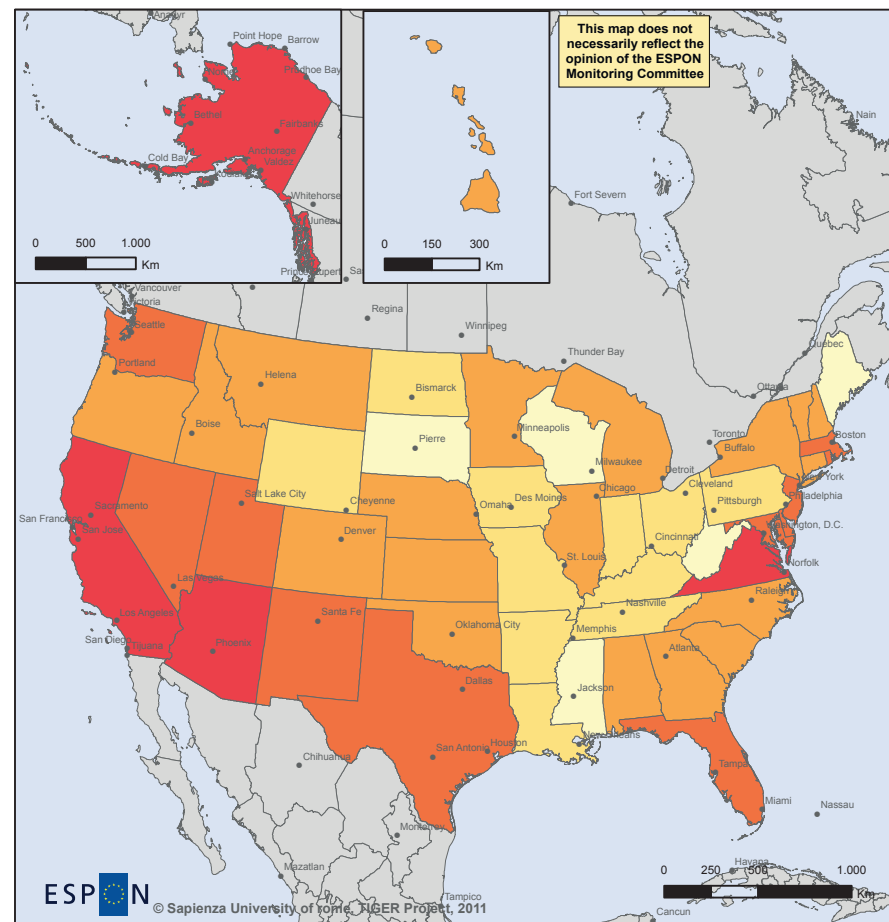
3 – Territorial endowments of human mobility, R&D and human capital

Europe is clearly a more popular destination than the USA for some countries outside of its neighbourhood probably due to history, linguistics and culture – such as most of Africa, Russia, Australia, Pakistan, Iran and Iraq and some parts of South America. As it stands, the USA would seem to be more attractive for migrants from China, East Asia and Brazil and the northern half of Latin America. Importantly, head to head, Europe is more attractive to USA outmigrants than vice versa.

If these flows of people are viewed in light of emerging economies, the USA may be seen to have an edge in their attempts to develop trade relationships with Latin America and China while Europe has an edge in Africa and Russia. But Europe has perhaps greater potential. It has its compactness and efficiency as a territory as well as cultural and linguistic ties with South America and India that cannot be easily replicated.

Europe's countries, regions and cities showcase this potential recently. The Mediterranean Europe, France, UK and Sweden have been attracting more non-European in-migrants; some Eastern European countries (Hungary, Romania) and the Baltic regions show a balanced attractive capacity for both European and non-European in-migrants, whereas Central Europe (Germany, Poland, Czech Republic) has seen recent in-migratory flows from other parts of Europe. Historical ties do explain many in-migration flows from South Asia to UK, from Southern America towards Spain and Portugal, from the Maghreb, Sub-Saharan Africa and from the former Indochina towards France.

Map 5 Historical significance of immigration in USA, 2007-2008



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Share (%) of immigrants over the total population

- 0,17 - 0,2
- 0,21 - 0,3
- 0,31 - 0,5
- 0,51 - 0,6
- 0,61 - 1,34

Europe's cities are generally rich in their potentials in terms of diversity and international flavour, which can prove more attractive to the highly skilled and entrepreneurial. The high density and wide variety of immigrant populations is a more distinctive characteristic of the largest European cities, notably London, Paris but also Frankfurt (25%), Rotterdam (20%), Brussels (just under 30 percent of the city centre population), and Stockholm. European urban areas, especially central cities have seen a huge flow of non nationals from outside Europe over the last few years. Around 10% of their residents are non-nationals, mostly (2/3) from outside the EU. In over 90% of cities, the proportions of non-EU nationals have increased.

- **How strong is Europe in R&D and skills production in comparison to USA, China and India?**

R&D and human capital are territorial endowments which can contribute to increasing the growth and the competitiveness of Europe in the world. Increasing R&D investment is a policy aim of the Europe 2020 Strategy, which sets out the concrete target of R&D investment reaching 3% of GDP.

Europe is a strong global player in R&D. Europe currently accounts for 24% of global R&D, well behind the USA (33%) but ahead of Japan (13%). But current spending on R&D in Europe as a share of GDP (2%) is well behind the Europe 2020 target, both the USA and China as well as many other developed and emerging economies. And R&D investment is growing at a much slower rate than all its rivals. The EU budget for R&D is around two thirds that of the USA.

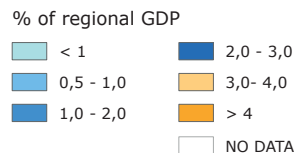
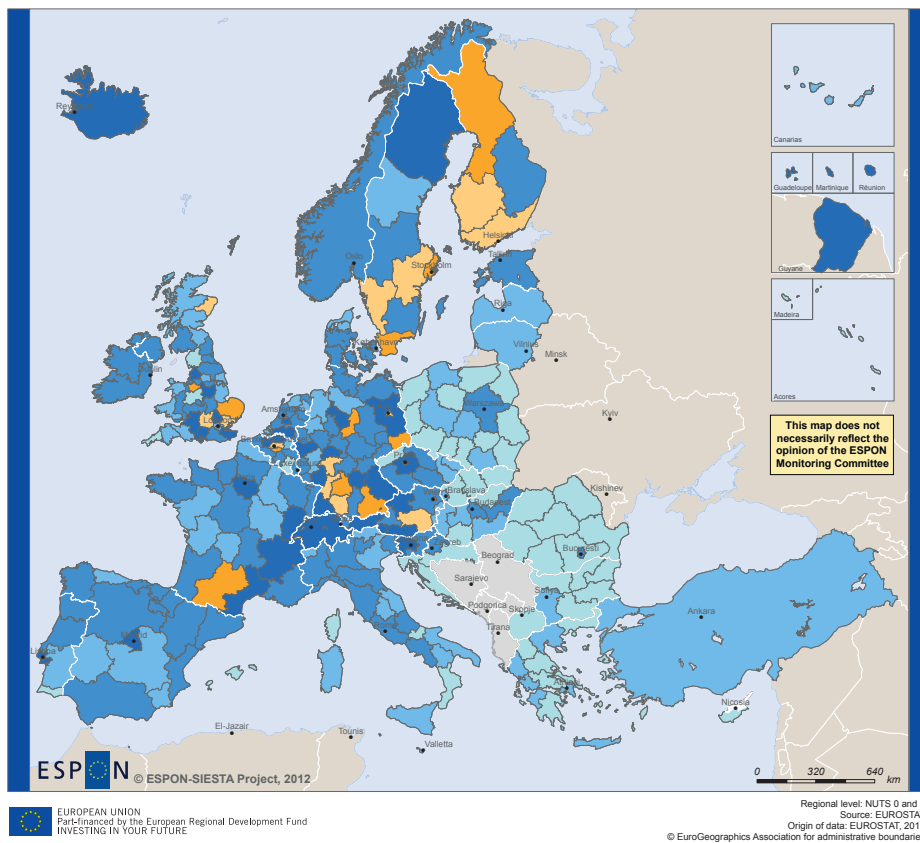
Europe's territorial pattern of where R&D investment takes place (Map 6) shows a great deal of diversity and potential. Some regions are high achievers, particularly within the traditional European core (Pentagon) but also in the Nordic countries with investment rates up to 7% of regional GDP. Regions in the East are noticeably lagging in their current R&D investment with rates as low as 0.5%.

A comparison of European territories with USA and with emerging countries, India and China, shows that geographic concentration of R&D at all levels is a common characteristic. There are regions that are far out in front (Beijing, San José, Braunschweig in Germany and Uttaranchal) of their territorial counterparts. In Europe, half of all R&D investment concentrates in one fifth of Europe's regions.

But Europe perhaps has an advantage in its R&D 'rich' territories that puts it ahead of China and India and the USA. Its R&D investment-rich territories are relatively close and relatively well connected. In India and China, R&D investment-rich territories are geographically relatively close to each other but these are not as well connected in terms of road, rail and air. The USA R&D investment-rich territories are spread across five time zones and over 5000km. Again, the compactness and well functioning internal "infrastructure machinery" of Europe seems to give it an advantage to explore.

3 – Territorial endowments of human mobility, R&D and human capital

Map 6 Public and private expenditure in R&D as % of GDP, 2007 and 2008



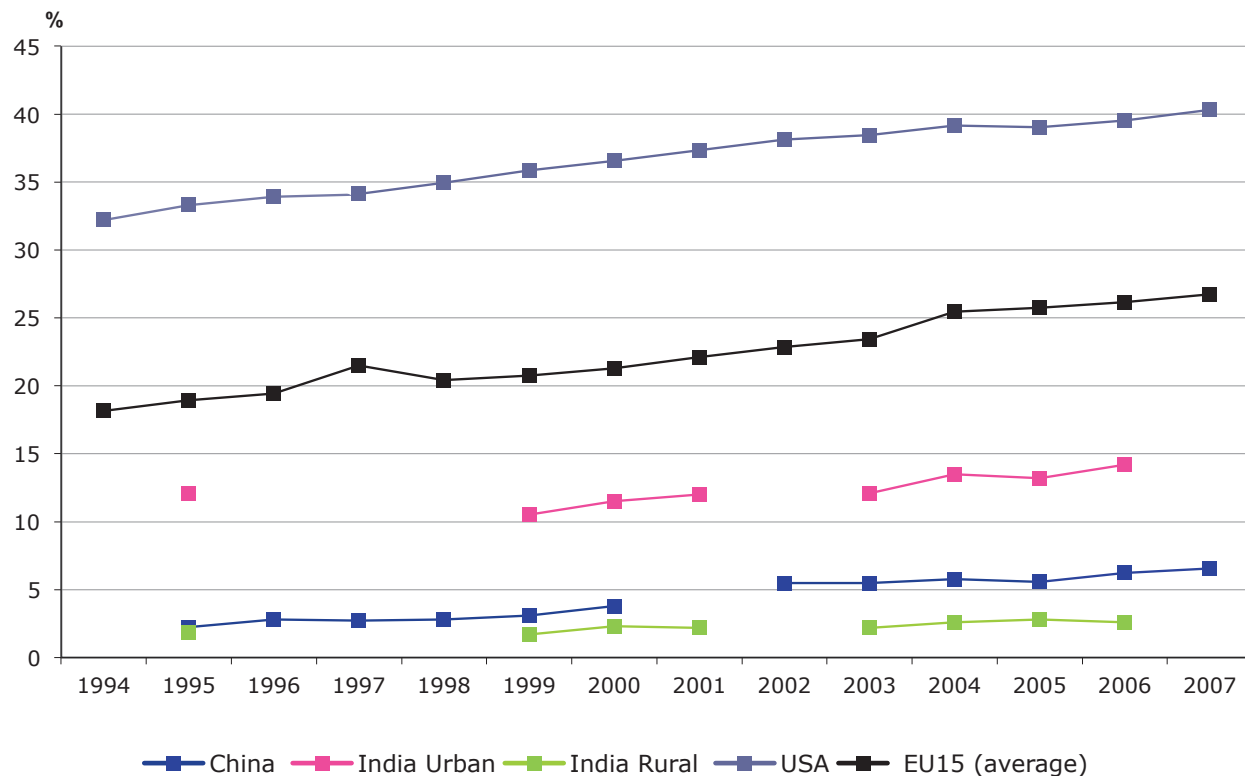
NOTES:
 ES, PL, PT, BE, FR, FI, IE, IS, EE, LV, LT, MT, CY, RO, HR, SI,
 CH, TR, NO and BG are shown for 2008.
 Data for GR are shown for 2005.
 IT, DE, AT, NL, DK, MK and SE are shown for 2007.
 TR, CH and NO are shown at country level.

Human capital is a key to knowledge production and to territorial development. In the past two decades both China and India have significantly increased investments in human capital, especially at degree level (Figure 2). Europe also possesses an advantage over China and India in terms of gross human capital, though not the USA. The third level attainment rate of Europe as a whole is significantly ahead of India and China but well behind the USA. However, this is 'gross attainment' covering many disciplines. Concentrating on attainment in key qualifications for knowledge production - like mathematics, science and technology this shows that Europe is in fact much more proficient at turning young people into science and technology graduates. In 2009, the EU-27 produced 14 of these graduates for every 1000 of the 20-29 year old population. In contrast, the USA produced 10.

Europe, the USA, China, and India show no conclusively strong alignment between human capital hotspots and research and innovation hotspots. India is the strongest case with four of its top human capital regions also in the ten most innovative regions lists, with Delhi and Chandigarh in the top three in both cases. This shows that the spatial relationship between human capital and research and development is complex.

3 – Territorial endowments of human mobility, R&D and human capital

Figure 2 Population with tertiary education in China, USA, India and Europe, 1994-2007



Further ESPON evidence suggests that regions with low knowledge endowment may not benefit from R&D investment without the skilled people to capitalise on it. In fact, human capital is more crucial for weaker regions as a precondition for growth and productivity. Many European countries that do not currently significantly invest in R&D have been highly successful producing mathematics, science and technology graduates – such as Ireland, Romania and Slovakia. These are perhaps fulfilling the preconditions for growth, productivity and capitalisation of research and development.

Overall, using the target of 3% R&D investment as a guide for public investment in many regions may not be an effective guide in promoting productivity and growth. Many regions have good experiences in importing results of R&D executed in other regions. Policymakers need to assess what the level of knowledge endowment is, and how much capacity their territory has to build on this. From a European perspective, the promotion of R&D “hotspots”, in certain places, competing at a world scale might be worth considering.

Source: OECD Factbook, 2009, 2010
China Statistic book, 1996-2008
India National Sample Survey

Note: China: College and higher, aged above 6
India: Diploma/Certificate, Graduate, Post Graduate and Above; 1995 (aged above 15), other years (aged above 7)
USA and EU15: Tertiary attainment for age group 25-64

ESPON-Kit Project - London School of Economics Team

4 – European cities in global networks

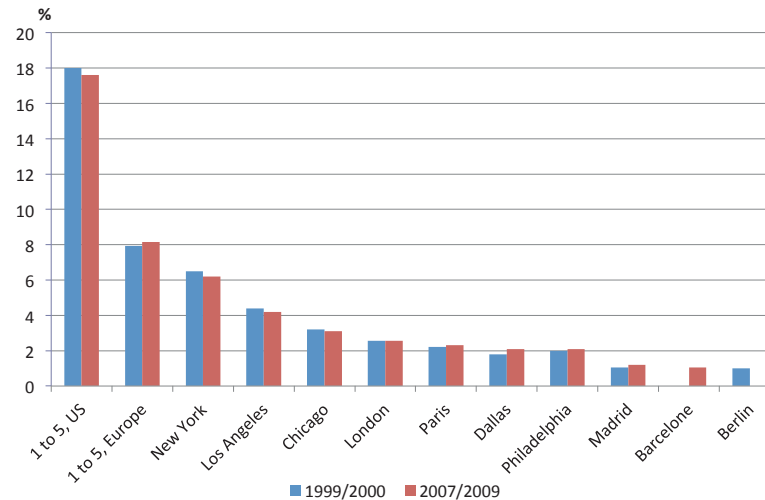
- What is the position of the European cities in global networks?

Cities drive the world economy and European cities are vital to regional, national and European territorial development. They are dominant locations for human flows, economic concentration and growth. They anchor Europe as a whole into the global economy. When they connect and function well in the global economy, they provide the whole European territory with new opportunities for growth and jobs.

Europe and the USA are highly urbanised and economically developed regions in a world perspective as around 80% of inhabitants live in cities. Yet Europe is a more balanced and compact territory. European cities are generally smaller and the biggest cities are far less predominant (though have increased slightly) (Figure 3 and 4). But also these cities are geographically much closer together, offering relatively easy access to do business, spanning three time zones. The USA cities span five time zones and the East and West Coast cities are a working day (8 hours or 5000km) away from each other.

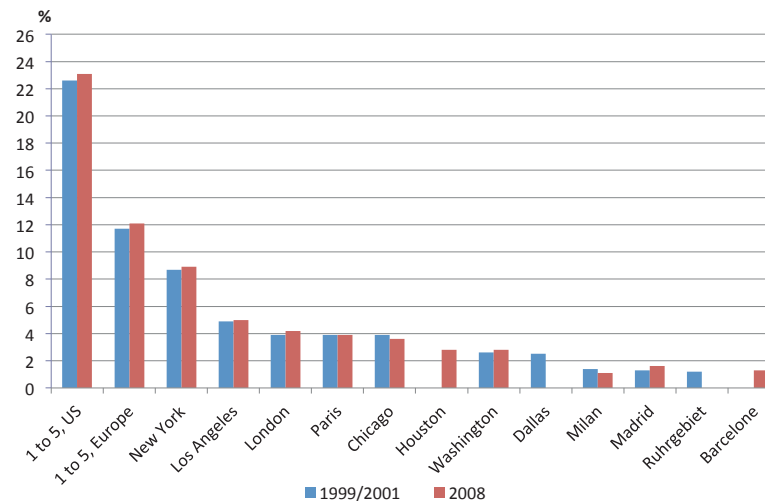
Globalisation, including international migration, financial flows, transport developments, or dissemination of technological innovations is contributing to increase geographical concentration (even in Europe) and the rise of large cities in different parts of the world. They are seen as the new motors of the global economy and key nodes for Europe's competitiveness in the world context and the centres of dense networking of transnational firms that are embedded in worldwide networks.

Figure 3 Population in major cities in Europe (1999 and 2007) and USA (2000 and 2009)



Source: EUROSTAT, ESPON Database and own calculation from ESPON TIGER Project; BEA, USA

Figure 4 GDP in major cities in Europe (1999 and 2008) and USA (2001 and 2008)



Source: EUROSTAT, ESPON Database and own calculation from ESPON TIGER Project; BEA, USA

4 – European cities in global networks

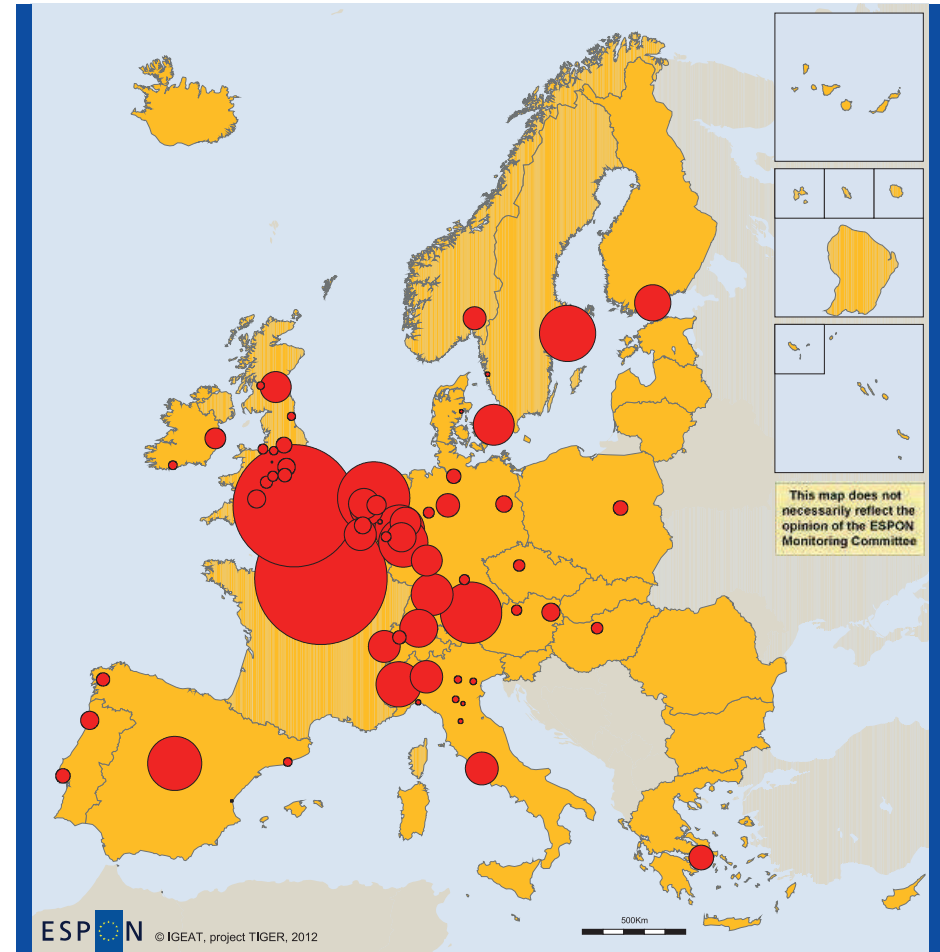
- Which are the Europe's main urban nodes in the global context?

Europe is the world hub for transnational businesses. Europe plays host to 40% of the world's biggest firms, ahead of the USA (33%) and Japan (15%). The role of Europe's cities in hosting transnational headquarters shows how important they are in global networks but also to wider European growth and development.

Most of the largest headquarters in Europe are located in the core area, the so called Pentagon, the most prominent 'global economic integration zone' in Europe defined by the cities London-Paris-Milan-Munich-Hamburg. Inside this large core area, London and Paris are the main nodes. In total, they account for 57.2% of the employees in European transnational headquarters.

This concentration and critical mass is much higher in Europe than in the USA's five main cities (40.1%), respectively. This may reflect the greater attractiveness and efficiencies of Europe's smaller 'big' cities compared to the USA.

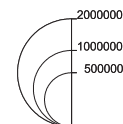
Map 7 Employees related to transnational headquarters in Europe, 2008



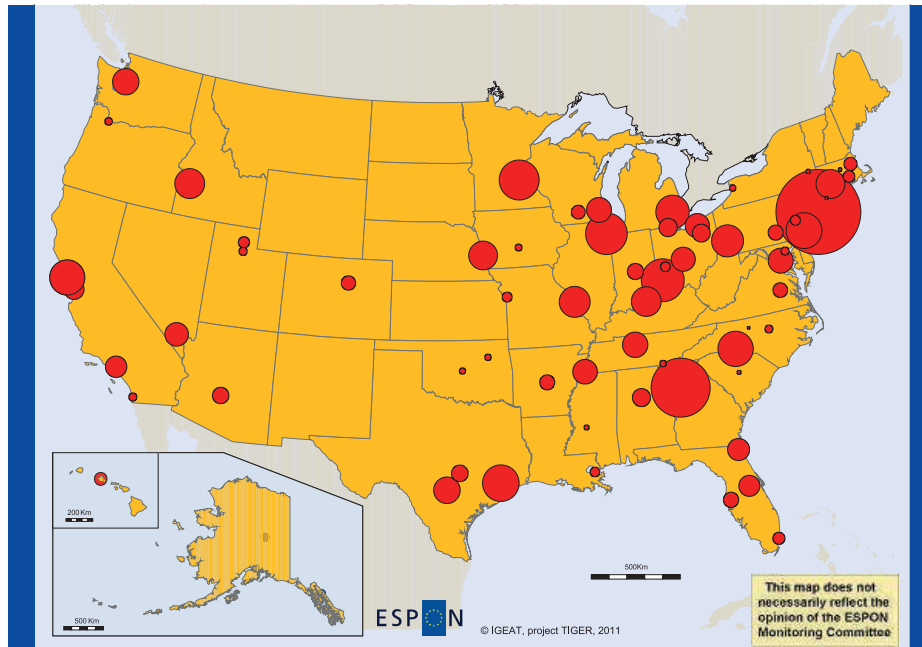
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© EuroGeographics Association for the administrative boundaries
Source : IGEAT, 2011
Origin of data : Forbes, own calculations.

Number of employees in firms with headquarters in the city

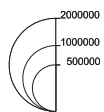


Map 8 Employees related to transnational headquarters in USA, 2008



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Number of employees in firms with headquarters in the city



Source : IGEAT, 2011
Origin of data : BEA 2008

Note: The prominence of transnational headquarters reflects cities roles in organising business and work across the globe. They are based on the Forbes figures on the top 2000 world companies. The map indicates those having their headquarters in the city and uses the companies' number of employees as an indicator of their importance.

- How are European cities integrated and connected in global networks?

Development processes are mainly shaped by the relations between cities, encouraged by the presence of knowledge, a critical mass and tertiary knowledge-based services. One way of assessing how globalised or globalising a city is, is to examine what role it plays in servicing global capital.

Europe's tertiary knowledge-based business relations in the world shows that its main cities are well connected into the global economy. The level of geographical concentration of the servicing of global capital is much higher in USA than in Europe. There is a small increase in concentration for both world blocs, but in the USA this increase is mainly related to the growth of New York (Figure 4). However, the cities providing the global services are in fact more evenly spread and balanced within the European territory.

4 – European cities in global networks

London remains Europe's top-ranking place servicing global capital followed by Paris, Milan and Madrid. This group of four cities leads both in 2000 and 2008. Other high performers are the cities Brussels, Munich and Amsterdam.

Since 2000, more cities are becoming more “well connected” in the global service economy. Approximately 60% of cities worldwide (in a total of 285 cities considered) gained networking capacity to global services. Europe's cities have done better than their USA counterparts in increasing their connections to the global services network (Map 9). All larger European cities have gained ground, especially in Eastern Europe, where for example Warsaw, Prague, and Bucharest have increased their position in the world city network of global services. At the same time, many major cities in Germany, including Frankfurt and Munich, are losing ground. As some cities in the core area of the EU has declined, cities in Eastern, Southern and Western Europe have shown significant improvements. This trend is helping to create a better balanced territory of European cities anchored in the global services economy.

The challenge for policymakers will be to continue to support and safeguard Europe's major cities influence in global networks while realising the potential of its smaller but increasingly globally connected cities. The main European global cities – like London and Paris – which are vital to the whole European territory may over time overheat and decline in competitiveness as a result. At the same time, Europe has a balanced

Figure 5 Tertiary knowledge-based services in cities of Europe and USA, 2000-2008

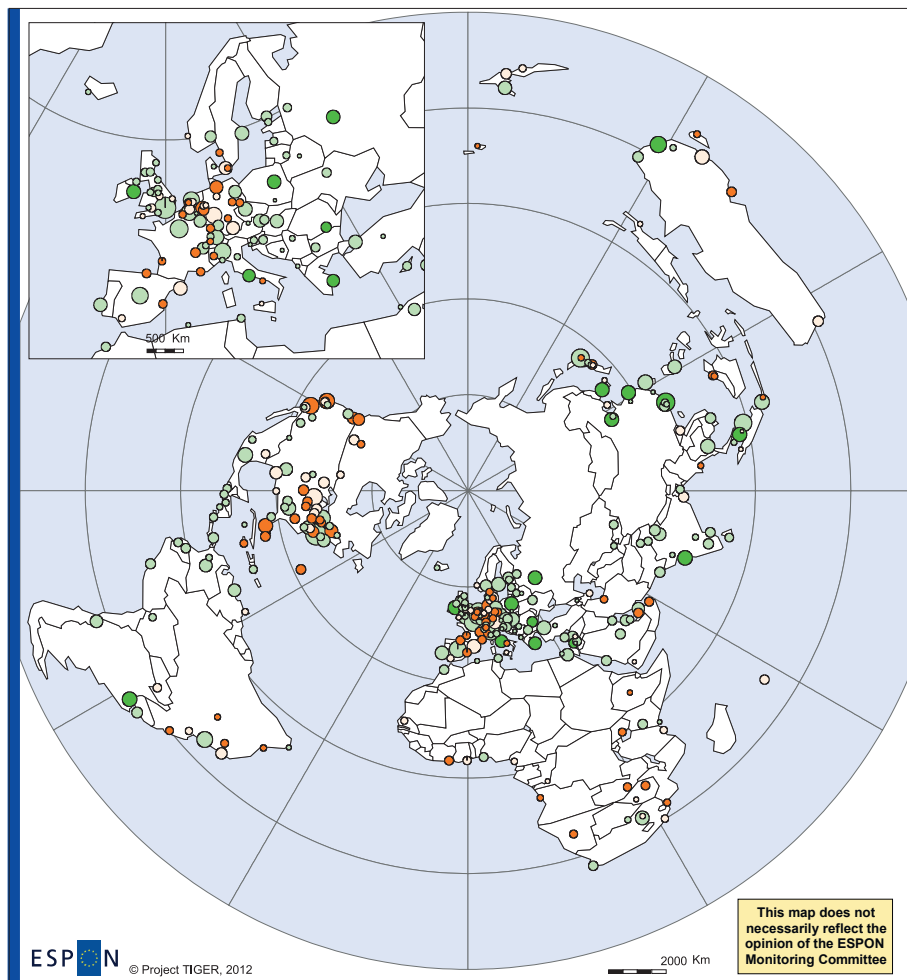
GaWC standardised (in % of cities) - EU				GaWC standardised (in % of cities) - USA			
2000		2008		2000		2008	
1 to 5	19.7	1 to 5	19.9	1 to 5	31.6	1 to 5	32.2
<i>London</i>	5.6	<i>London</i>	5.2	<i>New York</i>	9.8	<i>New York</i>	11.2
<i>Paris</i>	4.0	<i>Paris</i>	4.2	<i>Chicago</i>	6.2	<i>Chicago</i>	6.5
<i>Milan</i>	3.4	<i>Milan</i>	3.6	<i>Los Angeles</i>	6.0	<i>Los Angeles</i>	5.2
<i>Madrid</i>	3.4	<i>Madrid</i>	3.5	<i>San Francisco</i>	5.2	<i>San Francisco</i>	4.7
<i>Amsterdam</i>	3.2	<i>Brussels</i>	3.3	<i>Miami</i>	4.4	<i>Miami</i>	4.6
1 to 10	33.7	1 to 10	34.6	1 to 10	50.4	1 to 10	51.6
1 to 20	55.9	1 to 20	58.2	1 to 20	74.4	1 to 20	74.8
1 to 50	89.1	1 to 50	91.0	1 to 50	100.0	1 to 50	100.0

Source: GawC, 2010

Note: The Globalization and World Cities (GaWC) research network has measured and analyzed the spatial configuration of tertiary knowledge-based business relations in the World City Network (WCN), using information on the locations of global Advanced Producer Services (APS) firms - banking/finance, accountancy, law, advertising and management consulting firms - with multiple city-based offices worldwide. The basic assumption is that the size and the functions of offices generate connections between cities where they are located.

4 – European cities in global networks

Map 9 Evolution of cities servicing global capital, 2000-2008



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Number of connections between cities, 2000

300
150
75

Evolution of the number of connections (%)

- -80 - -20
- -20 - 0
- 0 - 30
- 30 - 322

Source : Gawc, 2011
Origin of data : Gawc, 2008

Note:
This map shows for 285 world cities development of inter-city relations from 2000 to 2008 based on the location of tertiary knowledge-based services. The circles indicates the total number of connections (links with other cities) in 2000. Colours of the circles show the evolution of connections.

and more even distribution of smaller cities than the USA and China. One example is Dublin which is now a globalised city. The city's assets – a critical mass of young skilled workers and internationally renowned education institutions – combined with an open national economy, have led it to become a strong player in globally traded services, which have remained relatively resilient in recent years.

Policymakers should safeguard and grow Europe's urban fabric further into the global economy through a number of actions. For example, by encouraging the most globally connected cities to cooperate with neighbouring territories to relieve pressure on housing and infrastructure.

Also, less prominent cities that wish to play a greater supporting role should be encouraged to do so, relieving global cities of functions that are not essential. By promoting themselves jointly as 'dual accessible alternatives', both to the global economy and to Europe's global cities, investors and entrepreneurs who seek global city proximity with lower associated transaction costs might find such places very attractive.

This overall approach would be able to create a win-win for both overall growth of Europe but also encouraging a more balanced growth and territorial cohesion.



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ESPON shall support Cohesion Policy development with European-wide comparable information, evidence, analyses and scenarios on framework conditions for the development of regions, cities and larger territories. In doing so, it shall facilitate the mobilisation of territorial capital and development opportunities, contributing to improving

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