REGIONAL CHALLENGES IN THE PERSPECTIVE OF 2020

REGIONAL DISPARITIES AND FUTURE CHALLENGES

A report to the Directorate-General for Regional Policy
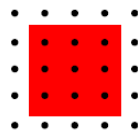Unit Conception, forward studies, impact assessment

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Produced by:

Francis Cripps, Enrico Wolleb,
Andrea Ciffolilli, Naret Khurasee

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ISMERI EUROPA

In collaboration with

wiiw

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SYNTHESIS

Globalization is the increasing integration of world markets due to diminishing transaction costs and weakened barriers to the exchange of goods, services, capital, people, ideas, information and knowledge. While it provides a unique opportunity for development, it benefits more strongly those regions which are in the most favourable position to participate with other regions lagging behind. The uneven spread of benefits and the challenge to traditional cultures have generated opposition to the phenomenon both in the developed world and in middle and low income countries. In this respect, globalization may be considered to represent a challenge to European regional cohesion.

In a globalised world the prosperity of each region depends heavily on exports to other areas. The highest rewards for participation in global trade typically accrue to enterprises that gain a dominant market position through branding, product innovation and process innovation. This has created a "knowledge economy" where high education and extensive international connections confer a significant competitive advantage. Apart from the "knowledge" effect, the ability of each area to gain external income depends on several other factors which impact local areas in very different ways including climate and natural resources, location and the pattern and strength of existing market linkages. This paper presents the results of an analysis of relationships between trade and income in Europe today, having regard to country-level impacts and regional sensitivity, and examines the potential for changes in the future.

The past decade

During the past decade exports and other sources of external income increased rapidly for most European countries and in 2007 were 3-6 times higher per capita than the level in neighbouring regions (the CIS, Middle East and North Africa). Europe as a whole has high earnings in all categories of external income except energy exports. By contrast neighbouring regions are strong exporters of energy and little else.

Services and other income flows were the most dynamic sources of external income for Europe as a whole, having increased by 84% and 124% respectively in real terms, overtaking exports of manufactures whose value net of import content increased only 32%. The value of energy exports also increased recently by a large percentage, bringing substantial benefits to Norway and Europe's neighbours, as the price of oil rose dramatically, peaking in mid-2008 before falling back to a level that is still high by historical standards. Average income per capita in Europe increased by 25% in real terms over the decade ending in 2007. Similar changes affected Europe's neighbours although income levels in these areas remained far below the average for Europe. Turkey raised its average income level by attracting inward capital flows but due to the lack of energy exports it still had a lower income level than the average for the CIS and Middle East. Average income in North Africa was lower than in Turkey and the economies of North Africa remained relatively closed with low exports per capita and low import content of domestic spending.

In 2007 four European countries had sustainable income[1] levels exceeding 27,000 EUR per capita. Two were members of the European Union (Sweden and the Netherlands) and two were not (Norway and Switzerland). Norway had a strong performance in food and raw materials and service exports as well as energy. Switzerland had a very strong performance in exports of manufactures and services and a high inflow of other income. The Netherlands had a very strong performance in all categories and Sweden was strong in all categories except energy.

Nine countries had sustainable income levels of between 20,000 and 27,000 EUR per person. These included all remaining countries in the North and West of Europe together with Austria and Italy. There is a substantial gap between these countries and the next 2 economies in the hierarchy, Spain and former Czechoslovakia, where the sustainable income level was around 16,000 EUR. Below these followed Portugal, Hungary, Greece and Poland with sustainable income levels between 12,000 and 13,000 EUR. Finally, the poorest European economies, those of two member states, Romania, Bulgaria and non-member states in former Yugoslavia and Albania, had sustainable income levels of between 4,000 and 7,500 EUR per person. By world standards, the top 13 countries[2] would be described as 'high income', the next 5 as 'middle income' and the remaining countries as 'low income'.

Although exports of commodities (food, raw materials and energy) remain a minor income source for most European countries, the dominance of countries in the North and West starts in this area. In 2007 net external income generated by exports of commodities exceeded 1,000 EUR per person in eight of the top ten countries (Norway, Netherlands, Denmark, Belgium-Luxemburg, Sweden, Austria, Ireland and Finland). The comparable figure for the bottom six countries (Hungary, Poland, Romania, former Yugoslavia and Albania) was less than 400 EUR per person.

Looking at performance in exports of manufactures, some dynamic factors are evident in the distribution of competitive advantage. Hungary and former Czechoslovakia joined the middle tier while the United Kingdom, Denmark and Norway were relegated to a lower tier. The dominant position in exports of manufactures still remains with Switzerland, Germany, Austria, Sweden and Finland. While relocation of manufacturing industries may have helped regional convergence in the past decade, the concentration of services and other external income kept high and middle-income countries in Europe well ahead of lower-income countries, suggesting the rise of a new dynamic of divergence based on services and investment income.

Sustainable income has been measured on the assumption that countries may run external deficits covered by capital inflows so long as the required rate of capital inflow is not such as to generate a very high level of accumulated external debt relative to GDP.[3] Several low income countries in Europe have had external deficits larger than this, implying that their current income level has been maintained with the support of capital inflows that are unlikely to be sustainable in the long run. This applies particularly to Spain, Greece, Portugal and Romania where high capital flows have raised income 25% or more above the sustainable level. On the other hand several high-income countries, notably

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[1] Sustainable income is actual level or the level at which the current account deficit would not exceed a sustainable level of capital inflow, given the past growth rate of GDP, and the actual value of exports and import content of domestic spending (see Annex 1)
[2] See Annex 2
[3] For the purposes of this study the acceptable or sustainable level of net external indebtedness has been set at 50% of GDP, implying a net outflow of interest and profits of between 2 and 4% of GDP.

Norway, Switzerland, Sweden, the Netherlands and Germany, have had substantial current account surpluses implying that people and firms in these countries are building up external investment positions that could be expected to return interest and profits in the longer run.

Looking at the experience of the past decade overall, Albania, Romania and Bulgaria showed rather dramatic gains in per capita income while Poland, Hungary and former Czechoslovakia achieved growth rates nearly twice the European average. The main engine for these gains was growth of exports of manufactures within Europe and to the CIS. Services were important for Albania and other income credits increased substantially for Hungary. In parallel with gains in manufacturing in lower-income countries, there were substantial reductions in net exports of manufactures per capita in some higher-income countries, notably Denmark and Belgium.

A methodology for looking ahead

Analysis of the current position and changes over the past decade has relied on an examination of sources of external income, dependence on imports and the balance-of-payments contribution of capital flows. To carry the analysis forward to 2020 it is necessary to make some extrapolations of growth of world markets and structural changes within Europe using a simple model that enforces consistency while allowing a wide range of alternative assumptions about recovery from the global recession.

Country-level scenarios using the world model provide the context for a more detailed examination of prospects for regions within Europe that gives us a sense of the circumstances in which regional disparities are likely to increase or diminish and a sketch of patterns of structural changes that will facilitate convergence.

Although this approach cannot provide any definitive answer to general questions about the future pace of globalisation and its impact on convergence, the rate at which institutional spillover benefits will continue or the balance between concentration and dispersion, it can provide an impression of the potential range of outcomes and patterns of structural change which may sharpen our understanding of the future role of the knowledge economy and the much-debated relationship between supply-side and demand factors that are both critical elements in any longer-term scenario.

There are many varied interpretations of the quantitative trends described in this paper including the changing pattern of functional specialisation and cross-border integration that deserve a far more detailed analysis than has been possible in this paper. There are also many important macro-economic issues including adjustment of savings and investment and real exchange rates within the European economy that are not addressed here.

The main tool for analysis of global trends in this paper is a databank and structural model of the world economy that relies on long-period historical series for 1970-2007. Two scenarios for the period to 2020 have been elaborated out using this model. Scenario A assumes a delayed recovery from the present recession and limited integration thereafter. In this scenario there would be little convergence in Europe up to 2020 although there may be some changes in ranking of countries due to the continuation of historical dynamics evidenced in the past 10-15 years. The boundary of prosperity that separates the North, West and Centre of Europe on the one side from the South and East of Europe on the other may flex slightly to the East, mainly at the expense of Ireland and the UK. In

this scenario the price of oil remains depressed and therefore there is no indication of any narrowing of the huge gap between Europe as a whole, and neighbouring regions such as the CIS, Middle East and North Africa.

Scenario B assumes a more rapid recovery from global recession with higher investment in most regions of the world including Europe and its neighbours. The scenario also assumes substantial shifts in production of food and raw materials and services from the North and West to the South and East of Europe generating a significantly higher growth rate for Europe as a whole. This scenario implies rapid catch-up of low income countries within Europe.

On the basis of these assumed developments at a country-level and an assessment of sensitivity of NUTS2 regions to the globalisation challenge, two regional scenarios for 2020 have been sketched in a qualitative manner.

In scenario A Europe will not experience the same expansion as over the past 10 years. However, regions that have strongly benefited from globalisation may be expected to increase their net export income from now to 2020. These regions, mostly located in Northern and Central Europe will be at the top of the league. Beneficiary regions located in the UK and Ireland will grow less and diverge from the top. Other beneficiary regions located in other Southern and Eastern European Countries, instead of continuing the catch-up path, will diverge further from the top performers. In conclusion, the group of European regions which are leaders with respect to globalisation may become thinner with only Northern and Centre in the top positions and other industrial or service based regions of rich countries following suit.

Intermediate regions, located mainly in Central Europe and adjacent to highly beneficiary regions, will tend to be influenced by the expected performance of their neighbours. Those located in Germany and Nordic countries are likely to be dragged along by the pace of the most dynamic regions and will tend to converge towards the top. Intermediate regions located in other relatively rich countries will lose ground. Other regions located in countries expected not to catch up with the income level of European leaders face serious risks of very high unemployment and slow growth. In conclusion, the intermediate group is likely to remain stable in number, some currently highly beneficiary regions joining while some currently intermediate regions become vulnerable. Again, Northern and Central European regions face the least negative perspective.

Regions that are currently most vulnerable (mainly in the South and East of Europe) may experience a further deterioration of their position. Those located in Southern Italy or scattered across France and the UK are likely to face more intensive cohesion problems than now. Vulnerable regions in Eastern Europe, still characterised by very low income levels, will experience divergence. In conclusion, in a pessimistic scenario, the group of vulnerable regions is likely to grow in number. Disparities between currently weak regions and top performers will increase substantially while some Eastern European areas which gained a lot during the last 10 years risk losing some of the advantages that they managed to acquire.

In scenario B there will be quick recovery from recession thanks to higher levels of public and private investment in Europe and other world regions. Within Europe, regions located mainly in Northern and Central Europe which are already highly beneficiary with respect to globalisation will increase their incomes by 40-80% (except regions in the UK and Ireland). The core beneficiary regions will gain advantages from income growth in

relatively fast-growing countries in the South and East which will boost the internal market for manufactures and return profits on capital invested in those countries. In conclusion, in this faster-growth scenario, currently beneficiary regions will retain their leadership and do not sacrifice their income levels although there would be reductions in their export income from agriculture and raw materials.

Intermediate regions, mainly located in Central Europe and adjacent to highly beneficiary regions will also benefit from income expansion in the fast-growing South and East, and the boost to internal demand for manufactures in those areas. They will however show reductions in net export income from agriculture and raw materials and slower growth of service exports. Performance of intermediate regions will be mixed, but this group may expand with a number of vulnerable regions improving their performance and joining the "club" which could be larger than the number of intermediate regions leaving the group.

Regions which are currently vulnerable, located mainly in the South and East of Europe will increase their average income by up to 10% per annum or 300% over the period from 2007 to 2020. They will benefit from relocation of agricultural productions from North and West and experience a rapid development of service exports. In conclusion, in this scenario, vulnerable regions will leap forward and experience remarkable convergence.

1. Introduction

This paper provides a concise analysis of the potential impact of globalisation on regional income disparities in Europe and of the role of neighbouring countries in this process in the period up to 2020.

The analysis is part of a broader project of DG REGIO, which, together with the World Bank and the Bertelsmann Foundation, has established the Regional Future Initiative, a network of experts looking at the future of regional trends. The objective of the network is to analyse and build a consensus on the future impacts of key challenges (globalisation, climate change, demographic change and migration, energy risks and social polarisation) that regions will face in the perspective of 2020 and to elaborate and discuss possible responses. The output of the network should provide a basis for policy discussion and choices in the coming years.

The paper is based upon a new analysis produced by the Regional Future network itself as well as prior research by international institutions and scholars. The project covers 5 challenges and the discussion of each challenge has been designed to avoid overlaps so far as possible. In the final phase the analysis of each challenge will be merged to produce two broad scenarios for European regions in 2020.

1.1   Goals of the analysis

The ultimate purpose of the analysis is to provide information that may be useful for the formulation of policies intended to improve prospects for reduction of income disparities, or convergence, in Europe at the regional level.

The most important question in relation to globalisation is the intensity or speed at which globalisation processes will continue and how this will affect convergence. Other relevant issues include future patterns of specialisation in global markets including in particular the place of the "knowledge economy", and the ongoing consequences of financial and commercial integration for development of local economies and institutions. Evidently issues of this kind can be examined from various perspectives incorporating a wide range of supply-side factors as well as macro-economic and financial variables and it is not possible to provide definitive answers to such questions here and now.

The main objective of this paper, after reviewing alternative interpretations of globalisation and its impact on the geographical distribution of income, is to provide quantitative evidence about recent and prospective trends using data on international trade, balance of payments and GDP for major world regions, Europe and individual countries in Europe on the one hand, and on adaptability and other success factors at the regional level within European countries on the other. Finally the paper will advance some preliminary conclusions about prospects for divergence or convergence at the regional level under different scenarios for the global and European economies.

Needless to say, trends revealed by historical data can be interpreted in different ways. Nevertheless such data do provide useful information about the scale of national and regional disparities in relation to domestic income and participation in external markets which is the most important direct manifestation of globalisation and this information can be used to get some idea about alternative contexts for the development of regional

economies in the period up to 2020. The paper will draw on such perspectives to reach conclusions about specific aspects of globalisation that need to be considered in framing policies to reduce regional disparities within Europe in the future.

1.2   Assumptions and content of the paper

Globalization is the increasing integration of world markets due to diminishing transaction costs and weakened barriers to the exchange of goods, services, capital, people, ideas, information and knowledge. Globalisation integrates world markets, thinning the boundaries between countries and economic blocks, allowing emerging and developing economies to interact more fully with the developed world, and easing mobility of people and ideas through lower communication and transport costs. Globalisation also puts pressure on pre-existing networks and benefits specific social groups and regions more than others. Thus while globalisation provides a unique opportunity for development it benefits more strongly those regions which are in the most favourable position to participate while other regions lag behind. The uneven spread of benefits and the challenge to traditional cultures have generated opposition to globalisation both in the developed world and in middle and low income countries.

For EU countries the present phase of globalization differs from previous periods of market integration. During previous stages of European unification since 1950, economic integration took place under a well-defined framework of rules in which elimination of different forms of protection (trade quotas, tariffs, subsidies and controls over capital flows) was accompanied by compensatory measures to ease the impact of adjustment on different regions and social groups. In Europe and more generally in the global arena, the political weight of developed countries allowed their governments to determine the pace and the direction of phases of integration.

Today criticisms of globalisation are provoked not only by issues mentioned above but also by the fact that there is widely perceived to be a lack of governance at national, as well as EU and world level and it often appears that large corporations and financial institutions play a pervasive and uncontrolled role. Therefore, despite the overall benefit for European growth and for developed countries in general, there is a feeling that many regions and social groups are paying a high price and that the uneven distribution of benefits has increased disparities among social groups, causing job losses in exposed sectors and harming regions that are less able to compete. In this respect, globalization may be considered to present a challenge to European regional cohesion. This observation brings us to the core of the matter which is to analyze who is winning and who is losing from this process within the European regions and why.

In a globalised world the prosperity of each region, large or small, depends heavily on exports to other areas. The highest rewards for participation in global trade typically accrue to enterprises that gain a dominant market position through branding, product innovation and process innovation. This has created a "knowledge economy" where high education and extensive international connections confer a significant competitive advantage. Therefore one important concern is the presumption that regional divergence will increase as areas where the labour force is highly educated and well-connected gain disproportionate shares of export income. The intensity of the "knowledge" challenge and vulnerability of European regions have been summarised in DG REGIO's working document "Globalisation challenges for European regions" circulated in January.

Apart from the "knowledge" effect, the ability of each area to gain external income depends on several other factors which impact local areas in very different ways including climate and natural resources, location and the pattern and strength of existing market linkages.

It must be expected that in future, given that countries and regions have a different potential to compete due to their existing specialization in more or less dynamic sectors, their capacity to attract global firms and highly skilled workers, their infrastructure endowments and the quality and size of their workforce, the ongoing process of specialisation and reorientation brought about by globalization will significantly alter the pattern of regional disparities and the degree of cohesion within Europe.

The analysis will concentrate on drivers which we consider crucial to the evolution of regional cohesion[4]:

– regional integration in the world economy. The starting hypothesis is that successful regional integration mainly depends on specialization in medium-high tech sectors as well as in services, arguably the most dynamic sector of trade today[5], while low tech specializations should progressively be abandoned. Business services as well as services connected to tourism are indicative of regional capacity to play an active role in globalisation and to attract resources, hence they are also taken into account;

– the size and evolution of regional employment and GDP per head affect the actual and potential ability of regions to adapt and upgrade their patterns of specialization and, therefore, to respond to competitive pressures. Positive performance of income and employment growth reflects an endogenous capacity to be successful and attract investments;

– the education and skill level of the work-force which affects competitiveness in the knowledge economy and specialization in high tech sectors. The demographic composition of the population is favourable to globalization and the knowledge economy when it guarantees a flow of young and well educated workers into the regional labour market.

After a review of relevant literature and hypotheses, the paper proceeds to examine the characteristics and dimensions of globalization as it affects Europe and neighbouring regions. The analysis focusses on countries first and then on regions (NUTS2). At the country level, the scope of the analysis is wider and benefits from the extensive availability and reliability of national data. The more limited availability of data at the regional level narrows down the scope of the exercise but nevertheless allows us to point out peculiar geographical patterns which are particularly relevant to cohesion.

The country-level analysis of globalisation (§ 2.1-2.2) provides a basis for examining the strength of individual Member States in different branches of trade (manufactures, services, raw materials and energy etc.) and other external income sources. A set of indicators is then used to calculate an index of sensitivity of individual regions in the face of

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[4] Factors such as economic governance, social and cultural aspects enhancing integration and communication, quality of life, but also the urbanization patterns, social capital, the welfare and tax systems, will play an important role in the new cohesion scenarios. These factors, however, can be considered to some extent partially reflected in the "hard" variables such as trade, specialization, workforce skills, FDI attraction, etc.

[5] World Bank (2007), Global Economic Prospects. Managing the Next Wave of Globalization.

globalization opportunities and pressures (§ 2.3). Three groups of regions are identified on the basis of this index: highly beneficiary, intermediate and vulnerable regions.

The final chapter looks forward to 2020 and considers prospects for European countries under two different scenarios for the world economy and European economy as a whole (§ 3.1-2). Finally, by combining insights stemming from the country-level analysis and the index of regional sensitivity the paper assesses the potential impacts of globalisation on regions in 2020 (§ 3.3).

1.3 Review of Literature[6]

1.3.1 A brief historical survey

Globalisation is not an unprecedented phenomenon. Early forms of intense commercial exchange and integration have characterised different ages of human history, from the Roman to the Islamic Golden Age, from the Silk Road during the Mongol Empire to the East India Company during the British Empire and so forth. However, two waves of global market integration stand out as the most considerable and important[7]. The first wave accompanied the industrial revolution in the period 1820-1914. The second wave is the current phenomenon which started approximately in the 60ies and accelerated in the 90ies. The current wave shows unique features when compared with the previous; we summarize these main features as described in the recent literature:

– The international economic system is now politically intertwined, characterised by the presence of international institutions and rules (e.g. WTO, IMF) and subject to challenging demands from the public.

  o Policy makers are asked, to a much greater extent than before, to guarantee income growth, promote employment and keep inflation under control, finance welfare programs and, simultaneously, lower taxes.

  o International competition for exclusive access to market was previously considered necessary for national prosperity and this led to two world conflicts, the reconstruction of protectionist barriers and controls over capital and labour mobility that characterised the period (1915-1960) between the main two globalisation waves[8]. Nowadays, these beliefs have been put aside in advanced countries.

– In terms of size[9], current globalisation, involves countries such as China, India and the states of the former Soviet Union, doubling the work force that has access to the global market.

  o This has allowed including significant shares of poor and agrarian population from the emerging countries, with a positive impact o the world overall divide among rich and poor. However, internal disparities among those who have access and

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[6] This paper covers a very broad topic which can be summarised in a few pages only if focussed on a limited number of aspects and quoting some but not all the most relevant literature.
[7] Baldwin R., Martin P. (1999), Two Waves of Globalisation: Superficial Similarities, Fundamental Differences, NBER WP, January.
[8] Kindleberger C. (1989), Commercial policy between the wars, in P. Mathias and S. Pollard (ed.), Cambridge Economic History of Europe, Volume VII, Cambridge University Press, Cambridge.
[9] Hamilton D., ed. (2008), Globalisation and Europe: Prospering in the New Whirled Order, Center for Transatlantic Relations, The Johns Hopkins University 2008.

those who are still excluded has a strong impact also on present day policy making environment which tends to be not entirely trade friendly in developing economies.

   o At the same time, the current wide income gap and the opportunities related to technology transfer may allow poor countries to grow today at much faster rates that before and finance welfare and redistributive measures.

   o A similar approach to globalization can be seen in the developed economies in which the competitive pressures in exposed sectors had a disruptive effect on wages and jobs of workers, often not adequately protected by the current welfare systems, despite the overall benefits from higher growth and the wealth effect of lower import prices.

− The nature of trade has changed significantly and "trade in ideas" has considerably grown in importance[10].

   o Huge capital flows are boosted by continuous information exchanges and advances in ICT; daily turnover in the foreign exchange markets has nearly quadrupled since the early 90s.

   o FDI is being carried out in manufacturing, services and outsourcing industries by multinational corporations. These substitute for North-South investments in primary production and railways which characterised globalisation in the 19th century.

   o The pace of global integration is nowadays higher due to the speed of transfer of both products and ideas. Previously, the drop in transport costs (driven by railways first and then by container shipping) fuelled the phenomenon. More recently (from the 80s) ICT brought about a drop in communication costs which far outpaced the decrease in transport costs. This is central to advanced economies dominated by the service sectors[11].

   o Trade is different in nature also because of intra-industry specialisation driven by scale economies and oligopolistic competition rather than by factor endowments and technological gaps, as in the past. All this translates in relatively rapid income convergence among advanced countries, in de-industrialisation of leaders and new industrialisation in some but not all developing nations[12].

− The redistributive nature of globalization has been emphasized as a fundamental feature of present global market integration.

   o As developing nations join the global economy, hundreds of millions of people have been lifted out of poverty[13]. China in particular recorded the largest decline in poverty in history dropping in 22 years from 74% to 15% in 2004; and in India from 63% in 1981 to 42% in 2001[14]. Nevertheless hundreds of millions remain in poverty not only in China, India and other countries of South Asia but also in most parts of Africa. Poverty also remains a major problem across South and Central America.

   o Rising inequalities within most countries over the past 2 decades pose one of the greatest challenges to economic policy makers in both developing and developed world. The available evidence suggests that income inequality has risen in most countries and regions. Trade liberalization and export growth are found to be

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[10] See WTO (2007), International Trade Statistics and World Bank, World Development Indicators.

[11] Wolf M. (2004), Why Globalization Works, New Haven: Yale University Press.

[12] In the past, on the contrary, convergence of more advanced countries was slower and accompanied by their industrialisation as well as by de-industrialisation of divergers (e.g. Indian colonies).

[13] Wolf op. cit.

[14] Hamilton op. cit.

associated with lower income inequality, while increased financial openness is associated with higher inequality. However their combined contribution to rising inequality has been much lower than technological change, both at global level and especially in developing countries[15].

Impact of globalisation on EU

As clearly stated in the Sapir report[16], the key policy issue for Europe is how to enjoy the benefits of globalisation while mitigating its costs. With current trends continuing at the present rate, the challenges[17] posed by globalisation are likely to become more and more acute and better understanding of economic, environmental and social impact of globalisation is fundamental to strengthen the conceptual framework and governance of cohesion policy.

– There is a wide agreement in the literature that globalisation has boosted world growth rates and largely benefitted Europe as a whole. Changes brought about by globalisation bring with them social costs of adjustment, especially for low-skilled labour and relating to the short-term negative consequences of migration[18]. On the same downside, increased profits of European companies channelled overseas may reduce investment and hiring in Europe[19]. Evidence on overall positive effect of globalisation:
  o The doubling of the number of workers in the world during the last twenty years is a matter of fact[20] as is the transformation of the nature of work due to the digital revolution, the capacity to segment work geographically and organisationally, the increasing tradability of services[21]. The integration of "new" workers (from developing and emerging economies) in the global workforce has expanded export opportunities for Europe while access to cheaper imported goods has boosted EU productivity. Job losses tend to be replaced by new higher-paid jobs. Furthermore two thirds of planned job reductions prior to the recession were due to internal corporate restructuring (2002-2005 average)[22] and to the impact of new technologies. In the same period, offshore sourcing and delocalisation accounted for less than 5% of job reductions and the effects were largely limited to the manufacturing sector.
  o Globalisation has been characterised by a shift of European trade from developed towards developing nations since 1990. However, Europe, the world's major trading area, carries out two thirds of total trade within its boundaries, with new member states growing in importance as commercial partners.

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[15] IMF (2008), Rising inequality: Technology or trade and financial globalization? Working Paper prepared by F. Jaumotte, S. Lall and C. Papageorgiou, July.

[16] "Sapir Report" (2003): an agenda for a growing Europe, making the EU economic system deliver. Report of an Independent High-Level Study Group established on the initiative of the President of the European Commission.

[17] Fisher S. (2003), Globalization and Its Challenges, Ely Lecture presented at the American Economic Association meetings in Washington DC, January 3.

[18] Unemployment, wage pressure on markets with flexible pay, higher welfare costs; see Nonneman W. (2007), European Immigration and the Labour Market, Migration Policy Institute, Bertelsmann Foundation, July.

[19] Hamilton, op. cit.

[20] Freeman (2006), The Great Doubling: The Challenge of the New Global Labour Market, University of Berkeley, August.

[21] Hamilton, op. cit.

[22] Storrie D. and Ward T., ERM Report 2007: Restructuring and employment in the EU: The impact of globalization, European Foundation for the Improvement of Living and Working Conditions, Dublin.

- o Europe has also become the main recipient of both inward and outward FDI since 1990. FDI has been dominated by services which are non tradable or less tradeable. Empirical studies suggest that again benefits outweigh costs, especially because most of outward FDI of EU countries remains within the Union, especially where R&D is concerned. Moreover, contrary to common belief overseas investments of European MNC are still mainly directed towards the U.S. rather than China or India.

– Even if the impact of globalisation can be considered positive for Europe as a whole, it is asymmetric across countries and regions and social groups. Some patterns of national differences are clearly pointed out by the literature[23] as well as by measures of vulnerability provided by international organisations and research centres[24]:
  - o Nordic countries are well placed to reap the opportunities of globalisation. They are characterised by flexible labour market, high level skills and education systems, low constraints to FDI etc. They drive innovation and do not compete head to head with developing and emerging economies.
  - o Most countries in continental Europe are also performing well but sometimes suffer relative weaknesses in education. Among these, countries with a German legal tradition may be held back by complex administrative procedures while countries with Napoleonic or civil legal systems are sometimes characterised by excessive state control which may constrain business start-up[25].
  - o Southern and Eastern European countries are more vulnerable. Despite the differences that characterise this group, these States are in general not well equipped in terms of human capital and, being specialised in low value added activities, tend to compete head-to-head with developing nations.

1.3.2   Regional and spatial development

– Division of labour, regional specialisation, gains from trade and technological innovation are widely recognised as the main forces behind world economic growth. Innovation emerges in specific places and organisational settings. Proximity enables technology spillovers at the regional scale and localised learning by doing[26]. Increasing returns arising from these conditions allow firms to earn monopoly rents for a period of time. When barriers to entry[27] are eroded, innovation diffuse and knowledge can be more easily, codified, copied, imitated. Geographical diffusion and non exclusive use of knowledge drive further rounds of innovation and fuel long-run growth, as in endogenous growth theory[28].
– Local monopolies and rents represent a divergence force while externalities of diffusion may contribute to convergence. In this dynamic view of long-term economic growth

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[23] See for example: Rae D., Sollie M. (2007), Globalization and the European Union: Which Countries Are Best Placed to Cope, OECD, December.

[24] See for example: the KOF Index of Globalization - Dreher, Axel (2006): Does Globalization Affect Growth? Evidence from a new Index of Globalization, Applied Economics 38, 10: 1091-1110. Updated in Dreher, Axel, Noel Gaston and Pim Martens (2008), Measuring Globalization – Gauging its Consequences (New York: Springer); the OECD Scorecard - Indicator of Ability to Cope with Globalization; the Global competitiveness Scoreboard and the Lisbon Scoreboard of the World Economic Forum.

[25] Hamilton, op. cit.

[26] Marshall (1920), Arrow (1962)

[27] Due for instance to tacit knowledge, trade/communication costs etc.

[28] See Romer (1990)

which we follow in this paper, creation and divergence as well as diffusion and convergence are part of a single process[29]. Globalisation plays an important function in this process since, once the sources of growth are created, they also need to be diffused to create economy-wide increasing returns which make long term growth possible.

– Not all the areas enjoy the rents from invention/innovation or the productivity effects of diffusion. Even when they can benefit from diffusion, the poorest regions might be not enough close related to areas benefiting from rents to climb up the technology ladder[30]. History and context matter from this point a view and this is a theme that still deserves to be studied further by the literature.

– Space matters. The recent World Development Report on "Reshaping Economic Geography"[31] highlights the relevance of spatial organization for economic growth. In particular, 3 dimensions are considered crucial for economic integration: density, distance and division. Economic integration means integration of urban and rural areas, of slums with other parts of cities, of lagging with leading provinces within a nation, of isolated and well-connected countries. Density (concentration of people and resources) means that it pays to be close to agglomerations and brings vigour to urbanization policies; distance from world markets eases migration which gives importance to territorial development policies, as distance, for example, is reduced by infrastructure; division (thick economic borders) prevents development and brings initiatives for integration to take advantage of scale and specialization.

– Faster technological development and diffusion in the past 2 decades have accelerated the pace of globalization and have disrupted the existing pattern of specialization. The assumption that emerging low cost economies would only attract low cost labour intensive productions is increasingly in doubt. Technological change has acted as a powerful driver of change of specialization and of employment patterns, independently from trade, FDI and offshore sourcing in the manufacturing and service sectors.

– In combination these phenomena have affected the organization of production, and its regional location patterns due to the internationalization of value chains in manufacturing and to a lesser extent tradable services. Multinational corporations and their spatial location strategies are at the heart of this transformation[32].

– Increased competition, the rise of new markets, the opportunities generated by new technologies and their cross-cutting potential across different sectors affects geographically concentrated production networks which tend to become longer, more dispersed and extensive, reaching across continents, and more connected. New integration patterns may disrupt existing concentration and generate new clusters, upstream or downstream of the value chain, in particular in locations offering more or different externalities[33].

Considering all the above, the impact of globalisation on European regions is clearly a complex phenomenon. Regional vulnerability partly mirrors national performance but also reflects regional capacities which may vary substantially within the same country. In general, theories and findings of core-periphery and cumulative causation suggest[34] that

[29] Aghion and Howitt (1997)

[30] Scott A. and Storper M. (2003), Regions, Globalisation, Development. Regional Studies, vol. 37: 6&7, pp 579-593.

[31] World Bank (2009), World Development Report: Reshaping Economic Geography.

[32] Storper M. and Chen Y. (2000), The Effects of Globalization on Location of Industries in the OECD and European Union, DRUID Working Paper No 00-7.

[33] Scott A. and Storper M. op. cit.

[34] See Feser (200?)

in some cases the opening up of regions to external competition can exacerbate income inequalities[35]. On the basis of existing contributions[36] but keeping in mind the enormous sub-national differences, it is possible to identify the following patterns:

– North Western Regions (especially in the periphery) are characterised by high employment, especially in advanced sectors, high education, and high productivity. They are able to cope well with globalisation.

– South and Eastern regions are specialised in low value added activities and they are unlikely to be able to leap ahead in the near future. Moreover they suffer from low workforce skill levels which imperils job creation and discourages FDI.

– All regions with major urban centres are more able to reap the opportunities of globalization. They are characterised by the presence of dynamic and advanced activities, as well as by larger share of highly educated population compared with rural regions.

A theme of particular interest for this project: European Neighbouring Countries and globalisation

– Neighbouring countries are important actors of the present globalisation; Russia and the European countries born from the collapse of the Soviet Union on one side, Turkey, and the Balkans have increasingly integrated with the EU and account for a significant share of external EU trade. Considering also the Middle East and North Africa, Europe's neighbours provide important opportunities for corporate Europe. The combined share of imports from the Middle East, Africa, Russia and Central and Eastern Europe was 38.7 in 2006, slightly less than developing Asia (43.3). This has balanced weaker imports from the U.S. Neighbouring countries provide opportunities for the EU to enlarge its sphere of influence and internal market. At the same time it has to be noted that there is no guarantee of closer relationships in the longer run as other parts of the world. particularly East Asia, have a strong interest in strengthening their commercial relationships with energy-rich countries in competition with Europe.

– Development of neighbouring countries can have a positive impact on regional cohesion within Europe as it is likely to benefit lower-income regions in the East and South of Europe which at the moment suffer from their peripheral relationship with core regions of Europe.

– Three main neighbouring areas have been identified as particularly relevant for the project and, according to the literature, their relative position with respect to globalisation is as follows:

   o States of the former Soviet Union (Russia, Ukraine, and Belarus) experienced a dramatic economic break-down after the disintegration of the Union. They slowly started to recover and grow. Russia, Belarus and Ukraine (together with the Balkans) accounted for 13% of EU flows to emerging markets in 2005 (34% total extra EU outflows) and have become an important offshore sourcing location[37]. Oil producers in these regions had at their disposal capital resources invested in

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[35] Venables (1998), Fujita and Hu (2001), Meardon (2001), Mansori (2003).

[36] DG REGIO (2009) Commission Staff Working Document Regions 2020, An Assessment of Future Challenges for EU Regions, January; John Dunning (2002), Regions, Globalization, and the Knowledge-Based Economy (Oxford: Oxford University Press; Alan J. Scott (1998), Regions and the World Economy: The Coming Shape of Global Production, Competition, and Political Order (Oxford: Oxford University Press);

[37] Hamilton et al. op. cit.

western financial markets. At the same time their consumption has periodically provided a major stimulus to the global economy[38].

o Turkey and the Balkans have recently experienced relatively high economic growth (approx 5.5 in 2007, double the level in the Euro zone). Turkey is a candidate for membership of the Union and was the most important destination for EU FDI in 2005 (especially from France) and an important offshore sourcing location. Turkey and Balkan countries still lag far behind in terms of competitiveness despite their proximity to the EU. Turkey and Croatia are behind both India and China (Global Competitiveness Index) while other Balkan countries (together with Ukraine) are behind Brazil. Despite a poor innovation performance, fast growing R&D investment is likely to increase their potential as trade partners for Europe.

o Middle East and North African regions are experiencing relatively high growth rates and since a long time are an important location for offshore investment[39]. Similarly to former Soviet countries, many of them are well endowed with fossil fuel reserves. The excess saving of oil producers has become a major source of investment in the EU, thanks to growing integration of world financial markets. Between 2000 and 2006 excess savings of oil-rich nations fuelled demand for imports and investment from the E.U. with Middle Eastern imports rising by by 116%, greatly helping to balance the growing oil deficit of the Union.

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[38] Russia, central and eastern Europe imports soared by 174% in 2000-06
[39] Hamilton et al. op. cit.

2. Exposure to globalisation: European, national and regional perspectives

2.1   The European outlook

To succeed in a globalised world, countries must by and large open their economies to imports and inward investment and maintain domestic income by a strong export performance. The highest performers generally have a current account surplus and net capital outflows.

During the past decade exports and other sources of external income increased rapidly for most European countries. After deducting estimated import content, the net income from exports and cross-border investment in 2007 averaged about 6,800 EUR per person in Europe as a whole.[40] This was in sharp contrast to neighbouring regions where net external income ranged from 900 EUR per person (North Africa) and 1,000 EUR (Turkey) to 1,400 EUR in the CIS group and 2,100 EUR in the Middle East. In other words the average performance in Europe was 3-6 times stronger than in neighbouring regions.

Europe as a whole has high earnings in all categories of external income except exports of energy. By contrast, neighbouring regions are strong exporters of energy and little else.

Although exports of manufactures are still very important for European countries, net income from services and cross-border investment taken together, at 3,400 EUR per person, was by 2007 considerably higher than net income from exports of manufactures at 2,500 EUR per person. Income from exports of food, raw materials and energy products were relatively small (around 900 EUR per person). In other words the strength of Europe's position increasingly relied on services and cross-border investment as sources of external income.

Given the strong performance of European countries in external trade and investment, the sustainable average level of income in 2007 was about EUR 21,400 per person.[41]

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[40] All figures in this chapter will be quoted on a per capita basis to facilitate comparison between countries with very different populations. EUR figures have been adjusted for comparability across countries and through time on a purchasing power (pp) basis using 2007 as the base year. The methodology is set out in Annex 1 and the main results are tabulated in Annex 2.

[41] Net external income in each category a is estimated as

$$vxn_a = X_a(1 - mx_a)/N$$

where X_a denotes exports or other income, mx_a represents the average import content of exports in the given category and N is population. Average import content is estimated on the assumption that exports of manufactures have twice the import intensity of other categories of final expenditure. This coefficient includes an allowance for the cost of outward income flows (interest, profits and remittances) that have become very significant for some European countries. In countries that host international financial centers, inward and outward income flows have increased together and the one must be considered as a cost of the other. To cover such cases, the allocation of outward income flows is heavily weighted towards inward income as opposed to exports and domestic production in general.

Looking at changes over the preceding decade, services and other income flows were the most dynamic external income sources, having increased by 83% and 122% respectively in real terms, overtaking exports of manufactures whose value net of import content increased only 32%. The value of energy exports also increased recently by a large percentage as the price of oil rose dramatically, peaking in mid-2008 before falling back to a level that is still quite high by historical standards.

In the past decade Europe's export performance (54% increase in net value) was considerably stronger than that of the US (19%) and Japan (29%) and slightly stronger than that of other countries in East Asia except China. The net value per capita of China's exports increased by no less than 365% over this period but the end-period figure was still very low at 614 EUR per person compared with 738 EUR for North Africa, 1912 EUR for the Middle East, 2763 for the USA, 3076 for Japan and 4842 for Europe.

Exhibit 1- External income sources of European countries in 1997 and 2007 (EUR per capita)

	1997	2007	(% change)
1. Exports	3,141	4,842	(54)
Food and raw materials	336	542	(61)
Energy products	119	345	(190)
Manufactures	1,892	2,498	(32)
European market	1,293	1,715	(33)
rest of world	599	783	(31)
Services	794	1,457	(83)
2. Other income	879	1,954	(122)
3. Total external income	4,020	6,796	(69)
4. Import content of domestic spending	22.47%	31.81%	(42)
5. Impact of capital flow	-561	304	...
6. Sustainable income level = (3)/(4) + (5)	17,330	21,668	(25)
7. Actual income level	17,330	21,668	(25)
8. Sustainability index = (5)/(6)	1.00	1.00	(0)

Average income per capita in Europe increased by 25% in real terms over the decade ending in 2007. The increase in average income was much less than the increase in net external income as there was a large rise in the import content of domestic spending (from 22.5% to 31.8%) over the same period.[42]

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[42] See Annex 1 for details of the calculation.

Similar changes affected Europe's neighbours although import content increased less in the Middle East and North Africa. Income levels in these areas remained far below the average for Europe. Turkey raised its average income level by attracting inward capital flows but the lack of energy exports meant that Turkey still had a lower income level than the average for the CIS and Middle East. Average income in North Africa was lower than in Turkey and the economies of North Africa remained relatively closed with low exports per capita and low import content of domestic spending (see Annex 2).

The export advantage of European countries as compared with global competitors was reduced by the greater degree of openness and higher import content of domestic expenditure (32% in Europe compared with 17% for the US, 14% for Japan, 8% for China and 26% for other East Asian countries). Nevertheless, sustainable income of Europe in 2007 as defined by external flows was not far below that of the US (21,700 EUR for Europe, 25,600 EUR for the US) and far higher than that of China (6,800 EUR) and other East Asian countries (5,300 EUR) although lower than the figure for Japan (24,100 EUR). Europe's capital account was roughly in balance in 2007 while Japan and China had large capital exports, reducing per capita income by an estimated 6,600 EUR and 1,600 EUR respectively, while capital imports boosted per capita income of the US by an estimated 7,000 EUR. In this sense at the onset of recession Japan was in a stronger position than either the US or Europe.

In terms of specialisation, Europe's sources of external income were very similar to those of the US and somewhat more diversified than those of China, Japan and other East Asian competitors that relied more heavily on exports of manufactures and received less income from exports of services.

2.2   Individual countries within Europe and neighbourhood

In 2007 four European countries had sustainable income levels exceeding 27,000 EUR per capita. Two were members of the European Union, Sweden and the Netherlands, and two were not (Norway and Switzerland). Norway had a strong performance in food and raw materials and service exports as well as energy. Switzerland had a very strong performance in exports of manufactures and services and a high inflow of other income. The Netherlands had a very strong performance in all categories and Sweden was strong in all categories except energy.[43]

Nine countries had sustainable income levels of between 20,000 and 27,000 EUR per person. These included all remaining countries in the North and West of Europe together with Austria and Italy. There is a substantial gap between these countries and the next 2 economies in the hierarchy, Spain and former Czechoslovakia where the sustainable income level was around 16,000 EUR. Below these followed Portugal, Hungary, Greece and Poland with sustainable income levels between 12,000 and 13,000 EUR. Finally, the poorest economies, those of Romania, Bulgaria, former Yugoslavia and Albania had sustainable income levels of between 4,000 and 7,500 EUR per person, less than one-quarter of countries at the top of the league.

[43] Note: tables and maps in this section of the report and in Annex 2 have been prepared using a databank and structural model of the world economy that relies on long-period historical series for 1970-2007. This implies some limitations on disaggregation of data by country. In particular the databank and model do not distinguish individual countries that emerged from the breakup of the former Soviet Union, Yugoslavia and Czechoslovakia.

Exhibit 2 - Sustainable income per capita in 2007
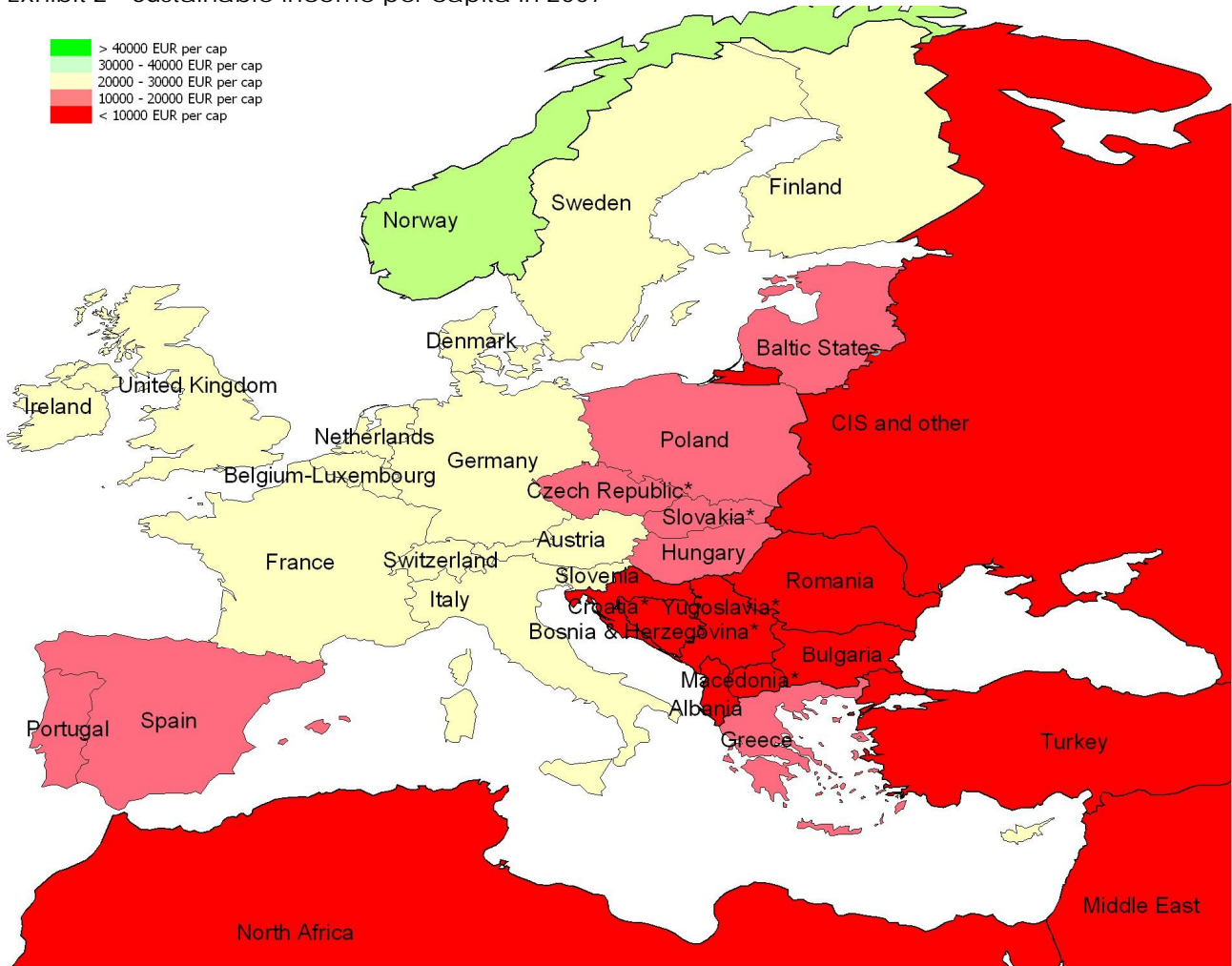
Note: the databank used for this project does not provide separate figures for countries marked * (members of former Yugoslavia or Czechoslovakia).

Differences in sustainable income levels have been compensated to some extent by large capital inflows, raising income levels in countries in the lower half of the ladder by up to one third in the case of Greece. Other countries whose income levels were heavily dependent on capital inflows that do not appear sustainable in the long run included Spain, Portugal and Romania.

Exhibit 3 - Net external income from exports of food raw materials and energy, 2007
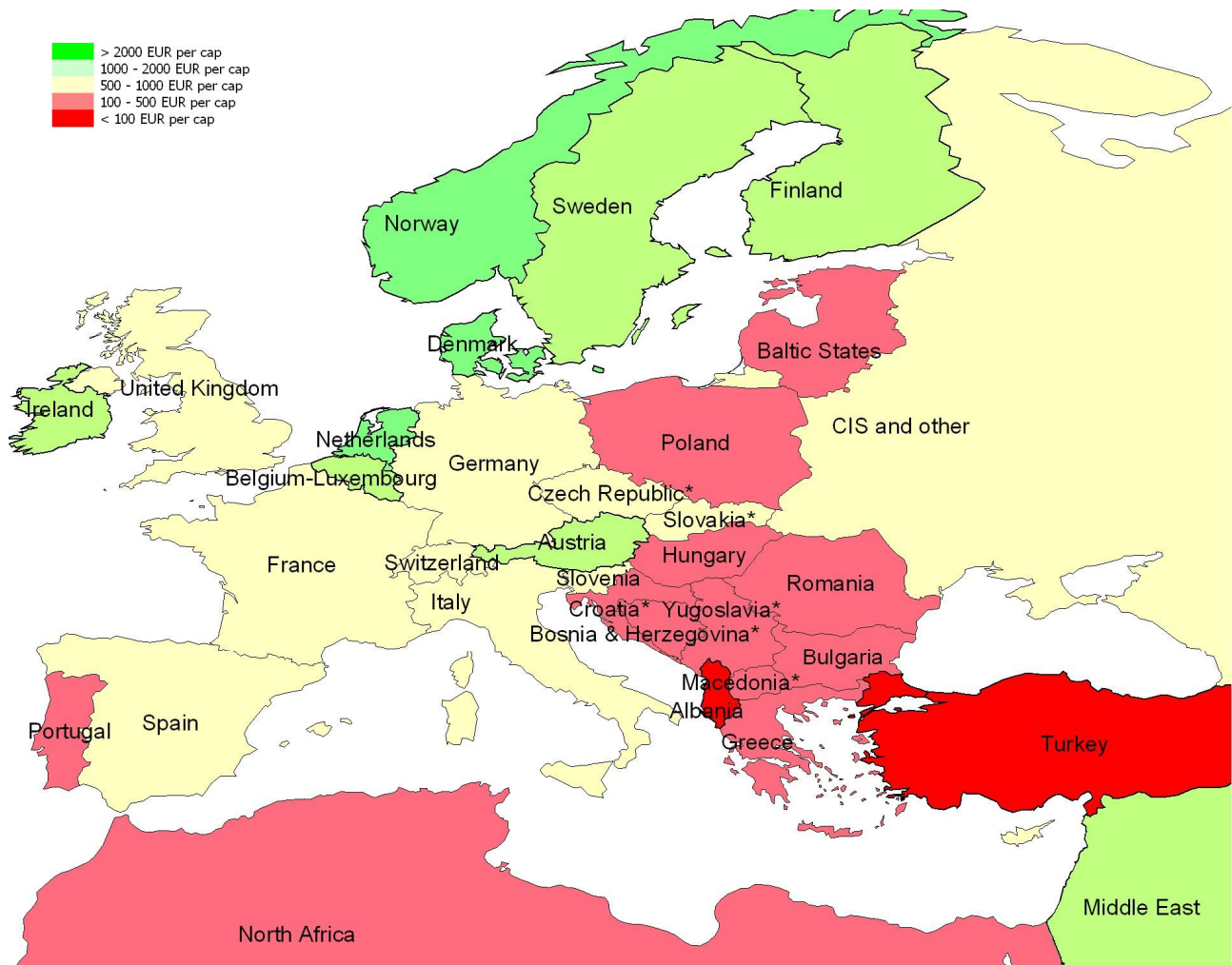
Although exports of commodities (food, raw materials and energy) remain a minor income source for most European countries, the dominance of countries in the North and West starts in this area. In 2007 net external income generated by exports of commodities exceeded 1,000 EUR per person in eight of the top ten countries (Norway, Netherlands, Denmark, Belgium-Luxemburg, Sweden, Austria, Ireland and Finland). The comparable figure for the lowest-income regions (Hungary, Poland, Romania, former Yugoslavia and Albania) was less than 400 EUR per person.

Exhibit 4 - Net external income from exports of manufactures, 2007
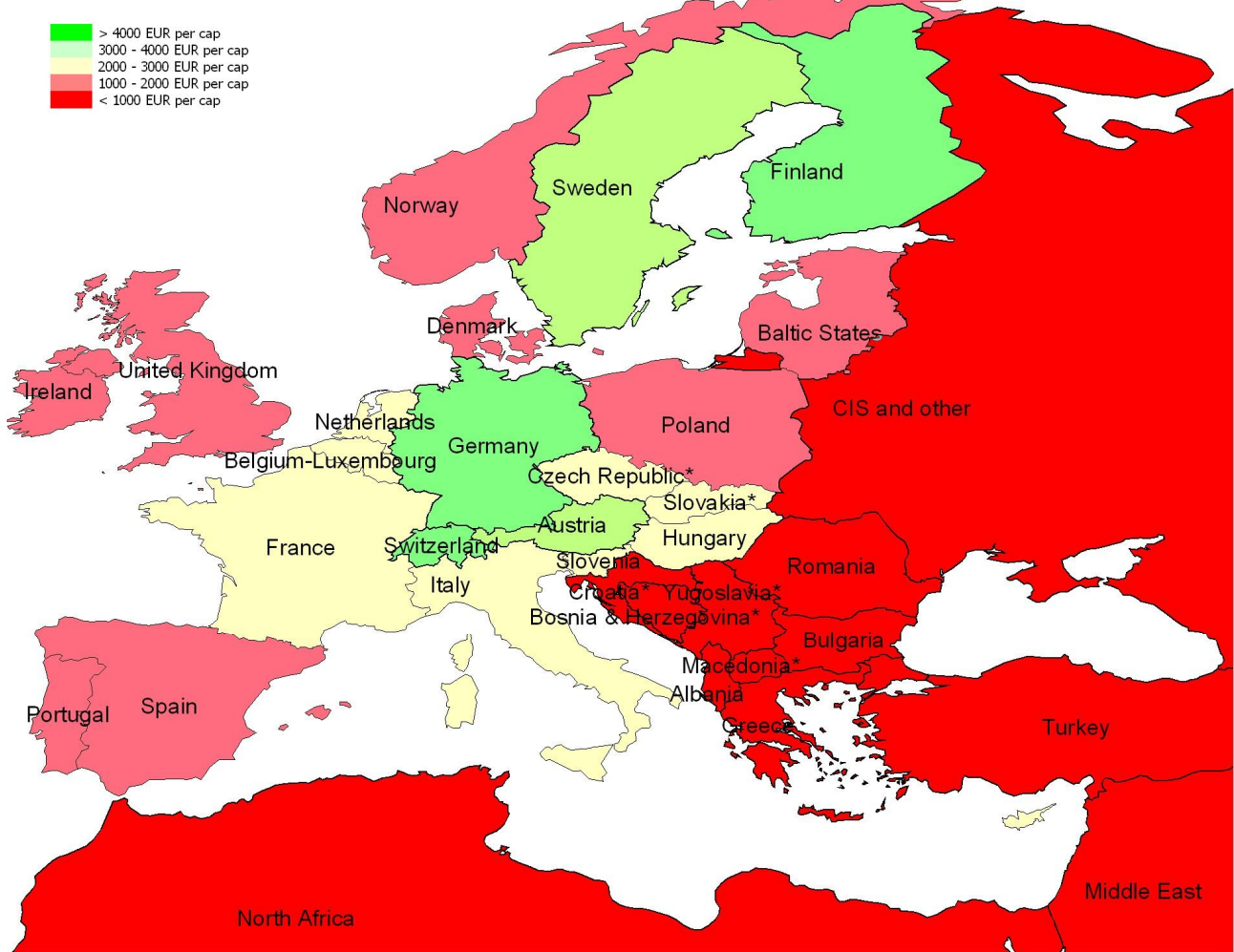
Looking at performance in exports of manufactures, some dynamic factors are evident in the distribution of competitive advantage. Hungary and former Czechoslovakia joined the middle tier while the United Kingdom, Denmark and Norway were relegated to a lower tier. [44] The dominant position in exports of manufactures still remains with Switzerland, Germany, Austria, Sweden and Finland.

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[44] The value of Ireland's exports of manufactures also appears to have fallen considerably when import content and income due to non-residents are taken into account. This fall was more than made up by large increases in net income from service exports and other income inflows.

Exhibit 5 - Net external income from services and other sources, 2007
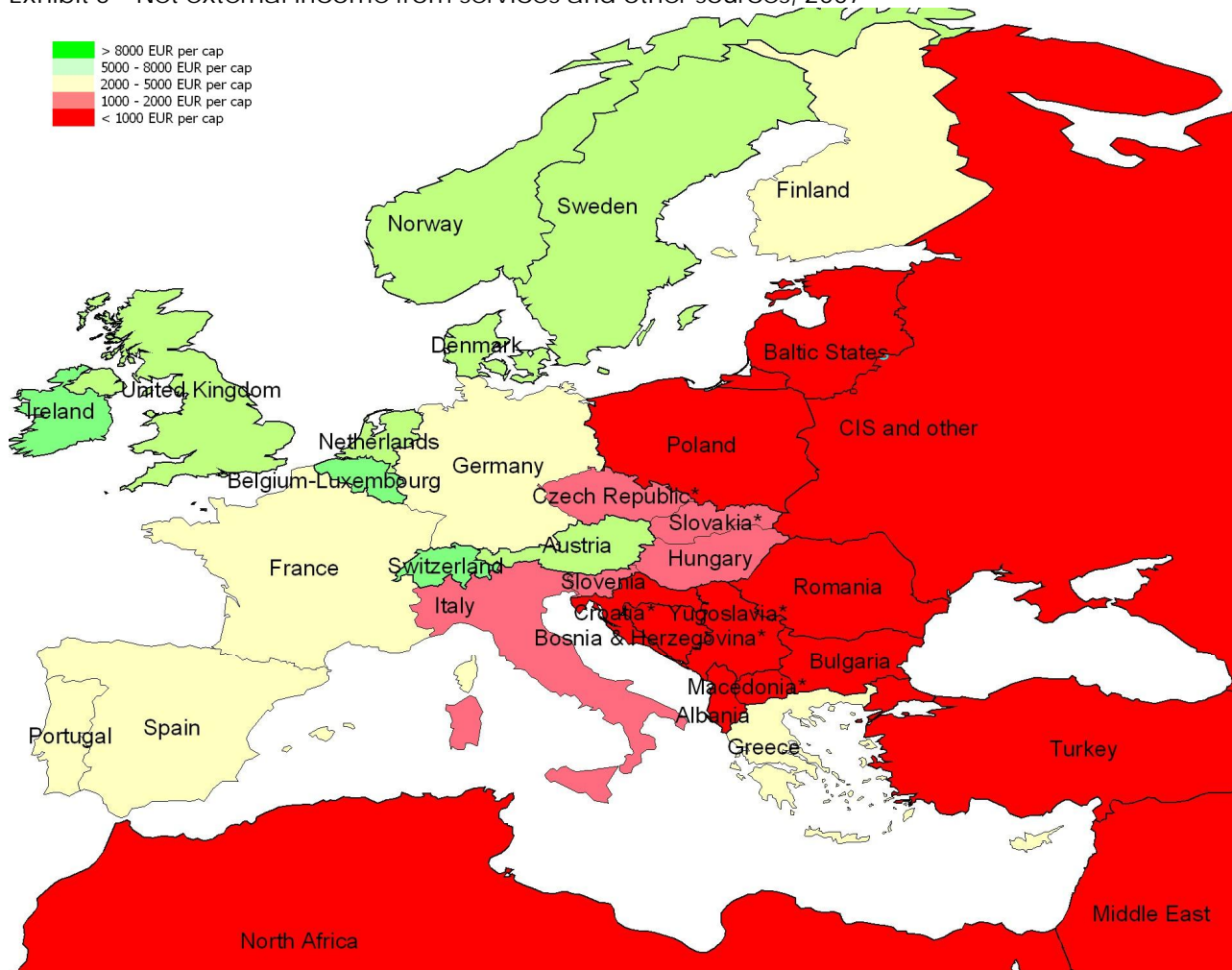
While relocation of manufacturing industries may have helped regional convergence in the past decade, the concentration of dynamic services and other external income kept high and middle-income countries in Europe well ahead of lower-income countries, providing a new dynamic of divergence. In 2007 per capita external income from services and other sources exceeded 7,000 EUR in five countries (Norway, Switzerland, Denmark, Belgium-Luxemburg and Ireland) and was less than 1,000 EUR in the poorest regions of Europe.

There is much less variation between countries in the level of dependence on imports than in export performance. Therefore differences in net exports per capita are for the most part reflected in per capita income. However the income level in some countries has been boosted by large capital inflows in which case sustainability of their relative position is doubtful. This is particularly true of Greece, Spain, Portugal and Romania. At the other extreme, Norway, Switzerland, Sweden and Germany had income levels in 2007 that were significantly below the levels warranted by their export performance, thereby earning current account surpluses invested elsewhere through net outflows of capital.

Looking at the experience of the past decade overall, Albania, Romania and Bulgaria showed rather dramatic gains in per capita income while Poland, Hungary and former Czechoslovakia achieved growth rates nearly twice the European average. The main engine for these gains was growth of exports of manufactures within Europe and to the CIS. Services were important for Albania and other income credits increased substantially for Hungary. In parallel with gains in manufacturing in lower-income countries, there were

substantial reductions in net exports of manufactures per capita in some higher-income countries, notably Denmark, Belgium-Luxemburg and Ireland.

2.3   Regional sensitivity

The intensity of the knowledge challenge and the vulnerability of the European regions to increasing globalization has been analyzed and measured in DG Regio's working document "globalisation challenges for European regions". The analysis is based on projections to 2020 of 5 available indicators which represent the main determinants of the regional performance: productivity growth, employment and unemployment, high and low educational attainment. This paper has produced a coherent and stimulating vision of the future impact of the challenge and represents the starting point of our exercise which is complementary to the DG Regio's analysis. Globalisation is examined from a different angle and on the basis of a different set of variables whose current value is considered to produce a picture of the present situation of regions. This portrait is then combined with the country level analysis of the future developments in order to produce regional scenarios.

The degree of sensitivity to globalization affects regional performance and consequently the level and pace of regional income growth and of the disparities among regions. Our approach to sensitivity analysis focuses on the comparative advantage of the regions to participate and benefit from increased trade integration. The rationale of this approach lies on the supply side theories by which regional and local competitiveness are based on the specialization and competitive advantage of the regional productive structure which is among other things created by the economies of agglomeration, causing increasing returns and positive local spillovers, increasing innovation and competitiveness. Each region can be specialized in a more or less dynamic sector and is integrated with a more or less successful national economy. The pattern of integration determined by specialization and the share of a partner market cannot be easily changed.

The drivers of sensitivity determine the direction and the strength of the challenge impact on the region. These must be chosen among those economic and social structural characteristics of a region which are crucial for globalization and the knowledge economy.

As pointed out in the first paragraph, the analysis focus on drivers which we deem crucial for cohesion:

– regional integration in the world economy. The starting hypothesis is that regional integration mainly depends from the specialization in medium-high tech sectors as well as in some strategic services while low tech specializations should progressively be abandoned. Services are by far the most important sector (between 60 and 70 per cent) in the regional economy. They are relevant for competitiveness and trade integration (business, finance, research, consulting and other high value added services) and at the hart of growth especially in the main urban centres[45]. Among services, tourism is an important source of income in a significant number of European

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[45] For our purpose we must acknowledge that service export data are much less reliable and more difficult to regionalize than manufacturing. Furthermore, the % of export service in relation to total service production is incomparably lower than manufacturing, and several services are incorporated in the manufacturing product export

regions which score relatively badly in other sectors of specialization and should be considered in the picture under a supply side approach. It represents the positive impact of the advantages of geographical location, quality of life, cultural heritage which benefit from globalisation and increasing mobility;

– the size and evolution of regional employment and GDP per head affect the actual and potential ability of regions to adapt and upgrade their patterns of specialization and, therefore, to respond to competitive pressures. Positive performance of income and employment growth reflects the endogenous capacity to be successful and attract investments;

– education and skill level of the work-force which affects competitiveness in the knowledge economy and specialization in high tech sectors. The demographic composition of the population is favourable to globalization and the knowledge economy when it guarantees a flow of young and well educated workers into the regional labour markets.

In our explanatory model, there are also sensitivity factors which have a national dimension and which is impossible to take into account at a regional level. The most important of national factors is the size of the national debt which can exercise a strain on private capital via interest rates, crowding out and other limitations to public investment. A second factor which has, both, a national and a regional dimension but is difficult to explicitly take into account is the regional location in the geopolitical space. The proximity to a fast growing trading partner and the presence of areas characterised by infrastructures which are essential for trade, such as ports and airports, produce clear advantages. These characteristics determine the physical as well as the cultural openness of the regional economy to the external world (i.e. proximity to the CIS or to the Middle East and North Africa can have an impact on to the regional integration process). They can also create opportunities for the location of new firms in border areas, for investments in logistic equipment etc. These factors have been taken into consideration in the intensity analysis which is carried out at country-level (§ 2.1-2.3) and can therefore modify the future income disparities among regions of different countries.

To transpose this sensitivity model in a sensitivity map of the European region we need to develop a further step: measure the drivers using variables for which data are available at regional level or which can be reasonably regionalized and then combine them in a summary index[46].

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[46] The summary index of sensitivity has been calculated using a Min-Max normalisation method, following the European Commission Working Document Regions 2020. In the present paper however the index provides a current snapshot of regional position as regards globalisation since we do not use projection but most recent available data or average of recent trends. All considered indicators have been first normalised, then a weighted average of indicators has been calculated. Finally, the weighted average has been rescaled on the basis of the following formula, in order to produce a ranking of European NUTS2 based on their sensitivity to globalisation:
$s=(S_i-S_{min})/(S_{max}-S_{min})*100$
where S_i is the weighted average value in region (i); S_{max} is the maximum value of the weighted average across EU27 regions; S_{min} is the minimum value across the EU. See footnote 47 for explanation of weightings.

The actual choice of variables is therefore limited by data availability. In detail, the summary index of regional sensitivity consists of:

§   Revealed Comparative Advantage (RCA)[47] in:
   o   Medium-high tech manufacturing.
   o   Business and other services;
   These reflect the regional capacity to trade and hence benefit from market expansion and integration. Regions showing an advantage in medium-high manufacturing as well as in services are likely to be in the best position to benefit from increasing returns, innovate and lead the knowledge economy. Specialisation in manufacturing is the key factor determining trade performance, with related service activities becoming more and more important along the value chains. Data is an estimate based on national trade broken-down on the basis of sector employment. It represents an important difference compared to the Regions 2020 working document which did not consider regional trade data.

§   People 15 years old and over with completed tertiary education attainment level (2007). This indicator of skills, already used in the EC Working document, reflects the capacity to compete in the global economy, attract investment, and benefit from knowledge diffusion. It is central to long term growth. It is obviously linked to the level of investments on education and research as well as to the effectiveness of the national research system.

§   The growth in GDP per capita (average 1995-2006) and the total employment growth rate (average 1999-2007) are dynamic indicators of competitiveness. They mirror a trend which is likely to influence regional performance from now to 2020.

§   Employment in the tourist sector (Hotel and Restaurants) as share of total employment (average 2004-2005 has been considered). It is an indicator of attractiveness. The rationale is to avoid disregarding the capacity of regions without strong high-tech or business services to compete. Regions with large urban centres are rewarded by the indicator on RCA so it was not necessary to add other specific indicators on the service sector.

A number of other factors will also strongly influence regional sensitivity and adaptive capacity to globalisation. However, due to data limitations and direct or indirect correlation of other factors with the chosen one, the selection is considered a good concise proxy of sensitivity.

The path dependency feature of the selected indicators of sensitivity should be emphasised: regions are likely to capitalise on the current performance even though they may proceed with a different pace towards 2020 leading to either convergence or divergence. In particular, GDP per capita and total employment growth are meant to capture this feature.

The summary index calculated on the basis of the foregoing variables is displayed in the following exhibit 8. In the calculation, a weight of 60% has been given to RCA and 40% to

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[47] RCA=(export of country x in sector y/export EU in sector y)/(total export country x/ total export EU). RCA in medium-high tech manufacturing, business services and other services in 2005 have been estimated on the basis of National trade data broken-down according to regional sector employment.

all others[48]. This is a compromise between a numbers of different variants that have been considered in the background analysis. The EU NUTS2 were ranked accordingly into three groups:

1. areas with relatively low sensitivity to globalisation which can be considered highly beneficiary of globalisation;

2. intermediate regions showing positive traits but not standing out as the previous group;

3. regions with strong sensitivity to the challenge and hence highly vulnerable.

It has to be noted that the ranking of regions into these three categories is not always clear cut. Those regions that are in between and score differently in the different drivers do not show a consolidated and unequivocal pattern in their performance; this could have been shown if we decided to increase the number of groups in our picture. For the time being, the three classes have been chosen as such that in each group there is an approximately equal number of regions. Therefore, the map is useful for identifying the main patterns of sensitivity in Europe but the relative score of each region should be interpreted with caution since the summary index, due to the way it is built, may be biased in certain cases.

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[48] Weights are essentially value judgements and a number of weighting techniques exist even though most composite indicators rely on equal weightings (OECD – 2008: Handbook on constructing composite indicators). This happens, for instance, when there is insufficient knowledge of causal relationships or a lack of consensus on the alternative. In fact, there is no "objective" way to determine weights and aggregation methods, but this does not necessarily lead to rejection of the validity of composite indicators as long as the entire process is transparent. In this paper, indicators and their weights have been chosen after having conducted a "sensitivity" analysis to gauge the robustness of the composite indicator and improve transparency. First, correlation indexes have been calculated in order to choose variables that do not "overlap too much" and tests based on inclusion and exclusion of individual indicators have been carried out in order to assess the impact of different choices. Secondly, to assess potential sources of uncertainty related to weighting, several tests were carried out starting from computing an index based on equal weighting and then changing weights in order to assess again the impact of different choices. The weights which have been eventually used do not cause the output to depart significantly from equal weightings; however, based on expert opinion, they better reflect theoretical factors and our explanatory model. The advantage of using not-equal weights is, in our case, that they allow underlining certain important geographical patterns on the map. The detailed weighting of indicators is the following:
- RCA medium-high tech manufacturing 30%
- RCA business services 15%
- RCA other services 15%
- GDP per capita growth 10%
- Employment growth 10%
- Education attainment 10%
- Tourism 10%

Exhibit 6 – Main patterns of regional sensitivity to globalisation in Europe
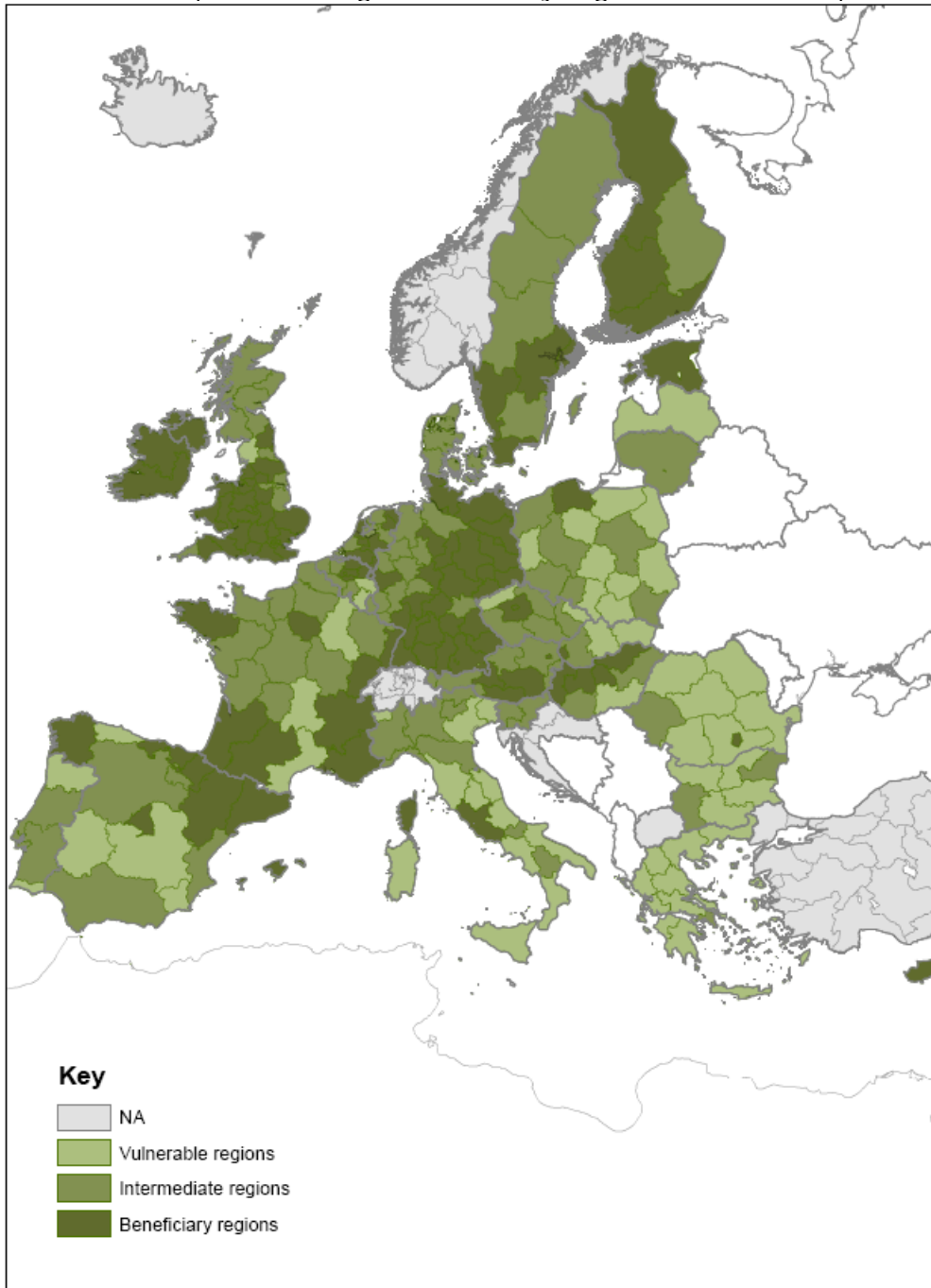
The map shows a general pattern in which Eastern and Southern regions (Italian Mezzogiorno, Greek and Central Spain regions) are vulnerable while Central and Northern regions appear highly beneficiary or at least in a position of medium-low risk. Some countries show more pronounced internal differences in vulnerability (e.g. Spain, France, Poland, Italy) while others (the UK, Germany, Nordic Countries) appear more uniform. This geographical pattern coincides with other analyses carried out with respect to the globalisation challenge. The outstanding performance of capital cities and good performance of the other large urban areas including port-cities and border areas in the core Central regions and Nordic countries present a different picture of sensitivity than that within Eastern and Southern countries including France.

Regions in the new member states bordering the central European core appear better adjusted while regions at the border with external neighbours look weak. Similarly, within the old EU15 cohesion regions, the score indicates a persistent disadvantage of most border regions on the shore of the Mediterranean. These patterns present a multi-polar picture of Europe around a central-northern core sustained by urban concentrations.

Let us look more in detail at the 3 groups of regions:

Highly beneficiary regions are spread across the continent in both old and new member states. Taken altogether they form a belt of territories well positioned to reap globalisation advantages which transversally cut Europe from the North-eastern side (Finland, Sweden and Estonia), going down through Germany and stretching towards South-eastern and South-western France, Northern Spain and Portugal. Some other strong areas emerge off this backbone that correspond with capitals and ports (e.g. Paris, Rome, Prague but also Bucharest), in Poland (Gdansk and Warsaw areas), as well as regions at the intersection of Belgium and the Netherlands, across Austria, Hungary and Slovakia and the UK and Ireland. All these regions, although sometimes characterised by substantial differences in income levels show a very good performance in terms of revealed comparative advantage in medium-high tech manufacturing with a strong export capacity. Moreover, these regions show higher than average performance in terms of education attainment, a very important driver of long term growth, higher than average attraction capacity (proxied by the tourism indicator) and a good performance in terms of employment growth during recent years. In terms of per capita GDP growth many of these regions, in particular those in new member states and Ireland, experienced rapid growth during the last decade.

Intermediate regions are mainly located in Central Europe and contiguous to highly beneficiary regions. This group includes regions that are strong in terms of revealed comparative advantage in medium-high tech manufacturing (even if not as much as the previous group) but tend to be weaker in terms of education attainment and have experienced a substantially slower growth than highly beneficiary regions. An area stretching from North-western Poland to Northern Italy (combining areas with large enterprises in the west and industrial districts in the East) going through western Austria belongs to this group. Another area of intermediate regions extends from Denmark down to north-western Germany and central France. Other regions with intermediate sensitivity to globalisation are located in southern Spain as well as central and southern Portugal areas. Other intermediate areas include Northern UK (Scotland and Northern Ireland) and regions scattered across new member states (Poland, Czech Republic, Slovenia, Romania and Bulgaria, Cyprus). As in the previous case, this group is heterogeneous in terms of income differences but shows similar shortcomings in capacity to benefit from globalisation.

Vulnerable regions are found mainly in Eastern Europe and peripheral areas where the industrial fabric is weak. The group of vulnerable regions includes Greece, most regions in Central and Southern Italy, some areas in central Spain and France. These territories show large differences in income level (new member states vs. EU15) but share a poor growth performance during the last decade. They are weak in terms of education attainment and in some cases, due to traditional low tech specialisation (e.g. Central Italy), suffered heavily from competition of low-labour-cost countries.

3. Perspectives for 2020

This chapter provides quantitative evidence about prospective trends using a global model to extrapolate data on international trade, balance of payments and GDP for major world regions, Europe and individual countries in Europe. Regional prospects are then examined in the light of country results on the one hand, and regional sensitivity indicators on the other. The final section advances some conclusions about prospects for divergence or convergence at the regional level under different scenarios for the global and European economies.

It is worth noting that national as well as regional perspectives proposed in this chapter take into account the current financial crisis and examined alternative are based on assumptions on the recovery path from the recession.

3.1   Global prospects and country impacts

There is inevitably much uncertainty about the growth of world trade and changing patterns of specialisation looking ahead to 2020. In this chapter the range of possibilities is examined by considering two scenarios:

A. gradual recovery from the world recession with minimum structural change;

B. rapid recovery with major structural shifts facilitating development of Europe's neighbouring regions and continued convergence of low-income countries within Europe.

These scenarios for major world regions and individual countries within Europe are prepared with a simple model of world trade that extrapolates past trends subject to macro-economic constraints and alternative assumptions about demand and structural change. Neither scenario should be considered as a forecast or even as a bound on conceivable developments over the next decade.

Scenario A

Considering the current recession it is unlikely that Europe as a whole can achieve the same expansion up to 2020 as occurred in the 10 years up to 2007. This scenario assumes that Europe's net export income will increase by around 14% with depressed world prices for primary products and oil which would have negative effects on Europe's neighbours. In the East Asia and America trade would grow more rapidly as the impact of a low oil price is less significant.

On the other hand the strong trend of external income credits is expected to continue, making this the most important source of external income by 2020. In such circumstances there would be little reason to expect increases in import content of domestic expenditure and sustainable income may in fact increase by as much as 25% compared with 2007 taking the average income level in Europe from 21,500 EUR in 2007 to around 27,000 EUR in 2020 (measured in 2007 purchasing power).

In this scenario North Africa, the Middle East and Turkey are expected to fall even further behind Europe in relative terms although the CIS would achieve some degree of catch up due to gains in energy exports, services and external income credits. The US is expected to have faster growth of net export value and import content of domestic expenditure, resulting in income growth similar to that of Europe after allowing for some correction of US dependence on capital inflow. Japan, China and other East Asian countries are expected to perform much better than Europe due to faster growth of trade within the region and strong links with the US.

The scenario implies some changes in the ranking of countries within Europe. Nordic countries together with Germany, Austria, Switzerland, Belgium-Luxemburg, the Netherlands, Denmark and France would remain at the top of the league with average incomes exceeding 30,000 EUR. Ireland, the UK, and Italy would remain in the second tier with incomes between 25,000 and 30,000 EUR. The third tier with incomes between 20,000 and 22,000 EUR would comprise Spain, former Czechoslovakia and Bulgaria, ahead of Greece, Portugal, Hungary, Poland and former Yugoslavia with average incomes below 18,000 EUR and Romania and Albania left far behind with average incomes still below 10,000 EUR. The implied relegation of Spain to tier 3 and Greece and Portugal to tier 4 may seem implausible but if world markets remain depressed and capital inflows weaken these countries may face severe pressures at the national level implying even more serious problems in the weakest regions. If it is necessary to explain why the economies of certain countries and regions in the South and East of Europe performed badly, it may be pointed out that these countries already had quite fragile economies with weak performance in most sectors before the recession. In the absence of strong global demand or supportive European policies it is hard to see how these countries and regions could gain any competitive advantage. Moreover governments of higher-income member states in the West and Centre of Europe, themselves facing problems of unemployment and slow growth, may find it difficult to support redistributive policies favouring countries in the South and East of Europe.

Exhibit 7 - Sustainable income levels in 2020 - scenario A
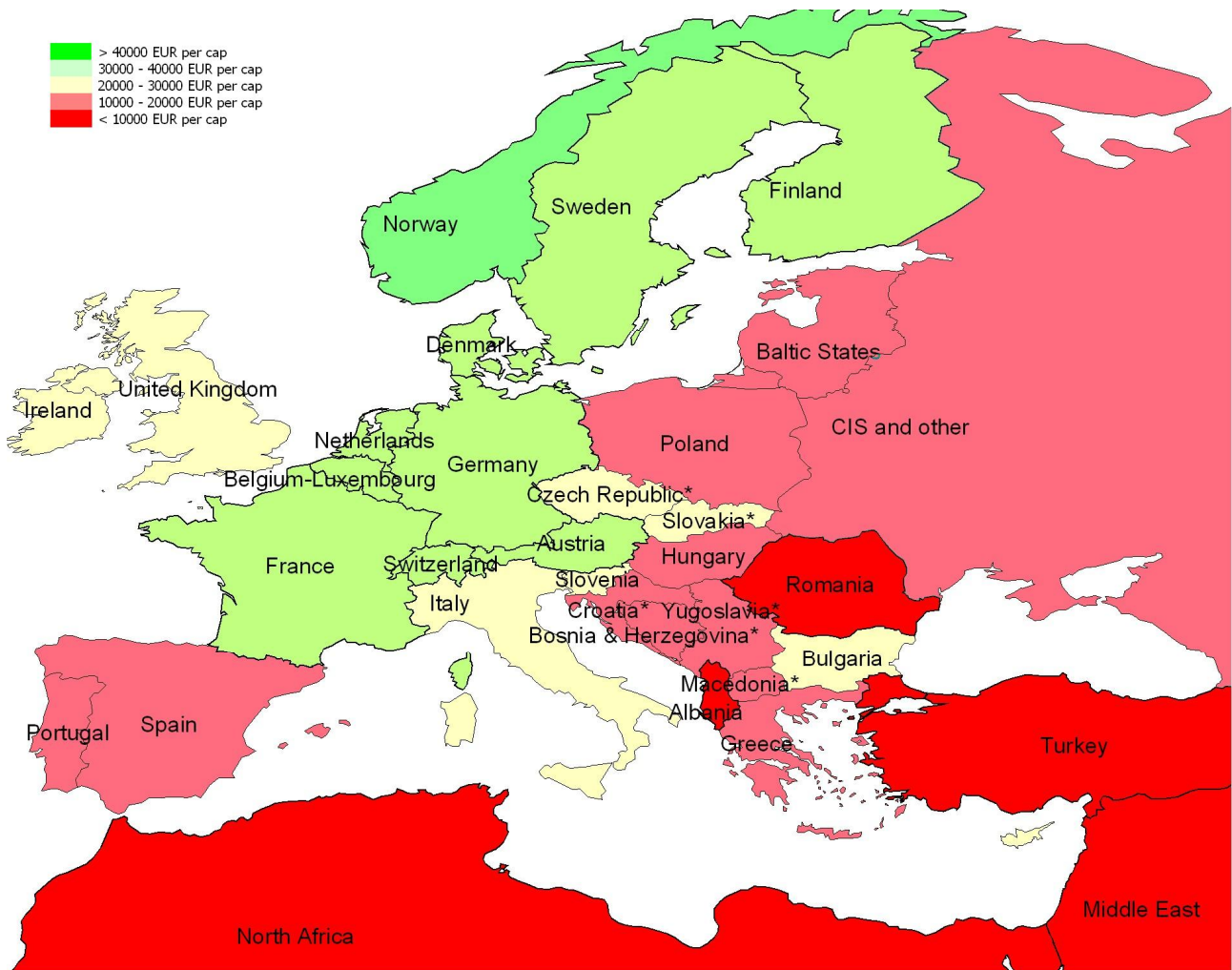
All in all, scenario A has negative implications for cohesion at the country level and therefore, a fortiori, similar or worse implications for cohesion at the regional level. This scenario may be categorised as demand-driven with insufficient demand to promote cohesion.

Scenario B

Our second scenario is designed to test the possibilities for convergence of low income countries in Europe and neighbouring world regions in the context of a strong recovery of the global economy from the present recession.

The first assumption is more rapid growth of demand in the world economy through higher public and private investment in Europe and neighbouring regions and some other parts of the world. The other main assumptions are systematic relocation of agricultural production in Europe towards the South and East from the North and West and rapid development of service exports in the South and East, whether by public or private initiative. This scenario intentionally does not assume relocation of manufacturing industries

beyond what is likely to happen in the normal course of events since the potential of manufacturing industries in Europe as a whole appears to have passed its peak.[49]

Higher investment and growth in neighbouring regions together with restructuring within Europe imply that Europe would achieve a better growth performance than the US and one roughly equal to that of Japan and other countries in East Asia except China. In 2020 average per capita income levels would be around 38,500 in Europe, 40,000 in the US, 44,500 in Japan, 15,000 in China and 9,000 in other East Asian countries. Income levels in Europe's neighbours would have improved but not as much as in the Far East. CIS countries would reach around 13,000 EUR, the Middle East 9,500, North Africa 9,000 and Turkey 9,500 EUR.

Given these premises, scenario B does not imply any sacrifice of average income levels in higher-income countries of Europe although there would be significant reductions in net export income from agriculture and raw materials and relatively modest gains in net income from exports of services. Income growth in relatively fast-growing countries in the South and East of Europe would substantially boost the internal market for manufactures and profits on capital invested in those countries. With the exception of the United Kingdom and Ireland, countries in the top half of the European league table would increase their average income by 40-80% as compared with 2007 while countries in the bottom half of the table would increase their average income by up to 300%. All countries in Europe would have average incomes of 20,000 EUR or more with those in the North, West and Centre of Europe having incomes of 30,000 EUR or more.

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[49] See details in Annex 3 tables 6 and 7.

Exhibit 8 - Sustainable income levels in 2020 - scenario B
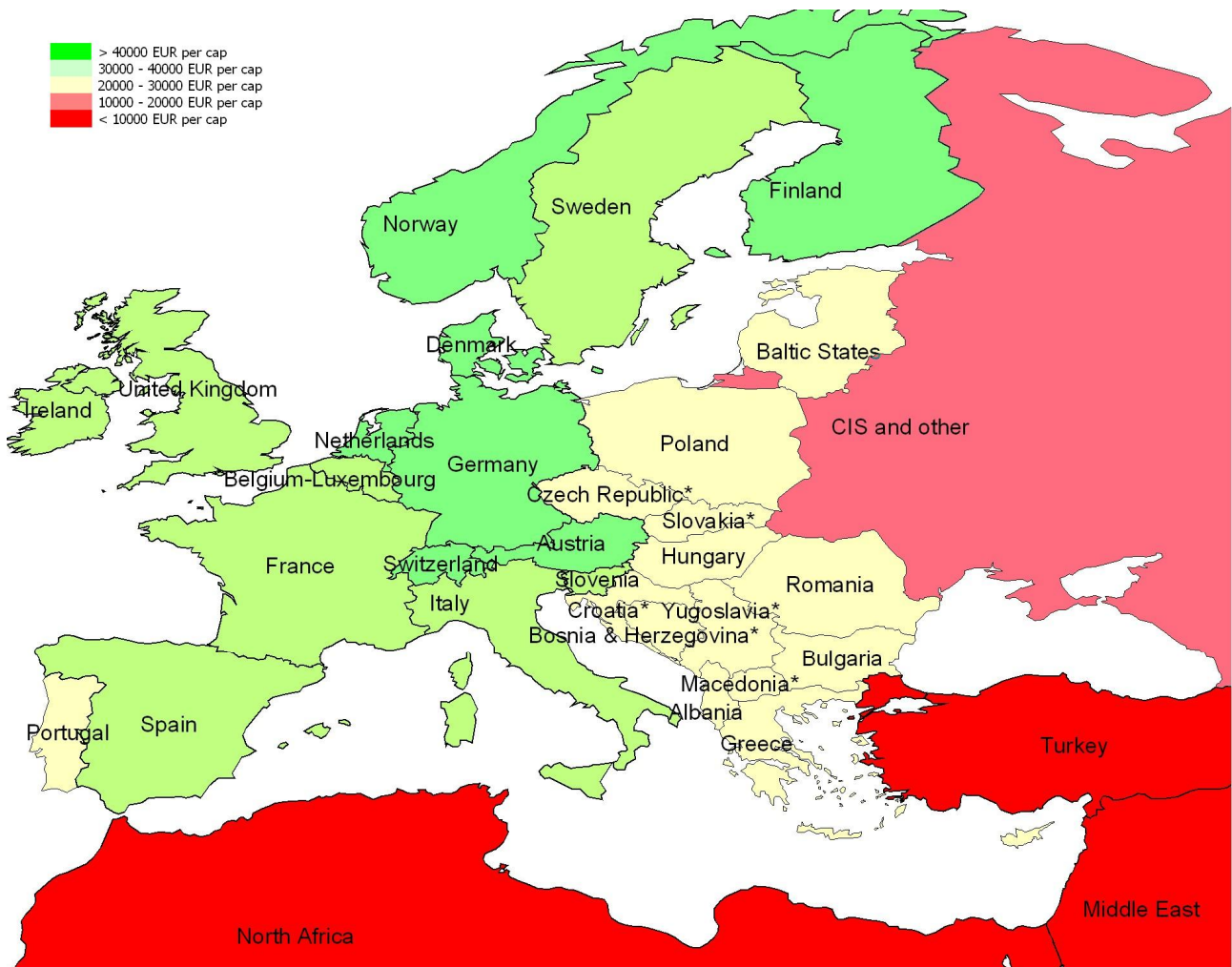
Although scenario B is no more than a fable, it does have lessons regarding forces for divergence and convergence in Europe at the national and regional level. In particular it draws attention to the importance of global recovery from the recession, and to the benefits to the European economy in general and countries in the South and East of Europe in particular implied by higher levels of investment in neighbouring regions as well as the potential for new patterns of trade in agriculture and services to supplement if not replace the restructuring of manufacturing industries as a means for more rapid development of low income countries in Europe.

3.2 Regional impacts

Impacts on regional disparities depend on the relation between challenge intensity, previously estimated for individual countries, and regional sensitivity. This relationship is assessed in a qualitative manner in the present chapter, according to the potential effects (relative certainties and likely effects; key uncertainties and potential consequences) of the challenge in the future.

The assessment of impacts starts from the groups of regions identified in section 2.3 as highly beneficiary, intermediate and vulnerable regions.

The results are summarized in two regional scenarios (A and B) which correspond to the two extremes of the expected range of variation of challenge intensity at a European and country-level described in the preceding section.

Scenario A

In the low growth scenario, world markets remain depressed and Europe may not experience the same expansion as in the past decade. It is assumed that

- net export income will increase in Europe by around 14% with a fall in the net value of export of food and raw materials as prices remain depressed;

- the strong trend of external income credits is expected to continue, making this the most important source of income by 2020;

- there will be little or no convergence at the country level.

This scenario may imply a substantial increase in unemployment resulting in defensive and inward looking policies as current political leadership become unpopular. All regions may suffer and the strain will be more acute for weak areas. In particular, rural regions and regions sharing boundaries with neighbouring countries are unlikely to be able to benefit from proximity to strong territories (e.g. the European backbone described in §. 2.3). These may be the ones which will be hit most.

The group of highly beneficiary regions may become thinner with only regions from the North and the Centre of Europe in the top positions and other industrial or service based regions of rich countries following suit. Regions located in the UK, Ireland, France and Italy will grow less and diverge from the top. Current beneficiaries which are located in other Southern and Eastern European Countries, instead of progressing on their catching up path, will diverge further from the top performers.

The group of intermediate regions is likely to remain stable in number: some regions which are currently highly beneficiary will fall back and join this group while other regions, now intermediate, will become more vulnerable. Again, Northern and Central European regions face the least negative perspective while intermediate regions outside the core of Europe are more at risk. Intermediate German and Nordic regions are likely to be dragged along by the pace of their neighbouring most dynamic territories. Current intermediate regions located in other relatively rich countries which will tend to diverge from the leaders (e.g. the UK and Ireland) may lose ground. Intermediate regions in countries expected not to catch up to the income level of European leaders (e.g. in Spain, Greece, NMS) face serious risks of unemployment and very slow growth.

The group of vulnerable regions is likely to grow in number. Disparities between (mainly) Southern and Eastern weak regions and top performers is likely to increase. Some Eastern European areas which gained substantial ground during the last 10 years of fast growth may lose some of the advantage that they managed to accumulate. Vulnerable regions located in Southern Italy or scattered across France and the UK are likely to face more intensive cohesion problems than now.

(1) Regional sensitivity		(2) National prospects scenario A	(1+2) Regional prospects in 2020 scenario A
Sensitivity ranking	Implications of analysis of regional sensitivity	Implications of assessment of challenge intensity at a European and country level	
Group 1 Highly beneficiary regions Currently includes over 100 EU NUTS2 it may shrink to 60-70	– above average revealed comparative advantage in medium high tech manufacturing – high education attainments – strong capacity to attract people and resources – satisfactory growth and employment performance during the past decade	– Sustainable income will increase by 25%; average income level will increase from 21.5k in 2007 to 26.5k in 2020 (2007 PP). – Nordic countries and central EU (Germany, Austria, Belgium, the Netherlands, and Switzerland) will have average income over 30k. – The UK, Ireland, France and Italy will have incomes between 20k and 30k. – Part of Southern (Spain) and Eastern Europe (e.g. Czech Rep., Slovakia) will have incomes between 15k and 20k. – The rest of Southern (e.g. Portugal, Greece) and Eastern Europe (e.g. Hungary, Poland) will be below 15 while Albania and former Yugoslavia below 10k.	Highly beneficiary regions, located in countries with optimistic prospects, will increase their net export income from now to 2020. On the contrary, beneficiaries regions, located in countries with negative prospects, may fall back. For example, Baden-Wurttemberg and Sachsen in Germany, Brussels Capital Region, Brabant and Utrecht in the Netherlands, Västra Götaland and Stockholm in Sweden as well as Southwest Finland, Prague and Bratislava in the NMS should maintain their leadership. On the other side, British regions such as the South East and the East, the West Midlands and Wales together with the Irish ones may lose ground. The same could happen to Northern Spain, for example Galicia, Cantabria and Catalonia. With respect to Eastern Europe, Northern and Western Transdanubia as well as Central Hungary and, for Instance, Polish Pomeranian that now are amongst the beneficiaries may fall behind too.
Group 2 Intermediate regions Currently includes about 80 EU NUTS2 it may remain stable in number	– average comparative advantage in medium high tech manufacturing – limited education attainments – mixed capacity to attract people and resources – mixed growth and employment performance during the past decade		Intermediate regions, located mainly in Central Europe and adjacent to highly beneficiaries, will tend to be also influenced by the mixed prospects of their countries. This group may incorporate the regions leaving the group of beneficiaries (e.g. Southern Britain, Northern Spain). At the same time, intermediate areas such as Lisbon and Centro in Portugal, Valencia in Spain, Scotland and East Midlands in the UK may leave the club and become more vulnerable while Piedmont and Lombardy may remain in the same relative position. In Eastern Europe, regions such as Southern Transdanubia in Hungary and Masovian in Poland may fall back, while others such as Sofia may keep their position.

Group 3 Vulnerable regions Currently includes over 60 EU NUTS2 it may increase to 90-100	– below average revealed comparative advantage in medium high tech manufacturing – poor education attainments – weak capacity to attract people and resources – mixed growth and employment performance during the past decade		Lacking strong European supportive policies, vulnerable regions (mainly located in the South and East of Europe) may experience a further deterioration of their position when their countries face pessimistic prospects. For example, all Greek regions and Central Spain, as well as rural Poland, and peripheral regions in Romania and Bulgaria risk to be at a standstill or further lose ground. The group of vulnerable regions may hence become more numerous, comprising intermediate territories which are backsliding (see above) and, at the same time, its distance from the other groups may increase.

Scenario B

In a scenario with quick and strong recovery from the crisis, former growth patterns may emerge with industries moving to lower cost areas through cross-border investment. The scenario assume:

– higher public and private investment in Europe and Neighbouring regions as well as in some other parts of the world will allow stronger recovery of the world economy;

– net export income will increase in Europe by around 63%;

– rapid growth will be accompanied by relocation of agricultural production to the South and East of Europe from the North and West;

– rapid development of service exports of the South and East, whether by public or private initiative.

In this scenario, most of European and neighbouring countries will have optimistic growth prospects. Event though growth is not a sufficient condition for diffused development, Europe may experience strong convergence of low income regions, with higher levels of investment and trade in agriculture and services supplementing if not replacing restructuring of manufacturing industries as means for more rapid development.

The group of highly beneficiary regions may grow in size with adjacent intermediate regions joining. Regions located in the North and Centre of Europe are likely to retain their leadership. They will not sacrifice their income levels although there would be significant reductions in net export income from agriculture and raw materials and limited gains in net income from export of services.

The group of Intermediate regions, mostly located in relatively rich parts of EU15, will experience positive income growth but their performance will be mixed. This group may become more numerous with vulnerable regions improving their performance and joining the "club".

Finally, the group of vulnerable regions may shrink significantly. These have the potential to leap forward and converge rapidly with average income which could increase by up to 10% per annum or 300% over the period 2007-2020. This group may benefit most from rapid global recovery from the recession, higher level of public and private investment and trade in agriculture and services.

(1) Regional sensitivity		(2) National prospects scenario B	(1+2) Regional prospects in 2020 scenario B
Sensitivity ranking	Implications of analysis of regional sensitivity	Implications of assessment of challenge intensity at the European and country level	
Group 1 Highly beneficiary regions Currently includes over 100 EU NUTS2 it may increase in number to 120-130	– Above average revealed comparative advantage in medium high tech manufacturing – High education attainments – Strong capacity to attract people and resources – Satisfactory growth and employment performance during the past decade	– All European countries will have average incomes of 20k or more with the North, West and Centre with incomes above 30k; – Significant reduction in net export income from agriculture and raw materials; – Relatively modest gains in net export income from services; – Countries at the top half of the European league (e.g. EU15, see table 6 in annex 2) would increase their average income by 40-80% as compared with 2007; – Countries at the bottom half (e.g. Greece, Hungary and especially Romania, Former Yugoslavia, Bulgaria and Albania) would increase their average income by up to 300%;	Highly beneficiary regions, located in Northern and Central Europe mainly, could increase their incomes by 40-80%. These will benefit from income growth in Southern and Eastern territories and from the boost of internal demand for manufactures as well as profits on invested capital in those areas. This is the case, for example, of Brittany, Poitou & Aquitaine in France, Brandenburg and Bavaria in Germany, Drenthe and Groningen in the Netherlands. Other regions, located in countries with less optimistic prospects may slowdown a bit, favouring catching up of followers, especially in Central and Eastern Europe. For instance, this may be the case of South East and Midlands in the UK as well as Southern Sweden.
Group 2 Intermediate regions Currently includes about 80 EU NUTS2 it may remain stable in number or increase to 100-110	– Average comparative advantage in medium high tech manufacturing – Limited education attainments – Mixed capacity to attract people and resources – mixed growth and employment performance during the past decade		Intermediate regions, mainly located in Central Europe and adjacent to highly beneficiaries, will also benefit from income growth in Southern and Eastern territories, and from the boost of internal demand for manufactures as well as profits on invested capital in those territories. They will however experience reductions in net export income from agriculture and raw materials. EU15 regions such as Alentejo and Valencia in Spain, Liguria and Emilia Romagna in Italy are likely to perform well and get closer to the leaders and/or join the 1st group. The same may be true for Eastern European regions located in Poland (e.g. Lower Silesian and Opole), Czech Republic (e.g. South Bohemia and Plze•), Hungary (e.g. Southern Transdanubia), Bulgaria (e.g. Sofia) etc. On the other hand, intermediate regions located in countries with relatively less dynamic (though not negative) growth prospects may experience some disadvantage. For example, this may be the case of Normandy and Pays de la Loire in France, Lower Saxony in Germany and Northern Sweden.

Group 3 Vulnerable regions Currently includes over 60 EU NUTS2 it may shrink to 30-40	– below average revealed comparative advantage in medium high tech manufacturing – poor education attainments – weak capacity to attract people and resources – Mixed growth and employment performance during the past decade		Regions which are currently vulnerable, located mainly in the South and East of Europe may increase their average income by up to 300%. They may benefit from relocation of agricultural productions from North and West and experience a rapid development of service exports. For Instance, Slovakian (e.g. Prešov and Košice), Romanian (e.g. Moldavia) and Bulgarian regions may perform very well, together with neighbouring countries such as Former Yugoslavia and Albania. Other traditional EU15 lagging behind regions (e.g. Greece, Italian Mezzogiorno, Castilla la Mancha and Murcia in Spain) may also have the potential to catch up significantly.

Annex 1 – The calculation of sustainable income and allocation of the cost of imports and income outflows

Income Y in each country or region is equal to domestic expenditure H plus the current account balance CA (surplus + or deficit -) on external transactions

$$Y = H + CA / rx^{50}$$

The current account balance is the difference between exports and inward income flows X and imports and outward income flows M.

$$CA = X - M$$

To understand the impact of external transactions, we will distinguish between imports related to exports and other external income sources M_x and imports related to domestic expenditure M_h, the latter being assumed to vary in proportion to the level of domestic spending

$$M_h = m_h H$$

Sustainable income

A simple measure of sustainable income, YS0, is given by calculating the level of income at which the current account would balance - in other words the level of income that could be expected in the absence of net capital inflows or outflows from the rest of the world. This is the case in which domestic savings are equal to domestic investment (public and private).

In this case we may assume $CA = X - M = X - M_x - m_h YS0 = 0$
and therefore derive sustainable income as

$$YS0 = (X - M_x) / m_h$$

This definition needs some modification to allow for sustainable capital flows. The limit on sustainable borrowing is usually specified in terms of a ceiling to the ratio of debt to income chosen so as to keep the cost of debt service to income within an acceptable level. For the purposes of the present analysis we assume that a reasonable ceiling to the ratio of net external liabilities to income is 50% implying net interest and profit outflows equal to between 2 and 4% of GDP[51].

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[50] The current account balance is converted to domestic purchasing power by dividing by the "real exchange rate" rx that measures the extent to which domestic prices exceed or fall short of prices in the world as a whole when converted at market exchange rates.

[51] Cross-border income credits and debits recorded in balance of payments statistics are typically between 4% and 8% of the recorded value of the corresponding assets and liabilities.

If the ratio of debt to income is to be maintained at or below a ceiling equal to 50% of GDP it follows that the net increase in debt in each year should average not more than 50% times the trend increment in GDP. In the present analysis we estimate the maximum sustainable capital inflow as

$$kimax = 0.5 \, g \, YS0$$

where g is measured by the average GDP growth rate in the preceding 5 years.

There are two main cases to consider.

i) countries where the net capital inflow exceeds the maximum sustainable level

For these countries we calculate sustainable income as the level consistent with the maximum sustainable capital inflow.

i.e. $YS = (X - M_x - CA)/m_h + CA/rx$ where $CA = - kimax$

  or $YS = YS0 + (1/m_h - 1/rx) \, kimax$

The right-hand expression, described in this paper as the "contribution of sustainable capital inflows", allows countries with reasonably strong growth rates to maintain a higher level of investment and income through sustained capital inflows without accumulating an unsustainable burden of net external liabilities.

Several low income countries in Europe have incurred current account deficits in excess of the estimated maximum sustainable level of capital inflow. For these countries the level of sustainable income is less than the actual level of income. The sustainability index

$$s = YS / Y \quad \text{takes a value less than 1.}$$

ii) countries where there is a net capital outflow or a net inflow within the maximum sustainable level

For these countries we may reasonably say that the achieved level of income is sustainable, at least from a balance of payments perspective. Whether and for how long countries that export capital need to continue acquiring external wealth is difficult to judge but it is not surprising that countries whose external income depends on the exploitation of oil and gas resources typically reinvest a proportion of the receipts in external assets and it is arguable that other countries with a strong external performance sometimes need to maintain a high level of external assets either to maintain their trading position (foreign direct investment) or to protect their position in case of downturns in world markets (exchange reserves).

Given that the achieved level of income is deemed sustainable, we write YS = Y and note that the sustainability index

$$s = YS / Y \quad \text{takes a value of 1}$$

The difference between the simple trade-based measure of sustainable income, YS0, and the achieved level of income may be considered to represent the influence of capital outflows or inflows.

The analysis of sustainable income in tables in the main part of this paper and Annex 2 examines sources and uses of external income and capital flows as follows:

Net external income $X - M_x$

Import content of domestic expenditure m_h

Impact of capital flows $YS - (X - M_x)/m_h$

Sustainable income YS

Actual income Y

Sustainability index $s = YS / Y$

The sustainability index takes the value of one (actual income equal to YS) when the current account is in surplus and the country or region is a net capital exporter or if the current account is in deficit and the deficit is less than the estimated sustainable capital inflow. On the other hand the sustainability index is less than one (actual income exceeds YS) if the current account is in deficit and net imports of capital exceed the estimated sustainable level. The essential point is that capital inflows allow a higher level of domestic spending, typically construction and other investment activities, and the resulting increment to income is sustainable in the long run provided that capital inflows remain at or below the level at which accumulation of external debt would imply excessive debt service obligations relative to GDP.

Allocation of the cost of imports and income outflows

The following is a short-cut method that yields approximate estimates for all countries and regions. A more precise analysis would require additional information about the composition of costs and sources of external income debits that is not currently available in national accounts and balance of payments statistics.

Assume that domestic expenditure and exports have the same import content with the exception of exports of manufactures and derive the following coefficients from data on domestic expenditure, exports and imports:

$$b_1 = M_{gs} / (H + X_{gs} + X_{mf})$$
$$b_2 = M_y / (H + X_{gs} + 5 X_y)$$

Now define $M_h = (b_1 + b_2) H$
$M_x = (b_1 + b_2) X_{gs} + b_1 X_{mf} + 5 b_2 X_y$

where H is domestic expenditure
M_h is the import content of domestic expenditure
M_x is the import content of exports and income inflows
M_{gs} is imports of goods and services
M_y is the outflow of external income and transfers (debits)

X_{gs} is exports of goods and services
X_{mf} is exports of manufactures
X_{y} is the inflow of external income and transfers (receipts)

Annex 2 – External income flows and sustainability in Europe, neighbouring regions and individual countries within Europe

Table 1   External income sources in 2007, Europe and neighbouring regions

(EUR per capita)

Income source	Europe	CIS	Turkey	Middle East	North Africa
1. Exports	4,842	1,179	888	1,912	738
Food and raw materials	542	120	66	46	35
Energy products	345	666	1	1,523	457
Manufactures	2,498	244	619	167	107
European market	1,715	125	386	17	71
rest of world	783	119	233	150	36
Services	1,457	148	202	176	139
2. Other income	1,954	176	80	186	126
3. Total external income	6,796	1,355	968	2,097	863
4. Import content of domestic spending	31.81%	16.19%	17.81%	23.31%	12.28%
5. Impact of capital flow	-561	-545	741	-1,802	-1,472
6. Sustainable income level = (3)/(4) + (5)	21,668	7,823	6,175	7,194	5,561
7. Actual income level	21,668	7,823	6,796	7,194	5,561
8. Sustainability index = (5)/(6)	1.00	1.00	0.91	1.00	1.00

Note: tables in this Annex have been prepared using a databank and structural model of the world economy that relies on long-period historical series for 1970-2007. This implies some limitations on disaggregation of data by country. In particular the databank and model do not distinguish countries that emerged from the breakup of the former Soviet Union, Yugoslavia and Czechoslovakia.

For further information please see "World Economy Database WD 3.0 User Guide" and "CAM Model of the World Economy Version 3.0 User Guide" by Francis Cripps and Naret Khurasee available from Alphametrics Co., Ltd.

Table 2   Net external income and sustainability in 2007
               European countries ranked by per capita income

Country	Net external income (EUR per capita)				Import content of dom exp	Sustain-able income (EUR per capita)	Actual income (EUR per capita)	Sust index
	Food, raw mats & energy	Manuf	Services & other income	Total				
Norway	9,834	1,935	7,428	19,197	33.90%	36,241	36,241	1.00
Switzerland	734	4,743	8,066	13,543	39.51%	28,882	28,882	1.00
Netherlands	3,967	2,950	6,042	12,959	42.22%	27,955	27,955	1.00
Denmark	2,733	1,659	7,121	11,514	42.94%	27,251	27,526	0.99
United Kingdom	592	1,833	5,431	7,856	31.40%	25,827	27,501	0.94
Belgium-Luxembourg	1,921	2,041	9,808	13,770	49.88%	26,982	26,982	1.00
Sweden	1,405	3,839	6,105	11,348	35.32%	26,628	26,628	1.00
Austria	1,346	3,916	5,043	10,305	35.39%	26,580	26,580	1.00
Ireland	1,263	1,840	9,940	13,043	51.04%	26,104	26,439	0.99
Finland	1,133	4,002	3,951	9,086	31.87%	25,882	25,882	1.00
France	705	2,471	3,044	6,220	27.01%	23,613	24,558	0.96
Germany	773	4,517	3,144	8,433	29.59%	23,933	23,933	1.00
Italy	548	2,726	1,916	5,190	25.20%	20,831	22,645	0.92
Spain	638	1,459	2,378	4,476	28.10%	16,571	21,673	0.76
Greece	459	402	2,591	3,452	29.42%	12,292	19,237	0.64
Portugal	454	1,254	2,069	3,777	28.81%	13,216	16,498	0.80
Fmr Czechoslovakia	605	2,921	1,212	4,738	30.84%	16,031	16,102	1.00
Hungary	393	2,312	1,458	4,163	32.81%	13,005	13,406	0.97
Poland	370	1,279	771	2,420	21.01%	12,324	12,324	1.00
Romania	189	636	588	1,413	20.80%	7,382	9,197	0.80
Bulgaria	387	613	674	1,674	24.46%	7,187	8,290	0.87
Fmr Yugoslavia	348	593	899	1,840	28.99%	6,659	7,615	0.87
Albania	43	100	645	789	18.59%	4,655	5,134	0.91
Europe	887	2,498	3,411	6,796	31.81%	21,668	21,668	1.00
Proportionate deviation	1.53	0.62	0.77	0.67	0.26	0.44	0.40	0.11

Table 3   External income sources of European countries in 2020
Scenario A

EUR per capita

	2007	2020	(% change)
1. Exports	4,842	5,520	(14)
Food and raw materials	542	410	(-24)
Energy products	345	474	(37)
Manufactures	2,498	2,909	(16)
European market	1,715	1,948	(14)
rest of world	783	961	(23)
Services	1,457	1,727	(18)
2. Other income	1,954	3,233	(65)
3. Total external income	6,796	8,753	(29)
4. Import content of domestic spending	31.81%	32.48%	(2)
5. Impact of capital flow	304	175	...
6. Sustainable income level = (3)/(4) + (5)	21,668	27,124	(25)
7. Actual income level	21,668	27,124	(25)
8. Sustainability index = (5)/(6)	1.00	1.00	(0)

Table 4   External income sources in 2020, Europe and neighbouring regions
Scenario A

(EUR per capita)

Income source	Europe	CIS	Turkey	Middle East	North Africa
1. Exports	5,520	1,626	934	1,802	877
Food and raw materials	410	112	60	48	43
Energy products	474	967	32	1,402	512
Manufactures	2,909	275	572	126	134
European market	1,948	136	371	14	88
rest of world	961	140	201	112	47
Services	1,727	272	270	226	188
2. Other income	3,233	458	116	391	173
3. Total external income	8,753	2,084	1,050	2,193	1,051
4. Import content of domestic spending	32.48%	17.96%	20.52%	22.73%	11.97%
5. Impact of capital flow	175	-1,254	160	-1,868	-1,596
6. Sustainable income level = (3)/(4) + (5)	27,124	10,345	5,280	7,779	7,183
7. Actual income level	27,124	10,345	6,743	7,779	7,183
8. Sustainability index = (5)/(6)	1.00	1.00	0.78	1.00	1.00

Table 5   Net external income and sustainability in 2020
European countries ranked by per capita income in 2007
Scenario A

Country	Net external income (EUR per capita)				Import content of dom exp	Sustain-able income (EUR per capita)	% change from 2007
	Food, raw mats & energy	Manuf	Services & other income	Total			
Norway	12,916	1,596	11,298	25,811	35.90%	46,034	27%
Switzerland	537	5,359	11,096	16,992	39.74%	37,926	31%
Netherlands	3,936	3,463	8,811	16,210	42.75%	35,625	27%
Denmark	3,242	2,583	9,754	15,579	41.48%	35,651	31%
United Kingdom	632	1,782	6,802	9,216	33.51%	28,021	8%
Belgium-Luxembourg	1,508	2,262	12,233	16,003	50.21%	31,343	16%
Sweden	1,046	4,842	8,322	14,211	34.90%	33,204	25%
Austria	1,014	4,644	7,175	12,833	35.19%	34,916	31%
Ireland	854	2,171	11,123	14,149	50.56%	26,462	1%
Finland	977	5,853	6,599	13,429	31.67%	35,264	36%
France	641	2,988	4,582	8,210	27.62%	30,020	27%
Germany	711	5,667	5,412	11,789	29.88%	34,512	44%
Italy	571	3,133	3,171	6,874	25.52%	28,279	36%
Spain	464	1,526	3,077	5,066	30.44%	16,986	3%
Greece	497	290	2,990	3,778	33.39%	11,399	-7%
Portugal	398	1,126	2,693	4,218	31.55%	13,476	2%
Fmr Czechoslovakia	576	3,059	1,974	5,609	29.18%	20,049	25%
Hungary	367	2,264	2,298	4,928	34.83%	14,353	10%
Poland	423	1,385	1,372	3,180	22.72%	14,698	19%
Romania	213	575	820	1,608	19.58%	8,372	13%
Bulgaria	535	1,905	1,397	3,837	20.27%	22,262	210%
Fmr Yugoslavia	385	771	1,208	2,364	26.87%	10,492	58%
Albania	42	61	668	770	20.56%	3,743	-20%
Europe	884	2,909	4,960	8,753	32.48%	27,124	25%
Proportionate deviation	1.89	0.67	0.71	0.68	0.26	0.58	

Table 6   Net external income and sustainability
                 European countries ranked by per capita income, 2020
                              Scenario B

Country	Net external income (EUR per capita)				Import content of dom exp	Sustain-able income (EUR per capita)	% change from 2007
	Food, raw mats & energy	Manuf	Services & other income	Total			
Norway	16,674	2,167	12,558	31,399	35.95%	52,893	46%
Switzerland	587	7,438	12,865	20,891	39.76%	45,103	56%
Netherlands	4,673	5,223	10,454	20,351	42.35%	43,320	55%
Denmark	4,002	4,064	10,787	18,853	40.05%	42,414	56%
United Kingdom	744	2,472	7,229	10,445	33.44%	31,980	24%
Belgium-Luxembourg	1,801	3,889	14,331	20,020	48.82%	38,992	45%
Austria	1,188	6,902	9,286	17,376	34.39%	39,257	47%
Ireland	1,157	8,434	9,162	18,753	34.73%	46,802	76%
Sweden	940	3,778	12,766	17,483	47.97%	33,566	29%
Finland	1,130	8,478	7,838	17,447	31.19%	44,027	70%
France	708	4,491	5,346	10,544	27.83%	35,889	52%
Germany	792	8,554	6,678	16,024	29.91%	43,378	81%
Italy	661	5,460	4,114	10,235	25.62%	37,733	81%
Spain	776	3,539	4,295	8,610	29.36%	30,907	87%
Greece	1,251	760	6,279	8,291	32.62%	26,365	114%
Portugal	766	2,468	3,658	6,892	31.40%	22,776	72%
Fmr Czechoslovakia	1,035	4,583	2,751	8,370	30.11%	28,265	76%
Hungary	663	5,476	4,358	10,496	35.86%	28,381	118%
Poland	1,617	1,663	2,505	5,786	28.13%	21,881	78%
Romania	683	1,274	4,376	6,333	24.29%	27,525	273%
Bulgaria	661	5,060	2,235	7,955	24.17%	29,476	310%
Fmr Yugoslavia	1,042	820	5,105	6,967	33.60%	21,879	229%
Albania	1,294	136	3,055	4,486	21.76%	22,689	387%
Europe	1,207	4,498	6,529	12,234	32.47%	38,566	78%
Proportionate deviation	1.73	0.61	0.54	0.51	0.21	0.41	

Table 7   External income sources in 2020, Europe and neighbouring regions
                                           Scenario B

(EUR per capita)

Income source	Europe	CIS	Turkey	Middle East	North Africa
1. Exports	8,001	2,070	1,425	2,255	1,100
Food and raw materials	583	110	62	47	43
Energy products	623	1,263	42	1,799	662
Manufactures	4,498	388	979	153	186
European market	3,333	224	748	20	129
rest of world	1,166	165	231	132	57
Services	2,296	309	342	256	209
2. Other income	4,233	548	157	460	186
3. Total external income	12,234	2,618	1,581	2,715	1,286
4. Import content of domestic spending	32.47%	18.01%	21.93%	23.17%	12.40%
5. Impact of capital flow	891	-1,764	411	-2,358	-1,351
6. Sustainable income level = (3)/(4) + (5)	38,566	12,771	7,623	9,360	9,021
7. Actual income level	38,566	12,771	9,569	9,360	9,021
8. Sustainability index = (6)/(7)	1.00	1.00	0.75	1.00	1.00