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# EU Monitor

European integration

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## Greece, Ireland, Portugal

# More growth via innovation

Authors
Antje Stobbe
+49 69 910-31847
antje.stobbe@db.com

Peter Pawlicki
(pawlicki@em.uni-frankfurt.de)

Editor
Barbara Böttcher

Deutsche Bank AG
DB Research
Frankfurt am Main
Germany
E-mail: marketing.dbr@db.com
Fax: +49 69 910-31877

www.dbresearch.com

Managing Director
Thomas Mayer

Greece, Ireland and Portugal (GIP) require economic growth. Since the countries in EMU have no way of improving their competitiveness via external devaluation, a main focus has to be on boosting productivity. Besides general structural reforms and privatisations the conditions for innovation need to be improved and measures taken to simplify the establishment and development of high-tech companies.

Companies are weak on innovation activity. Indicators such as corporate R&D expenditure and the number of patent applications underscore that GIP companies fall considerably short of the EU average. The conditions for corporate innovations could be improved via measures such as developing technology centres, ameliorating innovation funding and enhancing entrepreneurial expertise. The regional policy competence of administrative authorities also needs to be upgraded.

Ireland has the best prerequisites. The existing comparative advantages of Irish companies in IT services, medical technology and pharmaceuticals offer good starting points to further advance the innovation activity and networking of companies among themselves and with academic institutions. Particular attention ought to be paid to increasing the innovation activity of local small and medium-sized enterprises (SMEs).

Portugal: The low skills level is a curb on innovations. In a European ranking of innovation systems, Portugal occupies a lower mid-table position. Particular efforts are necessary in the education sector. Gearing the support to functional networks or clusters, e.g. in the automobile, pharmaceuticals or IT industries, will help to make the best possible use of the scarce funding available.

Greece's innovation system displays serious weaknesses. In Greece, high- and medium-high-tech industrial sectors and knowledge-intensive service sectors carry very little weight in the overall economy. There is little potential to leverage the development of fast-growing industries with high productivity levels.

For the reasons cited above, the upgrading of traditional industries and services in Greece and Portugal is of major significance. These include tourism and the textiles industry, for example. It is up to the companies themselves to improve their processes and enhance the culture of innovation.

Innovation policy only achieves positive effects in the medium term. In the short term, foreign direct investments may be able to help Portugal and Greece attract modern technologies and management methods to their shores. But to do so the underlying business conditions will have to be overhauled: a comprehensive economic strategy has to include a modernisation of the public sector and the implementation of structural reforms.

# Greece, Ireland, Portugal: More growth via innovation

Fiscal sustainability 1

Public debt is referred to as being "sustainable" when this debt does not permanently trend upwards and the sovereign can service its debt at any time without having to resort to drastic fiscal measures. The public-debt-to-GDP ratio develops according to the following formula:

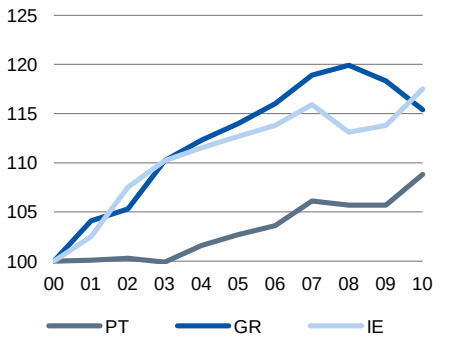
$d_{t+1} = (1 + r_{t+1}) / (1+g_{t+1}) - pb_{t+1}$

where "d" denotes the public-debt-to-GDP ratio, "r" the real rate of interest, "g" real GDP growth and "pb" the primary balance. Higher real GDP growth helps – ceteris paribus – to reduce the public-debt-to-GDP ratio.

For more see Becker, Sebastian et al. (2011). Public debt in 2020: Monitoring fiscal risks in developed markets. Current Issues. July 6, 2011. Deutsche Bank Research.

Major differences 2

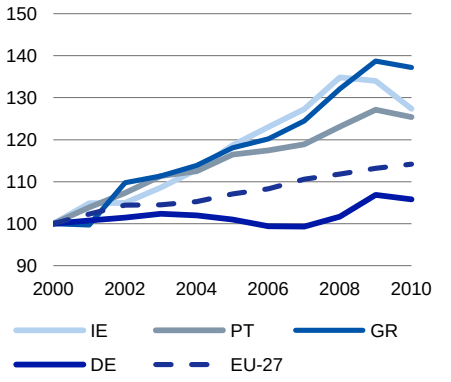
Real labour productivity per employee, 2000=100




Sources: AMECO, Eurostat, 2011

GIP: Unit labour costs up sharply 3

Nominal, index 2000=100




Source: Eurostat, 2011

The sovereign debt crisis confronts Greece, Ireland and Portugal (GIP)[1] with the challenge of restoring the health of their public budgets and putting their financial sectors back on a solid footing. Consolidating public budgets, however, further dampens economic growth in the countries concerned. By contrast, dynamic GDP growth would facilitate the reduction of the debt load (see chart 1) and raise the probability of the countries' returning to a sustainable public-debt-to-GDP ratio in the medium term. Therefore, the economic adjustment programmes agreed for Greece, Ireland and Portugal also provide for structural reforms in order to reduce distortions and boost potential growth. For example, the measures agreed for Portugal focus on increasing the flexibility of the labour market, tackling sector-specific reforms (energy, transport and telecommunications, for instance) and enhancing the general business environment (legal system, competition law and cutting red tape, to name but a few).

These measures comprise only part of the toolbox required to boost potential growth, though. In this paper we shall discuss what options Greece, Ireland and Portugal have to strengthen their innovation systems[2] and establish rapidly growing companies in the areas of high-tech and advanced technology. More product and process innovations have a positive impact on the competitiveness of companies and help them capture bigger shares of the global markets. Moreover, a higher R&D intensity goes hand in hand with greater business success and ultimately feeds through positively in macroeconomic terms to the growth of total factor productivity.[3] After all, it is important to seize the opportunities offered by the materialising international aid, e.g. for Greece, and encourage spill-over effects for the economy that are likely to be generated by direct investment.

Our analysis shows that the countries have very different prospects for doing so. Ireland is a successful supplier particularly of products and services to the global IT and pharmaceuticals markets and enjoys good underlying conditions and prerequisites for a return to sustainable growth. Portugal tends to occupy a lower mid-table position among the EU countries in terms of innovation conditions, but it has some strong industrial sectors with car manufacturing and parts suppliers. In its case, innovative sectors need to be bolstered, for example in the fields of electronics and information technology. Greece is in the bottom quartile of the EU ranking of innovation systems and – unlike Portugal – has shown no significant improvement over the past few years. Furthermore, the structure of the economy is dominated by traditional industries (agriculture, tourism, shipping lines etc.), so any transition to an economy featuring more high-tech industry and knowledge-intensive services will be a long and winding road.

## A look back: Fall in competitiveness

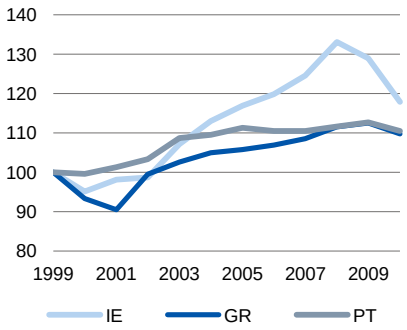
Different factors are responsible for the current crisis in each of the GIP countries. In Ireland, overinvestment in the housing market and the subsequent banking crisis are at the fore; in Greece, the ballooning sovereign debt and consumption-driven GDP growth are crucial aspects; in Portugal, a long spell of insipid growth is a major problem which is attributable to, among other things, rigid, inefficient labour and product markets as well as weaknesses in the country's institutional framework. The global recession during the financial market crisis compounded the impact in all the countries affected.

1 This report focuses on the EMU countries currently undergoing an economic adjustment
2 Innovation is a key component in the response to the current economic crisis designed to boost GDP growth. Related strategies can be found in the OECD Innovation Strategy and the EU Innovation Union, for instance.
3 For more, see Meyer, Thomas (2011). E-conomics. No. 83. Capital markets reward R&D. Deutsche Bank Research.

# Greece, Ireland, Portugal: More growth via innovation

Revaluation vis-à-vis trading partners 4

Real effective exchange rate vs
EU-27 + 9 trading partners*, 1999=100

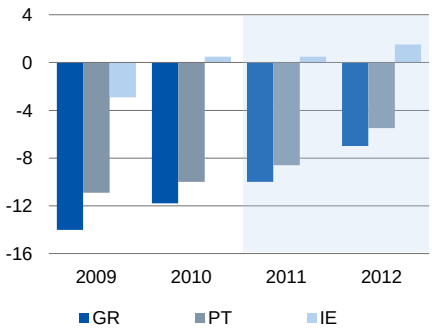



*Basis: Unit labour costs

Source: Eurostat, 2011

Greece & Portugal: Large current account deficit 5

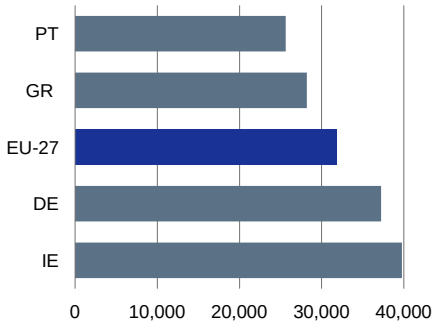
% of GDP




Source: DB Research, 2011

Differing GDP levels 6

GDP per capita (USD, PPP), 2010




Source: OECD

The crisis-stricken countries share a common characteristic in that they all became less competitive, in some cases drastically so, over the past few years. This was due to strong wage increases which more than offset the undeniably dynamic growth of labour productivity in Greece and Ireland (see chart 2). As a result, since the turn of the millennium the three countries have seen a significant increase in their nominal unit labour costs and a corresponding revaluation of their real effective exchange rate ranging from a rather moderate 12% in Portugal[4] up to nearly 40% in Ireland (see chart 4). Greece and Portugal have in turn run up massive current account deficits (see chart 5).

The wage increases were part of the reason that Portugal and Ireland lost some of their attractiveness as destinations for foreign direct investment (FDI). At the same time, markets such as China and Eastern Europe saw rapid growth and became more attractive globally: wage levels that had previously been considered competitive, in Portugal for instance, suddenly seemed excessively high. Some electronics production facilities that had been established in Ireland in the 1990s were relocated to new member states following the EU's eastern enlargement. Facilities were also relocated out of Portugal, for example in the auto industry. Since the countries in EMU have no way of improving their competitiveness via external devaluation, boosting productivity is of crucial significance.

## Call for higher productivity

Against this backdrop, numerous experts recommend that the crisis countries exercise wage moderation and increase the savings ratio.[5] At the same time, they call for structural reforms to raise overall productivity in the economy. Indeed, Greece and Portugal fall significantly below the EU mean in terms of real GDP per capita (see chart 6). Still, a positive trend has been observed since Greece acceded to EMU in terms of both labour productivity and total factor productivity (TFP)[6] – a measure of technological progress. Thus, this provides evidence of at least a moderate catch-up effect. By contrast, Portugal has reported only slow growth in labour productivity and in fact a decline in TFP since 2000 (see chart 7). Real GDP per capita did not budge over the past ten years. For this reason, Greece and Portugal require measures to boost the productivity of their economies and propel them onto a path of sustainable, dynamic growth.

To be sure, Ireland can boast an impressive performance until shortly after the turn of the millennium. The dynamic growth of TFP in the 1990s suggests that technological progress – among foreign-owned companies in Ireland in particular – and success in the education sector were key driving forces for the expansion of Irish GDP during this period. However, a boost to productivity growth would also help Ireland to improve its competitive position in the face of high wage levels (see chart 8) and reduce its high debt-to-GDP ratio.

## Can successful industrial policy serve as a blueprint?

Where can economic policy be focused in order to boost productivity and GDP growth? One option might be to improve the conditions for innovation and

[4] Leao et al. think that Portugal joined EMU with an overvalued real exchange rate. See Leao, Pedro and Alfonso Palacia-Vera (2011). Can Portugal Escape Stagnation without Opting Out from the Eurozone? Working Paper No. 664. Levy Economics Institute of Bard College.

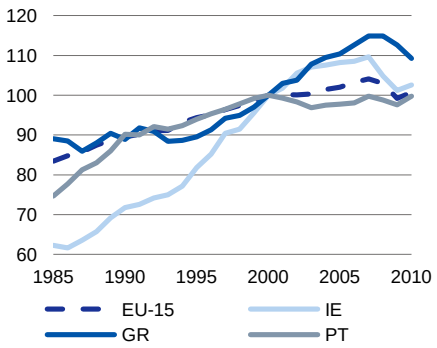
[5] For more on the situation in the run-up to the crisis, see Blanchard, O. (2007). Adjustment within the euro. The difficult case of Portugal. Portuguese Economic Journal 6:1–21, p. 8.

[6] Total factor productivity is a residual used as a proxy for long-term technological progress in an economy. Changes in TFP are sometimes linked with changes in the organisation of production as well as the quality of labour and capital.

# Greece, Ireland, Portugal: More growth via innovation

No technological progress in Portugal since 2000 7

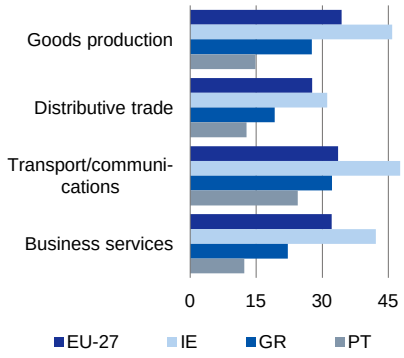
TFP, 2000=100




Source: AMECO, 2011

Personnel relatively cheap in Portugal 8

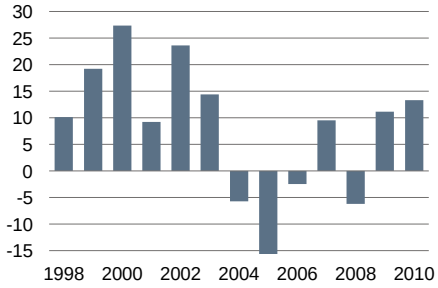
HR costs per employee, EUR '000, 2007




Source: Eurostat, 2011

Ireland benefited from FDI 9

FDI, % of GDP




Source: Eurostat, 2011

encourage the establishment of rapidly growing, innovative companies from high-tech sectors in order to raise the share of high-tech exports. Examples of such strategies are to be found in Taiwan, Israel – and Ireland itself.

— Taiwan, Israel and Ireland have benefited from the booming global growth of the IT sector. At completely different junctures, the countries positioned themselves in world markets: Taiwan as a manufacturer of IT hardware components, Israel as an R&D and/or service centre, and Ireland as the European production centre of multinational companies.

— Their governments actively pursued policies to attract business: they offered financial incentives, for example in export zones (Taiwan) or in the shape of low (zero) corporate taxes for foreign investors (Ireland, Israel). Furthermore, they developed technology parks and encouraged the formation of clusters (Israel, Taiwan).

— Foreign direct investment played a major role: for example, in the 1990s Ireland attracted foreign companies from the IT and pharmaceuticals sectors and thus laid the foundation of its economic upswing (see chart 9). Israel, in turn, is home to a large number of research facilities affiliated with international IT companies. Taiwan, by contrast, focused on international networking and integrated its domestic industry into international supply chains. This facilitated the technology transfer.

— Exports performed a key function in all these countries: Ireland served as a location for US companies which in turn exported to other EU countries. Israel has also strongly geared its IT sector to export business. In 2006, e.g., 72% of the IT goods and services produced in Israel were sold abroad.

— As a consequence of their incentive policies the countries have often developed very one-sided large sectors which can make them vulnerable to structural changes or cyclical swings. For example, the ICT sector in Taiwan generates 34% of that country's manufacturing output (2009).[7] In Israel it accounts for roughly 11% of GDP and around 30% of exports (2009).[8]

— One major challenge for all these countries is to generate spill-over effects for the domestic economy and create scope for broader-based growth. Even though critics in Israel continue to point to the risks of a dual economy, attempts have nonetheless been successful in establishing an entrepreneurial mindset around the IT sector. Some helpful aspects in this context were programmes to develop technology centres and incubators as well as funding to support the venture capital market. By contrast, in Ireland there are still major differences between the sectors dominated by FDI and those of the domestic economy.

— In all three countries, high public spending on education, currently totalling about 5-6% of GDP, provides underpinning for economic development.

The development of innovative high-tech clusters as greenfield operations has every chance of succeeding, as shown by the examples in Ireland, Taiwan and Israel. They are, however, inextricably linked with the high risk of misguided economic policy management and failure. While it obviously made sense in the 1990s to concentrate on the booming IT sector, today the sense of focusing policy support on specific sectors is not so clear. True, in numerous concepts the funding of renewable energies (e.g. proposals to support solar energy in Greece and Portugal) or electric mobility (Portugal) is high on the list of priorities. However, there is a risk that subsidised industries will ultimately be unable to hold their own in international competition.

[7] See Ministry of Economic Affairs, 2010 Industrial Development in Taiwan, R.O.C.
[8] See Samuel Neaman Institute for National Policy Research (2010). Science, Technology and Innovation Indicators in Israel: An International Comparison. Third Edition. p. 65f.

# Greece, Ireland, Portugal: More growth via innovation

Taiwan: High-tech with few brands 10

Within four decades, Taiwan has evolved into a leading location for high technology. The country sought to integrate its firms into the supplier networks of the international electronics industry and established itself as a production location. This went hand in hand with the internationalisation of production in the electronics sector to be observed since the 1970s. As a result, Taiwanese suppliers grew in step with the processes of outsourcing and offshoring pursued by multinational electronics companies. At the same time, Taiwan concentrated its efforts on an import substitution strategy that was designed to enable the development of locally anchored supplier networks. Today, Taiwan remains the global leader in the production of individual components such as motherboards (see table 13).

Taiwan's initially very limited public budget shaped industrial policy in its abandonment of subsidisation for national champions. This favoured the development of small and medium-sized enterprises (SMEs). Technology transfers succeeded via several channels: for one, direct collaboration with international clients triggered learning processes and transfers of process technologies. This drove technological upgrading processes. For another, the Industrial Technology Research Institute (ITRI) established by Taiwan's Ministry of Economic Affairs has played an important role. With strongly application-oriented R&D and a broadly-based spin-off policy it is one of the key pillars of industrial development in Taiwan.

Taiwan set up export zones at an early stage and supported the rapid integration of companies in international supplier networks. By 2010 over 50 industrial parks had been established, thus promoting the formation of high-tech clusters. Output from the high-tech parks generated a full 15% of GDP in 2007; they employed some 220,000 people. The World Economic Forum ranks Taiwan in third place worldwide in terms of cluster development.

Taiwan: IT firms are global leaders 13

| Product | World market share |
|---|---|
| Motherboards | 99.0% |
| Notebooks | 87.5% |
| LCD Monitors (>10") | 73.4% |
| Contract chip production | 68.4% |
| Chip testing and packaging | 54.3% |
| Large LCD panels | 45.9% |

Source: IRK/ITRI, 2007

Israel: A dual economy 11

Today, Israel is one of the leading locations for high-tech R&D, particularly for IT and biotechnology. Israel was quick off the mark in expanding its research activities. Back in 1959 Israel passed a law on the promotion of private investment that focused on business sectors with a high degree of gross value added and good export prospects. As this legislation offered tax incentives on inward investment US electronics companies started to invest in Israel in the 1960s. Foreign direct investment concentrated on pure R&D activities and small production operations up until the mid-1990s.

Until recently, business promotion policy was guided by the idea of neutrality. One key element was the development of technology parks. It was not until 2004 that the Research Committee – a body established in accordance with the Encouragement of Industrial Research & Development Law – attached priority to biotechnology and nanotechnology. This paved the way for the first government biotechnology incubator and a centre for nanotechnology. By 2006 a total of 27 technology incubators had been opened. In 2001, 13 of these facilities were privatised, partly by selling them to venture capital firms.

Israel has supplemented its business promotion policy with additional measures. Part of its focus is on education. Besides, the wave of immigration that followed the collapse of the Soviet Union substantially expanded the pool of researchers and engineers in Israel. With 140 engineers per 10,000 inhabitants Israel has the largest percentage of skilled workers in this area worldwide. Furthermore, the government has deregulated the capital markets and directly subsidised the VC market since the start of the 1990s. By international standards, Israel has a very highly developed VC market.

This highlights a fundamental problem in the allocation of innovation and investment funding. At the end of the day it is the market players themselves who decide which sectors of the economy and which projects attract entrepreneurial interest. A technology or sector-focused specialisation in cluster promotion – albeit still a common practice – usually does not lead to the planned objective. It is preferable instead to provide technology-neutral funding, for example within networks, and bolster the innovation system (see chart 12). In this context, innovation policy should be drafted in such a way that it stimulates further innovation in future.[9] In other words, the stylised facts should only be taken as an illustration of success stories – not as a blueprint.

East Germany: An example of modern promotion of innovation 12

Following Germany's reunification, east Germany initially underwent a massive round of de-industrialisation. The number of employed persons fell within three years (until end-1993) by approx. two-thirds. This resulted in substantial expertise in the area of industrial research being lost.* Subsequently, the German government focused on propping up core industries by deploying huge amounts of funding subsidies, while research and innovation policy was at first given lower priority on the agenda. Innovation policy temporarily focused on supporting individual projects and personnel in order to secure know-how in the research area and shore up existing R&D networks. In addition, policy moves supported technology-oriented start-ups and helped build up regional technology and entrepreneurial centres based on west German models.

At the end of the 1990s official policy changed tack with a switch to supporting projects as cooperative research alliances. In this context, one objective was to improve the only weak links between companies, research and business-related facilities at the regional level. The formation of clusters was also to be promoted in order to support high technology at the regional level. At present, the promotion of networks is in the cross-hairs of the federal government's R&D measures (e.g. improving the infrastructure of networks, subsidies for external management services) in order to establish larger research communities. This approach is mainly to be seen as a response to the intensification of international competition and a shorter time-to-market phase for academic research findings. While the innovation activity of east German companies continues to lag performance in west Germany, this is due in particular to companies being smaller in size. The developments in business promotion policy impressively highlight the abandonment of heavy-handed intervention to the benefit of business and network-oriented policy.

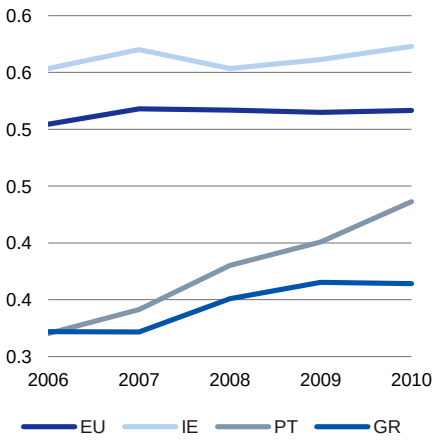
* For more on the development of innovation policy in east Germany see Günther, Jutta (2010). Im Fokus: 20 Jahre Innovationspolitik: Vom "nackten Überleben" zur Hightech-Förderung in Ostdeutschland. Wirtschaft im Wandel 2/2010.

[9] See Anvret, Maria, Massimiliano Granieri and Andrea Renda (2010). A new approach to innovation policy in the European Union. CEPS Task Force Report.

# Greece, Ireland, Portugal: More growth via innovation

Ireland: Innovation system functions well 14

Innovation index




Source: Innovation Union Scoreboard 2010

## The framework for innovations – a long-term objective

In the meantime, various proposals have been tabled for ways to stimulate the economic recovery of the crisis countries – for Greece in particular a number of plans have been drafted, by the German Ministry of the Economy, the European Commission and Bruegel, the Brussels-based think tank, to name but a few. In most cases they focus on different areas and range from investment programmes and the accelerated release of monies from the EU Structural Funds right through to temporary wage subsidisation. Politicians have also stoked the debate by raising the issue of establishing special economic zones in Greece. Only Bruegel's plan provides for measures to support innovation centres and company start-ups.

Innovation system: A definition 15

A functioning innovation system is based on well-developed, continuous network connections between institutions and agents. This includes, for example, companies, universities and public research facilities as well as science and technology parks, venture capital funds, business associations, training centres and consultation bureaus for company start-ups.

The forms of network relationships range from joint research and exchanges of personnel right up to cooperative ventures for procurement and market access. Thanks to the benefits of the long-term, overlapping relationship networks in an innovation system, it is possible to develop and market new technologies or products more simply as well as to influence the pace and direction of technological learning processes. Not only the underlying formal institutional conditions are of importance. The development of informal relations is equally important.

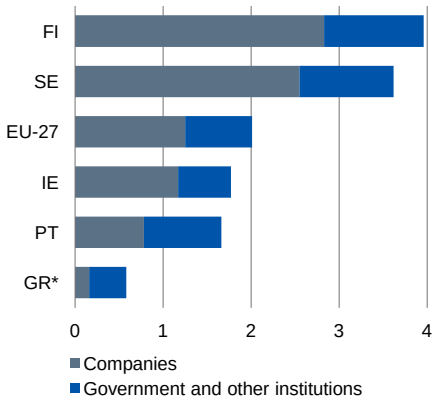
Innovation index 16

The innovation index of the Innovation Union Scoreboard is a composite measure based on data from a total of 24 indicators. These are grouped in 6 main categories: human resources, research system, finance and support, linkages & entrepreneurship, intellectual assets, innovators and economic effects. The maximum value of the indicator is 1.

Innovations require a stable and coherent institutional framework. A functioning innovation system is based on networks between companies, universities, government research centres and innovation agencies which facilitate flows of information and technology among the agents (see chart 15). Even though analytical endeavours and political practice often still focus on the development of the national innovation system, many people now realise that innovation policy ought to be geared more heavily to a regional approach.[10] In this context, regions are in many cases defined according to administrative borders at the sub-national level. In fact, though, for regional business and innovation activity, what are referred to as "functional regions", which cross administrative or national borders, are of greater significance. For simplicity's sake, in this analysis we shall first examine national indicators. This approach is supported by the fact that the GIP regions are largely classified on similar terms. Regional aspects will be discussed later.

Efforts required to stimulate R&D expenditure 17

R&D expenditure, % of GDP, 2009




* 2007, estimated

Source: European Commission, 2011

## Ireland: A good basis

Ireland has a well-functioning national innovation system that has developed positively over the past few years. In the Innovation Union Scoreboard 2010 Ireland was reported to have shown above-average performance in the group of Innovation followers (see chart 14). This is the second-highest of four performance groups categorising the 27 EU member states. The report underscores that Ireland is catching up with countries strong on technology and R&D such as Sweden and Germany. Ireland shows particular strengths in the field of education, at the tertiary level in particular, as well as in scientific publications.

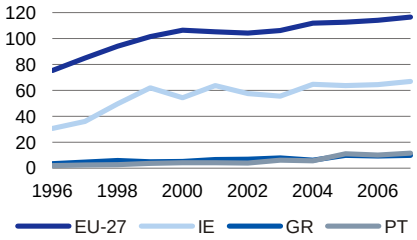
Nevertheless, problems are to be found in Ireland, too: R&D expenditure is still lower than the EU average and is a long way away from the Lisbon target envisioning R&D expenditure at 3% of GDP (see chart 17). The number of patent applications also stubbornly remains much lower than the EU average (see chart 18). A further notable point is the imbalance in business enterprise R&D activities in favour of the foreign multinationals operating in Ireland.

[10] See Dreger, Christian and Georg Erber (2011). Regionale Innovationssysteme in der EU. In Wirtschaftsdienst 8/2011, p. 565ff.

# Greece, Ireland, Portugal: More growth via innovation

Few patents 18

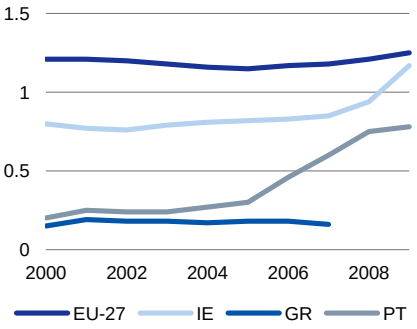
Patent applications filed with European Patent Office, per million inhabitants




Source: Eurostat, 2011

Greece & Portugal: Businesses still conduct little research 19

Corporate R&D spending, % of GDP

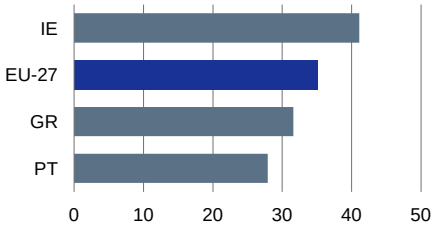



Data for Greece in 2006 & 2007 are estimates

Source: Eurostat, 2011

Ireland: Very knowledge-intensive 20

Employment in knowledge-intensive sectors, % of total employment, 2009




Source: European Commission, 2011

Foreign companies account for some 70% of the business R&D expenditure; 75% of the companies in this group are from the US.[11] Multinational enterprises (MNEs) continue to have a special status. At the same time, a relative weakness can be seen in the innovation activity of small and medium-sized enterprises (SMEs), particularly with regard to the launch of new products and processes. The EU therefore demands that the foreign MNEs locate more R&D activities in their core business in Ireland. It says building up more extensive innovation activity in Ireland could help to establish more rapidly-growing, innovative high-tech companies in Ireland.[12] This will also require efforts to stimulate the still insufficiently developed venture capital (VC) market.

## Portugal: Positive performance from low level

Over the past ten years Portugal has registered dynamic developments in its innovation system; however, it is still far short of the EU average (see chart 14). The performance in the Innovation Union Scoreboard 2010 ranks the country as a Moderate innovator (group 3). Even if the companies' R&D expenditures (as a percentage of GDP) remain a long way below the EU average, it is positive to note that they had been growing until the crisis struck (see chart 19).[13]

Nevertheless, Portugal still has a long way to go on the road to overcoming the weaknesses of the innovation system at the company level. In the area of patent applications, Portugal lags well below the EU average (see chart 18). It seems to be difficult to translate research findings into concrete applications which can be patented. A recent report underscores that the innovation activity of the SMEs in Portugal – in keeping with that country's development level – tends to be based on the implementation of existing knowledge rather than radical innovations.[14] Furthermore, employment levels in knowledge-intensive sectors remain far below the EU average (see chart 20). Even though the Portuguese innovation system has made significant advances over the past ten years, the EU is calling for further efforts to attract innovative enterprises from the high-tech and medium-tech segments.[15] To do so, it will also need improved funding options, e.g. via venture capital.

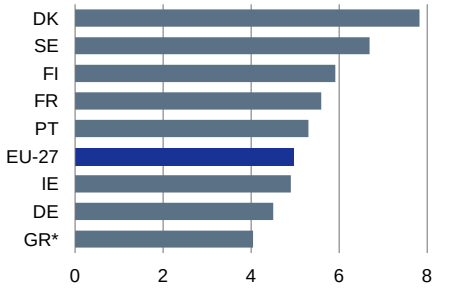
Moreover, Portugal's innovation system shows weaknesses in education. While public-sector spending on education slightly outstrips the EU average of 5% of GDP (see chart 21), this does not result in a high education level for the population at large: the shares of graduates both at the secondary level and at the tertiary level are still low in an EU comparison (see charts 22, 23). This proves to be a curb on the production of high-value goods and services. The OECD regards Portugal's poor scores on education to be one of the main reasons for the country's lagging productivity.[16] So further efforts are essential. Nonetheless, Portugal has relative strengths in sciences, as reflected in the publications of scientific findings or the number of researchers in relation to the population as a whole.

[11] See Innovation Union Competitiveness report (2011). p. 117f.
[12] See Innovation Union Competitiveness report (2011). Country Profile Ireland, p. 2.
[13] As things stand today, however, the growth slump has distorted the ratios in all countries to the upside.
[14] See Walendowski, Jacek et al. (2011). Regional Innovation Monitor. Innovation Patterns and Innovation Policy in European Regions. 2010 Annual Report.
[15] Innovation Union Competitiveness report (2011). Country Profile Portugal, p. 2.
[16] See OECD (2010). OECD Economic Surveys Portugal, p. 113.

# Greece, Ireland, Portugal: More growth via innovation

Differences in the EU 21

Public expenditure on education
% of GDP, 2007

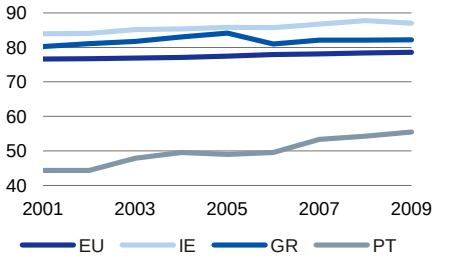



*Data for 2006

Source: Eurostat, 2011

Portugal trailing behind 22

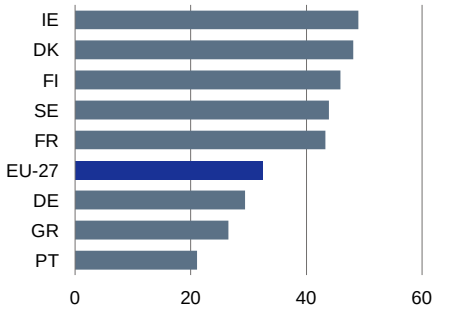
Share of 20-24 age group with higher secondary education (%)




Source: Innovation Union Scoreboard, 2010

Portugal & Greece: Need to catch up on tertiary education 23

% of population with tertiary degree, 2009




Source: Innovation Union Scoreboard, 2010

## Greece: A long way to go

Greece's national innovation system displays many weaknesses. Like Portugal, Greece is classified in the performance group of the Moderate innovators. However, Greece still ranks below Portugal in this group. The EU Innovation Competitiveness report emphasises the catch-up nature of Greece's innovation activity with its heavy dependence on imported technologies and expertise. Unlike in Portugal, the innovation environment there has improved only slightly over the past few years. One weakness is to be found in gross domestic expenditure on R&D. There are particularly glaring shortcomings at the corporate level, as documented for example by the very low share of business enterprise expenditure on R&D (see chart 19) or the low number of patent applications (see chart 18). Besides, the business R&D investments are concentrated on a few sectors such as consumer electronics, IT services and pharmaceuticals; these absorb nearly 50% of the expenditure. Furthermore, there are restrictions on funding innovations and start-up companies which have been further tightened because of the current crisis. Measures to promote the Greek innovation system heavily rely on financing from the EU Structural Funds.[17] However, the research and innovation system is not very capable of absorbing funding: this also suggests that there are too few projects worthy of promotion.

Like in Portugal, relative strengths may be noted in sciences, as evidenced for example by the share of scientific publications in leading journals. However, the number of researchers and new doctorate graduates is much lower than the EU average. A look at the data on higher secondary education indicates at first glance that Greece's situation is pretty good. In terms of university graduates and spending on education (as a percentage of GDP), though, the country ranks significantly below the EU average (see charts 21-23). Moreover, the Greek education system is often not able to provide the qualifications and skills required in the labour market.

## Policy: Regions in focus

Innovation policy should comply with several fundamental principles. First of all, it should build on the comparative strengths of an administrative or functional region.[18] The EU and OECD rankings on the location factors for innovations show relatively similar classifications for the regions in the GIP countries: according to a study commissioned by the EU most of the regions in Greece and Portugal belong to the so-called Knowledge-absorbing Innovating Regions, which are characterised by weaknesses in the area of business R&D activities. The Irish regions are classified as Industrialised Innovating Regions which have strengths in technological innovations, but are weak in the area of innovative entrepreneurship. The OECD says exceptions are to be found in, for example, the regions of Lisbon and Attica (the latter being home to Greece's capital, Athens, and the port of Piraeus).

Nevertheless, the regions within a country are not homogeneous in respect of industrial mix, academic institutes or infrastructure – for this reason a one-size-fits-all approach in economic policy is inappropriate. Rather, it is much more important to find a concept suitable for the respective region in order to promote the technological capabilities and innovation activity of the economic agents in the region and strengthen the cooperation between them. In practice, the promotion of clusters plays a major role (see chart 24). It is asserted that innovation potential mostly focuses on a few innovation centres whose superior

[17] See Innovation Union Competitiveness report (2011). Country Profile Greece.
[18] See Dreger, Christian and Georg Erber (2010).The Design of Regional Innovation Systems. Working Paper IAREG WP6/01, p. 9.



Clusters: Theory and practice 24

While policy in the EU is in many cases still based on the concept of clusters, academic literature points to the significance of promoting so-called functional networks.* Thus there is a considerable gap separating economic theory and business practice. The cluster approach focuses on the significance of geographic proximity and linkages between companies as well as resultant spill-over effects in the innovation process. The functional network, by contrast, builds on the networking of companies with closely related activities (related variety) and the development of a resources base in this network (future orientation). Companies and institutions benefit from the spill-over effects in such a (functional or regional) network.

* See Walendowski, Jacek et al. (2011). Regional Innovation Monitor. Innovation Patterns and Innovation Policy in European Regions. 2010 Annual Report, p. 28.

appeal is due to their variety of specialised services and favourable general conditions including access to highly qualified scientists and researchers.[19]

Moreover, the subsidiarity principle is also a major factor in the context of regional support and the promotion of innovation. Competence at the regional level should be used for the development of a regional development strategy and its implementation. Greece and Portugal are still quite far away from this stage, though: technology and innovation policy have mainly been centrally managed up to now.[20] Innovation policy in the regions of Greece, for example, is confined to the implementation of projects; strategies are not developed independently at the local level. Greater regionalisation would require that regional-policy competence be built up among the administrative authorities, however. This is likely to be a viable option only in the medium term. Furthermore, given the backdrop of scarce resources it is vital that there is no duplication at the regional level of measures that have already been launched at the national level. Instead, measures should be better coordinated between the various levels of government (including the EU).

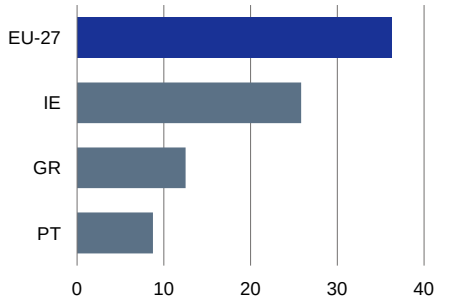
## Numerous policy areas requiring action

### Boosting of business R&D activities

Which areas should policy address in concrete terms in order to improve the general environment for innovations and attracting high-tech companies? One key challenge is to boost R&D activities of innovative SMEs in the regions of Greece and Portugal in particular. One option is to form better networks linking SMEs and academic institutes with the objective of establishing research partnerships. In this regard, all three crisis countries have low-ranking scores in relation to the EU average, as can be seen for instance in the number of public-private (research) co-publications (see chart 25). The Portuguese government, for instance, has set up a programme supporting cooperation between companies in the automotive sector and research institutes. Included among the participants are the Massachusetts Institute of Technology and one of the Fraunhofer Institutes.[21]

Co-publications still rare in GIP countries 25

Public-private co-publications, per million population, 2008




Source: IUS 2010

Moreover, corporate networks are to be beefed up. All three countries need to make progress in this area: only Portugal has implemented a cluster policy in its regions, for example in the Norte region (Norte 2015) and in the Algarve with the support of the EU Structural Funds 2007-2013 (Knowledge and Economy of the Sea Cluster, Wine Cluster, Creative Industries).[22] In Ireland, a cluster policy has at least been planned. At the regional level, Greece has still not implemented any cluster policy as yet, though it is supporting the development of “Regional innovation poles” at the national level. Furthermore, it is also desirable to gear funding to functional networks which may indeed cross national borders. One example is the automotive cluster in the north of Portugal which also extends to the Spanish region of Galicia.[23]

### Importance of EU Structural Funds

Against the backdrop of a critical budget situation in the GIP countries it will probably remain difficult to significantly increase the funding from national sources for the foreseeable future. Therefore, the EU Structural Funds are of major importance for these regions. Referring to the above-mentioned policy areas Walendowski et al. recommend that the use of the EU Structural Funds in the GIP regions should, for one thing, be focused more on supporting

[19] See Dreger, Christian and Georg Erber (2011). Regionale Innovationssysteme in der EU. In Wirtschaftsdienst 8/2011, p. 565ff., here p. 568.
[20] See OECD (2011). Regions and Innovation Policy. Policy Brief. May 2011. p. 3.
[21] See OECD (2010). OECD Economic Surveys: Portugal. p. 100.
[22] See Walendowski, Jacek et al. (2011). Regional Innovation Monitor. Innovation Patterns and Innovation Policy in European Regions. 2010 Annual Report. pp. 30, 47.
[23] The international intensification of innovation-based competition is also pushing the cross-border networking of regions to the fore. At the European level, what is referred to as the Innovation Union is meant to promote integration with third countries in the framework of the 2020 Strategy.

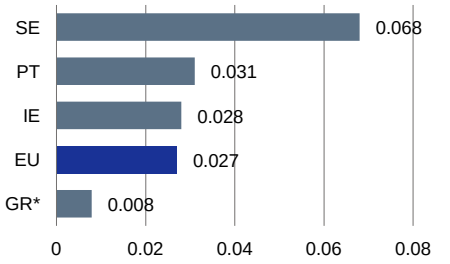
knowledge transfers and promoting innovation poles and clusters, and not so much on direct subsidisation. Potential measures might include, for instance, technology transfer projects or the financing of technology parks, innovation centres and cluster infrastructure. For another, they say support is helpful in creating an innovation-friendly environment. This includes, for example, improving innovation financing (e.g. building up VC funds), developing human capital, regulatory improvements or innovative approaches to public procurement and government services.[24] Furthermore, EU Structural Funds could assume a strategic role in piloting the way towards innovative regional projects. This is said to be of particular significance for regions with rather weak institutional framework conditions (governance), as is the case in most of the regions of the crisis countries. Moreover, EU innovation policy is also seen to have a key function in providing a proper framework, for example in the area of standardisation.

The subsidies from the EU Structural Funds can only develop their full impact if the complementary national funding is secured. To do so, countries should make better use of existing instruments, such as loans from the European Investment Bank (EIB) – in Greece in particular. Given the pressures on national budgets, furthermore, the resolution to recalibrate the rules for co-financing is fundamentally a sensible move, allowing more funds to be made available overall to the crisis countries.[25] However, this is also predicated on projects being set up and the funds available actually being drawn down. Particularly Greece, but also Portugal, have major fund absorption problems that are due to deficiencies and shortcomings in public administration and too low a number of concrete projects.[26] This underscores once again the necessity of tackling fundamental reforms in the public sector. Otherwise there is a risk of regional and innovation funding programmes failing to achieve the desired effect.

Finally, it is important to further expand the VC market in the crisis countries in order to support the development of start-ups and small businesses. Greece faces the challenge of developing a VC market from scratch (see chart 26). While the VC investment volumes in Portugal and Ireland are roughly in line with the EU average, Ireland has benefited hitherto from sizeable capital inflows. Both countries could further promote business start-ups with the aid of a larger VC market.

Greece: Virtually no VC investment 26

VC investment, % of GDP, 2010
Investment in portfolio companies




* 2009

Source: EVCA, 2011

## Education makes a difference

### Portugal: Improve access to education

Any strategy to improve conditions for innovation activity should attach particular attention to the topic of education. This applies especially in Portugal where there is a very pronounced gap in the areas of secondary and tertiary education. Persistently high investment in education – also in times of crises – and efficient use of funding are key prerequisites. Besides, access to education should be improved and the ratio of dropouts to those who complete their schooling should be reduced. On top of this, the probability of a person attending college or university heavily depends on the education level of the parents. The Portuguese government recently introduced student loans to help reduce this

[24] See Walendowski, Jacek et al. (2011). Regional Innovation Monitor. Innovation Patterns and Innovation Policy in European Regions. 2010 Annual Report, pp. 53 and 60f. Currently, though, some 75% of the monies in Ireland from the EU Structural Funds are used to support public research institutes, directly subsidise R&D projects or develop technology companies. The share in Portugal is about 50%.

[25] For more see http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/942&format=HTML&aged=0&language=DE&guiLanguage=en.

[26] For more on this subject see e.g. Marzinotto, Benedicta (2011). A European Fund for Economic Revival in Crisis Countries. Bruegel. p. 9.

dependence. Further efforts are necessary on the issues of thematic orientation and quality of vocational and tertiary-level education.[27]

### Greece: Focus on requirements of working world

In Greece, too, a key component of education policy is to boost the number of university graduates. Further starting points may be found in a qualitative improvement in education and further training and a better fit between educational content and vocational requirements. In this case, increasing the number of universities and specialised educational institutes would be a help. By international standards, Ireland scores much better on education than the other two countries. Given the evolution of companies towards products and services with higher value added, an area that should be targeted is the upgrading of human capital via specialised programmes at the university level and in the trades as well as in further education for higher qualifications.

## Greece and Portugal: Virtually no comparative advantages in high tech

All in all, there are numerous areas where the political powers-that-be can take action to improve the underlying conditions for innovation activity. It is not only a matter of financial support and improving the infrastructure for innovations (e.g. by developing technology centres), but also a matter of improving the competence of the administrative authorities for regional policy, developing funding concepts and projects, or boosting the efficiency of the education system. In which sectors is the promotion of innovation likely to find fertile ground in the GIP countries?

The innovation potential of a region is partly derived from the existing production structures and the course of their development to date. Technology-neutral promotion and/or the promotion of innovation networks ultimately starts with the resources pool that already exists in a region and supports projects driven by the established companies and institutions. Such projects are likely to emerge mainly from the strengths of the industries and services in the region. A region's comparative advantages can, for example, be influenced by the transmission channels for innovations and new knowledge, by the economic structure and the business clusters. Differing innovation systems are suited for innovations in high-tech and low-tech segments, hinging on the level of a region's development.

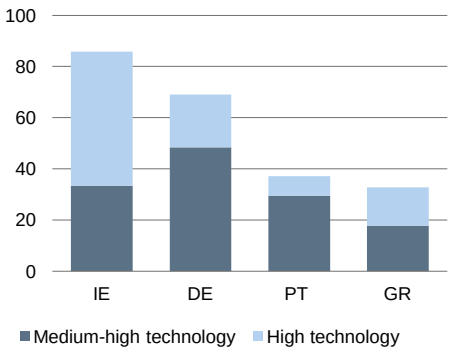
A look at the crisis countries' current areas of specialisation helps to assess their innovation potential. The balance of trade offers insights into the structure-related technological strengths and weaknesses of a country: the OECD classifies the exports of all countries by their technology intensity. In Ireland, over 80% of the manufacturing industry's exports are classified as high technology or medium-high technology (see chart 28). Here, too, it clearly emerges that Ireland is economically much more highly developed than Greece or Portugal. Despite the structural shift in recent years Portugal's exports mainly consist of goods with medium to low technology intensity. In Greece, the export shares of high technology and medium-high technology remain minor at 30%. Even though neither country shows a comparative advantage in medium-high-tech goods, they were each able to slightly improve their ranking in this segment in the decade up to 2007 (see chart 29).

Technology intensity 27

The OECD classifies sectors according to their R&D intensity, that is according to the ratio of R&D expenditure to GDP output or gross value added. Four technology categories emerge as a result: high technology covers aerospace, pharmaceuticals, office equipment and computers, TV and telecommunications devices as well as medical and other precision instruments. The category of medium-high technology includes electrical and other machines, autos, chemicals and transport systems. Medium-low technology covers shipbuilding, refinery products, rubber and plastics, non-metallic products and metals processing. Low technology comprises wood processing and print products, food as well as textiles and leather goods.

Stark contrasts 28

Manufacturing exports by technology intensity, % of total exports, 2009



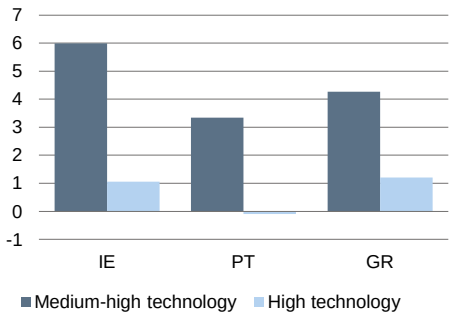

Source: OECD 2011

[27] See OECD (2010). OECD Economic Surveys Portugal, p. 113ff.

# Greece, Ireland, Portugal: More growth via innovation

Improvement in competitive position 29

Contribution to balance of trade / industrial goods
Change 1997-2007, pp




Source: OECD 2009

## Industry: Little high tech in Greece and Portugal

Where are the countries' comparative advantages to be found exactly? One descriptive proxy is the concept of revealed comparative advantage (RCA), which reflects the relative advantages of a country in individual categories of goods and services on the basis of trade flows. An RCA value greater than 1 points to a country's having relative advantages. In Ireland, the strengths determined in (medium-)high technology are mirrored via high RCA readings in the areas of chemicals and pharmaceuticals (RCA: 5), in the production of IT equipment (RCA: 2.2) and in the manufacture of medical and high-precision instruments (RCA: 2.3). Thus, in a comparison of OECD countries, Ireland achieves top rankings in these sectors.

This aggregated analysis tallies with the analysis of the most highly developed industry clusters in Ireland. Apart from the production of IT hardware, Ireland is home to another state-of-the-art technology sector: pharmaceuticals. Four Irish pharmaceuticals companies are represented in the R&D Scoreboard 2010. It should be noted that three of these companies are of Irish origin. The heavy reliance on foreign direct investment typical of the Irish IT sector does not apply here to the same degree. Medical technology is a further important high-tech sector. There is a cluster in the region of Galway and Cork providing jobs to roughly 20,000 employees. In a European comparison this cluster ranks as having the second-highest degree of specialisation in medical technology.[28]

## Portugal: Comparative advantages in low-tech categories

Portugal has the highest RCA values in the industrial segment. However, the advantages weigh in mainly in the two lowest categories of technology, for example in the tobacco industry (RCA: 5.8), wood processing (4.8), leather (3.96) building materials (3.8), and the production of paper (2.8) and textiles (2.6). Unlike Greece, though, Portugal has comparative advantages in medium-high technology in the auto industry (1.5), metals processing (1.8) and – to a lesser extent – electronics (1.1). Industry is concentrated primarily in the regions of Lisbon, Centro and Norte, with traditional sectors (leather, textiles and clothing, furniture) playing a dominant role in the Norte region. The automobile industry has taken up residence along the strip of coastline stretching from Braga to Setúbal, as have important parts suppliers, e.g. from the electronics industry. The auto sector is of great importance to the Portuguese economy as Portugal is the location not only of assembly operations but also of a broad swathe of autoparts industries (metals, rubber, electronics, textiles, glass, plastics etc.).[29] Besides, the auto industry is above average in terms of research intensity. The Norte and Centro regions are home to business parks and specialised R&D centres. With CEIIA (the Centre for Excellence and Innovation in the Automotive Industry), the Norte region boasts a facility that has focused on the ongoing development of the Portuguese mobility industry since 2000. Furthermore, while it is rather small from a macroeconomic perspective, the plastic mould-making segment in the Centro region has a very strong export bias.

## Pharmaceuticals in Lisbon …

In addition, the pharmaceuticals industry in the Lisbon region is developing into an aspiring producer of state-of-the-art technology. The pharmaceuticals company Bial is listed in the R&D Scoreboard 2010. However, Portugal has not yet been able to achieve comparative advantages in this sector (RCA in chemicals and pharmaceuticals: 0.58). Moreover, Portugal has a small microelectronics industry with specialised semiconductor companies in the Porto region. About 30 ICT firms have located at Porto's TecMaia (a science and

## … and IT in Porto

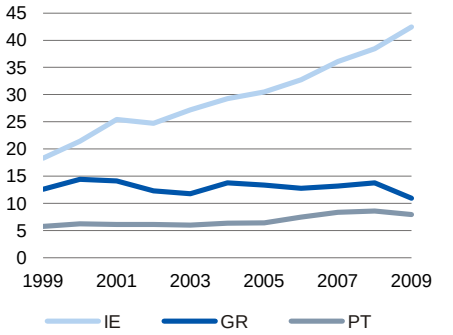
[28] See Center for Strategy and Competitiveness (2011). Smart Specialization in Europe: European Specialization by Industry. Stockholm School of Economics. April 2011.

[29] See aicep Portugal Global (2011). Portugal – Country profile, p. 33. Over the past few decades, the automobile sector has been shaped largely by industrial policy and foreign direct investment. Its success is based on – among other things – international technology transfers and regional spill-over effects. See OECD (2010). OECD Economic Surveys: Portugal 2010. p. 100.

# Greece, Ireland, Portugal: More growth via innovation

Uneven growth 30

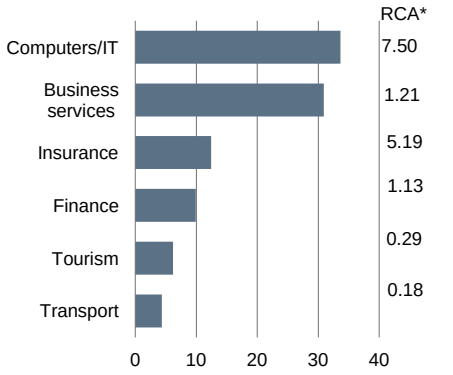
Services exports, % of GDP




Source: OECD 2011

Technology country 31

Ireland, share in services exports, %, 2008

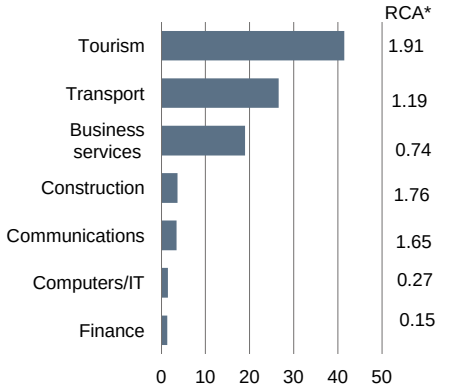



*Revealed comparative advantage, 2007

Source: OECD 2011

Tourism country 32

Portugal, share in services exports , %, 2008




* Revealed comparative advantage, 2007

Source: OECD 2011

technology park), including major business services companies such as Wipro and Accenture as well as local VC firms. There are also links with academic institutes: the Fraunhofer Gesellschaft opened its research centre for *Assistive Information and Communication Solutions* in Porto in 2008.

In Greece, there are pronounced comparative advantages particularly in the fisheries sector (19.3), tobacco production (5.8) and agriculture (3.7). In manufacturing, Greece has advantages internationally in the two lowest technology categories in segments such as food production (2.6), textiles (1.8), metals processing (1.8), printing (1.5) and the production of rubber and plastics (1.3). Greece's chemicals and pharmaceuticals sector (1.16) is the only branch of industry from the (medium-) high technology segment with comparative advantages. The Attica region, including the capital of Athens and the port of Piraeus, is the region of Greece that is home to the most clusters featuring knowledge-intensive services (financial services, transport) and industrial sectors apart from agriculture and low technology. Note the pharmaceuticals industry, which with over 13,000 employees is mainly specialised in the production of generic drugs. However, this puts the cluster only in 17th place among the most important pharmaceuticals regions in Europe.[30] Pharmathen, a Greek firm from this region, is listed in the R&D Scoreboard 2010 of the 1,000 companies that invest the most in R&D across Europe.

## Services: Tourism and transport

Several countries have seen the emergence of dynamic service sectors over the past few years, some of them strongly driven by technology. The composition of Ireland's exports reflects the structural shift in the country from a manufacturing location to one offering high-value services. The share of services in Ireland's total exports has increased in recent years (see chart 30). The focus is on IT and business services (see chart 31); this sector provides employment for approximately 250,000 people. More than 100 shared service centres have been established in Ireland, with nearly one-third of them specialised on high-tech sectors. Among other areas, they substantially focus on finance and accounting, IT, human resources and customer service.[31] Ireland is the beneficiary of a high-quality education system and of the fact that English is a native language.

In Greece and Portugal exports of services are far less important for GDP. Despite a relative loss in the significance of the tourism industry, Portugal remains a tourist destination (see chart 32). Apart from tourism, the most important roles are played by the transport and business-services sectors. Between 2000 and 2008 these sectors grew at average rates of some 21% and 18% p.a. respectively, or roughly twice as fast as tourism. So far, Portugal has not gained any comparative advantages in business services, as documented by the RCA reading of 0.74. In the Lisbon region, though, a dynamically growing services cluster has emerged over the past few years. Between 2007 and 2010 the number of people employed there rose from about 88,000 to roughly 143,000.[32] Numerous shared service centres of IT companies and financial service providers have set up shop here. Furthermore, approximately one-third of the companies in the small IT services and software industry are to be found in this region.[33]

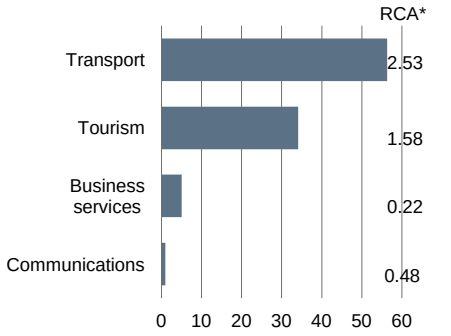
Since 2003, transport services have accounted for the largest chunk of total services exports in Greece, and have grown dynamically (see chart 33). In an

[30] See Center for Strategy and Competitiveness (2011). Smart Specialization in Europe: European Specialization by Industry. Stockholm School of Economics. April 2011.
[31] See Accenture (2010). Sustaining High Performance in Shared Services: An Irish Perspective.
[32] See Center for Strategy and Competitiveness (2011). Strong Clusters in Innovative Regions. Stockholm School of Economics. May 2011.
[33] See aicep Portugal Global (2011). Portugal – Country profile, p. 38.

# Greece, Ireland, Portugal: More growth via innovation

Transport country 33

Greece, share in services exports, %, 2008

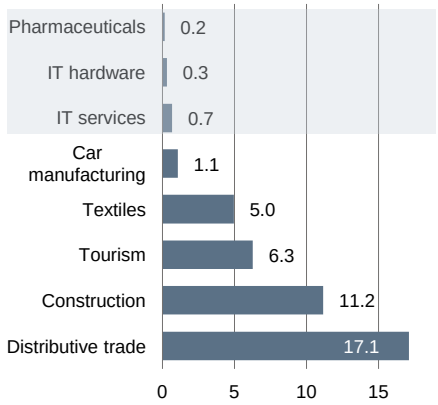



* Revealed comparative advantage, 2007

Source: OECD 2011

Portugal: Low on high technology 34

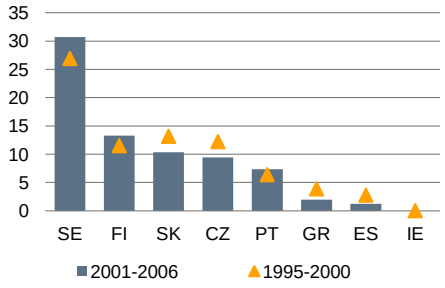
Share of total employment (%)
2008




Source: INE

Electronics: Portugal on growth path 35

Productivity growth (% yoy)
5-year average




Source: OECD 2010

OECD comparison Greece shows the second-highest RCA value (2007), which is due to the international significance of the Greek tanker fleet. The various shipping lines based mainly in and around the port of Piraeus make Greece one of the world's leading nations in the cargo shipping and tanker business.
In the port segment, by contrast, Greece has become less and less significant over the past few years. Piraeus, Greece's biggest port, has not ranked among the world's top 50 container ports since 2004.[34] There is strikingly little diversification among Greece's services exports, with the only other main focus being tourism.

## High technology: Mostly only small poles of growth

In Ireland, there are good underlying conditions for further productivity increases in high technology and business and/or IT services as well as for upgrading to more knowledge-intensive services. The main starting points lie in the promotion of business R&D activities, for Irish SMEs in particular.

The economic structures in Greece and Portugal, by contrast, are heavily segmented – only a small percentage of companies there can be classified as suppliers of high technology or knowledge-intensive services. At present, innovative sectors generate only a small percentage of total GDP in Portugal (see chart 34).[35] One of the few modern sectors with strong productivity growth, for example, is the electronics industry in Portugal (see chart 35). Nevertheless, there are points for leveraging the promotion of high-tech industries. The IT sector and the pharmaceuticals industry have remained small so far and in order to be rapidly developed they require skilled workers, measures to foster business R&D activities and cooperative ventures with academic institutes. Priority should also be given to support for the companies' foreign activities. Given the very limited fiscal means available it is crucial to concentrate the funding on regional or functional networks in order to achieve as high a degree of effectiveness as possible with the funds deployed. Furthermore, there is potential to strengthen innovation activity in the automotive industry, with several policy approaches towards the promotion of electric mobility already in place.

In Greece, (medium-)high technology has even less significance. For this reason there are very limited options to promote innovative companies from this segment. The relatively small pharmaceuticals industry, which specialises mainly in generics, offers several starting points. Furthermore, both politics and business have floated the idea of developing the solar industry. So far, though, Greece has built up only very limited capacities in photovoltaics at 270 MW.[36] This means the use of solar energy would have to be developed substantially further – though with corresponding risks.

## Bolstering traditional sectors

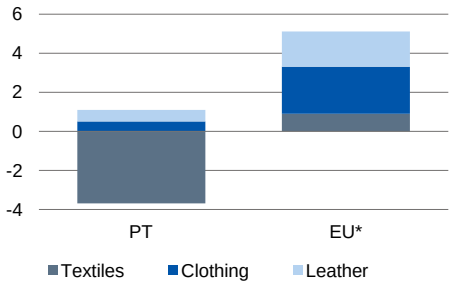
An innovation-policy approach focusing primarily on high technology does not go far enough in either Greece or Portugal. This is confirmed by a look at the economic structure: in Portugal, for example, the primary sector, the construction industry and traditional service sectors such as trade and tourism provide jobs for 37% of all employees. However, the majority of these activities are marked by low-skilled labour and weak productivity growth. Therefore, it is

[34] See Rodrigue, Jean-Paul et al. (2009). The Geography of Transport Systems. Container Traffic of the Top 100 Ports, 1970-2008. Hofstra University, Department of Global Studies & Geography.
[35] However, this can be observed in other countries, too: in the US the innovative sectors biotech, semiconductors and environmental engineering account for only slightly more than 1% of employment. See McKinsey Global Institute (2010). How to Compete and Grow: A Sector Guide to Policy. McKinsey & Company.
[36] Germany has a capacity of 19,000 MW.

# Greece, Ireland, Portugal: More growth via innovation

Portugal: Textile production unprofitable 36

Average profit margin (%)
1995-2009

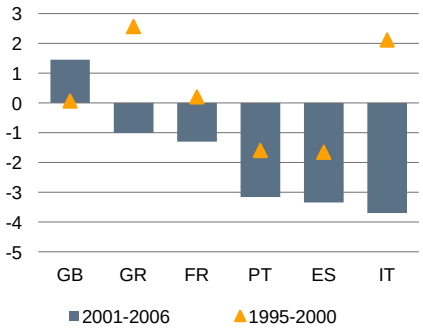



* EU-19, simple average

Source: European Commission, 2009

Hotels: Eliminate inefficiencies 37

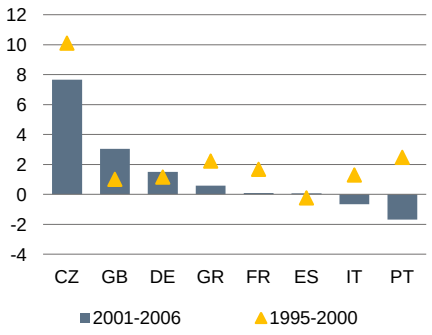
Productivity growth (% yoy), 5-year average




Source: OECD 2010

Wholesale: Poor performance in southern EU countries 38

5-year average




Source: OECD 2010

important to boost productivity also in the low-technology industries and in the traditional service sectors which are highly significant for the overall economy. One of the main issues here is to improve processes, for example via automation and the increased use of information technology and via a change in innovation culture in companies themselves.

In Portugal, special attention needs to be paid to the textile industry, which continues to represent the biggest branch of industry in that country with 5% of all employees. All in all, the companies are not operating profitably (see chart 36) and have failed over the past ten years to register any productivity growth. Thus, the sector has lost global market shares. Given the deregulation of market access and the tough competition from Eastern Europe and Asia it is important for companies to realign their focus on high-quality products and raise the productivity of the sector as a whole. This is primarily the job of the companies. However, politicians can help by improving the underlying conditions and supporting R&D activities which enable upgrading. Moreover, independent research institutes can develop and spread their expertise. For example, the CITEVE Institute in Porto fosters the development of technical textiles. The automotive industry may be a potential customer and partner in cooperative alliances.[37]

It is also important for service sectors in Greece and Portugal to pursue a strategy of “climbing up the value chain”. Besides the challenge of upgrading the quality of its product the tourism industry has to find ways to lift its productivity (see chart 37) and tap new business areas, such as the luxury travel segment. Wholesale and retail businesses are suffering in a weak competitive environment from very small company size in an international comparison and poor or even falling productivity (see charts 38, 39). The reduction of the informal sector and increased use of modern technologies to boost automation and optimise both inventories and logistics are likely to increase the productivity of the sector.

## Time plays a role

Measures that improve the environment for innovations and R&D investments have positive medium-to-long-term macroeconomic effects.[38] This also holds for programmes which boost the scope and quality of education and further training. They are of major significance for a medium-term bolstering of potential growth in the crisis countries. However, these policy approaches should be combined with measures which also counter the recession in the near term. These include not only the above-mentioned strengthening of the traditional industries, for example investment programmes for industry and selected service sectors.[39]

Against the backdrop of fiscal consolidation this can probably only be funded by EU monies or foreign direct investment. In this context, a key role will fall to foreign investors, for as a rule they have not only investment capital, but also modern technologies and efficient business structures at their disposal. Moreover, they bring the fresh impetus of competition with them which will probably also benefit the traditional companies in the domestic market.[40] This is of major importance precisely for Greece since the country has some catching-

[37] For more on the ongoing development of the textile industry using Germany as an example, see Heymann, Eric (2011). Textile and clothing industry: Innovation and internationalisation as success factors. Current Issues. July 13, 2011. Deutsche Bank Research.

[38] See Varga, J. and J. in’t Veld (2010). The Potential Impact of EU Cohesion Policy Spending in the 2007-13 Programming Period: A Model-Based Analysis. European Economy Economic Paper No. 422.

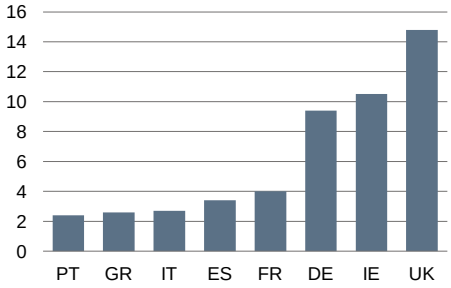
[39] See Marzinotto, Benedicta (2011). A European Fund for Economic Revival in Crisis Countries. Bruegel.

[40] See Klodt, Henning (2011). Rösler-Initiative. Exportschlager Ordnungspolitik. In: Wirtschaftsdienst 8/2011, p. 504.



Portugal & Greece: Small retailers 39

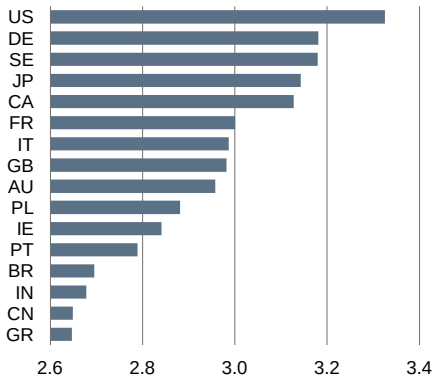
Number of employees per firm, 2006




Source: Eurostat

Management tragedy 40

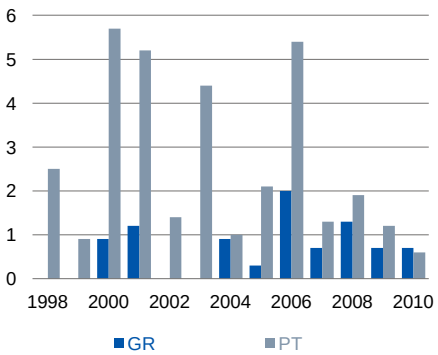
Management assessment from 1 (worst) to 5 (best)




Source: Bloom & Van Reenen, 2010

FDI important in Portugal, only minor inflows in Greece 41

FDI, % of GDP




Source: Eurostat, 2011

up to do on modern management methods (see chart 40). Besides, Greece is likely to find it difficult to modernise under its own steam. However, Greece also has a long way to go on the topic of FDI since, in contrast to Portugal, it has hitherto never been a preferred destination for foreign direct investment (see chart 41). In addition, obstacles still exist for FDI in the product markets.[41] In Portugal, the special challenge facing the automotive industry is to rekindle its appeal to foreign direct investors in order to counter the growing competition that has developed in eastern European and Asian locations over the past few years. As the example of Israel or Ireland demonstrates, the local anchoring of foreign direct investment remains a key task in such a strategy to enhance the growth of the domestic economy.

The success of innovation and growth policy in Greece, Ireland and Portugal hinges crucially on the improvement of the macroeconomic environment in the three countries. Apart from wage restraint to lower unit labour costs, this will include reforms to make the labour market more flexible. In Greece and Portugal in particular such supply-side structural reforms and privatisation moves are necessary to improve the functioning of institutions and markets. Reforms of the political and administrative systems also have to be pursued in order to reduce the extent of the black economy and red tape, while boosting the efficiency of the administrative authorities. It is precisely with a view to innovation policy that the improvement of regional-policy competence in administration and the development of promotion concepts and projects have to assume a key role. Finally, the underlying framework for company start-ups needs to be improved as a whole. In Greece in particular it is time-consuming and costly to set up a new company. One reason for this is demanding administrative requirements.

## Outlook

Greece, Ireland and Portugal face the challenge of boosting their competitiveness and their productivity growth. The conditions for innovation need to be improved and measures taken to simplify the establishment and development of high-tech companies. All three countries have particular weaknesses in business research and innovation activity. For this reason they are confronted with the job of improving the underlying conditions for business research and development, for example by building up technology centres or developing entrepreneurial expertise. There also needs to be increased networking of companies with one another and with academic institutes. Developing institutions that work in the area of application-oriented R&D has high priority. However, a comparison of the three crisis countries clearly shows that there are considerable differences in the starting positions with regard to innovation activity and sector structure.

Ireland has the best prerequisites, benefiting partly from the strong influx of foreign direct investment in the high-tech segment in the 1990s. The comparative advantages it already enjoys in IT services, medical technology and pharmaceuticals offer opportunities to further promote innovation activity and corporate networking on innovation processes. Politicians' priorities should be to integrate local SMEs and broaden the basis for entrepreneurial innovation activity. The country has good prospects of returning to a sustainable growth path.

Even though Portugal has substantially improved its innovation system in recent years, the country still occupies a lower mid-table position on numerous indicators in EU-wide comparisons. Therefore, Portugal also needs to strengthen its business R&D activities. With a focus on the automotive industry and its parts suppliers as well as small high-tech sectors, such as IT or

[41] See OECD (2011). OECD Economic Surveys Greece, p. 41.

pharmaceuticals, the country is well placed to push ahead with innovation activity and the upgrading of the sectors. Particular efforts are necessary in the education sector since the relatively low qualification level of the workers has proved to be a curb on productivity growth. Focusing on functional networks and clusters helps to make the best possible use of the scarce incentive funds available. With regard to the tough international competition for production locations in some of the most significant sectors in Portugal the boosting of R&D activities and productivity have high priority.

Greece's innovation system displays substantial weaknesses and is a lagging performer in an EU comparison. Unlike Portugal, Greece's performance has in most cases not significantly improved over the past few years. Since the economic structure still relies heavily on industrial sectors from the low-technology segment and on basic services, there is still a long way to go towards developing fast-growing sectors with high productivity growth. Especially in Greece, but also in Portugal, it is therefore of major importance to upgrade traditional industrial and service sectors. It is up to companies here to devote high priority to sustainably boosting productivity and profitability.

Innovation policy only achieves positive effects in the medium term. However, the crisis countries are compelled to boost growth also in the short run. Foreign direct investment may play a key role in helping Portugal and Greece to attract modern technologies and management methods to their shores. But to do so the underlying business conditions will have to be overhauled: a comprehensive economic strategy has to include a modernisation of the public sector and the implementation of structural reforms.

Antje Stobbe (+49 69 910-31847, antje.stobbe@db.com)

Peter Pawlicki (pawlicki@em.uni-frankfurt.de)

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