RIO Country Report 2016: Greece

Research and Innovation Observatory country reports series

Amanatidou E, Damvakeraki T, Karvounarakis A

2017
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**Contact information**
Email: JRC-B7-NETWORK@ec.europa.eu

**JRC Science Hub**
https://ec.europa.eu/jrc

JRC105901

EUR 28494 EN


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How to cite: Amanatidou, E; Damvakeraki, T; Karvounarakis, A; RIO Country Report 2016: Greece; EUR 28494 EN; doi:10.2760/102221

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**Research and Innovation Observatory Country Report 2016 Greece**
The 2016 series of the RIO Country Report analyses and assesses the development and performance of the national research and innovation system of the EU-28 Member States and related policies. It aims at monitoring and evaluating the EU policy implementation as well as facilitating policy learning in the Member States.
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Foreword

This report offers an analysis of the R&I system in Greece for 2016, including relevant policies and funding, with a particular focus on topics of critical importance for EU policies. The report identifies the main challenges of the Greek research and innovation system and assesses the policy responses implemented. It was prepared according to a set of guidelines for collecting and analysing a range of materials, including policy documents, statistics, evaluation reports and online publications. The quantitative data are, whenever possible, comparable across all EU Member State reports. Unless specifically referenced all data used in this report are based on Eurostat statistics available in January 2017. The analysis does not take into account the full set of CIS 2014 data that was released mid-January 2017. However, the factsheet includes one indicator from the last wave of the Community Innovation Survey. The report contents are partly based on the RIO Country Report 2015 (L. Tsipouri, S. Athanassopoulou and R. Gampfer 2016).
Acknowledgements

This report has benefited from the comments and suggestions of Asterios Chatziparadeisis from the Greek General Secretariat for Research and Technology, SLAVCHEVA Milena of Unit B.7-JRC EC and KYRIAKOU Dimitrios of Unit B.3 JRC EC

Comments from DG REGIO, DG EAC and DG RTD are also gratefully acknowledged.

Authors

Effie Amanatidou, Manchester Institute of Innovation Research / University of Manchester

Tonia Damvakeraki, HAREVA Business Ideas E.E.

Athina Karvounarakí, European Commission, Directorate-General Joint Research Centre, Directorate B – Growth and Innovation, Knowledge for Finance, Innovation and Growth Unit (Brussels, Belgium)
HIGHLIGHTS

• The Greek real GDP contracted in 2015 by 0.2%. In 2016 it is expected to mildly contract again before an economic recovery in 2017.

• In August 2015 a new three-year stability support programme was approved by the European Stability Mechanism (ESM). Since then, significant progress has been made in legislating structural labour, market and fiscal reforms.

• The Europe 2020 R&D target for Greece of 0.67% of GDP set in 2013 has already been achieved (0.96% of GDP in 2015). It is estimated that Greek GERD will reach 1.2% of GDP by 2020.

• The national public budget, supported by the European Structural and Investment Funds (ESIF), has been and continues to be the main funding source for R&D activities. Despite the increase of 11.3% in the business expenditure for R&D in 2015, Greece had the fifth-lowest BERD intensity among the EU-28 (0.32% GDP).

• Budgetary cuts in the scientific research funding, significant decrease in the salaries and the high rate of unemployment have led graduates and researchers to search and find job opportunities abroad.

• Additional funds for R&D have been secured within the framework of the implementation of the agreement, signed in July 2016 between the Greek Government and the European Investment Bank (EIB). This agreement has been transposed into National Law (4429/2016) providing for 240m euros for the funding of the Hellenic Foundation for Research & Innovation (HFRI) (for a 3 year period). The first instalment of 18 m euros is earmarked for the support of doctoral and post-doctoral research grants in Universities and Research Centres. The relevant open calls for proposals have already been launched by the General Secretariat for Research & Technology.

MAIN R&I POLICY CHALLENGES

• Increase public support and prioritisation in funding allocation. Greece lacks a well thought-out R&I strategy focusing on a limited number of areas of national strength. In the past, the R&I system often followed the general priorities of the EU Framework Programmes, which were not always related to the needs of the country. Despite the adoption of the smart specialisation approach, the number of national research priorities appears to be quite broad.

• Reduce hindrances for private R&D and foster collaboration between business and academia. The continuous increase in taxes, the reduced business revenues due to the crisis, the insufficient support provided by the banking sector (i.e. limited business loans) and the administrative bureaucracy in the management of publicly funded programmes, make it difficult for the business sector to engage in RDI activities.

• Develop an evaluation culture. Evaluations of funding programmes are not done systematically. At the same time, evaluations of policies hardly exist which means that the knowledge base for policy learning and improvement is still quite limited.

MAIN R&I POLICY DEVELOPMENTS IN 2016

• The Greek Strategy for the European Research Area (ERA), National Roadmap 2015-2020, (April 2016);

• The National Reform Programme 2016 (April 2016).

• Revision of the implementation law (Law 4386/2016) of the National Strategy for Research, Technological Development and Innovation (ESETAK), (May 2016);

1. Main R&I policy developments in 2016

**Greek Strategy for the European Research Area (ERA), National Roadmap 2015-2020,** (April 2016);

The Greek national roadmap describes the guiding principles for each ERA priority at both national and European level, and presents the current situation in Greece in relation to the pursued objectives and policy directions. Moreover, it sets targets for 2020, or 2025 where needed, depending on the maturity of the proposed actions and of the means to implement them, and it details the actions foreseen and/or any additional measures needed for meeting these targets.

**National Reform Programme 2016**, (April 2016).

It presents the country’s policies and measures to sustain growth and jobs and to reach the Europe 2020 targets. In order to avoid duplication the Commission does not issue additional recommendations to Greece in the framework of the European Semester.

**Revision of the implementation law (Law 4386/2016) of the National Strategy for Research, Technological Development and Innovation (ESETAK),** (May 2016);

The revision practically redefines evaluation regimes, foresees improvements in the working conditions for publicly employed researchers, and facilitates timely absorption of SF funding.

**Establishment of a Foundation for Research and Innovation (ELIDEK),** October 2016 by Law 4429/2016.

The institution is sponsored by the European Investment Bank (EIB) funding combined with Greek national funds. The aim is to retain sufficient numbers of highly-qualified scientists in Greece, as these funds will be invested on curiosity – driven research and human capital development as well as entrepreneurship and innovation. The Greek Research and Innovation Foundation will allocate €240m by 2019.

1.1 Focus on National and Regional Smart Specialization Strategies

Description and Timing: The Smart Specialisation strategy RIS3 was developed both at national and at regional level (13 regional plus 1 national smart specialisation strategies). At the national level, RIS3 places emphasis on eight sectors. It was prepared by the General Secretariat for Research and Technology, and adopted in July 2015 by the Council for Smart Specialization Strategy. Funds for Thematic Objective 1 (Research & Innovation) are estimated to reach €1.25b and when coupled with the national contribution will reach €1.5b, implying an increase by 50% compared to the amount initially earmarked for R&D (€1b) in the framework of the current NSRF. Monitoring of RIS3 at national and regional level will be effected by GSRT through output and result indicators, field studies, and public consultation with the business and research community, and through evaluation studies of actions by independent experts.

New developments: Referring to the progress in implementation of RIS3 at regional level, it is to be noted that the Region of Western Greece has launched the first call for proposals under the RIS3 priority areas, microelectronics and advanced materials. Submission of proposals was possible between 29/9/2016 and 7/11/2016. The Region of

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1 The Council is composed of the General Secretaries of all ministries with authority on development measures
Eastern Macedonia and Thrace is also about to launch a RIS3 call for proposals in the areas of plastics and polymers, following a consultation phase with stakeholders in correcting the first drafts of the call. Next in row is the Region of Northern Aegean that is currently preparing the first RIS3 call.

At national level, under the Smart Specialisation Strategy, the call “Research-Create-Innovate” that will allocate around €280m, is expected to be launched by the GSRT in February 2017. A draft of the call was published early in August 2016 in order to allow beneficiaries to prepare themselves and work on their proposals.

Also, the GSRT has launched 3 calls for bilateral cooperation projects between Greece and Germany (budget 9 m euros), Greece and Russia (2 m euros) and Greece and Israel (9 m euros).

Furthermore, 2 more calls for R&D have been launched since July 2016; the first (30 m euros) aiming to support the strategic priorities of the Research Centres and their alignment to the priorities of the National Smart Specialization Strategy. The second call (73 m euros) is devoted to the funding of the preparatory phase of selected of Research Infrastructures.

2. Economic Context

Contrary to the initial predictions real GDP growth in 2015 turned out to be only slightly negative, at -0.2%. In 2015 GDP per capita was at €16,200, which corresponds to 56.5% of the EU28 average. In 2016 Greece’s real GDP is forecast to continue contracting by 0.3%. (EC, Spring 2016) Budget deficit increased to 7.5% of the GDP in 2015 from 3.6% in 2014 and the General Government primary balance dropped to -3.4 from 0.4% of GDP the same period (ELSTAT, April 2016). Debt Sustainability analysis showed that Greece’s debt-to-GDP in 2016 will increase before gradually decreasing from 2017 onwards (EC, June 2016). Although the unemployment rate dropped in 2015 to 24.9% from 26.5% in 2014 it is still the highest in EU28. In August 2015 a third assistance programme was launched under the European Stability Mechanism (ESM) framework. Since 2015 Greece has been highly affected by the migration and refugee’s crisis. The dramatic increase in the inflows bears an additional financial cost in terms of refugee reception and settlement and puts at risk the tourism industry in some areas. In all cases the refugee-related cost in 2016 is expected to be higher than the one of the precedent years. (NRP, 2016)

Greece ranks on the 86th place (out of 138) of the Global Competitiveness Index rankings for 2016-2017 (last among the EU28). The Labor Productivity Index (per hour worked) for 2015 is lower compared to 2014 (94.9 vs 96.1). According to the IMF (IMF, 2016) the growth of the Greek economy depends critically on the contribution of Total Factor Productivity driven by structural reforms. A realistic assumption is that Greece’s reform effort would be commensurate with bringing TFP growth to around 1 percent, slightly below the historical euro-area average (1.2). This, together with the contributions of labor and capital would imply a long-run growth rate of 1.25 percent.

2.1 Structure of the economy

In 2015, the Greek service sector contributed over 80% to the national GDP and employed 74.1% of the workforce. The contribution from knowledge intensive services only is about 38%. The manufacturing sector contributed almost 9.5% of the national GDP (of which 1.9% come from High and Medium-High Tech sectors) and employed 8.4% workforce. The agriculture sector (including, forestry and fishing) contributes 4.1% to the GDP and absorbs 11.7% of the country’s work force. Greece’s economy is based on SMEs and in particular micro or small enterprises, which represent more than 95% of the businesses in Greece. Overall, between 2008 and 2014, SME employment has fallen by approximately 19% and SME value added has dropped by 33%. The number of SMEs
has declined by approximately one fifth. Large firms have performed equally bad with their value added falling by 32% in the same period. (SBA, 2015)
There are no specific policies for attracting R&D intensive FDI. The overall level of FDI in the country is low which reflects the actual (and low) absorption capacity of Greece (SBA, 2015). Data from the Bank of Greece show that although the country’s performance in attracting foreign investment until 2014 was rather satisfactory\(^2\), in 2015 the total (gross) investment capital inflows were much fewer, and net inflows presented a negative value, as a result of capital controls and of the general economic and political instability during this year\(^3\).

### 2.2 Business environment

Greece ranks 61\(^{st}\) among 190 countries in the World Bank's index "Doing Business 2017" that is, in a slightly lower position compared to the previous year (58\(^{th}\)). Similarly, Greece went down four places in the World Bank indicator "Ease of getting credit" (World Bank, GII 2016) and it ranks 69\(^{th}\) worldwide and 20th among the EU28.

Despite a variety of funds that have been created especially since 2011 providing loans to firms for business development, as well as guarantee schemes, access to VC funds, and risk capital (e.g. ETEAN S.A, TEPIX, Guarantee Fund, IFG), allocation of funds has not taken up because of the reluctance of banks to issue loans. Additionally, there are regulatory restrictions in getting support in case SMEs are in debt to the state or to banks (SEB, 2014).

The main obstacles for the Greek enterprises today are: shortage of funding, bureaucracy and stifling regulatory and fiscal frameworks. According to the OECD Product Market Regulation index, the Greek markets are among the most heavily regulated within OECD members. OECD has been closely working with Greece since 2012 to assess competition laws and regulations hindering competition. The latest project's results on five sectors of the Greek economy (e-commerce, construction, media, wholesale trade and selected sub-sectors of manufacturing i.e. chemicals, pharmaceuticals) were published on 7 November 2016.

The capital controls imposed in July 2015 have affected Greek importers of goods and services as well as companies listed in the Greek stock exchange and investment firms that rely on the local investments. As the Guardian reports on 1 August 2016 "from 2008, the year before the country’s debt crisis erupted, until the end of 2015, an estimated 244,700 small-and medium-sized businesses have closed with many more expected to declare bankruptcy this year". A similar figure (250,000) has been given by Mr Korkidis, General Secretary of the Hellenic Confederation of Commerce and Entrepreneurship.\(^4\) Based on the most recent data available from October 2013 to February 2015, the number of new businesses halved in comparison to the period April 2011-September 2013 (51,138 new entries vs. 108,822). (SBA, 2015) The Greek General Electronic Commercial Registry (GEMI) shows a reduction of 3,824 enterprises in the first quarter of 2016.

### 2.3 Supply of human resources

Tertiary education attainment level in the age group 25-64 years old has been steadily increasing in Greece from 22.8% in 2008 to 29.1% in 2015, approaching the EU28 average of 30.1%(Eurostat, 2016). Until 2014 Greece had not achieved the headline

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\(^2\) OECD data for 2014 place Greece 15\(^{th}\) among 21 EU MS for which FDI inward flows are available.


target of at least 40% share of 30 to 34 years-old with tertiary education attainment (37.2% in 2014) (NRP, 2016). However, according to the new data from Eurostat, the target has been achieved in 2015 as this share increased to 40.4%\(^5\) i.e. above the EU28 average of 38.7%.

Greece continues suffering from a 'brain drain'. According to Labrianidis the total number of graduates living abroad in 2011 was estimated between 114,000 and 139,000 (Labrianidis, 2011). A recent report from the Bank of Greece (ΤηΕ, Ιούλιος 2016) indicates that in the period 2008-2013 almost 223000 people aged 25-39 left the country. Surveys and studies (Labrianidis & Pratsinakis, 2016) on the characteristics of the new emigrants show that the majority are university graduates, although a considerable share of people with lower educational background have left Greece too. Based on the results from the International Survey on Careers of Doctorate Holders – (CDH)(ΕΚΤ, 2015) Greece, with 7.3 doctorates per thousand economically active population, was placed 9\(^{th}\) out of 22 countries participating in the survey.

3. **Main R&I actors**

The government is the largest R&D funder (in 2015 52.7% of the GERD was funded by GOV) and the third largest R&D performer (after Higher Education Institutes and Business). The share of public budget devoted to R&I is low (below the EU average of 1.36% in 2015), even more after the crisis, and it depends on Structural Funds and EU competitive funding.

The National Council for Research and Innovation (NCRI) is the supreme State advisory body for national policy for research, technology and innovation. The responsibility of funding research is shared between the Ministry of Education, Research and Religious Affairs and the Ministry of Economy, Development and Tourism. Funds coming from the Regional Operational Programmes are typically under the responsibility of the Regional Authorities. The Ministry of Rural Development and Food supervises the National Agricultural Research Foundation (NAGREF), which undertakes research and technology in Greece in agricultural, forest, animal and fish production and other related areas.

The Higher Education sector is the largest R&D performer accounting for 38.2 % of the total R&D expenditure in 2015. At the end of 2015, the Higher Education sector was composed of 22 public universities and 14 public Technological Education Institutes (TEI). In addition to public there are 28 private universities of various types accredited by the Ministry of Education, Research and Religion operating in the country (Tsipouri, et al., 2016). There are 15 public research organisations, of varying sizes, supervised by the GSRT.

The Business Sector is the second largest R&D funder and performer in Greece (31.8% and 33.3% of the total GERD respectively). Based on EU2016 Industrial R&D Investment Scoreboard, five Greek companies (one more than the previous year) featured among the top 1,000 EU companies on R&D spending: PHARMATHEN (Pharmaceuticals & Biotechnology), INTRALOT (Technology Hardware & Equipment), the National Bank of Greece (Banks), GALAXIDI Marine Farmand Creta Farms (Food Producer). A large number of SMEs and start-ups are also declaring R&I activities mainly in service and incremental innovations. Very few multinationals are research actors in the country. There are numerous Private Non Profit (PNP) organisations in Greece but only a few of them are actively engaged in research or innovation activities. Their contribution to the Total R&D expenditure accounts only for 0.8% in 2015.

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\(^5\) Break in the series in 2014
4. R&I trends

In 2015 the total R&D expenditure (GERD) increased by 13%, (figure 1). In particular, the public (GOV+HES) expenditure showed 15% growth compared to 2014 and BERD 11%. At the same time the Greek GDP continued contracting, leading to the further improvement of the R&D intensity (0.96% GDP). Greece's original EU2020 R&D target was 2%, but it was revised downwards to 0.67% in 2013 in the face of austerity and continuing recession. Based on the latest figures, it is estimated that GERD will reach 1.2% by 2020(NRP, 2016) which is aligned with the new EU2020 R&D target of 1.21% set in 2014. The improvement of the GERD can be partially explained by the fact that 2015 is the last year (N+2) for using funds from the previous programming period 2007-2013.

According to the European Innovation Scoreboard 2016, Greece is a Moderate Innovator. Over time, its innovation performance improved until 2014, followed by a strong decline in 2015. Greece performs below the EU average on all dimensions. Still, Greece's performance is above the EU average for some individual indicators such as: international scientific co-publications (120% of the EU average), non R&D innovation expenditure in the private sector (127%), SMEs marketing/organisational innovations (124%) and innovative SMEs collaborating with others (120%).

4.1 Public allocation of R&D and R&D expenditure

The national public budget, supported by ESIF, has been and continues to be the main funding source for research and innovation activities in Greece. In 2014 over 53% of the Total R&D expenditure (GERD) was funded by the government, which is well above the EU average (32.3%). In 2015, there was no significant change. As in many other Member States, the public sector (GOV+HES) takes the lion's share of the funding from the government.

The budget for R&D (GBAORD) increased by about 10% (in nominal terms) in the period 2011-2013, but it declined again in 2014 and 2015. According to Eurostat’s provisional data, institutional funding accounted for 53.73% of total GBAORD funding in 2015 (against 55.49% in 2014). The largest part of institutional funding is channelled to universities and research centres in the form of block funds covering mainly salaries. The decrease of institutional funding (4.4% in 2015 compared to 2014) is attributed to the austerity policy of the last years. On the contrary project based funding has been steadily increasing and accounted for 46.27% of total funding from GBAORD in 2015 (against 44.51% in 2014). Project funding is co-funded by ESIF, hence is not considerably affected by the crisis.

It is expected that the implementation of the National Smart Specialization Strategy (RIS3), which was adopted in July 2015, the increased funding provided in the PA for Research, Technological Development and Innovation, which is estimated to reach €1.25b and the stabilization of salaries and annual budgets for PRCs and HEIs will
significantly contribute to the attainment of the R&D intensity target of 1.2% of GDP in 2020 (NRP, 2016)

4.2 Private R&D expenditure

In 2015 the business expenditure for R&D increased more than 11.3%. Nevertheless, Greece had the fifth-lowest BERD intensity (0.32% GDP) among the EU-28. BERD intensity has followed an upward trend since 2011 largely due to the contraction of GDP, which in 2014 had lost around 25% compared to the pre-crisis (2008) level. The private sector has been the largest contributor to Greek BERD whereas funding from abroad is rather marginal (covering 8.9% of the total BERD in 2015). Direct support from the government decreased in 2015 and it covers only 8.8% of the total BERD in that year.

Data on sector-level R&D expenditure in Greece is available only for 2011 and 2013. Comparison between these two years shows an increase in the R&D of the service sector which was largely counterbalanced by the decrease in the R&D investments in the manufacturing sector (by 7.7%). In 2013, the pharma sector was by far the largest R&D investor in the manufacturing sector. "Wholesale and retail trade; repair of motor vehicles and motorcycles", is the sector with the highest increase in R&D investments (117.8% compared to 2011) whereas "professional, scientific and technical activities" sector lost 30% of its R&D investments. "Financial and insurance activities" were the leading R&D spending sector within services. The inclusion of the National Bank of Greece in the top 1000 European R&D investors in 2015 suggests that the increase continued beyond 2013 (last available data).

According to the National Reform Programme 2016, Greek enterprises having understood that R&D investments is the only solution for the transition to growth, will increase their R&D expenditures (BERD) to an expected 0.38% of GDP in 2020. Moreover, the National Regional Innovation Strategy 3 (RIS3) (GSRT, 2015) includes initiatives to stimulate research and innovation in the private sector that will gradually materialise into programmes. So far, 2015 data for Business R&D confirm this tendency.

4.3 Public sector innovation and civil society engagement

The latest available indicators and rankings suggest that Greece has slightly improved in some areas of public sector innovation. Since 2014 there was an increase by 1% in the number of individuals who have had interactions with public authorities via internet. A positive development has been the launch of the eGovernance Strategy and associated Action Plan for 2014-2020, adopted in January 2015, targeted at encouraging public participation and open public data, and improving integrity and accountability of the public sector. Moreover, a number of eGovernment portals have been put in place. With regards to public procurement of advanced technology products, Greece holds the 121st place (out of 138) in the World Economic Forum ranking (2016-2017) climbing up from the 133rd place in 2015-2016 (WEF, 2015); still, this improvement does not catch up with 2012, when Greece held the 113th place. Enterprises with procurement contracts for domestic and/or foreign public sector in 2012 represented 26.6% of all enterprises. As stated in the National Reform Programme 2016, the Greek authorities introduced a new legal framework on public procurement (in force from January 2016) with a view to simplifying, codifying and consolidating the Greek public procurement legislation, as well as transposing the new EU directives.

Social entrepreneurship has risen in importance in recent years and continued to gain attention after the new government took power in 2015. A new draft law, revising the existing Law 4019/2011 on Social Economy and Social Entrepreneurship, where the creation of a National Committee for Social and Solidarity Economy is also foreseen, was approved by Parliament on 19 October 2016.
The economic crises highlighted the need for collaboration and mobilisation of the social capital. Social innovation activities in Greece include private initiatives of individual entrepreneurs, or state-supported initiatives or even grass-roots, community initiatives targeted at tackling social consequences of austerity such as increasing unemployment, poverty, disappearance of certain social services, etc. Crowd funding is an emerging trend especially in relation to supporting social entrepreneurship. Although the regulatory framework for crowd-funding is still absent, a national crowd-funding platform (act4Greece) has already been set up by the National Bank of Greece.

5. Innovation challenges

5.1 Challenge 1: Increase public support and prioritisation in funding allocation focusing on results and overall impact

Description

Greece lacks a well thought-out R&I strategy focusing on a limited number of areas of national strength. Currently, funding depends on ESIF and absorption rather than impact is the dominant funding decision criterion. Exacerbated by the crisis, R&I funding is more oriented towards solving liquidity problems than towards addressing R&I performance and long-term challenges. The high dependence on ESIF has resulted in fragmented planning and budgets being allocated to various sectoral and regional Operational Programmes. The lack of prioritisation has been an obstacle to achieving economies of scale or critical mass in research areas where the country is strong (e.g. microelectronics). In the past, the R&I system often followed the general priorities of the EU Framework Programmes, which were not always related to the needs of the country (Grant, et al., 2011). The current debt crisis and the severe budget cuts increase the importance of consolidated and targeted funding towards few and well-defined priority areas. Over the period 2011-2014 the government imposed 40-50% cuts in scientific research funding, making conditions for researchers extremely difficult. Seeing their salaries decreasing significantly and their career prospects deteriorating, has led to a wave of migration towards other EU countries or elsewhere. The total number of graduates living abroad is estimated at 114,000 to 139,000 (Labrianidis, 2011). Recent studies suggest that emigration figures are expected to remain high in 2014 and 2015, especially if the approximately 35,000 young Greeks studying abroad decide to stay abroad to seek employment.

Policy response

The National Smart Specialization Strategy for Research & Innovation (RIS3) for 2014-2020 was adopted in July 2015. It is expected that the implementation of the strategy will mitigate the adverse effects of the economic crisis on R&D by supporting the strongest sectors in Greece through research and innovation, thus boosting their competitiveness and putting the Greek economy on the development track. (NRP, 2016) In the current PA for Research, Technological Development and Innovation, funds for the Thematic Objective 1 (Research and Innovation) are estimated to reach €1.25b. Quick absorption of these funds will boost R&I activities. Further boost of both curiosity driven research and innovation activities is expected through funds of the recently established National Foundation of Research & Innovation (NFRI)

Brain drain has been recognized as a key challenge in the Operational Program for Competitiveness, Entrepreneurship and Innovation as well as the Greek Strategy for the European Research Area – Roadmap 2015-2020 (GSRT, 2016). The recently established (L.4429/2016) National Foundation for Research and Innovation (NFRI-ELIDEK) in the footsteps of the National Science Foundation (NSF) of the US, or Germany’s Deutsche Forschungsgemeinschaft” aims to address this challenge. The Foundation, co-sponsored by the European Investment Bank (EIB) and national funds, aims to funding combined with Greek national funds. The aim is to attract and to keep highly-qualified scientists in Greece, through funds devoted both to curiosity driven research and entrepreneurship and innovation.

More effective national research systems and an open labour market for researchers are two of the main priorities of the National ERA strategy/roadmap (2015-2020).

Policy Assessment

Despite the implementation of the entrepreneurial discovery approach in the design of RIS3, which has a high potential to drive structural transformation and help exiting the economic crisis, the number of national specialization priorities appears to be quite broad, while at regional level these strategies are more specific and targeted. The problem remains that due to the limited national R&D budgets, there is no actual prioritization underlined by strong support to a small and targeted number of sectors, although dynamic sectors do exist (e.g. logistics, nano/microelectronics, biomedicine, energy, environment). A positive change, in the way R&D policies are designed was the wide implementation of stakeholders’ consultation for the identification and selection of the national and regional priority areas (around 100 people per thematic priority from policy, industry, research, and society)

Greece is usually slow in the absorption of ESIF. The absorption rate over the 2007-2013 period was 51%, although still above the EU average of 42% (Katsarova, 2013). The ongoing third ERA progress report is expected to be published end 2016/beginning 2017. With regards to the policies to be adopted for reversing the current wave of Greek brain drain, this remains to be assessed in the future.

5.2 Challenge 2: Reduce hindrances for private R&D and foster collaboration between business and academia

Description

Business demand for R&D, as well as private spending on research and innovation, is low compared to other EU Member States of similar size and development (Tsipouri, et al., 2016). BERD intensity in 2015 was only 0.32% i.e. the fifth lowest in EU28. According to the European Innovation Scoreboard 2016, Greece performs below the EU average on all dimensions and its innovation performance declined significantly in 2015.

According to the 2015 Global Survey of R&D Tax incentives, Greece offers R&D super deductions of 130% for eligible expenses incurred in scientific and technological research activities, as well as various indirect incentives to promote investments in innovative projects including a patent box. (Deloitte, 2015) However, “the Greek scheme results in a very large degree of heterogeneity of the tax support that translates into higher administrative and compliance costs for firms and overall makes the R&D tax incentives non-transparent”.

The continuous increase in taxes, the reduced business revenues due to the crisis, the insufficient support provided from the banking sector (i.e. limited business loans) and the administrative bureaucracy in the management of publicly funded programmes, make it difficult for the business sector to engage in RDI activities. At the same time, private equity is not an alternative source of funding, with venture capital investments
the lowest in EU28, close to 0% GDP in 2015 (Invest Europe, 2015). When it comes to publicly funded programmes, the complexity of the administrative rules, the delays in the implementation and the inefficient management, reduce the ability of SMEs to see any positive impacts from their participation. This also constrains the potential for science-business cooperation, as it reduces the range of attractive cooperation partners on both sides (EC, 2014a). Although in 2014 the translation of scientific research into marketable goods was flagged as a priority in the Fourth Review of the Second Economic Adjustment Programme for Greece, commercialization of research results continues to be yet another deficiency of the Greek R&I system.

**Policy response**

The government recognises low private R&I activity as a significant challenge and has included it among the objectives of the 2016 National Reform Programme with the aim to achieve BERD intensity of 0.38% of GDP in 2020 (0.32% in 2015). The Operational Program for Competitiveness, Entrepreneurship and Innovation includes new direct support programmes to promote business R&I investment. The development of RIS3 priority areas is also intended to support and grow the specific strengths of regional private R&I performers. Cross-cutting strategic priorities of the RIS3 process explicitly include support to increase private R&I investment, development of an innovation culture, and the fostering of knowledge transfer and open science. It is critical to mention the efforts made by the GSRT and the Prefectures to create awareness of the value of research and innovation for businesses by actively involving them in the entrepreneurial discovery process for the preparation of the Smart Specialisation Strategy.

Eligibility criteria for fiscal incentives are currently under review. A presidential decree was expected in 2015 revising the definition of qualifying research expenses to align with the OECD Frascati Manual, i.e., Greek law currently offers a broader definition of qualified expenses. The General Secretary in his recent interview mentioned the new legal framework governed by Law 4386/2016 for research that will shape the collaboration between universities and business stakeholders. The new Foundation for Research and Innovation (ELIDEK) that will be supported by EIB and national funds will also provide funding for both blue skies and applied research. The agreement between EIB and the Greek State for the creation of ELIDEK has already been signed. A private initiative that is also worth mentioning is the Sustainable Greece 2020 Initiative that was launched by QualityNet Foundation in partnership with Greek businesses. Sustainable Greece 2020 aims to raise awareness among the Greek business community and society at large on issues of sustainable development, responsible entrepreneurship and social responsibility. Sustainable Greece 2020 is developed in cooperation with 33 business associations, 120 companies, 17 local authorities and 43 civil society organizations and it is endorsed by a number of International Organizations.

**Policy Assessment**

The RIS3 Action Plans provide for private R&I support that is better targeted to regional industry’s needs and capacities, and thus hold potential for effectively boosting business R&I activities. However, the direct support programmes have not been launched yet. R&D tax incentives’ effects will only be possible to be assessed robustly once more companies register again profits of a sizable amount. Any measure to support private R&I investment will only have lasting effects if bank lending, equity supply, and company liquidity pick up again. It is expected that the structural reforms in competition regulation, labour market legislation, and taxation, which the Greek government must implement in order to

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receive financial support from the European Stability Mechanism will also improve the framework conditions for R&I investment (NRP, 2016). Given that significant implementation risks remain (EC, June 2016), it is too early for an assessment. Similarly, the assessment concerning the framework that will be applied for fostering collaboration between universities and the business sector can only be carried out after the programme has been implemented.

In addition, the OECD was asked to carry out an independent policy assessment to identify rules and regulations that may hinder the competitive and efficient functioning of markets in five sectors of the Greek economy: e-commerce, construction, media, wholesale trade and selected subsectors of manufacturing, such as chemicals and pharmaceuticals. These sectors account for about 11% of Gross Value Added and 16% of employment. Lifting barriers to competition in these sectors may significantly help the Greek economy. Overall, the review has led to the identification of 577 potential regulatory barriers found in 1 288 legal texts that were included in the assessment.

5.3 Challenge 3: Development of evaluation culture

Description
Evaluations of funding programmes are not done systematically. The latest impact assessment study concerning GSRT’s funding programmes for the period 2001-2013 was completed at the end of 2015. At the same time, evaluations of policies hardly exist, which means that the knowledge base for policy learning and improvement is still quite limited. Universities and public research organisations are evaluated, but evaluation results are not taken into account for budget allocation (EC, 2014) although the last evaluation led to merging or annulment of certain university departments. Data on statistical indicators related to R&I was not systematically reported for the period 2008 to 2010, leading to breaks in the time series, which makes monitoring and performance analysis very difficult.

Policy response
The revised implementing law for Research (L.4386/2016) adopted in September 2016, practically redefines evaluation regimes, foresees improvements in the working conditions for researchers, and facilitates timely absorption of ESIF funding. The GSRT is responsible for: collecting and classifying all research data needed for assessing the outcomes of the National strategy. According to the same law, GSRT will also be going under evaluation every three years by an independent committee. Law 4386/16 introduced new methods to evaluate RPOs. Evaluations will take place every 5 years by committees of 5-7 (Greek and foreign) external evaluators. Also foresees for the establishment of a certified registry of evaluators/reviewers, in accordance of international best practices for project and program evaluation. for undertaking project and programme evaluation.
GSRT with the support of the National Documentation Centre has started to regularly evaluate funding programmes. It has also embarked on a more systematic monitoring of the R&I system, with regular publication of related data and results. Problems with reporting statistical indicators have been resolved with a reorganisation of data collection mechanisms in 2013.
The latest large scale evaluation of GSRT Programmes was completed in 2015. This evaluation concerned 6 research programmes designed, funded and managed by the GSRT during the period 2001-2007. This evaluation provided significant insights on the impacts of the specific programmes as well as on the planning and design process for future actions.
Higher Educational Institutes are constantly evaluated by the Hellenic Quality Assurance and Accreditation Agency (HQA). In particular, the HQA has been given responsibility for
the formulation, organization, completion, specialization and standardization of principles, criteria and indicators, as well as for the methodology and accreditation procedures in the above framework. (Tsipouri, et al., 2016)

Policy Assessment
An assessment of the new R&I strategies' impact is not yet possible, as the corresponding law only became effective in May 2016. The changes in the R&I governance structure proposed in the National Strategy have been judged largely positively by the European Commission as well as by independent consultants (EC, 2014a). The effective implementation of institutional changes remains to be seen. Meanwhile, severe budget cuts and personnel reductions negatively affect staff motivation for organisational change within government agencies (Tsipouri, et al., 2016). Regarding evaluation and policy learning, the monitoring and data publication activities of the National Documentation Centre are a step in the right direction. However, the extent to which these results will influence policy making is not clear yet. Mandatory or recommended evaluations in the context of ESIF have largely guided evaluation activities until now and may, in the longer term, improve the evaluation culture in general. The Evaluation Plan submitted to DG REGIO, which is mandatory for the current Programming Period (2014-2020) lists a number of planned RTDI evaluations at national and regional level. They are not expected to start before 2017.

6. Focus on creating and stimulating markets
This section describes and assesses national level efforts to introduce demand-side innovation policies to stimulate the uptake of innovation or act on their diffusion, including public procurement and regulations supporting innovation. It also analyses policy measures aimed at internationalisation of companies with the aim of increasing the innovativeness of the economy.

There are no dedicated national measures for public procurement for innovation in Greece. The current economic situation of the country is affecting negatively all efforts to adopt pre-commercial procurement on innovation. According to OECD (2012) the Greek procurement market is quite small compared to OECD average. Moreover, since 2009, there is an ongoing programme of macro-structural and financial stabilisation, in the frame of which, Greece has pledged to overhaul its public procurement structures and systems and downsize its procurement spending. Despite these difficulties, according to the 2015 SBA fact sheet, Greece's overall performance in entrepreneurship is in line with the EU average. On the contrary, its performance on individual indicators like "average delay in payments from public authorities" and "percentage of businesses submitting e-procurements" deviates significantly from the EU average. OECD has also pointed out that efficiency of public procurements in Greece is one of the lowest among the OECD countries.

The latest SBA country profile for Greece (2015), indicates that the performance of Greece in terms of internationalisation still remains below EU average. Greece lags behind the rest of the EU member states both with regards to trade performance of SMEs and trading conditions (i.e. time required for the export and import processes, cost and bureaucratic effort needed to trade with non-Member States). Only 6% of Greek manufacturing SMEs are exporting to non-EU markets, ranking amongst the lowest performances in the EU.

A new legal framework on public procurement with a view to simplifying, codifying and consolidating the Greek public procurement legislation, as well as transposing the new EU directives on public procurement and concessions was introduced by the Greek authorities and entered into force on the 31st of January 2016. According to the National Reform Plan for Greece (2016), the Greek authorities and the Commission will appoint
independent experts to monitor progress and completion of the actions and ensure that all necessary actions will be taken and all information/data is provided to allow for the completion of the assessment.

A new law was passed by the Parliament to combat bureaucracy and promote e-governance by making it compulsory to publish public documents requested by individuals and businesses on the official public administration portal ERMIS. Accordingly, stakeholder consultation has become a regular practice, and it is compulsory to put policy proposals online on the Open Government portal for eight weeks to allow public comments. Each draft law or amendment of significant importance to the economy and society must also be accompanied by an analysis of its impact on the economy (including business competitiveness), society, management and the environment. In addition, each draft law should also be followed by a "justification report" that is also made available in the website of the Hellenic Parliament (SBA, 2015).

A national export strategy and a Roadmap were launched in 2012 (Greece, 2012) with the aim to facilitate international trade. The strategy had three major goals: (a) to reduce up to 50% by 2015 the number of days needed for processing an export, (b) to reduce the administrative costs up to 20% by 2015 and (c) to introduce an integrated information system (the 'Single Window') to make exporting and importing procedures easier. The national export strategy was complemented by the programme 'Internationalisation-Business Competitiveness' which was launched in 2010, and entered its second phase in 2013. The need for a new strategy has been indicated to the government by the Greek International Business Association. Meanwhile, The Greek "Action Plan for Exports promotion" is ready and the implementation of the third OECD toolkit is in progress. The latter aims at removing barriers of competition in five sectors two of which are e-commerce and wholesale trade. (NRP, 2016)

Finally, in 2014, a new institution, Enterprise Greece, was set up by merging the existing Greek Organisation for Foreign Trade and Invest in Greece SA. The role of Enterprise Greece is essential, since it bridges the need to attract international funds/investment and the requirement for more proactive entrepreneurship. (SBA Factsheet, Greece, 2015).

According to the first review of the Third Economic Adjustment Programme, "Greece has made further progress in Public Financial Management reforms including by upgrading the legislation on public procurement." However, most of the measures have been implemented so recently that it is difficult to assess their effectiveness. Despite the improvements in legislation, the delays in the payments by public authorities are still very long, putting at risk the viability of a number of SMEs. Progress in this area between 2012 and 2014 (from 114 to 105 days) is too small to make a substantial impact. The national export strategy and roadmap have not been assessed. However, the programme "Internationalisation-Business Competitiveness" was much welcomed by businesses. The initial budget was doubled when the programme entered its second phase in 2013.
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## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>HQA</td>
<td>Hellenic Quality Assurance and Accreditation Agency</td>
</tr>
<tr>
<td>BERD</td>
<td>Business Expenditures on Research and Development</td>
</tr>
<tr>
<td>CDH</td>
<td>International Survey on Careers of Doctorate</td>
</tr>
<tr>
<td>DESI</td>
<td>Digital Economy and Society Index</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>ERA</td>
<td>European Research Area</td>
</tr>
<tr>
<td>ERC</td>
<td>European Research Council</td>
</tr>
<tr>
<td>ESETAK</td>
<td>National Strategy for Research, Technological Development and Innovation</td>
</tr>
<tr>
<td>ESIF</td>
<td>European Structural and Investment Funds</td>
</tr>
<tr>
<td>ESM</td>
<td>European Stability Mechanism</td>
</tr>
<tr>
<td>ETEAN S.A</td>
<td>Hellenic Fund for Entrepreneurship and Development</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EU-28</td>
<td>European Union including 28 Member States</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>GBAORD</td>
<td>Government Budget Appropriations or Outlays on R&amp;D</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GERD</td>
<td>Gross Domestic Expenditures on R&amp;D</td>
</tr>
<tr>
<td>GII</td>
<td>Global Innovation Index</td>
</tr>
<tr>
<td>GOV</td>
<td>Government</td>
</tr>
<tr>
<td>GSRT</td>
<td>General Secretariat for Research and Technology</td>
</tr>
<tr>
<td>GVA</td>
<td>Gross Value Added</td>
</tr>
<tr>
<td>HEI</td>
<td>Higher Education Institute</td>
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<tr>
<td>IFG</td>
<td>Institute for Growth</td>
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<tr>
<td>KEP</td>
<td>Citizens Service Centres</td>
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<tr>
<td>NAGREF</td>
<td>National Agricultural Research Foundation</td>
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<td>NCRT</td>
<td>National Council for Research and Technology</td>
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<td>NDC</td>
<td>National Documentation Centre</td>
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<td>PCP</td>
<td>Pre-commercial Procurement</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<td>---------</td>
<td>-----------------------------------------------</td>
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<tr>
<td>PCT</td>
<td>Patent Co-operation Treaty</td>
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<tr>
<td>PNP</td>
<td>Private non-profit sector</td>
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<tr>
<td>PPI</td>
<td>Public Procurement for Innovation</td>
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<td>PRO</td>
<td>Public Research Organisation</td>
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<td>R&amp;D</td>
<td>Research and development</td>
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<td>R&amp;I</td>
<td>Research and innovation</td>
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<td>RIS</td>
<td>Regional Smart Specialisations</td>
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<tr>
<td>SBA</td>
<td>Small Business Act</td>
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<tr>
<td>SME</td>
<td>Small and Medium-sized Enterprise</td>
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<tr>
<td>TEI</td>
<td>Technological Education Institutes</td>
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<tr>
<td>TEPIX</td>
<td>Entrepreneurship Fund</td>
</tr>
<tr>
<td>TFP</td>
<td>Total Factor Productivity</td>
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<tr>
<td>WEF</td>
<td>World Economic Forum</td>
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Factsheet

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<td>GDP per capita (euro per capita)</td>
<td>21400</td>
<td>20300</td>
<td>18600</td>
<td>17300</td>
<td>16500</td>
<td>16300</td>
<td>16200</td>
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<td>Value added of services as share of the total value added (% of total)</td>
<td>79.74</td>
<td>81.08</td>
<td>81.07</td>
<td>80.13</td>
<td>79.85</td>
<td>80.35</td>
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<td>Value added of manufacturing as share of the total value added (%)</td>
<td>8.54</td>
<td>8.19</td>
<td>8.89</td>
<td>9.1</td>
<td>9.52</td>
<td>9.5</td>
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<td>Employment in manufacturing as share of total employment (%)</td>
<td>9.85</td>
<td>9.15</td>
<td>8.94</td>
<td>8.75</td>
<td>8.42</td>
<td>8.45</td>
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<td>Employment in services as share of total employment (%)</td>
<td>69.97</td>
<td>71.47</td>
<td>72.78</td>
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<td>72.95</td>
<td>73.3</td>
<td>74.1</td>
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<td>Share of Foreign controlled enterprises in the total num of enterprises (%)</td>
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<td>0.2</td>
<td>0.24</td>
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<td>Labour productivity per hour worked (Index, 2010=100)</td>
<td>100</td>
<td>100</td>
<td>96.7</td>
<td>94.9</td>
<td>94.1</td>
<td>96.1</td>
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<td>New doctorate graduates per 1000 population aged 25-34</td>
<td>0.46</td>
<td>0.47</td>
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<td>Summary Innovation Index (rank)</td>
<td>24</td>
<td>24</td>
<td>24</td>
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<td>24</td>
<td>23</td>
<td>24</td>
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<tr>
<td>Innovative enterprises as a share of total number of enterprises (CIS data) (%)</td>
<td></td>
<td>52.3</td>
<td>51</td>
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<td>Innovation output indicator (Rank, Intra-EU Comparison)</td>
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<td>Turnover from innovation as % of total turnover (Eurostat)</td>
<td>11.8</td>
<td></td>
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<td>Country position in Doing Business (Ease of doing business index WB)(1=most business-friendly regulations)</td>
<td>58</td>
<td>60</td>
<td>61</td>
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<td>Ease of getting credit (WB GII) (Rank)</td>
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<td>Venture capital investment as % of GDP (seed, start-up and later stage)</td>
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<td>0.002</td>
<td>0.004</td>
<td>0</td>
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<td>E-Government Development Index Rank</td>
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<td>Online availability of public services – Percentage of individuals having interactions with public authorities via Internet (last 12 months)</td>
<td>14</td>
<td>16</td>
<td>27</td>
<td>34</td>
<td>36</td>
<td>45</td>
<td>46</td>
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<tr>
<td>GERD (as % of GDP)</td>
<td>0.63</td>
<td>0.6</td>
<td>0.67</td>
<td>0.7</td>
<td>0.81</td>
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<td>GBAORD (as % of GDP)</td>
<td>0.36</td>
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<td>0.48</td>
<td>0.44</td>
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<td>R&amp;D funded by GOV (as % of GDP)</td>
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<td>0.42</td>
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<td>BERD (as % of GDP)</td>
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<td>0.23</td>
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<td>0.27</td>
<td>0.28</td>
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<td>Research excellence composite indicator (Rank)</td>
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<td>Number of scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country</td>
<td>8.46</td>
<td>8.62</td>
<td>8.98</td>
<td>9.08</td>
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<td>Public-private co-publications per million population</td>
<td>12.89</td>
<td>13.58</td>
<td>14.74</td>
<td>11.46</td>
<td>9.18</td>
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<td>World Share of PCT applications</td>
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<td>0.06</td>
<td>0.05</td>
<td>0.06</td>
<td>0.05</td>
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Figure 1: Evolution of the total GERD over time. ................................................................. 10
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doi:10.2760/102221