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Research and innovation as sources of renewed growth

{SWD(2014) 181 final}

1. RESEARCH AND INNOVATION: THE SOURCES OF FUTURE GROWTH

Europe is well placed to capture the next growth opportunities. With the largest internal market in the world it is home to many of the world's leading innovative companies, and has a leading position in many fields of knowledge and key technologies such as health, food, renewable energies, environmental technologies and transport.[1]

It has untold wealth stemming from its highly educated workforce and its leading talent in cultural and creative industries. However, efforts are still required to ensure the smooth functioning of its single market, to improve the framework conditions for businesses to innovate, and to speed up investments in breakthrough technologies in fast-growing areas.[2]

New growth opportunities come from providing new products and services derived from technological breakthroughs, new processes and business models, non-technological innovation and innovation in the services sector, combined with and driven by creativity, flair and talent, or, in other words, from innovation in its broadest sense. They should benefit from a strong economic policy focus and from policies tackling societal challenges such as the ageing population, energy security, climate change, including disaster risk management, and social inclusion, which need breakthrough innovations.

To reap the benefits from these advantages in terms of economic prosperity and quality of life, governments across Europe need to take an active stance in supporting growth enhancing policies, notably research and innovation.

The gradually improving economic situation allows Europe now to shift its focus towards enhancing growth while keeping up the pace of reform to secure a lasting recovery. As Europe exits the crisis, it is increasingly clear how supporting growth enhancing policies have ultimately paid off. Evidence shows that much of recent productivity gains come from innovation[3] and that, on average, those countries that invested more in research and innovation (R&I) before and during the crisis have been the most resilient during the economic downturn.[4]

Research and innovation as a growth enhancing investment

For this reason, the Europe 2020 strategy and recent Annual Growth Surveys,[5] emphasise the need to sustain and where possible promote growth enhancing expenditures within overall fiscal consolidation efforts. This is also reflected in the 2014 European Semester Country Specific Recommendations.

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1 Innovation Union Competitiveness Report 2013, SWD(2013) 505.

2 COM(2014)014.

3 GDP growth in OECD countries from 1985 to 2009 was to a large extent resulting from growth in capital and multi-factor productivity, the later driven by the output of research and innovation systems. See OECD (2011) 'Productivity and growth accounting'.

4 Conte (2014), 'Efficiency of R&D Spending at national and regional level', Joint Research Centre, European Commission, *forthcoming*. Ciriaci, D., Moncada Paternò Castello, P., and Voigt, P. (2013) "Innovation and job creation: a sustainable relation?", IPTS Working Papers on Corporate R&D and Innovation series No. 01/2013, European Commission.

5 COM(2013) 800 final.

Public investment generates the knowledge base and talent that innovative companies need and it also leverages business investment in research and innovation, crucial elements to fulfil the ambitions of the Europe 2020 strategy. Curbing public investment in R&I, even if due to difficult budgetary conditions, may also have a considerable impact on a country's long term growth potential by reducing the capacity to absorb research and innovation performed elsewhere and through the loss of attractive career opportunities for a country's most talented young people.

The Union budget for 2014-20 marks a decisive shift towards R&I and other growth enhancing items, with a 30 % real terms increase in the budget for Horizon 2020, the new EU programme for research and innovation. A further EUR 83 billion is expected to be invested in R&I as well as SMEs through the new European Structural and Investment Funds.

However, this additional investment from the Union budget must complement, and not substitute for, investments by Member states both from public and private sources. To make further progress towards the Europe 2020 R&D investment target of 3 % of GDP,[6] governments across Europe need to continue investing in research and innovation, ensuring its efficiency and leverage over private investment. Framework conditions to facilitate this should also be improved,[7] taking into consideration the current industrial policy orientations[8]. Such public expenditure is not a cost, but an investment in the future, a reality that is now recognised in the revised European System of National and Regional Accounts, Eurostat's method for calculating public spending.[9]

However, several Member States have cut direct R&D spending within their fiscal consolidation efforts, as shown in Figure 1, even if in some cases this is partly compensated through increased R&D tax incentives. These cuts are particularly noticeable since 2012. During the first period of the crisis, from 2008 to 2010, many Member States protected their R&D budgets and some even increased their expenditure on R&D.

Moreover, most Member States remain far from their national R&D targets under Europe 2020 as shown in Figure 2.[10] This mainly reflects a deficit in business R&D expenditure.[11]

This Communication will explore how the potential of research and innovation as drivers of renewed growth can be maximised through raising the quality of investments within Member States' growth friendly fiscal consolidation strategies.

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6 Research and Development (R&D) spending is used for statistical purposes in this Communication. It does not cover broader innovation, falling outside the definition of R&D.

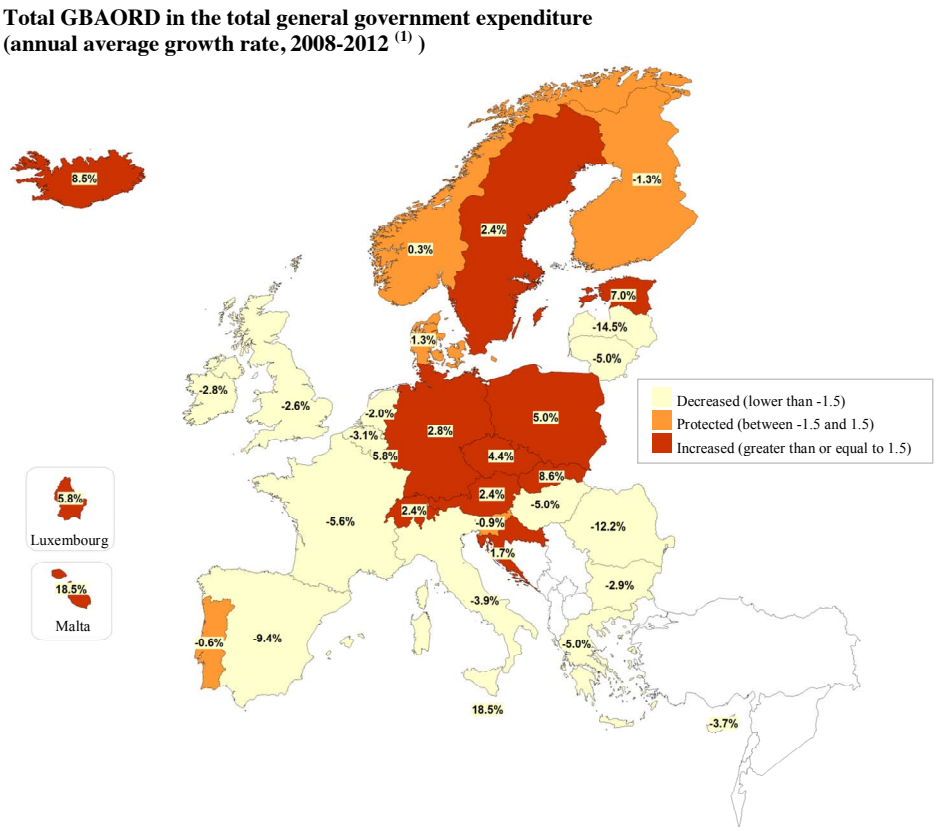
7 Such as access to finance, adequate strategies for human resources, the full implementation of the single market for services, and supporting the development of the enabling technologies of the future, including to foster a digital economy.

8 COM(2014)014

9 European System of National and Regional Accounts (SEC 2010) will be updated in September 2014.

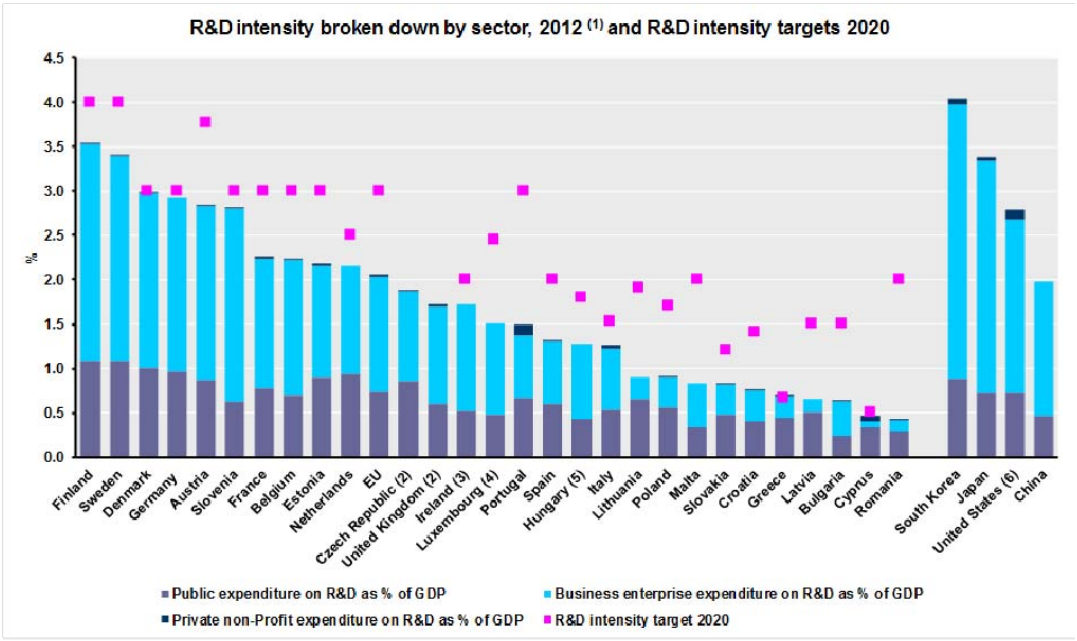
10 COM(201) 130final/2.

11 In this respect, an important evolution over the past years has been to complement direct public investment in R&I with indirect measures such as R&D tax incentives.



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat, DG ECFIN
Note: (1) HR: 2009-2012, CH: 2008-2010.

Figure 1. *Changes in R&D as a share of total government expenditure (2008-2012)*



Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat, OECD, Member States
Notes: (1) LU: 2010; JP, KR: 2011.
(2) CZ, UK: No R&D intensity targets have been set. For CZ a target of 1% is available only for the public sector.
(3) IE: The R&D intensity target is 2.5% of GNP which is estimated to be equivalent to 2.0% of GDP.
(4) LU: The R&D intensity target is between 2.30% and 2.60% of GDP (2.45% was assumed).
(5) HU: The R&D intensity sectoral breakdown does not add up to total R&D intensity.
(6) US: (I) Most or all capital expenditure is not included; (II) Government expenditure on R&D refers to federal or central government only.

Figure 2. *Public and private R&D intensity in 2012 in the Member States, EU, and third countries*

2. INCREASING IMPACT AND VALUE FOR MONEY

2.1 Raising the quality of public spending on research and innovation

Under continuing difficult budgetary conditions, it is critical to maximize impact from public spending by improving its quality. Public investments therefore need to go hand in hand with far reaching reforms of research and innovation systems, including by enhancing the leverage effect of public spending on private investment. Governments need to become smarter about how and where they invest,[12] and in doing so should be inspired by the bold strategic approach developed in the Innovation Union flagship initiative and the European Research Area agenda.[13]

Assessing the quality, efficiency and impact of public spending on R&I is challenging and available indicators face limitations. Focussing exclusively on the ability of the private and public sectors to translate investment in R&D into patent applications,[14] the available metrics show that some countries are capable of extracting more impact from their public and private R&D expenditures than others, as illustrated in Figure 3. The countries with higher efficiency of spending tend to be those with higher levels of public spending in R&D and GDP per capita, and a stronger knowledge base. In addition, business investments in R&D tend to be higher in those countries with higher public R&D spending, given that efficient public R&I systems are capable of better leveraging private investment in R&D[15].

Improvements in the quality and efficiency of spending can contribute to the creation of a virtuous cycle by leveraging higher investment levels from the private sector and generating increasing economic returns.[16] Reforms to improve quality and efficiency of public spending are important for all Member States. Overall, for those that are more fiscally constrained and less efficient in spending, it is vital to get more impact with far reaching reforms and to be in the condition to increase investment wisely as their economies recover. On the other hand, for those with adequate fiscal space and high efficiency, benefits will arise from getting smarter about their investments in order to generate more value for money.

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12 European Commission, 2012, "The quality of public expenditures in the EU", Occasional Paper (DG ECFIN) n. 125

13 COM(2010) 546; COM(2012) 392

14 Conte (2014), 'Efficiency of R&D Spending at national and regional level', Technical Report, Joint Research Centre, European Commission, presents a comprehensive analysis of the options and methodological approaches to compute scores to measure the efficiency of R&D systems. The efficiency scores in Figure 3 are calculated using a statistical technique (Stochastic Frontier Analysis), which computes an efficiency frontier using total R&D intensity as input measure and patents per capita as output measure, over the period 2005-2011. It should be noted that the variability of relative measures of R&D and patenting performance is larger across sectors than across countries (Meliciani, 2000), and that the ratio of patents to R&D spending also differs largely across manufacturing sectors (Danguy *et al*,, 2013). Efficiency scores using patents are thus influenced to a large extent by the R&D specialisation profiles of each country. Other output indicators can also be used to approximate efficiency, including notably scientific publications and citations. Composite indicators can also be used for that purpose.

15 Evidence shows that the level of cooperation between the public sector and businesses is positively influenced by the intensity of public R&D spending. Using 2011 data, the correlation between the level of private funding of public R&D and public R&D intensity is statistically significant.

16 There are also persistent differences in: overall innovation performance across Member States, as shown by the Innovation Union scoreboard; in innovation outputs as confirmed by the Commission's innovation output indicator; and in overall quality of government, as shown by the Commission's 6th Cohesion Report.

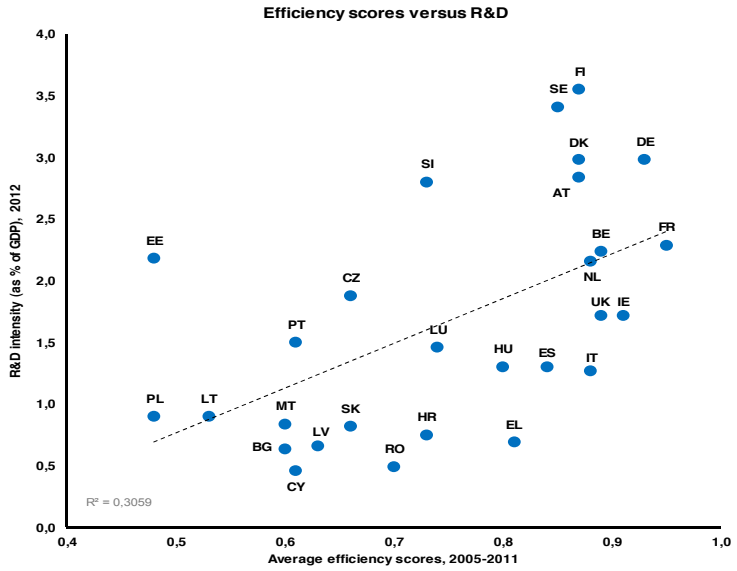

***Figure 3**. R&D intensity and efficiency scores*[17]

Increasing the efficiency of spending on R&I will also contribute to improving the general quality of public finance. It will allow for a better use of scarce resources and hence will also deliver longer term improvements, by supporting the valorisation of R&I outcomes. Cross-cutting practices adopted to improve efficiency of policies include regular public spending reviews or a result-oriented performance-based budgeting. Case studies (France, Austria, Sweden and the Netherlands) highlight that Member States using these approaches have succeeded in generating significant and quantified results in terms of budget transparency, efficiency and savings without lowering (and even improving) the quality level of public service.

2.2 Priority axes for reform

R&I reforms need to be tailored to the characteristics of each Member State. Therefore, it is a major challenge for all Member States to identify, design and implement those reforms needed to improve the quality of their R&I investments. To date progress has been made as regards reforms stemming from Innovation Union and the European Research Area.

The 2014 State of the Innovation Union report accompanying this Communication shows growing momentum around innovation[18], within the context of the review of the Europe 2020 strategy[19]. Major results include more innovation friendly business environment through the Unitary Patent and the Venture Capital passport. Union support for R&I has been fundamentally reformed in a single, integrated and simplified programme, Horizon 2020, with clear, measurable objectives focusing on scientific excellence, industrial leadership and societal challenges.

Many Member States are also undertaking reforms of their public support to R&I. Experience shows that implementing reforms in a way that increases the quality of spending and ensures

17 Efficiency levels across Member States are illustrated in this Figure on the basis on the relationship between patents *per capita* and total R&D intensity. See Conte (2014).

18 Staff Working Document 'State of the Innovation Union, Taking Stock 2010 – 2014'.

19 COM(2014 130).

economic and societal impacts is a continuous process and a long term challenge to all countries. Improving value for money requires maximising the impact of R&I policies, including by establishing closer links between quality and the resources allocated to these areas. Consistent incentives to drive up the quality of public spending and preserve growth-enhancing expenditures, notably R&I, are thus essential.

Drawing on this experience, three axes of reform emerge, which are relevant to all Member States.

I Improving the quality of strategy development and the policy making process

R&I affect many policy areas and involve a large number of actors and should therefore be driven by an overarching strategy and be steered at a sufficiently high political level. Such a strategy should encompass both research and innovation activities, including infrastructure investments. Policy design should take account of the long term impact of R&I and operate on the basis of a stable multi-annual strategic framework and forward planning of public investment. Embedding growth-enhancing spending such as R&I within the multiannual planning perspective of a medium-term budgetary framework[20] can combine the benefits of sounder public finances with increased visibility of the medium-term priorities of governments. This can build credibility and improve the attractiveness of the R&I system.

Member States should at the same time take care to not spread scarce resources too thinly, focusing on a limited number of key strengths and opportunities, through the process of smart specialisation as supported under the European Structural and Investment Funds. Given the dynamic changes in R&I, policy making should also take account of emerging thinking and paradigms.[21] Objective information and evidence is an integral part of policy making, including foresight and systematic ex-ante and ex-post evaluations, in particular to assess the long term socio-economic impact of R&I funding. Member States need to continuously monitor the impact and review their policies in a European and international context.

Box 1. Many Member States are redefining their national R&I strategies based on a broad concept of innovation, encompassing education, research and innovation. Germany has put forward a comprehensive innovation-oriented strategy ('The High-Tech Strategy for Germany') drawing on forward looking analysis, with a focus on new technologies linked to the societal challenges, on intensifying cooperation between science and industry, and on improving framework conditions for innovative businesses. Following its update in 2010, Germany plans now to strengthen the Strategy and its overarching and inter-departmental innovation policy approach.

Several Member States are assessing value for money from R&I expenditure as part of broader public spending reviews. The Netherlands, for example, has set up an extensive policy monitoring system for the review of selected policy areas, including research and innovation, to identify options for future savings and achieving more value for money based on *ex ante* and *ex post* evaluation. These reviews bring together the public finance ministry, research ministry, ministry of economic affairs, and independent organisations and benefit from public support to policy-relevant research and insights on the basis of gathered evidence. Estonia has maintained a long term strategy of sustained increases in R&D investment, multiplying its initial level of spending in 2000 by more than 10 times. The country has a holistic strategy consolidating all available EU resources to deliver development leaps.

[20] As encouraged by Council Directive 2011/85/EU on requirements for budgetary frameworks of the Member States, which lays out among others the features and benefits of credible medium-term budget frameworks.

[21] Such as big data, open innovation, and Science 2.0. New insights as regards the effects of globalisation and innovation on job creation and inequality or on the role of innovation in promoting inclusive growth should also be considered. Science 2.0 describes the ongoing changes in the way of doing research and organising science. Enabled by digital technologies and driven by the globalisation of the scientific community, it promises better value for money thanks to more transparency, openness, networking and collaboration but entails risks, too, in terms of fraud and scientific integrity.

II Improving the quality of programmes, focusing of resources and funding mechanisms

Significant amounts of public R&I funding are managed through programmes, the objectives of which have traditionally been set in terms of scientific disciplines, technology areas, or industrial sectors. As in Horizon 2020, Member States should consider increasing the focus of their programmes on key societal challenges, as there is considerable growth potential in turning these into the business opportunities of tomorrow, while at the same time providing solutions for citizens' concerns. A better coordination of priorities between Member States through joint programming of national research and innovation agendas increases the impact of public investment in a given R&I area. [22]

As set out under the European Research Area, quality of public spending through programmes can be increased by allocating funding on a competitive basis, through open calls for proposals according to excellence, for instance on the basis of international peer review, and by allocating institutional funding on the basis of proven performance. Open competition should equally apply to programmes targeted towards specific economic and/or societal objectives, with clear expected impacts defined and a robust evaluation system to assess proposals against those impacts using independent expertise. In line with more focused and aligned strategies ("smart specialisation"), the monitoring of real outputs and impacts of projects supported should provide accurate and comparable information about the quality and efficiency of funding through R&I programmes.

R&I programmes need to be relevant and accessible to businesses, including through reducing administrative burdens to participation, accelerating time to grant, monitoring business involvement, and taking seriously the feedback received from participants. The essential role of frontier science in advancing the state of the art and in triggering breakthrough technological innovations should be addressed, building on successful initiatives at the EU level such as the European Research Council.

Box 2. Many Member States are introducing greater competition in the allocation of public R&I funding. Following the R&I Bill in 2008, Sweden introduced the competitive allocation of a certain portion of the basic funding to universities -initially 10% and subsequently increased to 20%- on the basis of their performance in scientific publications and in attracting external funding. Poland introduced in 2011 reforms to increase the share of public funding allocated to R&I on a competitive basis through calls for proposals evaluated by independent and international experts. As of 2013, Croatia has established a new model of public funding for fundamental research, which uses three-year performance-based institutional contracts. Greece has recently set up a competitive process to decide on a limited number of national research infrastructure projects. Science Foundation Ireland has introduced peer reviews of the economic and societal impact of grant applications, complementing the scientific peer reviews.

A number of funding agencies are starting to rigorously monitor and evaluate the impact of their programmes. The monitoring system of Tekes, the Finnish Funding Agency for Innovation, demonstrates that for every euro invested by Tekes companies increase their R&D expenditure by 2 euros, and that the SMEs it supports have 20% greater increase in turnover and 17% greater increase in employment than comparable SMEs.

III Optimising the quality of public institutions performing research and innovation

In all Member States, a large share of public R&I funding is provided as institutional funding to universities, technology institutes and other public research and technology organisations.

[22] The Strategic Energy Technology 'SET' Plan, COM(2013)253, provides an example of how a single integrated roadmap of priorities at the EU level supports a better coordination of industrial investments, Member State and EU programmes.

These institutions need to be encouraged to be entrepreneurial and seek out new opportunities and partnerships, including outside Europe, to allow for an improved transfer of knowledge to the private sector and to reallocate resources to activities that have the greatest impact. These institutions therefore need sufficient autonomy and flexibility, while ensuring accountability, as part of which they should be subject to regular independent evaluation and quality assessment.

Institutions also need to be able to attract the best possible researchers to work for them. However, as identified by the European Research Area, a lack of open, transparent and merit-based recruitment in some countries which undermines the performance of institutions and holds back career attractiveness and development for the most able researchers.

Box 3. Several Member States, including Austria, Poland and Italy, have introduced national regulations stipulating that vacancies in universities and other public research organisations have to be published internationally, for example via the European researchers' portal 'EURAXESS'.

New partnerships involving R&I performing institutions are boosting economic development at the regional level. A partnership of six universities between Germany, France, Belgium and Luxembourg is allowing greater specialisation, sharing of courses and improved knowledge transfer to businesses. In April 2014, the UK Government announced a £1 billion Greater Cambridge City Deal in partnership with the University of Cambridge to invest in growing the region's technology cluster, which already employs 54,000 people in more than 1,500 technology-based firms, generating an annual revenue of over £12 billion. The 'Vanguard' initiative gathers 18 EU regions (Asturias, Baden-Wurttenberg, Euskadi, Cataluña, Lombardia, Małopolska, Nordrhein-Westfalen, Norte, Oberösterreich, Pays de la Loire, Rhône-Alpes, Scotland, Śląsk, Skåne, Tampere, Vlaanderen, Wallonie and Zuid Nederland) to jointly implement smart specialisation strategies, mobilising public and private resources in favour of R&I around cluster initiatives for emerging and transforming technologies.

2.3 Commission support for Member State reforms

To assist Member States in the process of implementing R&I reforms based on the priority axes identified in section 2.2 of this Communication, the Commission will review the currently available tools to assess the quality and effectiveness of R&I reforms and launch discussions with Member States on the implementation of the R&I priority reforms and the possible need for an integrated, evidence-based approach to assess the quality of R&I policies at Member States level. In doing so it will draw on relevant experience gained from the self-assessment tool presented in the Innovation Union and from the analysis of progress with respect to the European Research Area, and make use of relevant indicators, including the Commission's Innovation Union Scoreboard and the indicator of innovation output.[23] The Commission will also provide world-class data, analysis and intelligence on research and innovation (R&I) policy and performance at EU and national level,[24] and use the Policy Support Facility foreseen in Horizon 2020 including technical assistance, peer reviews and mutual learning.

In this context, the Commission will also promote further research to provide a better evidence base for R&I policy making, for example by using big data approaches and by improving the way in which the long term positive impact of R&I is taken into account in some of the macro-economic models used to support policy making.[25]

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23 COM(2013) 624 final.

24 As part of activities of the Commission's Research and Innovation Observatory.

25 The Royal Netherlands Academy of Arts and Sciences published recently its report '*Public knowledge investments and the value of science*', which argues that, while the Netherlands has a long tradition of using macro-economic models to examine the impact of public policies and budgets, these do not sufficiently reflect the long term benefits of public investments in research and innovation.

The Commission will facilitate exchange of experiences with the design and implementation of indirect measures such as expenditure-based R&D tax incentives to ensure cost effectiveness, avoid unwanted cross border effects, and review whether young and fast growing companies, who account for a disproportionately large number of new jobs, are able to benefit.

3. STRENGTHENING THE INNOVATION ECOSYSTEM

Successful innovation depends not only on the quality of public policies but also on innovation-friendly framework conditions.

In recent years, the Commission has made a concerted effort to reduce internal market fragmentation and restore economic confidence. It fostered the functioning of the Single Market,[26] took steps to complete the Banking Union,[27] and took measures to facilitate and diversify access to finance,[28] and to streamline legislation and reduce regulatory burdens,[29] and is committed to fostering the long term financing of the European economy.[30]

The Commission has also promoted the effective use of public procurement and demand-side instruments, addressed barriers to science-business cooperation and mobility, and fostered a favourable and efficient intellectual property rights system. The revised State Aid guidelines support Member States to redirect State Aid towards R&I, for example in the new General Block Exemption Regulation and by increasing the thresholds for notification and by broadening the categories of aid, e.g. to support the construction and upgrading of research infrastructures and to enable closer to market support. Similarly, the revised State Aid guidelines for Risk Finance allow greater flexibility to support venture capital and other financial instruments for innovative businesses, helping them to overcome the most critical stages of their life cycle. In parallel, revised State Aid rules introduce new requirements on impact evaluation of large aid schemes that will contribute to more effective measures with clear incentive effect.[31]

Yet the accompanying assessment of progress under Innovation Union shows that there are a number of areas where further efforts need to be made:

– The Single Market is a major asset that can attract innovative investments to Europe. However, fragmentation and inefficiencies in the Single Market undermine business investments in R&I in particular in high tech areas such as ICT, including in digital networks, content and services, and healthcare. By contrast, Europe is a global leader in transport research and technology, bolstered by a well developed single market, which will, however, need to keep pace with rapid innovation as the transport sector increases energy efficiency, improves safety and tackles congestion. Moreover, major innovations need to be anticipated with the development of Single Market

[26] COM (2011) 206; COM(2012) 573.

[27] On 20 March 2014, the European Parliament and the Council reached an agreement on the proposed Single Resolution Mechanism (SRM) for the Banking Union. The mechanism complements the Single Supervisory Mechanism (SSM) which, once fully operational in late 2014, will see the European Central Bank (ECB) directly supervise banks in the euro area and in other Member States which decide to join the Banking Union.

[28] The European Commission supports companies throughout the innovation lifecycle. Besides venture capital, it supports funding via business angels, technology transfer vehicles or more traditional bank lending.

[29] COM(2012) 746; COM(2013) 685.

[30] COM(2014) 168.

[31] See OJ C 19, 11.1.2014, page 4.

frameworks that enable wide scale commercial uptake.[32] Full implementation of the single market for services, which accounts for 60% of the EU economy, would have a strong impact on innovation, in particular on non-technological innovation, such as the development of new business models and services design. In addition, regulatory frameworks need to foster the commercial use of new knowledge and facilitate the entry of new firms.

– The public sector is a major economic actor and needs to become more entrepreneurial to benefit from innovation so as to raise productivity, efficiency and the quality of public services, as well as to create demand for innovation in the private sector.[33] Mutual learning is of particular relevance in this context. Public procurement, which accounts for around one fifth of GDP across the Union, can provide markets that demand innovative solutions. This requires a coordinated effort across procurement authorities to avoid a fragmentation of demand. The move towards open data has a major potential to improve public services, create opportunities for new products and services, and strengthen accountability and transparency in public administration. Increasing the quality of public services and public financing requires a robust evidence base for budgetary and policy decisions in line with smart regulation principles. User-centred pilot actions, smart use of ICT and the opening up of digital public services will enable the public sector to efficiently develop and provide new services.

– The transformation of the European economy towards sustainable competitiveness requires a human resource base with the necessary skills and with far more researchers with business and entrepreneurial skills. It also requires frontier science to advance the state of the art and play an active role in triggering breakthrough innovations. Education and training systems need to provide broad innovation skills (idea generation, problem solving, critical thinking, cross-cultural communication, etc.) that allow employees and institutions,[34] to adapt to new circumstances. Digital technologies bring major new opportunities to access education,[35] but require major innovations in national education systems, such as fostering open and digital teaching and learning practices.

– Europe's citizens need to see that R&I is improving the quality of their lives and is responsive to their concerns, for example through allowing individuals to have their say in setting priorities.[36] R&I policy needs to incentivise and enable individuals to engage in innovation as co-creators and lead customers, promote social innovation and social entrepreneurship, and allows innovative firms to test and roll-out solutions in real world environments.

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32 For example, the new markets in advanced biofuels, waste and recycling, renewable energy and environmental technologies where the EU has innovation strengths.

33 Evidence also supports the role of government in promoting investments in R&I due to market failures, including technological uncertainty, indivisibilities and economies of scale, and knowledge spillovers.

34 The cooperation with the OECD the 'HEInnovate' initiative, a Commission has developed in self-assessment tool to support higher education institutions in becoming more entrepreneurial.

35 COM(2012) 173 final. 'Towards a job rich recovery'

36 For example the "Voices" project (www.voicesforinnovation.eu/) allowed citizens to provide views on research topics to be funded by Horizon 2020 on waste as a resource.

4. CONCLUSIONS

To fully capture the potential of research and innovation as sources of renewed growth, the following are crucial elements:

– In line with the concept of growth friendly fiscal consolidation, Member States need to prioritise growth enhancing expenditure, notably on R&I.

– Those investments need to go hand in hand with reforms to increase the quality, efficiency and impacts of public R&I spending, including by leveraging business investment in R&I.

– In doing so, Member States should focus on three main axes of reform, relating to the quality of strategy development and the policy making process; the quality of programmes, focusing of resources and funding mechanisms; and the quality of R&I performing institutions.

– To assist Member States in the successful implementation of R&I reforms, the Commission will draw on the experience gained under the Innovation Union flagship initiative and European Research Area, and fully exploit the Research and Innovation Observatory and the Policy Support Facility foreseen in Horizon 2020 in order to support an integrated and evidence-based approach to policy making and budgetary decisions.

– Strengthening the broader innovation eco-system and putting in place the right framework conditions to stimulate Europe's companies to innovate is crucial. Important progress has been made since the launch of the Innovation Union, but further efforts need to be made in deepening the Single Market, facilitating and diversifying access to finance, strengthening the innovation capacity of the public sector, creating resilient jobs in knowledge intensive activities, developing a human resource base equipped with innovation skills, fostering frontier research, addressing the external dimension of R&I policy, and embedding science and innovation more strongly in society. The review of the Europe 2020 strategy will examine the progress made with the Innovation Union.

The Commission invites the Council to launch discussions on raising the quality of investments in R&I in line with this Communication, as part of its broader discussions on improving the quality of public finances and implementation of structural reforms.

In addition, the Commission invites the Council to discuss the challenges for future R&I policy.