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NOTE

From:	General Secretariat of the Council
To:	Permanent Representatives Committee/Council
Subject:	<i>Preparation of the Competitiveness Council on 29-30 May 2017</i> Economic rationale for public research and innovation funding and its impacts - Exchange of views

Delegations will find attached a Presidency paper for the exchange of views at the Competitiveness Council on 30 May 2017 on the 'Economic rationale for public research and innovation funding and its impacts'. It is based on the European Commission's paper on "The Economic Rationale for Public R&I funding and its impacts" that was officially launched on 16 March 2017 in St. Julian's, Malta, during the 33rd meeting of the European Research and Innovation Area Committee.

The Economic Rationale for Public research and innovation funding and its Impacts

Research and Innovation (R&I) are crucial to address Europe's economic and societal challenges. They contribute to reaping the new growth opportunities generated from knowledge, technological breakthroughs, process and product innovations, and new business models that support economic performance and help tackling societal challenges by, for instance, improving health outcomes, fighting climate change and building inclusive and resilient societies.

Assessing the economic rationale and impacts of R&I and public R&I funding, even though the measurement of positive societal returns is inevitably hampered by methodological limitations, is important to ensure public accountability and to nurture better evidence-based policy action.

Overall, ample empirical evidence demonstrates that R&I is a key driver of productivity and economic growth. Some typical findings of the estimates of R&I impacts on productivity and economic growth are:

- Two-thirds of economic growth in Europe from 1995 to 2007 derive from R&I, broadly defined¹. The most restrictive definition of R&I estimates its impacts on labour productivity² growth, between 2000 and 2013, at 17% in countries such as Finland, Germany or the United Kingdom and at near 30% in Ireland³.
- Among all investment categories that drive labour productivity growth, including investment in tangible capital or economic competences⁴, R&I accounted for 15% of all productivity gains in Europe between 2000 and 2013, with large differences across Member States. In Finland or the United Kingdom, R&I accounted for 50% and 40% of these gains respectively, while in Hungary, Greece, Czech Republic or Slovenia, it accounted for less than 10%⁵.

¹ Bravo-Biosca et al, 2013

² Defined, generally, as the total output produced in an economy divided by the total number of hours worked.

³ INTAN-INVEST and EIB, 2016

⁴ Comprising aspects such as training, organisation capacity through management and branding

⁵ INTAN-INVEST and EIB, 2016

- Increases in R&D investment are associated with gains in productivity. Based on econometric analyses of elasticities⁶, in the European case, for example, an increase in R&D investment of 0.2% of GDP would result in an increase of 1.1% of GDP, i.e. an increase five times bigger in absolute terms.

However, the impact of R&I depends on a broad set of place specific factors, and thus, the impact of R&I varies across countries, sectors or companies. Factors that have proven to affect both the levels of R&I investment and its productivity and thus, impact, on the economy, are

(1) macroeconomic stability; (2) business environment, including the functioning of markets and the impact of a fragmented single market in the European case; (3) financial conditions, (4) availability of human capital, (5) economic structure and degree of international openness; or (6) distance to the technological frontier.

The impact of R&I can also evolve over time. Recent data on the lack of progress in Total Factor Productivity growth in Europe suggest that the positive relationship between R&I and productivity growth may have temporarily changed giving rise to a "productivity paradox". (OECD, 2015).

This slow-down in productivity growth can be explained by (1) a potential slowdown in innovation; (2) obstacles to the diffusion of innovation from productivity-leading companies, sectors and countries to laggards; and (3) barriers to the creation, entry and post-entry growth of new firms in productivity thriving sectors. The increasing speed of change in the innovations process, the increasing complexity of innovations that require mastering several technologies and competencies, and the concentration of innovation benefits on a compact set of global leaders, are all potential causes for the slow-down in innovation diffusion.

Encouraging more innovation and removing barriers to its faster diffusion in the economy brings forward a number of implications for the formulation of public R&I policies, both in terms of improving business conditions to enhance R&I investment and for the development and uptake of innovations. Traditionally, public R&I funding aimed at fixing markets that suffer from market failures caused by low private R&I investment that led to non-optimal investment levels.

⁶ Donselaar and Koopmans, 2016

In the current economic context, public R&I policy seems more important than ever before to create and shape new innovation-driven markets. Public R&I actions and investments, that embrace the whole research and innovation cycle, from blue-sky research to market-creating innovation, enable the development of radically new and breakthrough products, services, processes and business models. These open up new markets with potential for rapid growth.⁷

The impact of public R&I funding is large and significant as it acts as a catalyser to boost the productivity growth needed to accelerate economic growth and to create more and better job opportunities. Maximising the impact of public R&I funding will require the adoption of holistic strategies that enable faster and deeper innovation development and diffusion across companies, sectors and countries.

Ministers are invited to address the following **questions**:

Question 1: Which measures of public R&I policy and funding are most appropriate to speed up the creation and diffusion of innovation? How do you think that this should affect public R&I policy, notably in relation to market-creating innovation?

Question 2: In a context where the nature of innovation is deeply and swiftly changing, what impacts should public policy makers, at both national and European level, seek to obtain from public R&I investments and what should be done to maximise such impacts?

⁷ Illustrated by past developments such as the internet, the smartphone, 3-D printing, the discovery of penicillin or the development of precise and quick genome-editing technologies.