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From:	ERAC Secretariat
To:	ERAC (European Research Area and Innovation Committee)
Subject:	ERAC Workshop and Plenary (item 3.1 - Strategic capacity of ERAC) - "Inclusiveness and R&I" - note by the Commission

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ERAC delegations will find in annex a note from the Commission on "Inclusiveness and R&" with questions for discussion, in view of the ERAC Workshop on the "Future of EU R&I policy" and the ERAC Plenary (agenda item 3.1), that will take place on 5 and 6 June respectively.

## INCLUSIVENESS and R&I

### 1. Inclusiveness in Europe

**The context.** The aftermath of the last economic crisis has revealed that Europe not only needs to continue tackling its economic challenges, but it should also ensure that everybody reaps the benefits of progress.

Major political disruptions, in e.g. the US and the UK, but also in France or Italy, have provoked an intense discussion on the growing divergences and inequalities between groups of people and in particular those who feel ‘left behind’ by the current political and economic system are finding themselves increasingly heard. Those discussions are also increasingly focussed on geographical imbalances (as a token: the debate on the “geography of discontent”) or economic imbalances (emerging analyses on the lack of productivity diffusion between leading and laggard firms, for example).

Increased inequality as well as underperforming productivity and growth dynamics are now seen as the two main challenges of Europe’s political agenda. Europe is a more equal place to live overall, when broad indices compare its performance to that of other countries. This is largely driven by the Europe’s national tax and welfare systems. However, EU income inequality has increased<sup>1</sup>, in particular within countries and for population groups of certain age or place of residence (OECD, 2019a).

These evolutions challenge the traditional view that high competitiveness and strong investments in research and innovation (R&I) automatically lead to higher growth and more jobs. There is growing awareness that competitiveness and inclusiveness must go hand in hand. Recent evidence suggests that overly high levels of inequality are not economically, socially and politically sustainable (Iammarino et al., 2018; IMF, 2018; OECD 2019b).

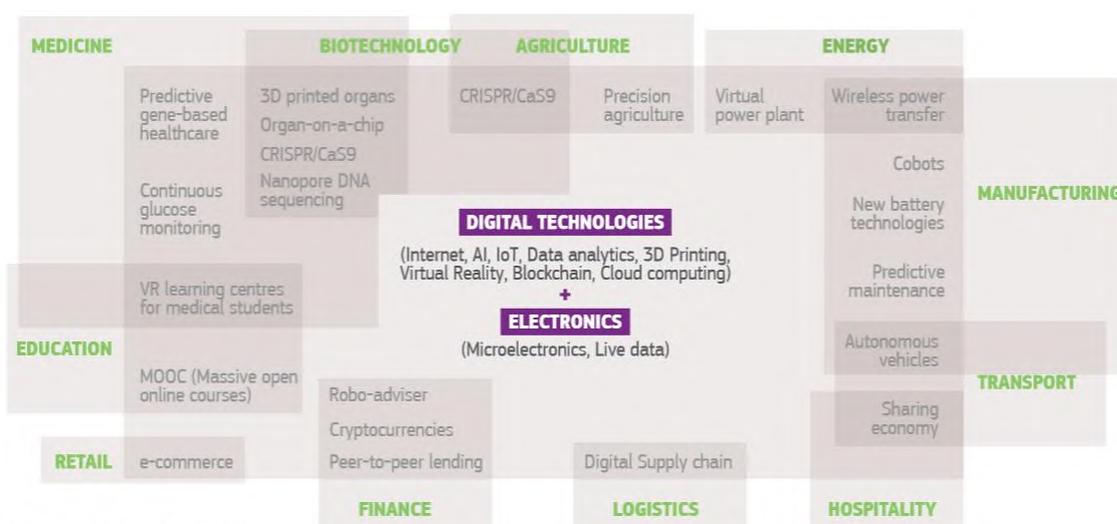
**Digitisation, innovation and inclusiveness.** The digital transformation of our economy and society is a root cause of the above trends. Digital innovation is fast and complex. The convergence of digital technologies with the physical and biological world has enabled the rise of many important break-through innovations (see Figure 1), while at the same time has rendered the technological and innovation process more complex, as companies need to master different technologies and new business models. This, coupled with strong and rising network effects leads to “winner takes all” behaviours that result in a strong concentration of benefits in certain countries, regions and firms.

The benefits from innovation therefore do not accrue to all people at the same time and at the same rate. Technological developments that drive society towards more automation, AI, robotisation, less routine jobs, and overall more information and communication technology in the work place have created a fear of large-scale job displacement and of a lowering of job quality. The upskilling and reskilling of the labour force has become a critical element to ensure that digitisation leaves no one behind.

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<sup>1</sup> The Gini Index for market income (before taxes and social transfers) in the EU increased from 46 in 1995 to 48.4 in 2016, being larger than Japan (42 in 2015) and Korea (34 in 2016) and lower than the US (50.8 in 2016).

Figure 1 – Deep-tech innovation: science-based digitally-enabled innovations



This paper looks at the divergences that started to become apparent across four dimensions: countries, regions, firms and people. It presents available evidence and explores some of the emerging implications for R&I policy.

## 2. Inclusiveness in Europe: challenges and trends

### a. Countries

European economies are highly heterogeneous in economic structure and innovative capacity. The innovation gap in Europe has traditionally been seen as an EU 13-EU 15 divide, with EU 13 countries lagging behind more innovative economies. However, the landscape has been shifting over the last decade, with innovation performance of some of the EU-13 countries catching up to the EU average, while some of the Southern European economies have not managed to achieve the same dynamics.

Upwards convergence in Europe reflects notably the fact that Central, Eastern and South European economies (CEESE) engaged in successful catching-up, moving from 43% of the average EU GDP per capita in 1990 to 66% in 2017, and outpacing thus the EU average performance since the onset of the 1990s (EIB and European Commission, 2018). However, CEESE performance slowed down in the last decade and this calls for reflections on the sustainability of their FDI-led growth model and the need to move towards a more innovation-driven model.

Higher investment in R&D and intangible assets and a greater upskilling of the labour force would allow these countries to move up the ladder of global value chains and social prosperity (Iammarino et al., 2019; EIB and European Commission, 2018).

Several EU policies, and notably the European Cohesion policy funds<sup>2</sup>, including their strengthened orientation towards supporting R&I have been tackling the reduction of disparities across Member States and their regions. The “widening” measures of the Horizon 2020 programme and national reforms that have been incentivised through the Horizon 2020 Policy Support Facility (“PSF”) instrument<sup>3</sup> also offered support to Member States in their catch-up and reform processes.

### **b. Regions**

Divergences do not only exist between Member States but also within Member States, including the more developed ones. The high concentration of R&I activities and economies of agglomeration imply that there are regions where these investments are in an advantageous situation, while others the periphery find it hard to connect to develop new and knowledge based activities as well as to connect to international global value chains (Figure 2).

These internal divergences are most apparent in the increasing gap between capitals and metropolitan areas, where most of economic and innovative activities are concentrated, on one hand, and declining industrial and peripheral areas experiencing skilled emigration and being less resilient to change, on the other. If left unmanaged, technological change is likely to widen these divergences as shown by the most recent evidence (European Commission, 2017; Iammarino et al., 2019).

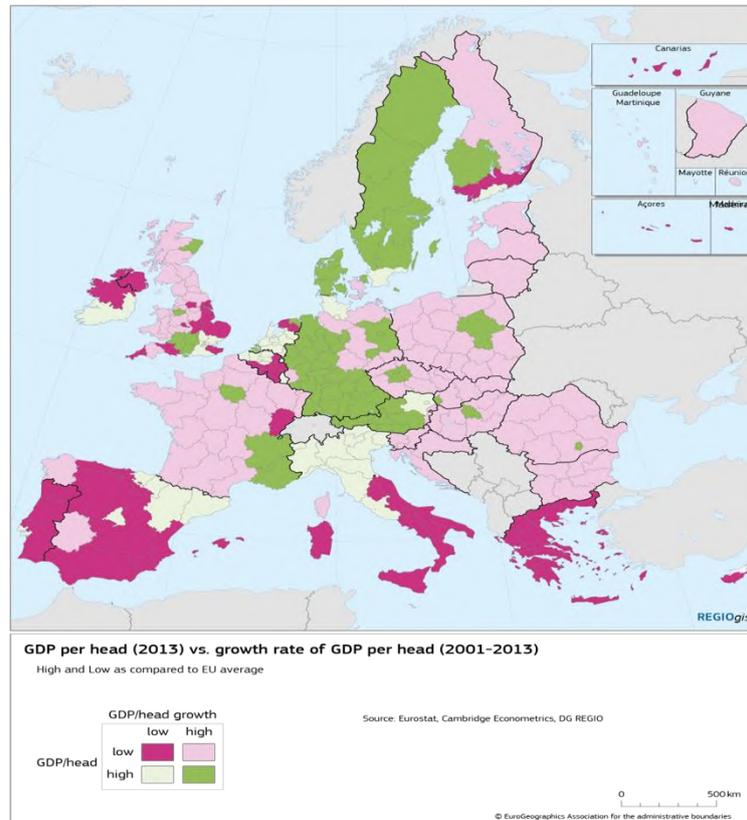
As has already been happening over the last decade, a “geography of discontent” is emerging, with increasing distrust towards political and democratic institutions or even “revolt against the status quo” (Rodríguez-Pose, 2017) coming from those places that “don’t matter”. This is mainly driven by the dissatisfaction of those who are most affected by the negative impact of technological change, i.e. the older and less educated, living in industrial or decaying areas (Iammarino et al., 2018).

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<sup>2</sup> ‘Cohesion policy’ is the policy behind the hundreds of thousands of projects that all over Europe receive funding from the European Regional Development Fund, the European Social Fund and the Cohesion Fund (the latter applies to EU Member States with a GDP lower than 90 % of the EU27 average).

<sup>3</sup> See <https://rio.jrc.ec.europa.eu/en/policy-support-facility>.

Figure 2 – Regional inequalities



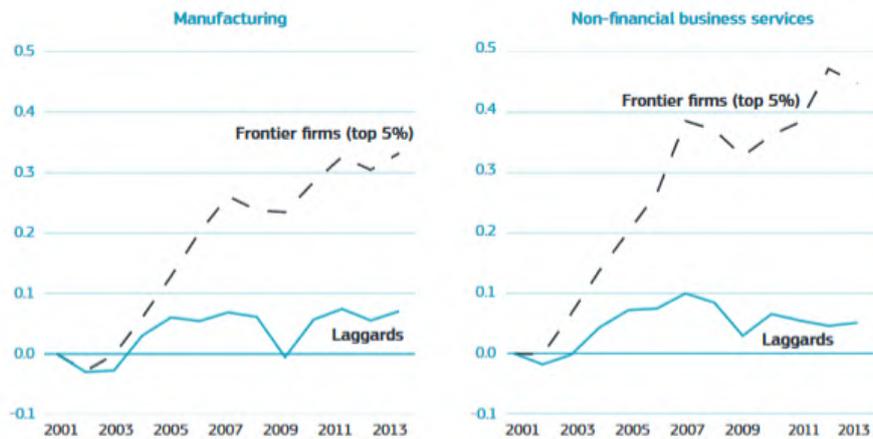
Source: Iammarino et al. (2018).

### c. Firms

Despite intrinsic difficulties in properly measuring the impact of the digital transformation on the economy and society (OECD, 2019), over the past decades, evidence is strongly growing around increased divergences that are becoming very apparent at the firm level. The digital transformation and digital technologies, including AI, big data, the Internet of Things or machine learning algorithms, have enabled some of the most impressive breakthrough innovations in our economy (OECD, 2018; European Commission 2018a). However, if we take a closer look at productivity growth trends, these reveal that only a small number of leading firms have championed strong productivity growth rates leaving a wide fat tail of laggard firms behind (Andrews et al., 2016; Criscuolo, in European Commission 2018a).

In an increasingly digital economy characterised by speed, complexity and “winner-takes-all” dynamics, the increasing productivity gap has been traced to limited innovation diffusion (European Commission, 2018b). The potential negative implications of this trend are many, including stalling aggregate productivity growth and a lack of spread of innovation benefits across all segments of the population. Reduced competition due to the emergence of (quasi) monopolies may also have negative effects on innovation output in the medium term.

Figure 3. The widening labour productivity gap between frontier firms and other firms



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: Andrews, Criscuolo and Gal, 2016

Note: <sup>1</sup>The global frontier is measured by the average of log labour productivity for the top 5% of companies with the highest productivity levels within each 2-digit industry. Laggards capture the average log productivity of all the other firms. Unweighted averages across 2-digit industries are shown for manufacturing and services, normalised to 0 in the starting year. The vertical axes represent log differences from the starting year: for instance, the frontier in manufacturing has a value of about 0.3 in the final year, which corresponds to approximately 30% higher in productivity in 2013 compared to 2001.

Stat. link: [https://ec.europa.eu/info/sites/info/files/srip/partii/partii\\_1/figure\\_ii\\_1\\_3.xlsx](https://ec.europa.eu/info/sites/info/files/srip/partii/partii_1/figure_ii_1_3.xlsx)

#### d. People

The rise of the digital economy has led to growing concerns about the net displacement of jobs brought about by the deployment of new technologies and about a potential loss of “quality” in newly created jobs. With the increasing ability of machines to automate routine jobs, the demand for labour can shrink. Such a technologically driven substitution of labour with technology could introduce productivity gains, but also decrease the labour share of income<sup>4</sup> and contribute to future inequalities affecting mostly lower skilled workers (EPSC, 2019).

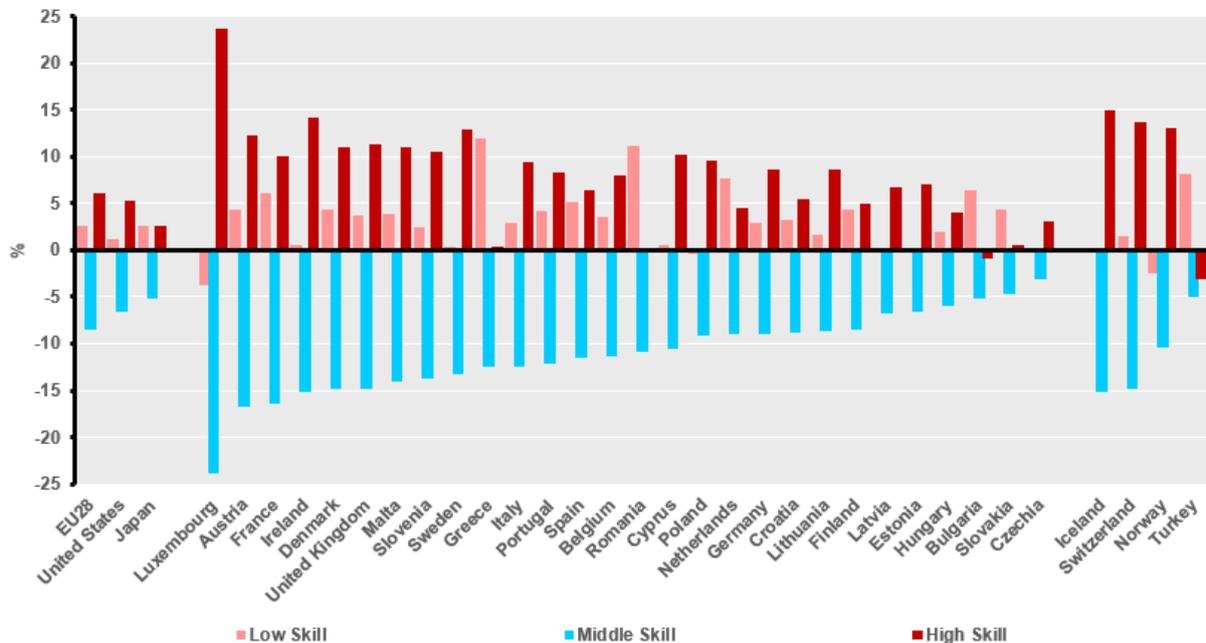
Available forecasts on potential job displacement are inconclusive (World Bank (2016), Frey and Osborne (2013; 2017), Nedelkoska and Quintini (2018)), yet the effects of an increasingly digital economy, including many jobs created through the platform economy and new unconventional working arrangements, started to emerge.

Available evidence reveals high rates of job polarisation and the hollowing out of medium routine tasks jobs, with middle-skilled workers being the most affected, as their tasks are more easily automatable and sensitive to offshoring. At the same time, the quality of jobs of the least skilled is likely to decrease, as is their income share. Overall, although employment rates in many European countries and in the United States are currently in record high numbers, the described trend is expected to accelerate as digital technologies become more

<sup>4</sup> The evolution of the labour income share in the EU28 reveals a declining trend from 72% in 1995 to around 60% in 2015.

pervasive<sup>5</sup>. This trend appears less pronounced in many of the new member states, where labour costs are relatively low and the incentives for automation are supposedly lower.<sup>6</sup>

Figure 4. Percentage point change in occupational employment shares, 1995-2018



Source: DG RTD - DG EMPL (2019), forthcoming

### 3. Key policy considerations

**Incentivising national R&I policy reforms.** Tackling the challenges above, driven by societal challenges and the digital transformation of the economy and society, require ambitious policy reforms at national level to address policy shortcomings in many countries (OECD, 2018; European Commission, 2018a). For the less developed Member States, this implies embracing the shift towards an innovation led growth model and away from a more traditional FDI-driven growth model (EIB and European Commission, 2018).

A number of EU instruments have been put place over the past years to help Member States in delivering targeted reforms. This concerns support via the Cohesion policy Funds, where the Commission's contribution to the informal EU27 leaders' meeting in Sibiu (Romania) on 9 May 2019<sup>7</sup> announced stronger links between those funds and the European Semester. The Horizon 2020 Policy Support Facility or the current Structural Reform Support Programme and the proposed Reform Support Programme also provide structured support to reform agendas. The heterogeneity of the regional economies, also apparent in more developed Member States, results from different development trajectories and causes different policy needs, calling for stronger place-based innovation policies.

<sup>5</sup> Employment rate (age range 15-64) in OECD countries raised from 66% in 2010 to 69.5% in 2017, EU from 64.1 to 67.7% and the US from 66.7% to 70.1

<sup>6</sup> OECD (2017), OECD Employment Outlook 2017, OECD Publishing, Paris.

<sup>7</sup> [https://ec.europa.eu/commission/future-europe/commissions-contribution-informal-eu27-leaders-meeting-sibiu-romania-9-may-2019\\_en](https://ec.europa.eu/commission/future-europe/commissions-contribution-informal-eu27-leaders-meeting-sibiu-romania-9-may-2019_en)

**Skills.** Given the way in which people with different skills sets are affected differently by the transformation processes described above, the availability of relevant skills should be a strong focus of both national and EU policy. Skills are crucial to ensure that people not only contribute to but also benefit from innovation, avoiding social hardship. The fundamental interrelation between skills, jobs and income makes investment in skills and upskilling and reskilling policies a clear prerequisite for an inclusive society.

**Innovation diffusion.** As noted above, the characteristics of the new digital economy lead to an insufficient diffusion of innovation across firms, regions and sectors, and this restrains the spread of innovation benefits across the EU, its Member States, regions, companies and people. Policies that address the bottlenecks to innovation diffusion at all levels will enable less developed companies and regions, also within more developed Member States, to benefit from knowledge spillovers and become better integrated into global value chains.

**Investing in and for the SDGs.** While R&I investments drive growth and jobs, they also enable and accelerate the necessary systemic transitions towards an environmentally, socially and economically sustainable Europe (see the paper “Investing in and for the Sustainable Development Goals”, also for ERAC). The Commission’s reflection paper “Towards a Sustainable Europe by 2030” (European Commission, 2019) highlights that Europe needs to deploy research and innovation to support the shift from a linear to a circular economy, correct imbalances in food systems, and deliver future-proof energy, buildings and mobility. The Communication that the Commission put forward to the Sibiu Summit made it clear that Europe should focus research and innovation to support ecological, social and economic transitions that are fair for all. Because of the scope, scale and urgency of the societal challenges facing Europe, and their impact on inclusiveness, policy is called to pay increased attention not just to the rate (the quantity and quality) of R&I investments, but also to the overall direction of these investments. This shall not only support the transformation of a broad range of interconnected systems crucial to Europe’s economy and society (energy, agro-food, health, mobility, production and consumption) but ensure that the benefits spread across all segments of the population.

#### **4. Questions for discussion**

- How can the tools available at EU level to incentivise national reforms be optimised to stimulate an inclusive approach to innovation?
- Given the increasing concentration of R&D, innovation and its benefits in a few countries, regions, firms and people, how can policy makers generate a broader diffusion of innovation activities and their benefits?
- Given the importance of skills in tackling divergences, how can the R&I agenda be better aligned with other policies such as education, training or life long learning?
- How do you think that synergies between Horizon Europe and other EU and national programmes could best support inclusiveness objectives?

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