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White Paper

Beyond the Equity- Efficiency Trade-Off: Practical Ideas for Inclusive Growth and Competitiveness in Europe

The Europe Inclusive Growth and Competitiveness Lab

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The Europe Inclusive Growth and Competitiveness Lab

The Europe Inclusive Growth and Competitiveness Lab aims to support the design, launch and implementation of actionable agendas for public-private collaborations to increase competitiveness and inclusive growth in Europe. It is a joint initiative between the World Economic Forum and the European Investment Bank Group (EIB Group¹), with contributions from Bruegel. It is carried out under the framework of the World Economic Forum Regional Business Council on Europe and is the second regional lab catalysed by the World Economic Forum, following the Latin America Competitiveness Lab.

The first, analytical, phase (February 2016-January 2017) identified concrete areas for action through a consultative process benefiting from the participation of stakeholders from the private and public sectors and academia via workshops held in Paris (with the World Economic Forum Global Agenda Council on Europe), Brussels (hosted by Bruegel), Luxembourg (hosted by the EIB) and Vienna (in collaboration with and hosted by the Oesterreichische Nationalbank).

The Europe Inclusive Growth and Competitiveness Lab has also greatly benefited from consultation with a High-Level Advisory Group comprised of experts with specialized knowledge and regional expertise: Kalin Anev Janse, Roman Arjona Gracia, Jon Azua, Marc Baltés, Edward Bannerman, Annegret Bendiek, Carl Bildt, Fabrizio Coricelli, Diane Coyle, Andreas Esche, Daniel Gros, Michael Heise, Tom Hulme, Akira Kirton, Tilmann Kupfer, Robert Madelin, Maija Manika, Mariana Mazzucato, Ann Mettler, Stephan Morais, Geoff Mulgan, Tommaso Nannicini, Osvaldas Smitas, Markus Sovala and João Vasconcelos.

The publication of this White Paper is intended as a basis for action by Partners and stakeholders in a second phase of the initiative, which will focus on the implementation of concrete public-private partnership opportunities at the EU, macro-regional and/or industry level, to advance the inclusive growth and competitiveness agenda.

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Preface

The integration of the European Union has been a profoundly positive force for peace on the continent, yet over the past decade economic, political and social forces have started driving Member States apart. These include the stress that the repercussions of the financial crisis, declining productivity growth and stagnating real wages are exerting on individuals, firms and national governments across Europe. The rapid pace of globalization and technological change are also posing formidable challenges for governments, prompting an increasing number of Member States to fall back on more inward-looking policies. The Brexit vote was a manifestation of this.

Part of the answer will have to be a fundamental rethinking of our current economic model. We will have to move away from prioritizing growth over inclusion and treating them as two separate processes, understanding that long-term growth presupposes an inclusive economic system at the base. In implementing a new growth strategy, we see the need for interventions that are good for both competitiveness and inclusion simultaneously. The Europe Inclusive Growth and Competitiveness Lab aims to be a catalyst for such interventions on the basis of public-private coalitions. In particular, this White Paper draws together existing initiatives from across Europe that can provide starting points for concrete action. While many important initiatives in this vein already exist in Europe, implementation needs to become more systematic.

We would like to express our gratitude to our partners, the European Investment Bank (EIB) and Bruegel, for joining us in this effort, and gratefully acknowledge the contributions by stakeholders from the private and public sectors and academia via workshops held in Paris (with the World Economic Forum Global Agenda Council on Europe), Brussels (hosted by Bruegel), Luxembourg (hosted by the EIB) and Vienna (in collaboration with and hosted by the Oesterreichische Nationalbank), as well as roundtables at the World Economic Forum Annual Meeting 2017 in Davos-Klosters. We also gratefully acknowledge the support of the World Economic Forum Regional Business Council on Europe. The Lab builds on the competitiveness work carried out by the World Economic Forum since 1979, in particular its *Global Competitiveness Report*, as well as its *Inclusive Growth and Development Report (2015, 2017)*. It is the second regional lab catalysed by the Forum, following the Latin America Competitiveness Lab.

The Europe Lab has greatly benefited from consultation with and contributions from a High-Level Advisory Group comprised of experts with specialized knowledge and regional expertise: Kalin Anev Janse, Roman Arjona Gracia, Jon Azua, Marc Baltés, Edward Bannerman, Annegret Bendiek, Carl Bildt, Fabrizio Coricelli, Diane Coyle, Andreas Esche, Daniel Gros, Michael Heise, Tom Hulme, Akira Kirton, Tilmann Kupfer, Robert Madelin, Maija Manika, Mariana Mazzucato, Ann Mettler, Stephan Morais, Geoff Mulgan, Tommaso Nannicini, Osvaldas Smitas, Markus Sovala and João Vasconcelos.

We are also grateful to Silja Baller, Practice Lead, Competitiveness and Innovation, for her leadership of this project, and the project team, Annika Brack, Oliver Cann, Gemma Corrigan, Anna Knyazeva, Peter Vanham and Aditi Sara Verghese, for their contributions to this effort.

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Foreword

The European Union is a historic achievement of unique importance. It is all about unity, cooperation and common values – overcoming the terrible rifts that used to divide our continent. It is also a story about inclusion, about spreading a more inclusive market economic model and about spreading prosperity through economic convergence across the Union. Since the beginning of this century, this transformational process has advanced at a tremendous pace: the introduction of the euro, the integration of the Eastern bloc countries, and then the rapid response to the crisis, with measures to deepen and strengthen the euro area.

We have many strengths but we also face a number of challenges. While it is clear that we need to do more to restore our global competitiveness and to maintain our prosperity, it is also clear that we need to do much more to progress on the inclusion of all members of our societies and on the economic and social convergence of all parts of the Union, to ensure the cohesion and solidarity on which our common future depends. We cannot be complacent any longer.

The recovery in Europe remains sluggish. Very high levels of unemployment in many European countries persist and pose a threat to our long-term growth potential. What is more, we are still not investing enough: not in comparison with historical recovery episodes, not when you consider the depth of monetary stimulus, and not when you consider the size of the gaps that exist if we are to catch up in terms of digital technologies, smart infrastructure, education and innovation, to restore competitiveness and tackle challenges like climate change.

Falling productivity growth is at the heart of the problem. We urgently need to work together, both public and private actors, to address this decline in competitiveness. We need further reforms to create the market flexibility to support innovation and productivity growth, to remove barriers and improve conditions for investment, particularly on issues of single market integration. We also need public support for investment, making the best use of available EU and national financing capacities to catalyse private finance, to address investment gaps in infrastructure, innovation and digitalization, and to help alleviate the financial constraints faced by smaller firms.

This is where the EIB Group plays a unique role, complementing the efforts of the Member States, our shareholders, and of other European institutions. With a balance sheet of around €570 billion, the EU Bank finances investment projects that address systemic market failures or financial frictions, addressing specific Member State structural needs and contributing to EU-wide objectives. The Investment Plan for Europe undertaken by the European Commission and the EIB further enhances the EU policy response. It consists of regulatory reforms to remove bottlenecks and ensure an investment-friendly environment; comprehensive technical assistance to unblock investment projects and get them ready for financing; and the European Fund for Strategic Investments (EFSI) – a commitment to generate €315bn in new investment – that enhances the EIB Group's capacity to address market failures.

We are very happy that the EIB Group has been able to partner in the Europe Lab initiative. We believe this White Paper is a very important step in showing the great breadth of opportunities we face not just to enhance our productivity and competitiveness, but to do so in a way that deepens inclusion and cohesion, and thus strengthens the foundations of our whole society. Importantly, it goes beyond high-level analysis, working to build up and share a great knowledge-base of practical actions that can be taken at all levels. It shows that we have really no excuse not to act!

Werner Hoyer,
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Executive Summary

Key findings of the Europe Inclusive Growth and Competitiveness Lab

Stagnating wages, the lasting repercussions of the financial crisis as well as immense uncertainty over the economic prospects of the European middle class are creating major tensions in Europe. Real wages are still below pre-crisis levels for many European workers² and productivity growth has been on a steady decline from more than 5% in 1975 to under 0.7% in 2015.³ The youth unemployment rate is still very high at almost 20% for the EU28 on average.⁴ This situation calls for an urgent mobilization of resources by committed coalitions of representatives of the public and private sectors, academia and civil society to restore Europe's growth performance on a substantially more equitable basis.

The Europe Inclusive Growth and Competitiveness Lab (Europe Lab) aims to catalyse such resource mobilizations by supporting the design, launch and implementation of public-private collaborations. In a first step, the Europe Lab has identified concrete areas for action relating to the two key drivers of inclusive growth and competitiveness (innovation and entrepreneurship), as well as the three key enablers (integrated markets for goods and services, the labour market and human capital, and access to finance). Recommendations for action range from accelerating mechanisms for technology diffusion, fostering digital social innovation and investing in smart transport infrastructure, to leveraging non-traditional sources of financing. To move this agenda one step closer to implementation, the Lab has in addition collected a series of practical examples that can provide starting points for implementation (Table 1). These examples show that greater inclusion is by no means a costly luxury but can indeed be a catalyst for greater prosperity in Europe.

Reviving inclusive growth and competitiveness in view of the emerging Fourth Industrial Revolution

Digital and emerging technologies have immense potential to be the key source of renewed growth, yet profound technological transformations also reshape national and global distributions of income, wealth and opportunities in profound ways, bringing structural change to our societies. Leveraging technology to achieve higher growth will require that leaders and societies be prepared to anticipate and manage the social repercussions, in particular the strong polarization dynamics inherent in the technologies of the Third and Fourth Industrial Revolutions. History provides many warnings for the dramatic upheavals that can result from a failure to do so.⁵ Yet technology can play a double role: it can also be directly leveraged as a tool to make the growth process more inclusive, as the nearly 1,000 European digital social innovation initiatives show.⁶

Despite the criticality of the current situation, the encouraging news is that Europe has many bright poles of excellence from which it can and should draw strength. The European inclusive growth and competitiveness frontiers coincide with the global frontiers on many dimensions.⁷ And as the practical examples included here show, Europe does not suffer from a lack of ideas. There is thus much scope for the transfer of knowledge, know-how and good practice to those parts of the EU that are currently struggling the most. The key is for European stakeholders to come together to accelerate and, importantly, to scale and spread existing initiatives.

The need to link competitiveness and inclusion and to operate in the win-win space of initiatives that are good for both productivity growth and inclusion must be emphasized. This approach breaks with the equity-efficiency trade-off thinking, and instead recognizes that interventions can be efficiency and equity enhancing at the same time.

The term "inclusion" is used here in a broad sense, encompassing first and foremost a concern with equal opportunity and social mobility over time. Both inequality at the individual level as well as gaps in economic performance between larger economic units, such as subregions and countries, and at the subnational level are considered. These different dimensions of inequality are each associated with separate levers to achieve greater inclusion. Note that elements of competitiveness may be related to various forms of inclusion in different ways. For example, innovation may be positive for social mobility while increasing top-level income inequality.⁸

While high-level consensus is slowly emerging on the importance of achieving growth with inclusion, implementation is still lacking. Progress in translating this high-level ambition into real change will require a significant and persistent effort to change mindsets that still reflexively see inclusion as an afterthought to growth. The Europe Lab sets out a framework to guide thinking about the interlinkages between competitiveness and inclusion, and offers a series of win-win interventions to enhance competitiveness and growth that at the same time help to realize a more inclusive society.

The scope of the initiative is the European Union (EU), not least due to the fact that in many cases solutions to current challenges do not lie at the national level but at the EU level. At the same time, it is necessary to recognize differences within the region, such that some of the recommendations will be more relevant in some locations than in others. The need to adapt to the local context and priorities is clear.

The five dimensions of inclusive growth and competitiveness

The Europe Lab identifies five dimensions of inclusive growth and competitiveness that are particularly relevant for Europe's performance against the background of the unfolding Fourth Industrial Revolution. Each of these dimensions – two drivers and three enablers – contains elements of both competitiveness and inclusion.

The framework builds on the competitiveness work carried out by the World Economic Forum since 1979, in particular its Global Competitiveness Index, as well as recent competitiveness research by the European Investment Bank,⁹ and the Forum Inclusive Growth and Development framework.¹⁰ The competitiveness–inclusion nexus for each dimension is explained in detail in the relevant section.

Innovation and business dynamism and entrepreneurship are considered the key drivers of inclusive growth and competitiveness in Europe. For new ideas to spread in the region through the growth of innovative companies, the economy needs to be quick to deploy its resources to their most productive use. An open, diverse and collaborative innovation environment contributes to productivity growth and allows diverse groups of citizens to participate in and benefit from innovation processes. Business dynamism and entrepreneurship are important for catalysing innovative, productivity-enhancing ideas and for levelling the playing field between incumbents and entrants. The framework considers well-integrated *markets for goods and services, the labour market and human capital, and access to financing for productive and innovative firms* to be the main enablers. The first concerns entry barriers for domestic and foreign companies and the level of competition in a market; the second relates to preparedness to match current and future demands for skills; and the third recognizes that innovative firms can only thrive and grow if financial markets provide the necessary financing.

A cross-cutting issue is the transformational impact of digital technology and its importance for both competitiveness and inclusion. Digital technologies are not only a vitally strategic arena for innovation and entrepreneurship, but they play a key role in the development of smart infrastructure, future skills needs and the future of finance. Digital technologies need to be considered both in terms of how they impact how they impact inclusion and how they can be deliberately used to foster a more inclusive society.

In Europe, single market integration is another cross-cutting issue that has ramifications across the economy. It has implications for access to goods and services markets, labour mobility and financial flows. It is linked to the digital transformation through the need to create a harmonized digital economy across Europe.

Areas for action and practical examples

Table 1 summarizes the key recommendations. All address an important European bottleneck for each of the five dimensions. For each case, one or several practices were identified as starting points for implementation.

Key areas for action for the five dimensions emerge as: (i) not just more open innovation systems but critically also increasing efforts to diffuse existing general-purpose technologies more rapidly across all types of firms – the objective of the Austrian Pilotfabrik 4.0, for example; (ii) not just the right framework conditions for entrepreneurship but also ensuring a successful transition from start-up to scale-up – as supported by the TechCity Upscale Programme in the United Kingdom; (iii) better enabling conditions for greater inclusion and competitiveness created through smarter infrastructure, including better connected digital, transport and energy networks – for instance through initiatives such as Superfast Cornwall, Real Time Passenger Information systems in Madrid and Enexis, the Dutch smart grids for electric cars; (iv) ensuring that the population is equipped with the best possible cognitive and digital skills, an outstanding challenge for Europe and crucial to ensure that the largest possible number of people benefit from technological progress – as supported for example by the European Institute of Innovation & Technology's important ideas in this area; and (v) accelerating efforts to provide ready capital to innovative firms, tailored to their needs at different stages of the life cycle – such as more venture and growth capital funding for start-ups and credit guarantee schemes for small and medium-sized enterprises, such as the InnovFin SME Guarantee Facility.

The initiative offers a point of departure for the major challenge of building a more inclusive future for Europe across the chasms arising from ever more rapid technological change. The community of European stakeholders is called upon to collaborate in developing the initiative further.

Table 1: Practical Ideas for Catalysing Inclusive Growth and Competitiveness in Europe

| Recommendation | Practice |
|---|---|
| Innovation and technology diffusion | |
| Promote public-private innovation partnerships | – Vinnova Strategic Innovation Programmes, Sweden |
| Diversify the innovator base | – I.am.angel Foundation, USA |
| Create the right conditions for (digital) social innovation to flourish | – Ospedal Grando, Treviso, Italy |
| Accelerate the diffusion of innovation among firms | – Pilotfabrik 4.0, Austria |
| Business dynamism and entrepreneurship | |
| Facilitate firm dynamism by setting up appropriate framework conditions | – European Regulation on Business Insolvency, EU |
| Catalyse the entrepreneurial ecosystem | – Impact Hub, global network – Startup Lithuania |
| Enable the scaling of start-ups | – TechCity Upscale Programme, UK |
| Address cultural attitudes towards risk | – European Forum for Entrepreneurship Research (EFER) European Entrepreneurship Colloquium (EEC) Entrepreneurship Educator Training, EU |
| Build support schemes for migrant entrepreneurs | – ASM Hamburg, Germany |
| Smart infrastructure for a more connected Europe | |
| Roll out fast broadband for all | – Superfast Cornwall (high-speed broadband to connect rural firms to the greater economy), UK |
| Accelerate investment in smart transport infrastructure | – IoT applied to urban mobility: Real Time Passenger Information systems in Madrid, Spain |
| Invest in smart grids as the backbone of the coming energy transition | – Enexis (smart grids for electric cars as part of Digital Energy System 4.0), Netherlands – NordBalt (integration between the Nordic and Baltic electricity markets), Sweden/Lithuania |
| Labour market and human capital | |
| Equip young people with the best possible cognitive abilities | – Early childhood education programmes |
| Create a coherent strategy for teaching advanced digital skills | – European Institute of Innovation & Technology (EIT) Knowledge and Innovation Communities (KICs), several locations in Europe |
| Access to finance for innovative firms | |
| Promote equity financing, in particular venture and growth capital funding | – European Angels Fund – European Investment Fund–National Promotional Institutions (EIF–NPI) Equity Platform, EU – European Innovation Council: Start-up and Scale-up initiative, EU |
| Mitigate the effects of market failures for small and medium-sized enterprises with credit guarantees | – InnovFin SME Guarantee Facility – Employment and Social Innovation (EaSI) Guarantee Financial Instrument and Social Impact Accelerator (SIA), EU |
| Improve investment readiness | – InvestHorizon (Horizon 2020 Work Programme on Access to Finance), EU |
| Increase the role of non-bank intermediaries in small and medium-sized enterprise finance, including FinTech and non-bank lending | – Novo fund (supporting bank lending through small and medium-sized enterprise securitization), France – SBOLT (securitization based on peer-to-peer lending), EU/Germany |

1. Inclusion and Competitiveness – Beyond the Trade-Off

Stagnating wages, the lasting repercussions of the financial crisis as well as immense uncertainty over the economic prospects of many Europeans are creating major tensions in Europe. Real wages are still below pre-crisis levels for the majority of European workers¹¹ and productivity growth has been on a steady decline from more than 5% in 1975 to under 0.7% in 2015.¹² The youth unemployment rate is still very high at almost 20% for the EU28 on average.¹³ Furthermore, as technology is rapidly advancing, medium-skilled jobs are under threat. Figures for key European economies show moderate growth over the 1995-2015 period for low-skilled occupations (up to 7.5% in Italy) and slightly higher growth for high-skilled occupations (more than 10% in the United Kingdom and France); medium-skilled jobs on the other hand have been declining across the board, by more than 10% for example in Italy and Spain over the period.¹⁴ This overall situation of increasing polarization and weak productivity growth calls for an urgent mobilization of resources by committed coalitions of representatives of the public and private sectors, academia and civil society to restore Europe's growth performance on a substantially more equitable basis.

The Europe Inclusive Growth and Competitiveness Lab has taken up the challenge of identifying concrete areas for action and catalysing a new public-private coalition to accelerate the mobilization of resources. In wide-reaching consultations with experts, the Lab has also identified a series of practical examples that can provide starting points for implementation. This initiative is only a point of departure for the major challenge of building a more inclusive future for Europe across the chasms arising from increasingly rapid technological change. The community of European stakeholders is called upon to collaborate in developing the initiative further. In addition, a necessary complement to the initiatives proposed in this White Paper is the urgent need to design and implement fiscally sustainable and socially adequate safety nets across Europe to help meet the challenges ahead.

Digital and emerging technologies have immense potential to generate new growth, yet profound technological transformations also reshape national and global distributions of income, wealth and opportunities in profound ways, bringing structural change to our societies (Box 1).¹⁵ Leveraging technology to achieve higher growth will require that leaders and societies be prepared to manage the social repercussions, in particular the strong polarization dynamics inherent in the technologies of the Third and Fourth Industrial Revolutions. History provides many warnings for the dramatic upheavals that can result from a failure to do so (Coyle, 2016). Yet technology can play a double role: it can also be directly leveraged as a tool to make the growth

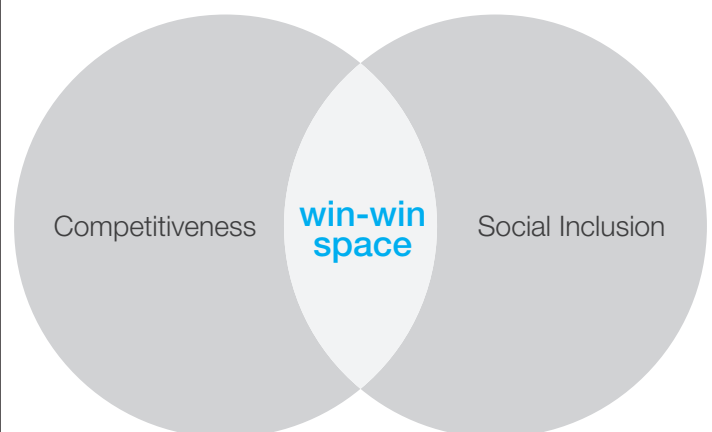
process more inclusive as the nearly 1,000 European digital social innovation initiatives show (EC, 2015). A win-win space of initiatives and policies exists that is good for both competitiveness and inclusion and that technology can help accelerate.

Despite the criticality of the current situation, the encouraging news is that Europe has many bright poles of excellence from which it can and should draw strength. The European inclusive growth and competitiveness frontiers coincide with the global frontiers on many dimensions (World Economic Forum, 2016b and 2017). And as the practical examples (entitled "Practice" in this paper) show, Europe does not suffer from a lack of ideas.

There is thus much scope for the transfer of knowledge, know-how and good practice to those parts of the EU that are currently struggling the most. The key is for European stakeholders to come together to accelerate and, importantly, to scale and spread existing initiatives.

Throughout this paper, the need to link competitiveness and inclusion and to operate in the win-win space of initiatives that are good for productivity growth and inclusion (Figure 1) is emphasized. This approach breaks with the equity-efficiency trade-off thinking and instead recognizes that interventions can be efficiency and equity enhancing at the same time. The trade-off will become less relevant if the policy focus can shift from redistribution to pre-distribution (Heckman, 2015; Bell, Chetty et al., 2016¹⁶).

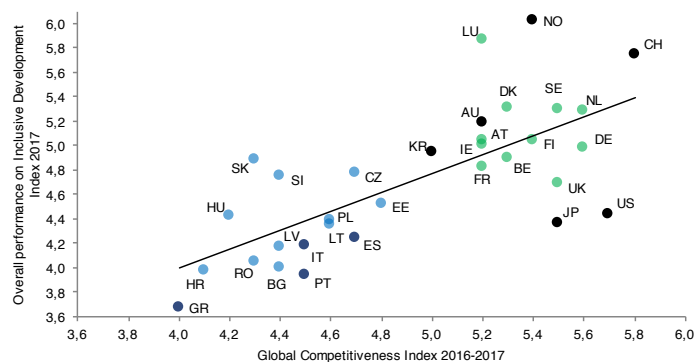
Figure 1: Targeting the Win-Win Space



Source: World Economic Forum, 2015b

As illustrated in Figure 2 good performance on both competitiveness and inclusion is by no means a contradiction.

Figure 2: Competitiveness vs Inclusive Growth Performance
EU28 and leading economies, scores from 1 (worst) to 7 (best)



Note: Malta and Cyprus are excluded from *The Inclusive Growth and Development Report 2017* due to data limitations.

Source: Data from *The Global Competitiveness Report 2016-2017* and *The Inclusive Growth and Development Report 2017*

The term “inclusion” is used here in a broad sense, encompassing first and foremost a concern with equal opportunity and social mobility over time. Both inequality at the individual level as well as gaps in economic performance between larger economic units, such as subregions and countries, and at the subnational level are considered. These different dimensions of inequality are each associated with separate levers to achieve greater inclusion, which should all be taken advantage of. Note that elements of competitiveness may be related to various forms of inclusion in different ways. For example, innovation may be positive for social mobility while increasing top-level income inequality (Aghion et al., 2016).

While high-level consensus is emerging on the importance of achieving growth with inclusion, consistent implementation is still lacking. Progress in translating this high-level ambition into real change will require a significant and persistent effort to change mindsets that still reflexively see inclusion as an afterthought to growth. This paper sets out a framework to guide thinking about the interlinkages between competitiveness and inclusion. It offers a series of win-win interventions to enhance competitiveness and growth that at the same time help to realize a more inclusive society. To illustrate these recommendations, this paper describes examples of practical steps taken by the public and private sectors throughout Europe and in other parts of the world.

The focus of this paper is the European Union (EU) and it seeks to have general relevance for the EU as a whole. This is not least due to the fact that in many cases solutions to current challenges do not lie at the national level but have to be at the EU level. At the same time, it is necessary to recognize differences within the region, which means that some of the recommendations will be more relevant in some locations than in others. The need to adapt to the local context and priorities is clear. The initiative is thus European in the sense of spanning the EU, but it acknowledges the diversity of local challenges and fully embraces the principle of subsidiarity.

Box 1: The Fourth Industrial Revolution

The beginning of this global transformation is characterized by the convergence of digital, physical and biological technologies in ways that are changing both the world and the very idea of what it means to be human. The changes are historic in terms of their size, speed and scope. This transformation – the Fourth Industrial Revolution – is not defined by any particular set of emerging technologies themselves, but rather by the transition to new systems that are being built on the infrastructure of the digital revolution. As these individual technologies become ubiquitous, they will fundamentally alter the way humans produce, consume, communicate, move, generate energy and interact with each other. And given the new powers in genetic engineering and neurotechnologies, they may directly impact who we are and how we think and behave. The fundamental and global nature of this revolution also poses new threats related to the disruptions it may cause – affecting labour markets and the future of work, income levels and geopolitical security as well as social value systems and ethical frameworks.

Adapted from Schwab, 2016

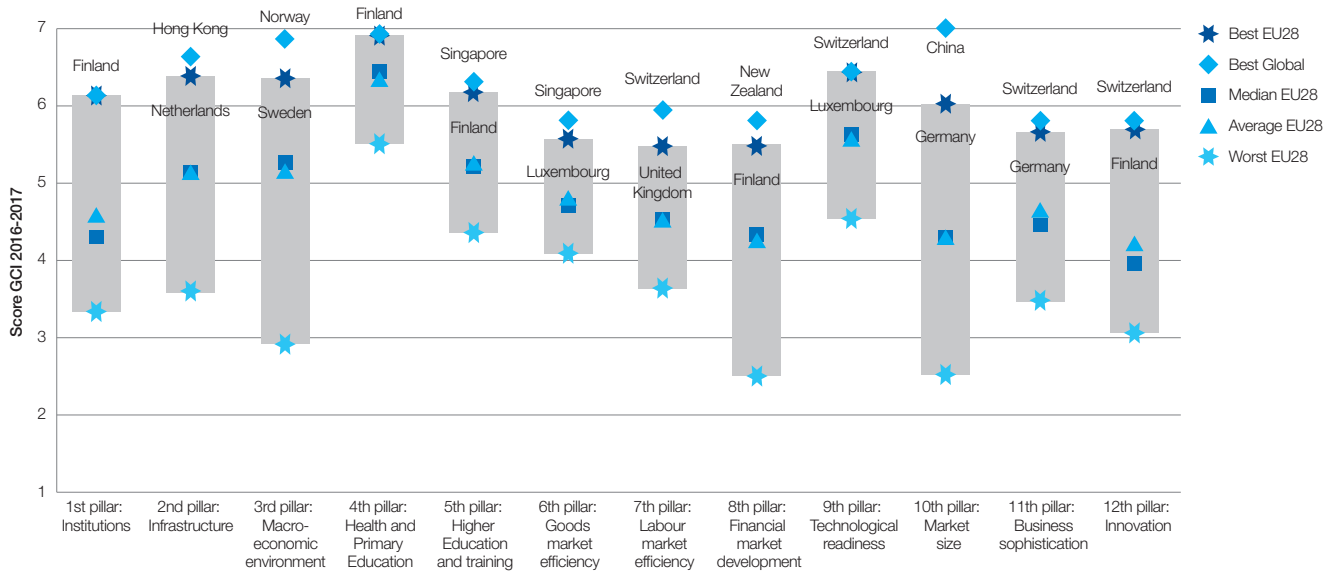
1.1 The competitiveness and inclusive growth landscape in Europe

Europe is one of the most economically advanced regions in the world. The World Economic Forum *Global Competitiveness Report 2016-2017* ranks six of the EU28 countries among the world’s top 12 most competitive economies (Figure 3). Nonetheless, the EU is also a region of contrasts, with different countries facing different challenges, which is even threatening the cohesion of the EU project.

The EU is experiencing uneven growth some eight years after the global financial crisis. While growth in gross domestic product (GDP) was only about 1% for two of the largest economies (France and Italy) in 2016, others grew by more than 3% (Bulgaria, Ireland, Luxembourg, Malta, Romania, Slovakia, Spain and Sweden).¹⁷ Over a longer time horizon, stagnating productivity and potential output growth (Figures 4 and 5) mark the situation. The trend towards inward-looking policies in many EU countries further threatens the fundamentals that have underpinned the EU’s strong economic position, and could undermine economic growth in the future. Growth forecasts for the EU28 were revised downward following the Brexit vote in June 2016 (EC, 2016a).

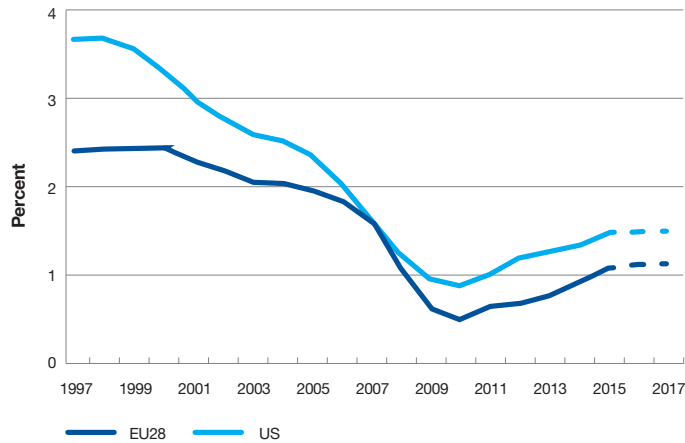
Patterns of European income inequality unfold along the following lines: while the EU28 average income inequality before taxes and transfers is as high as in the United States, the average net income inequality after taxes and transfers is significantly lower in the EU28, and has been falling on average in recent years (Figure 6). Overall, income inequality in Europe does not stand out as particularly high when compared internationally. However, rates of unemployment and especially youth unemployment do stand out, as does low social mobility, in particular in the United Kingdom and Southern European countries (Darvas and Wolff, 2016). A further dimension of European inequality is the major regional divide in economic prosperity: while Eastern European countries have been converging with the rest of the EU (Box 2), the financial crisis has been a major setback, particularly for Southern Europe (Darvas and Wolff, 2016) where income inequality is also generally higher than in other areas (Figure 7).

Figure 3: Global Competitiveness Index Score Range for EU28, All Pillars, 2016-2017, Score 1-7



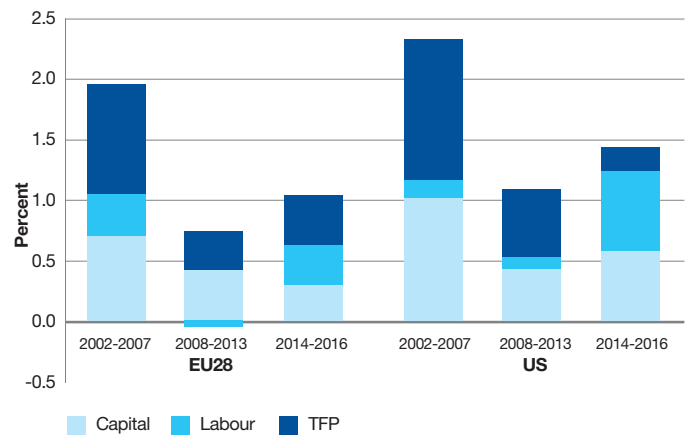
Notes: 1=worst, 7=best; See the Appendix for information on the GCI methodology. Source: Data from *The Global Competitiveness Report 2016-2017*

Figure 4: Evolution of Potential Output Growth over Time (EU28 vs US), 1997-2017 (%)



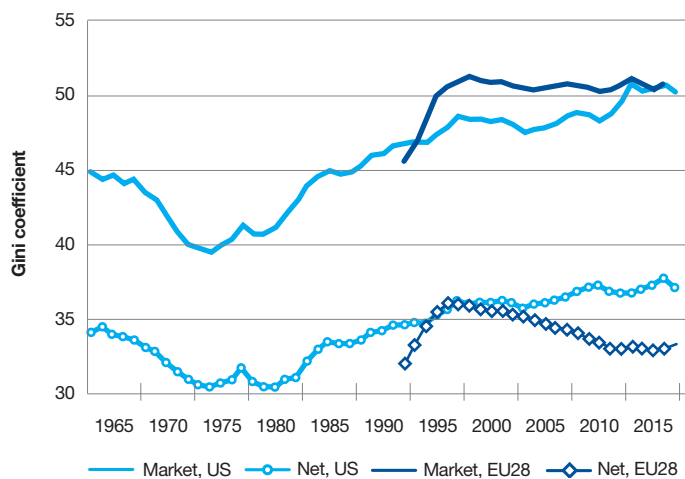
Source: EIB/ECON Potential Output Model, November 2016 estimates (authors' calculations)

Figure 5: Decomposition of Potential Output Growth – Contribution of Capital, Labour and TFP* (EU28 vs US), 2002-2016 (%)



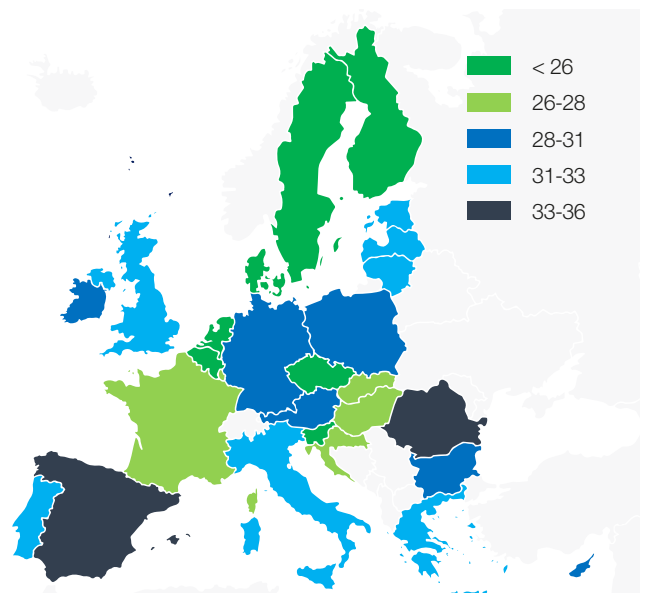
*TFP = total factor productivity, a measure of efficiency. Source: EIB/ECON Potential Output Model, November 2016 estimates (authors' calculations)

Figure 6: Gini Coefficient of Market (Before Taxes and Transfers) and Net Income Inequality (EU28 vs US), 1965-2015



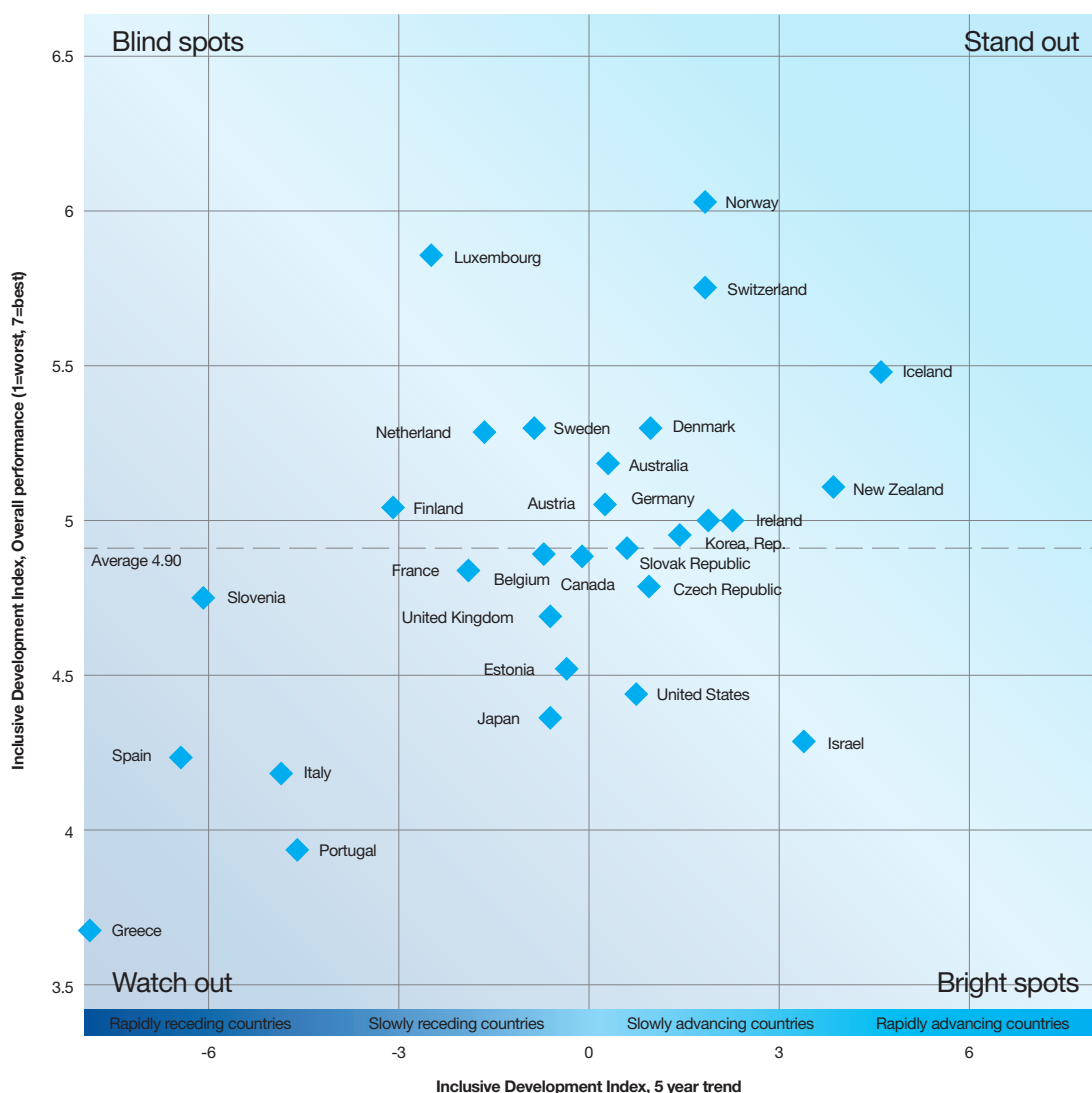
Note: A Gini index of zero represents perfect equality (i.e. incomes are perfectly evenly distributed) and a Gini index of 100 indicates perfect inequality (all incomes are owned by one person). Sources: Darvas and Wolff (2016), Figure 2, based on US data: the Standardized World Income Inequality Database (SWIID) from Solt (2016); EU28 data: Darvas (2016), based on the individual country data from Solt (2016). Thereby, the US and EU28 data reported in this figure are comparable.

Figure 7: Gini Coefficient of Net Disposable Income: EU28, 2000-2014 Average



Source: Darvas and Wolff, 2016: Figure 4

Figure 8: Inclusive Development Level and Trend for Advanced Economies



Source: Based on Figure 8 of *The Inclusive Growth and Development Report 2017*

Furthermore, in the wake of the global financial crisis, the method of fiscal consolidation has meant that national governments are increasingly bypassing the win-win space, reducing both the quality and quantity of public spending. As Darvas and Wolff (2016) show, EU countries have cut public investment spending significantly, with a strong negative effect on GDP and employment. While they have broadly maintained social spending and for the most part protected pensions, the countries (particularly those facing the greatest fiscal pressure) have cut quasi-investment spending on families and education. Such trends promote neither long-term growth nor inclusion.

An aggregate measure of inclusive growth components, which includes but goes beyond standard measures of inequality, shows some worrying signs of deteriorating conditions in the majority of EU28 countries. Figure 8 maps the normalized aggregate score for 12 performance indicators of inclusive growth across three components: (i) growth and development (GDP per capita, labour productivity, healthy life expectancy, employment); (ii) inclusion (net income Gini, poverty rate, wealth Gini and median living standards); and (iii) intergenerational equity (natural capital, carbon intensity, public debt and dependency ratio). The graph shows levels and the five-year trend. Note that only five of the EU28 countries – Ireland, Germany, the Czech Republic, Denmark and Austria – have improved their performance on this aggregate over the last five

years. Five countries show a rapidly deteriorating performance (Greece, Spain, Slovenia, Italy and Portugal), with the rest experiencing slower deterioration.

Technological developments have been affecting the income distribution in the EU differently than elsewhere in the world. In general, two mechanisms are relevant: first, skill-biased technological change, used to explain patterns of skill premia and top-level income inequality; and second, the theory of automating routine jobs, which increases polarization of wage distribution. Currently, the former mechanism does not seem to be relevant for European economies. Indeed, evidence suggests that the skill premium has been falling in most European countries, with the exception of Germany (Darvas and Wolff, 2016).¹⁸ The other mechanism, however, is becoming increasingly important as routine jobs are becoming systematically automated, accompanied by a shrinking middle class (Jaimovich and Siu, 2012; Frey and Osborne, 2013).¹⁹ Extended further, this development may exacerbate another dimension of Europe’s pattern of inequality, namely low social mobility in several countries, and is a major threat to the stability of the European middle class.

A framework introduced in the following section will help to break down the macro patterns observed for European growth and inequality into their most important drivers.

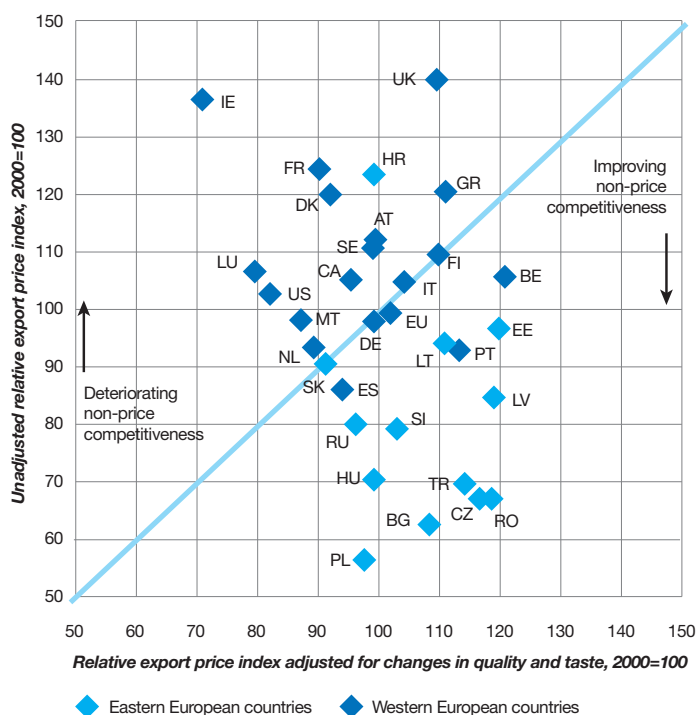
Box 2: The Competitiveness of Central, Eastern and South-Eastern Europe EU Member States: Trends and Prospects²⁰

The rapid and deep integration of Central, Eastern and South-Eastern Europe (CESEE) in world economic structures has supported its remarkable catch-up process. The international market shares of CESEE countries have increased tremendously as the region has benefited from liberalized market access and promoted exports of goods and services to the rest of Europe and other countries around the world. This is even more remarkable given China's emergence over the past decades as a main player in the world economy, which has notably increased competitive pressures in international markets. Yet, the CESEE economies have withstood these pressures. An analysis of the factors behind this achievement also point to future challenges in competitiveness for CESEE.

Upgrading the quality of CESEE export goods has played a significant role.

Figure 9 clearly shows that improvements in price competitiveness clearly shows that improvements in price competitiveness alone cannot explain the growth of CESEE market shares. Between 2000 and 2014, the export prices of most CESEE countries showed stronger increases than the global average (indicated by a value of over 100 on the horizontal axis). The development of unit labour costs and real effective exchange rates also corroborates this finding. However, a favourable development in non-price competitiveness absorbed decreases in price competitiveness. In this context, upgrading the quality of export goods has played an especially important role. If prices are adjusted for changes in quality and consumer tastes, most CESEE countries have managed to reduce their export prices relative to global competitors since 2000 (indicated by a value below 100 on the vertical axis).

Figure 9: Changes in Export Prices Relative to the World Average, 2000-2014

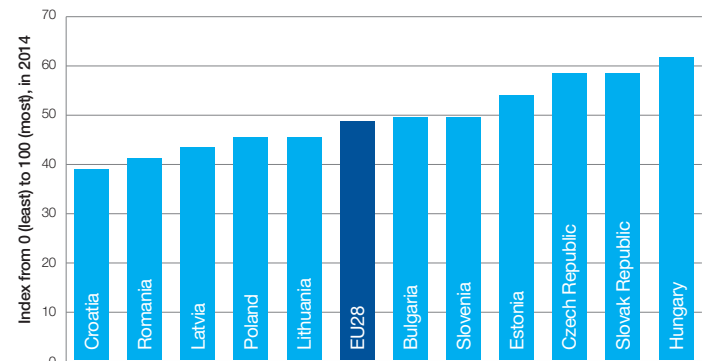


Source: ECB/COMPNET data

Integration in global value chains reshapes the view on competitiveness.

CESEE's level of integration into international production networks (global value chains [GVCs]) is already surprisingly high already surprisingly high (Figure 10). In 2014, certain Central European countries (Hungary, Slovenia, Slovakia and the Czech Republic) were even more integrated into GVCs than the EU average, reaching a level comparable to that of the Netherlands or Belgium. Hungary even reported the third-highest level of integration in the EU, after Malta and Luxembourg. The Central European countries are part of their region's automobile production cluster, centred on the highly competitive German car industry.

Figure 10: Participation in Global Value Chains



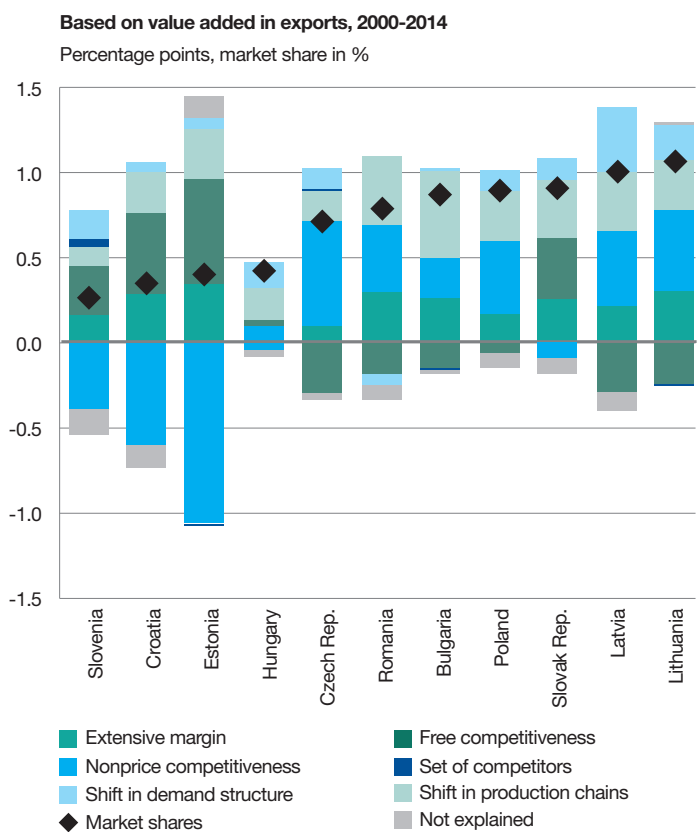
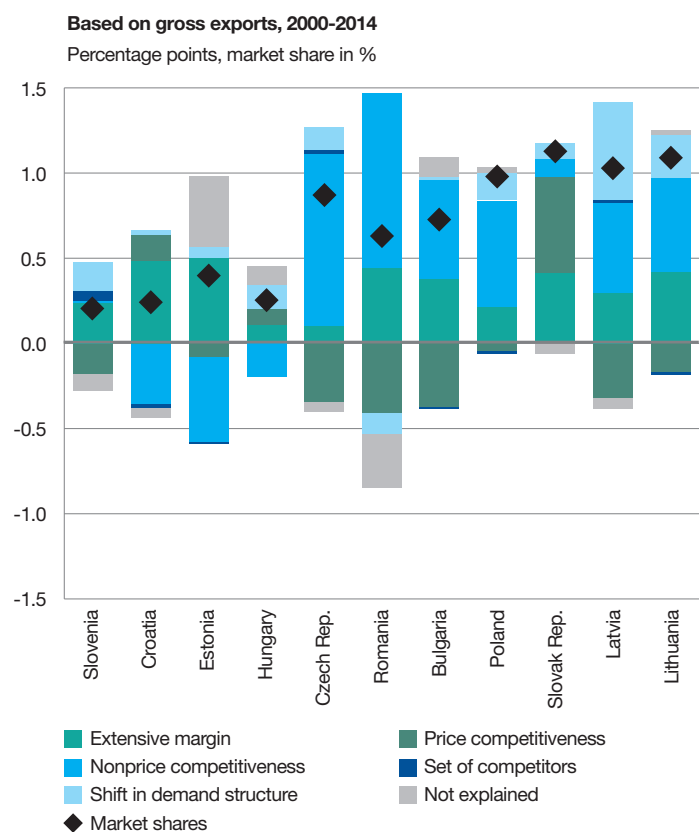
Source: ECB/COMPNET data

Quality improvements often hinge on processing higher quality inputs.

Figure 11 breaks out the gains in global market shares achieved by the CESEE countries between 2000 and 2014. When focusing on the traditional concept of gross trade flows (i.e. exports in the classical sense, incorporating both domestic and foreign value added in export goods), CESEE countries improved their global market shares mainly through rising non-price competitiveness and despite a loss in price competitiveness (Figure 11, left-hand panel). Furthermore, the extensive margin, which compromised growth in market shares related to entering entirely new markets, played an important role. This was clearly related to the former centrally planned economies opening up to world trade, and to the easier access to European and international markets.

The factors driving market share gains, however, change if the analysis focuses on the more policy-relevant domestic value added in exports – namely, if the value of domestic exports is adjusted for imported inputs into production. Positive contributions from the extensive margin and gains in non-price competitiveness are greatly diminished. Instead, market share gains have apparently strongly profited from deeper integration in international production networks (i.e. shifts in production chains). This reflects the CESEE countries' position in global value chains as places for assembling high-quality inputs and parts. Put differently, CESEE economies would have experienced even stronger gains in global market shares had they also increased the relative quality and value added of the domestic content of their export goods, or moved into higher-value-added segments of the production network.

Figure 11: Decomposition of Changes in World Market Shares



Source: Update from Benkovskis and Wörz, 2016

Evidence shows that the CESEE countries have become more competitive within production networks mainly by assembling rather than producing high-quality export goods. In other words, the domestic value added in those exports is often rather small. To some extent, the better quality of imported intermediate inputs, rather than genuine quality enhancements in domestic production, is improving the quality of export goods.

The way forward

Ample room exists for further improvements. Most CESEE countries show mid-level rankings in international competitiveness; in the World Economic Forum *Global Competitiveness Report 2016–2017*, the average rank reported for CESEE countries was 51, compared to an average of 28 for Western European countries.

The ranking's sub-indices show that CESEE countries lag behind Western European EU Member States, especially on innovation and business sophistication. The gap is less pronounced in basic requirements and efficiency enhancers. However, the variation is very high for outcomes of individual indicators composing the "basic requirements" sub-index. While CESEE countries perform somewhat better than those of Western Europe in the macroeconomic environment, and are broadly similar on health and education, a noticeable gap exists in infrastructure and institutions.

Against this background, the future for CESEE countries seems obvious. Investments in infrastructure and institutions, as well as the creation of a more innovation-friendly environment, seem pivotal to promoting the expansion of the domestic exporting industry into new and potentially higher-value-added fields of production. This is also the way towards achieving more domestic value added in export production to further exploit the benefits of integrating with European production networks.

References

- Benkovskis and Wörz, 2015
- Benkovskis and Wörz, 2016
- Karadeloglou and Benkovskis (eds), 2015
- Ritzberger-Grünwald et al., 2016

1.2 Framework for assessing competitiveness and inclusive growth

This White Paper identifies five dimensions of inclusive growth and competitiveness that are particularly relevant for Europe's performance against the backdrop of the Fourth Industrial Revolution. Each of these dimensions – two drivers and three enablers – contains elements of both competitiveness and inclusion. An open, diverse and collaborative environment for innovation, for example, contributes to productivity growth and allows all members of society to participate in and benefit from innovation processes. Business dynamism and entrepreneurship are important for catalysing innovative, productivity-enhancing ideas, and contribute to developing an inclusive economic system. Under the appropriate framework conditions, they can create broad-based opportunities for growth and inclusion.

The framework builds on the competitiveness work carried out by the World Economic Forum since 1979, in particular its Global Competitiveness Index, as well as recent competitiveness research by the European Investment Bank (EIB, 2016b) and *The Inclusive Growth and Development Report (2015, 2017)*. For each case, the competitiveness-inclusion nexus is explained in more detail in the relevant section.

Innovation and **business dynamism and entrepreneurship** are considered the key drivers of inclusive growth and competitiveness in Europe (Figure 12). For new ideas to spread in the region through the growth of innovative companies, the economy needs to be quick to deploy its resources to their most productive use. The basics must also be gotten right. As the main enablers, three important dimensions are explored in more detail: the **markets for goods and services**, the **labour market and human capital** and access to **financing of productive and innovative firms**. The first concerns entry barriers for domestic and foreign companies and the level of competition in a market; the second relates to preparedness to match current and future demands for skills, including digital skills, and the third recognizes that innovative firms can only thrive and grow

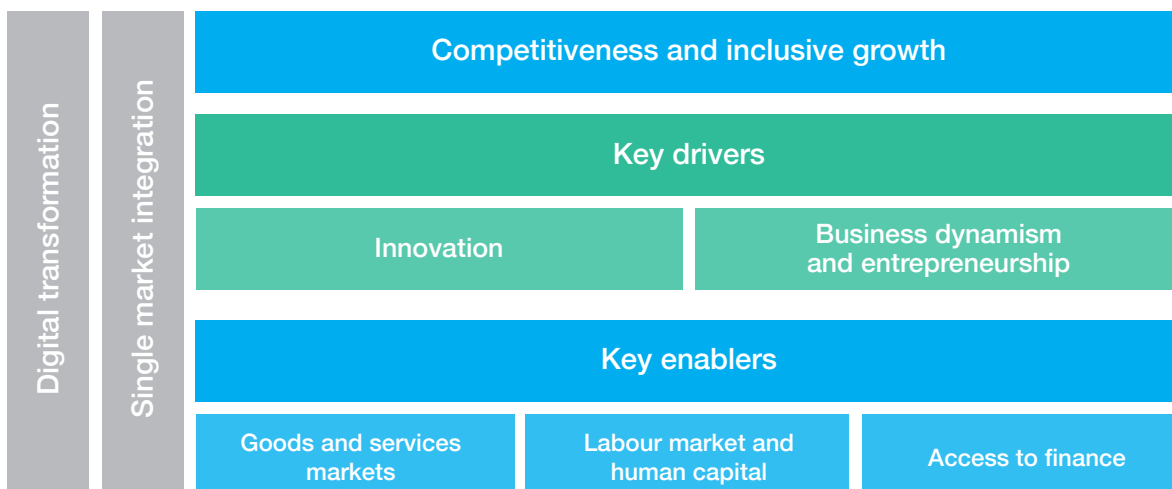
if financial markets provide the necessary financing, a key ingredient for competitiveness and inclusion.

A cross-cutting issue is the transformational impact of digital technology and its importance for both competitiveness and inclusion. Digital technologies are not only a vitally strategic arena for innovation and entrepreneurship, but they play a key role in the development of smart infrastructure, future skills needs and the future of finance. Digital technologies need to be considered both in terms of how they impact on inclusion and how they can be deliberately used to foster a more inclusive society.

In Europe, single market integration is another cross-cutting issue that has ramifications across the economy. It has implications for access to goods and services markets, labour mobility and financial flows. It is linked to the digital transformation through the need to create a harmonized digital economy across Europe.

The following sections consider the status quo in Europe for each of these drivers and enablers separately and present public-private practices that can help to overcome bottlenecks to more competitiveness and inclusion in light of the Fourth Industrial Revolution.

Figure 12: Europe Inclusive Growth and Competitiveness Lab Framework



2. Innovation and Technology Diffusion

With a shrinking labour force and few resources to fall back on, the EU has to rely heavily on innovation and creative destruction to drive and spread productivity growth.

Digital technologies are increasing the urgency for firms to innovate continuously. This is especially relevant as product cycles become shorter and industries strategically important to the EU28, such as automotive and financial, are being transformed through new business models (World Economic Forum, 2016c). To the extent that digital platforms are reducing the fixed cost of market entry in many sectors, they allow for greater participation and thereby generate effects that promote competition and encourage innovation across the board. In the information and communications technology (ICT) and digital services sectors, where much of the value created comes from the new platforms, open-source technologies increase firms' ability to leapfrog others; they allow for almost instantaneous value creation through recombination, with little upfront investment (Varian, 2010). Yet, those competing to build new platforms face additional pressure to innovate fast because network effects are creating winner-take-all dynamics, placing an infinite premium on reaching the destination first.

The empirical relationship between innovation and inequality is complex. Recent evidence indicates that the more innovative economies, as measured by patenting activity, tend to have higher top-level inequality (Aghion et al., 2016). This may simply be the fair reward for innovation and the resulting risk-taking. However, when network effects are strong, there is a danger that top-level inequality solidifies into concentration of economic rents in the long term. The same study suggests that social mobility tends to be higher in more innovative economies, where barriers to entry are low and, particularly, where incumbents' lobbying activity is constrained. Yet, other recent research shows that this social mobility for those who innovate successfully is limited to certain groups; targeted efforts are necessary to reach the potential for innovation among people of all backgrounds. A key lesson from recent US-based research in this area is that significant gaps in innovation occur across parental income groups, race and gender, driven by differences in exposure to innovative environments (Bell, Chetty et al., 2016). Other dimensions of the innovation-inequality relationship are equally important, including the intra-industry and spatial ones. In particular, the tendency of high-return, knowledge-intensive industries to cluster has led to sharper spatial divides.

Progress in five areas will largely determine how widely Europeans will feel the gains from future innovations: (i) boosting private investment in research and development (R&D) and aligning incentives for socially beneficial innovation by setting up multistakeholder innovation partnerships; (ii) realizing Europe's full potential for innovation by diversifying the innovator base; (iii) scaling digital social innovation initiatives successfully; (iv) addressing the growing divides in intra-industry productivity by diffusing the latest general purpose technologies more quickly; and (v) addressing geographical divides in innovation between European countries and at the subnational level between regions, as well as between rural and urban areas.

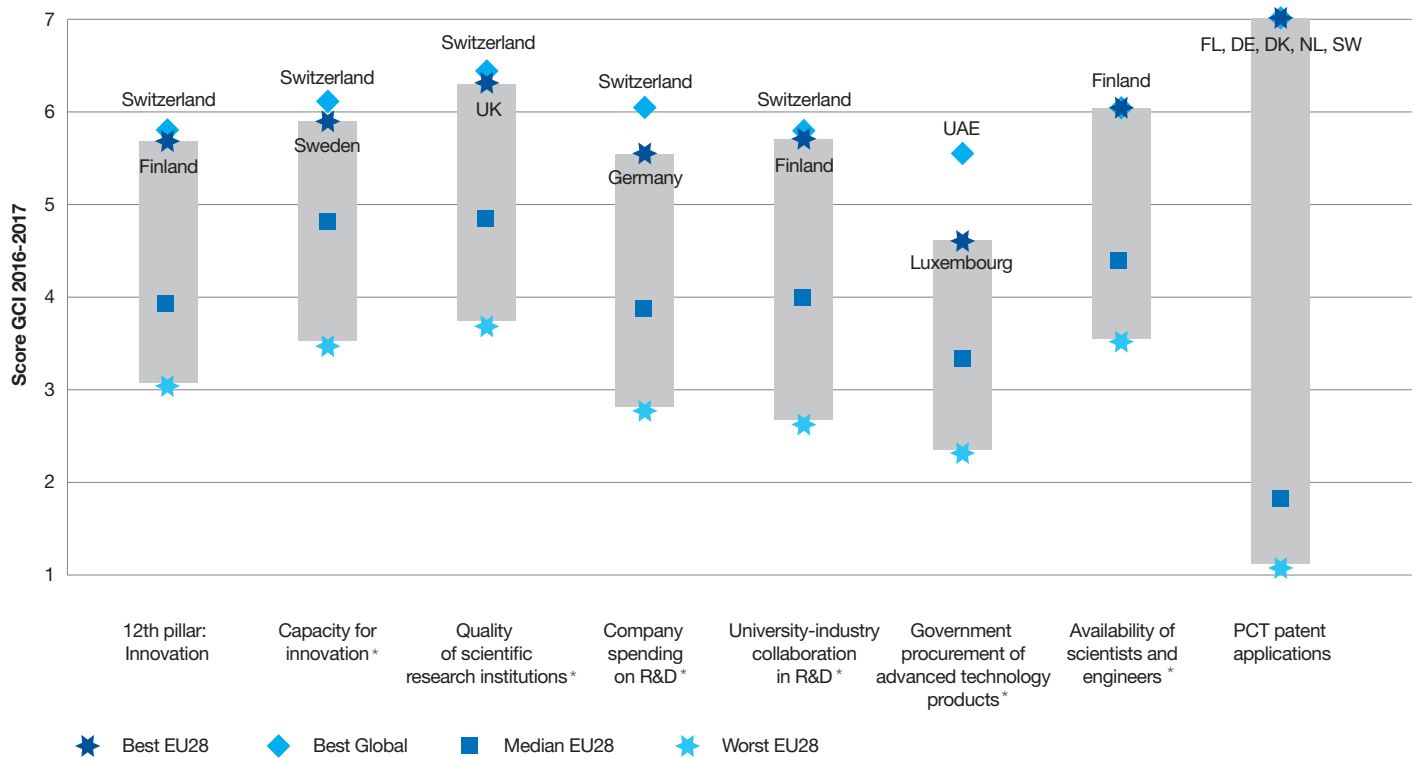
2.1 Promote public-private partnerships on innovation

Where social gains from innovation are greater than private returns, private investors lack incentives to engage in socially optimal levels of innovation. In these cases, public-sector initiatives can help attract private investment in R&D, which is generally low in Europe compared to South Korea, Japan, the United States and China (EC, 2016). Innovation that helps to mitigate climate change is a classic example: efforts related to the 2015 Paris Climate Conference, for example, use public guarantees to encourage private investment in mitigating technologies. These public-private partnerships are ideally embedded in a larger process of multistakeholder consultations which help to reveal priorities in addressing social challenges. The Strategic Innovation Programmes of Vinnova, Sweden's innovation agency, represent broader platforms that bring together companies, universities, research institutes and the public sector to determine research priorities and to pool resources. Accompanying initiatives that include civil society can make innovation processes even more inclusive: the Danish Board of Technology Foundation,²¹ for example, engages citizens to provide feedback to decision-makers on research priorities, and plays an active role in disseminating research results to the general public.

Another important facet of public-private collaboration is the exchange between universities and industry, which is currently perceived as relatively weak in Europe. The Global Competitiveness Index records business executives' perceptions of various parts of their national innovation system (Figure 13).

Figure 13: Drivers of Innovation, EU28 Performance

Global Competitiveness Index Innovation Pillar and selected innovation indicators, Score 1-7



Note: 1=worst, 7=best; PCT = Patent Cooperation Treaty; * denotes perception-based indicators from the World Economic Forum's *Executive Opinion Survey*
 Source: Data from *The Global Competitiveness Report 2016-2017*

Concerning the six perception indicators (denoted by * in Figure 13), EU28 executives are most positive about their countries' capacity for innovation and the quality of scientific research institutions, followed by the availability of scientists and engineers. Public-private innovation records somewhat lower scores for university-industry collaboration and government procurement of advanced technologies. Private R&D spending is a weak link in the innovation system, a finding also demonstrated by mapping perception data from the Global Competitiveness Index.

Practice: Vinnova Strategic Innovation Programmes, Sweden

Vinnova, the Swedish innovation agency, is a needs-driven funder of research that catalyses collaborations between companies, universities, research institutes and the public sector. Launched in 1994, its Strategic Partnership Programmes cover Sweden's strategically important sectors of forestry and timber, transport, information technologies (IT), telecommunications, mining, steel, bioscience and financial market research. Ventures usually involve at least 50% co-financing by the private sector. Building on these partnerships, Vinnova introduced Strategic Innovation Programmes (SIPs) in 2012. SIPs have proven to be effective vehicles for multistakeholder collaboration in defining the direction of new strategic research and innovation ventures at the sector level and in channelling investments accordingly. SIPs are developed to improve Sweden's competitiveness in selected sectors and to provide solutions to its most important social challenges.

Source: Vinnova, <http://www.vinnova.se/en/Our-activities/Cross-border-cooperation/Cooperation-Programmes/> <http://www.vinnova.se/en/>

2.2 Diversify the innovator base

To reach its full potential for innovation, Europe must identify all of its population's talents. Recent research conducted under the Equality of Opportunity project (Bell, Chetty et al., 2016) suggests much innovative talent goes unnoticed; not all population groups are exposed to innovative environments from an early age, a key determinant of success for an innovator later in life. In particular, a lack of exposure to environments that encourage innovation explains gaps by parental income group, gender and race in the United States.

Diversifying the innovator base is also an important, decentralized mechanism for reaching underserved markets and ensuring innovations are socially beneficial. As the pool of innovators becomes more diverse, innovations should serve the needs and preferences of more diverse demographic groups. This can help align incentives for socially beneficial innovation through the composition of the group of innovators, which complements the external alignment through public-private partnerships already described.

The mission of the i.am.angel Foundation reflects the belief that innovative talent is hidden across the entire population. The Foundation encourages youth from one of the most deprived neighbourhoods in Los Angeles (USA) to discover their potential as technology pioneers.

Practice: i.am.angel Foundation/i.am.STEAM programmes

The i.am.angel Foundation believes in the innovative potential of every citizen, and provides exposure to environments that encourage innovation for groups that normally would not have such access. Established in 2009 by the former singer Will.i.am, the Foundation sought to give a new lease of life to Boyle Heights, his Los Angeles neighbourhood. Once a thriving industrial centre, the neighbourhood suffered from industrial decline and poverty. The Foundation works to give Boyle Heights youth the skills to innovate and thrive in the digital economy. It encourages them to pursue a college education and take up STEAM (science, technology, engineering, arts and math) subjects by providing scholarships, offering college preparation and STEAM education. Cynthia Erenas, the winner of a robotics contest run by the Foundation, went from a seemingly predetermined path in the food trade to following aspirations of becoming a student at the Massachusetts Institute of Technology.

Sources: i.am.angel Foundation, <http://iamangelfoundation.org/>; TEDxBoyleHeights, "Now making robots, instead of pan (bread): Cynthia Erenas", *YouTube*, 10 June 2014, <https://www.youtube.com/watch?v=EaCAVPIZQuM>

2.3 Create the right conditions for (digital) social innovation to flourish

While the vast majority of internet activity has been commercial, a recent mapping exercise by the European Commission (EC, 2015) shows that nearly 1,000 European social innovators are using digital networks to build communities that advance social causes by sharing resources and spreading power.

Digital social innovation (DSI) activities are improving Europeans' living conditions in many ways, including through:

- Initiatives on open democracy that promote transparency of government data and greater citizen participation
- Funding acceleration and incubation
- The open access movement that promotes safeguarding a bottom-up, privacy-preserving decentralized infrastructure to maintain the open internet
- Awareness networks for emergency response or longer-term mapping of environmental conditions
- Skills- and resource-sharing platforms that support the growth of the collaborative economy
- New ways of creating and using 3D printing technologies for products designed and prototyped by a community

While the European Commission (EC, 2015) identifies four highly active and well-connected hubs in the European DSI landscape, the vast majority of the 1,000 initiatives have only very few connections and are often of small scale. The challenge is, therefore, how to bring these initiatives to scale. The example of the Treviso Grand Hospital illustrates that scaling of social innovation is indeed possible and shows a new type of coalition between social impact investors, public and private sector that can make this type of venture happen.

Practice: Ospedal Grando, Treviso

The public health infrastructure in Italy is facing pressure to serve more people with fewer resources. In response, the city of Treviso has developed an innovative public-private partnership (PPP) to build and operate a new 990-bed hospital with a total investment of €250 million. Construction will begin in 2017.

Such an infrastructural project can be an engine for local innovation and growth. To exploit this potential, Lendlease, the multinational corporation specialized in urban regeneration leading the consortium partnership Ospedal Grando srl, has joined forces with PlusValue.org (a research and consultancy venture specialized in social impact strategy) to embed social impact investing in the PPP and realize this ambition. Ospedal Grando Impact Investing (OGII) is the new local fund established to invest in new businesses and services to increase the positive impact of the hospital in the community. This pilot approach realizes the new emphasis put on social impact by the Juncker Investment Package and new European regulation on public procurement.

Currently investors are engaging local stakeholders, including the City Council, Diocese, industrialists and third-sector organizations to identify needs and opportunities on the territory. Community engagement is fundamental to identify the potential and mobilize the community for an effective social impact strategy. For instance, one project considered as eligible to OGII is a social-impact bond to reduce emergency room visits and hospitalization rates and length through an ICT-based telemonitoring system. In 2017, the consortium plans to put in place online tools to monitor the impact and keep the community engaged during all the phases of the project, building a database for social impact assessment.

Source: Contributed by Robert Madelin, University of Oxford

2.4 Accelerate the diffusion of innovation among firms

As a complement to innovation activities, the diffusion of new ideas is crucial to realizing broad-based private and social gains from innovation. The next two topics present ideas for ensuring better diffusion of key technologies across European firms and regions.

While European firms are at the frontier of global innovation in many industries, a significant intra-industry gap exists between leaders and followers (Andrews et al., 2015).²² This shows in the gap in average productivity between frontier and follower firms, which has grown rapidly in recent years (Andrews, Criscuolo and Gal, 2016). Associated with these productivity dynamics is an equally fast-growing gap in wages between workers in frontier firms and those in follower firms (Nicoletti and Schwellnus, forthcoming). Greater diffusion of technology, in particular of key basic technologies, is an important element of increasing productivity growth for the industry as a whole, and will help spread productivity gains from innovation more evenly across society.

Anecdotal evidence suggests that the innovations spawning the ICT revolution, which themselves have become general purpose technologies, have not yet been implemented in a way that translates into higher productivity growth across the

board (Roland Berger Strategy Consultants, 2015). An EIB survey of 12,000 European firms provides some evidence of this gap, with companies indicating that only 44% of their machinery and equipment is state of the art (results range from 62% in Germany to 24% in Bulgaria).²³ It also gives some clues about what may be holding back follower firms from adopting technology. Uncertainty about the future is the most problematic factor for investment for firms claiming to have invested too little over the past year. This likely includes uncertainties about the right choice of technology, given the speed of technological developments. Initiatives such as the Pilotfabrik für Industrie 4.0 in Austria can address such gaps in investment by building understanding of the latest technologies and reducing uncertainty about the right choice.

Practice: Pilotfabrik für Industrie 4.0 – Austria

The Pilotfabrik (pilot factory) in Seestadt Aspern, Austria, is an experimental factory featuring the latest networked production technologies. Partner firms can learn about emerging technologies and adapt or develop them further to modernize their production processes. The factory also provides an environment for developing prototypes of new products, and includes a training centre for students and employees of partner companies. The Pilotfabrik is a public-private initiative between the Austrian Ministry of Innovation and Technology, the Technische Universität Wien and several firms that are co-financing the project.

Source: Bundesministerium für Verkehr Innovation und Technologie, 2015

2.5 Bridge regional innovation divides

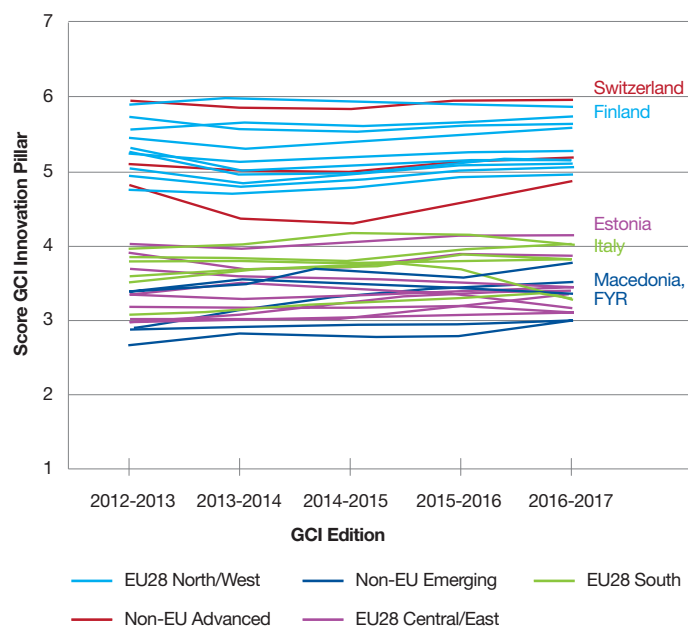
In addition to intra-industry divides, Europe continues to suffer from geographical gulfs in innovation. At the country level, innovation performance, as measured by the Global Competitiveness Index, remains split along a divide between the North/West and the South/Central/East (Figure 14). This result is confirmed at a more disaggregated level by the finding that the proportion of innovative to total firms is significantly higher in Northern EU economies than in Southern EU and EU CEE countries (Figure 15). These different subregional contexts need to be kept in mind for designing initiatives that enhance EU28 productivity growth, as the optimal institutional set-up will differ in each case (Acemoglu et al., 2006).²⁴

Building on local strengths and linking local innovation hubs across the region into value chains will create conduits for knowledge and transferring technology. They will also strengthen local innovation capacities, thereby contributing to regional convergence.

To further ensure that innovation success is shared across geographies, divides at the subnational level need to be addressed. Such gulfs have clearly appeared in voters' political choices. With Brexit, the geography of "leave" votes can be mapped very closely into low-productivity, deindustrialized areas (Coyle, 2016). The systematic collection of economic data at a level sufficiently detailed geographically is a critical precondition for effective policy intervention (Coyle, 2016).

If no countervailing measures are taken, regional divides are expected to deepen as the growing knowledge-intensive digital services sector is subjected to strong forces of agglomeration. In light of this, the section on smart infrastructure discusses the importance of having rural-urban transport links, as well as high-quality digital infrastructure everywhere.

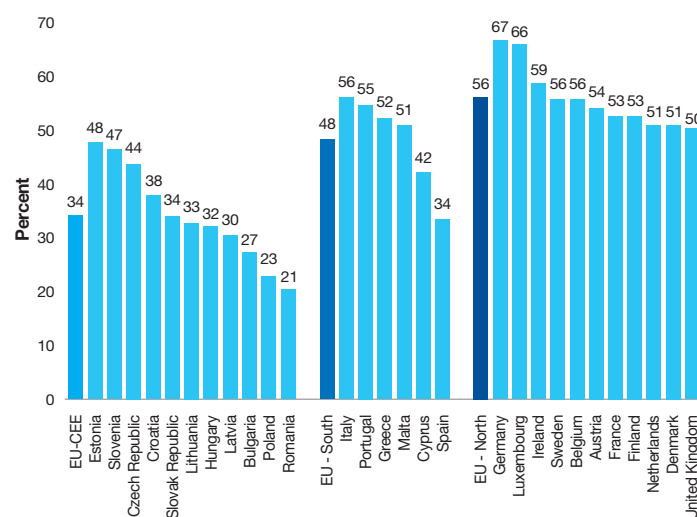
Figure 14: Global Competitiveness Index Innovation Pillar, 2012-2016, Score 1-7



Note: 1=not innovative, 7=very innovative

Source: The Global Competitiveness Report 2016-2017

Figure 15: Share of Innovative Firms to Total Firms, 2010-2012



Sources: EC, 2016: Figure II-1-11; eurostat data

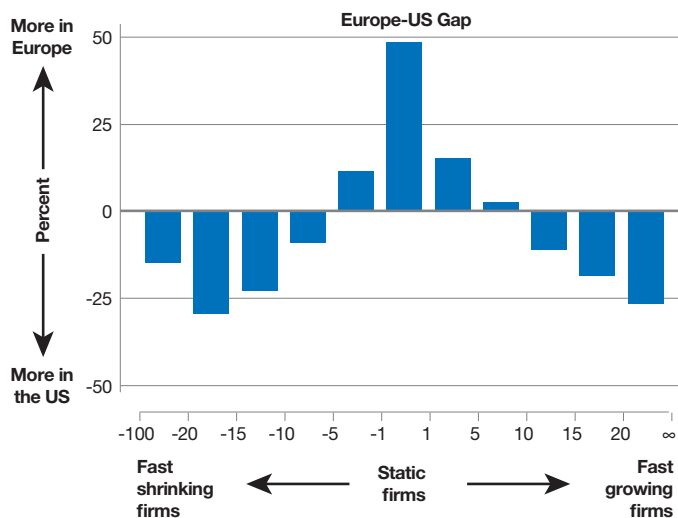
3. Business Dynamism and Entrepreneurship

To catalyse innovative, productivity-enhancing ideas, both business dynamism and entrepreneurship are vital; in fact, and under the appropriate framework conditions, they can create broad-based opportunities for growth and inclusion.

Dynamism in the economy is important because it increases competition and therefore competitiveness. This, in turn, levels the playing field between new entrants and incumbents, which ensures that only the most productive firms remain in the market. Finally, the fluid entry and exit of firms in an economy allows resources to flow to the organizations and opportunities where they can be used most productively (Andrews and Criscuolo, 2013).

While European firms tend to be more static, US companies demonstrate greater dynamism (Figure 16), with a larger proportion of firms growing or shrinking (Bravo-Biosca et al., 2014). Europe has a large share of stable firms (those whose employment grows less than 5% or shrinks less than 5% a year) and a low share of fast-growing firms compared to the United States (Bravo-Biosca et al., 2014).²⁵

Figure 16: Business Growth Distribution
Share of firms by growth bracket, Europe-US comparison



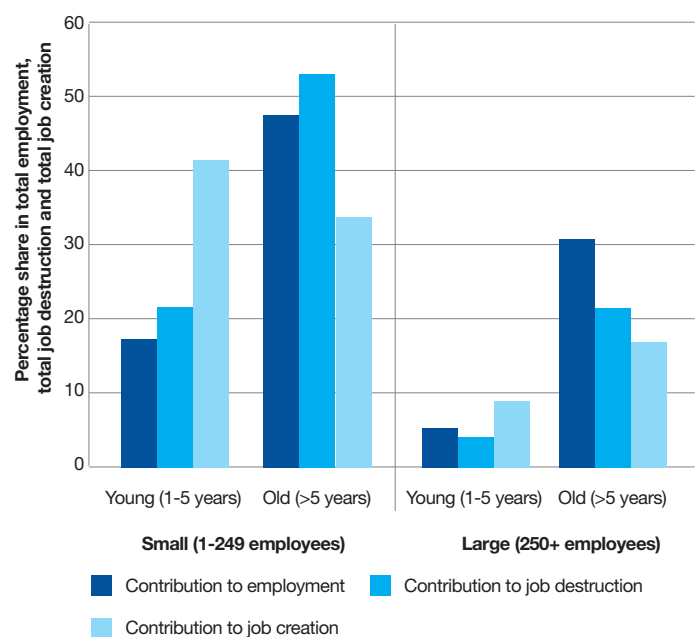
Note: Europe corresponds to the average of Austria, Denmark, Italy, Netherlands, Spain, Norway, UK.
Source: Bravo-Biosca, Criscuolo, Menon, 2014

Firm dynamism in the United States facilitates the entry of new firms and the exit of older, less competitive ones from the economy, ensuring that resources are allocated to the most productive organizations. In Europe, the incumbent firms are static and have less competitive pressure, which is not only bad for the dynamism of the economy but also crowds out innovative new firms.

Young firms are critical for competitive and inclusive economies because they provide new, innovative ideas, products, services and processes. Business dynamism ensures that labour and capital are allocated to the most productive firms, including new entrants. As seen in the United States, this leads to greater experimentation and more widely spread innovation and entrepreneurship.

A growing body of evidence (OECD, 2013b; Haltiwanger et al., 2011; Stangler and Litan, 2009) shows that young firms create the bulk of new jobs (Figure 17), thus highlighting that a firm's age is an important determinant of growth.

Figure 17: Employment, Job Creation and Job Destruction, by Firm Age and Size



Source: Criscuolo, Gal and Menon, 2014

Given that innovative young firms are the job creators, the creation of new firms must be encouraged. While many may not succeed, the entrepreneurial dynamic created by a continual flow of new entrants challenging incumbents will lead to greater dynamism, innovation and growth in the economy (Schumpeter, 1934). The "creative destruction" process allows more productive firms to enter and forces less productive ones to exit (Aghion and Howitt, 2009).

However, countries show significant differences in the propensity and ability of their entrepreneurs to start and grow firms. These differences stem from varying framework and market conditions across nations. Policies to promote entrepreneurship can include addressing cultural perceptions

about entrepreneurship and risk, developing the necessary human and social capital to spur entrepreneurship, facilitating the development of a functioning entrepreneurial ecosystem, addressing issues of access to finance, and reducing regulatory and administrative barriers.

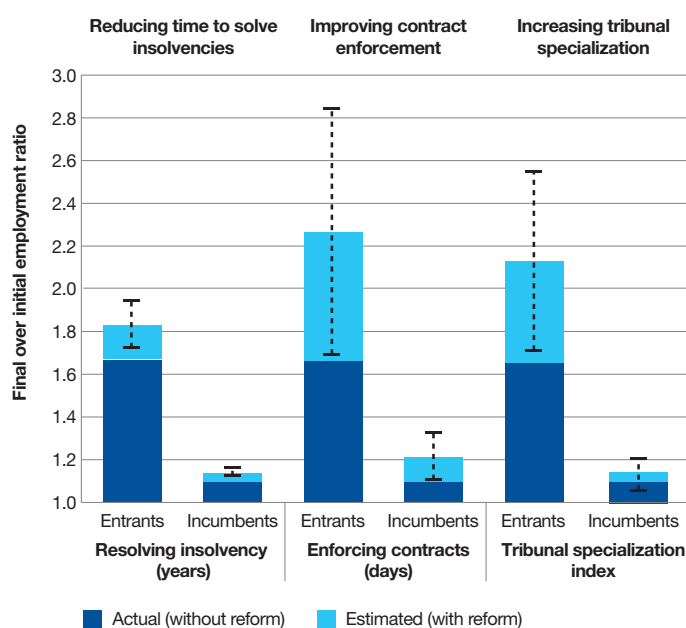
3.1 Facilitate firm dynamism through appropriate framework conditions

A dynamic business environment requires a coherent regulatory setting that facilitates and promotes cross-border activities. The lack of integration of EU markets is one of the key barriers to growth in Europe, as it results in a fragmented marketplace that restricts the size of the playing field and, therefore, the growth of firms.

Bankruptcy regulations, labour and product market restrictions and other framework conditions significantly impact the creation and growth of innovative firms (Andrews and Criscuolo, 2013). If the real, or even perceived, penalties of failure are high, entrepreneurs will have no incentive to start firms. In addition, if the regulatory or administrative burdens are too high, these can dissuade potential entrepreneurs or create barriers to growth. In the same way, high barriers to competition can stifle entrepreneurship. In Europe, policy on competition has historically focused more on incumbent firms (Aghion et al., 2005), resulting in a higher cost of entry and lower firm turnover. Changes in framework conditions can impact entrants (especially the more innovative firms) more than incumbents, as shown in the simulations in Figure 18.

Figure 18: Reform Simulations Related to Bankruptcy Regulation and Civil Justice

Italy: estimated effect in the information technology and other information services sector



Note: The bars show the effect *ceteris paribus* of policy changes on the response variable if the econometric estimates reported in the paper are interpreted causally. The dotted lines represent confidence intervals. The darker part of the bars shows the actual value registered in the [OECD] DynEmp v.2 database. The response variable is final over initial employment ratio.

Source: Calvino, Criscuolo and Menon, 2016

Practice: European regulation on business insolvency

As cited in a European Commission press release of 22 November 2016 on a new approach to business insolvency in Europe:

“This initiative [on business insolvency and restructuring] is a key deliverable under the Capital Markets Union Action Plan and the Single Market Strategy. It aims to contribute to removing important barriers to the development of capital markets in the EU by providing legal certainty to cross-border investors and companies operating across the EU. The new rules will help attract investors, create and preserve jobs, as well as help economies absorb economic shocks. Currently, too many viable companies in financial difficulties are steered towards liquidation rather than early restructuring and too few entrepreneurs get a second chance.

The proposal is also good news for financial stability since efficient restructuring procedures will prevent businesses from defaulting on their loans to the banks and will help addressing the issue of high levels of non-performing loans in parts of the EU banking sector. This in turn will allow banks to lend more to consumers and businesses.

The proposed Directive focuses on three key elements:

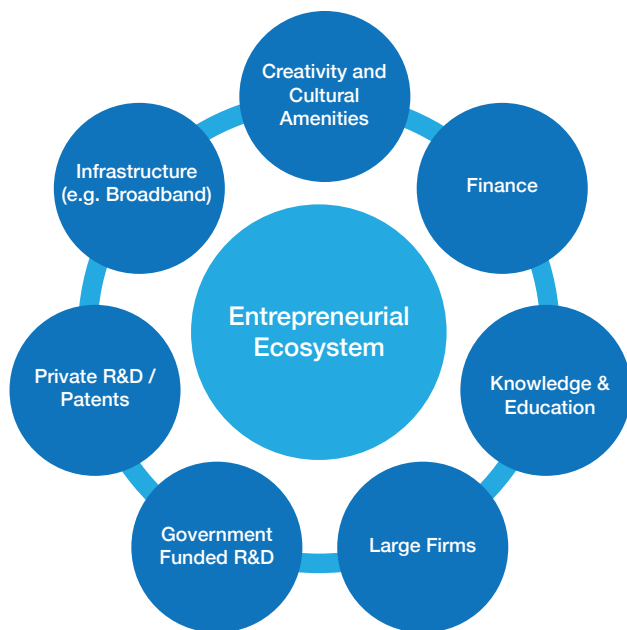
- Common principles on the use of early restructuring frameworks, which will help companies continue their activity and preserve jobs.
- Rules to allow entrepreneurs to benefit from a second chance, as they will be fully discharged of their debt after a maximum period of three years. Currently, half of Europeans say they would not start a business because of fear of failure.
- Targeted measures for Member States to increase the efficiency of insolvency, restructuring and discharge procedures. This will reduce the excessive length and costs of procedures in many Member States, which results in legal uncertainty for creditors and investors and low recovery rates of unpaid debts.”

Source: EC, 2016c

3.2 Catalyse the entrepreneurial ecosystem

Entrepreneurs are attracted to places with well-functioning infrastructure, including access to broadband, and a vibrant entrepreneurial ecosystem (Figure 19). Such ecosystems consist of large firms, start-ups, universities and governments (Schramm, 2004). The key is not just the roles that these organizations play, but also the interactions between them – for example, between academia and business, or small and large firms.

Figure 19: Key Drivers of the Entrepreneurial Ecosystem



Source: Authors

Interest in the phenomenon of ecosystems has grown over the past several years. Research projects have sought to better understand ecosystems and how they develop. Policy-makers in a number of countries have become more interested in trying to create Silicon Valley clones (Wooldridge, 2012). A growing number of entrepreneurial ecosystems have developed in Europe and other parts of the world (e.g. Cambridge, Berlin).

Most successful ecosystems were not planned; they developed over time from the actions and networks of key individuals, often serial entrepreneurs. Increasing evidence points to the importance of social capital (Stuart and Sorenson, 2007) as the driver of these ecosystems on both local and global scales (Shukla, 2012). As successful entrepreneurs start and grow new companies, they share their experience, knowledge and networks with others. Building on this, accelerator models (Miller and Bound, 2011), such as Techstars and Y-Combinator, have emerged. Accelerators provide tailored mentoring and support to the selected teams as well as connections with key players in the ecosystem. Experience has shown that a more focused approach and facilitated access to highly relevant networks play a key role in the successful growth of start-ups. A growing number of accelerator models are developing in Europe and elsewhere.

Practice: Impact Hub

According to its website, Impact Hub, a global platform and network supporting social innovators, is “part innovation lab, part business incubator and part community centre”. It offers members “an ecosystem of resources, inspiration and collaboration opportunities to grow impact”, and believes “the combined accomplishments of creative, committed and compassionate individuals focused on a common purpose” will help the world evolve into a better place. Located in over 80 cities and supporting over 15,000 members, the Hubs have “a shared focus on creating positive impact. Members benefit from a diverse and global community that provides guidance, resources and opportunities shared between all Impact Hubs”. The Hubs span entrepreneurship’s physical and virtual environments, providing resources, connections, knowledge, talent, markets and investment, and enabling collaborative action for sustainable impact.

Source: Impact Hub, www.impacthub.net/

Practice: Startup Lithuania – Enterprise Lithuania, Ministry of Economy, Government of Lithuania

Enterprise Lithuania, a government agency under the Ministry of Economy, established Startup Lithuania in 2013 as a one-stop shop for the country’s start-ups. The initiative facilitates the matching of entrepreneurs to investors and larger enterprises through events, such as the Startup Lithuania Roadshow and LOGIN Startup Fair. It encourages learning through other events (e.g. Barcamps, Fail-ups and Hacker Games), and strives to propose data-driven policies, including one to introduce a Startup Visa.

The number of local start-ups grew to over 400 in 2016. By helping bridge the gap in knowledge and coordination, Startup Lithuania has made these enterprises and the ecosystem as a whole more competitive. The initiative promotes inclusion in different ways, for example by making all information required by start-ups easily available in one place. In addition, Startup Lithuania addresses some of the main challenges of small businesses; it gives them access to investors and mentors, and encourages women to participate by reaching out through local networks. Moreover, it sees entrepreneurship as a way to reduce youth unemployment.

Critically, the initiative’s success relies on a broad coalition of stakeholders, including thought leaders, corporate leaders, the government and universities, all of whom were involved in Startup Lithuania’s early stages.

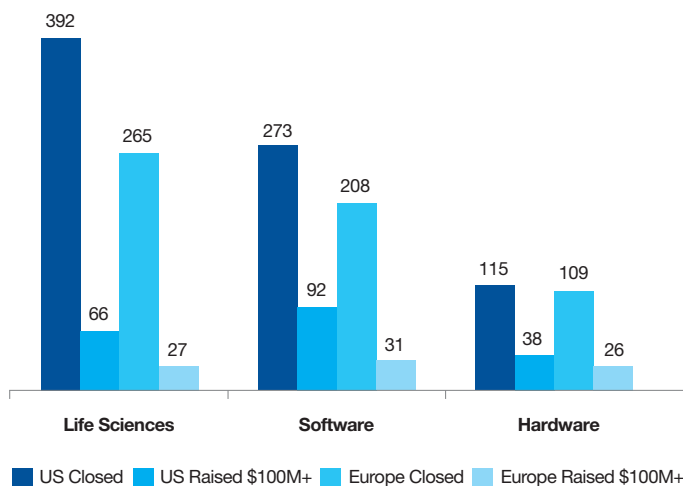
Source: Contributed by Osvaldas Smitas, Director, Economic Development, Ministry of the Economy, Lithuania

3.3 Scale up start-ups

While many countries in Europe show success with the number of firm starts, the companies are not able to grow to scale. Barriers to scaling are related to fragmented areas, such as access to finance and differences in framework conditions. The development of financial markets directly influences the growth of firms. As noted in the Access to Finance for Innovative Firms chapter, Europe's financial markets rely primarily on banks. Progress on an expanded capital market, as proposed in the Capital Markets Union, is critical to broadening the base of financing for firms, particularly those seeking growth capital that is often in the form of equity (OECD, 2011; Wilson, 2015).

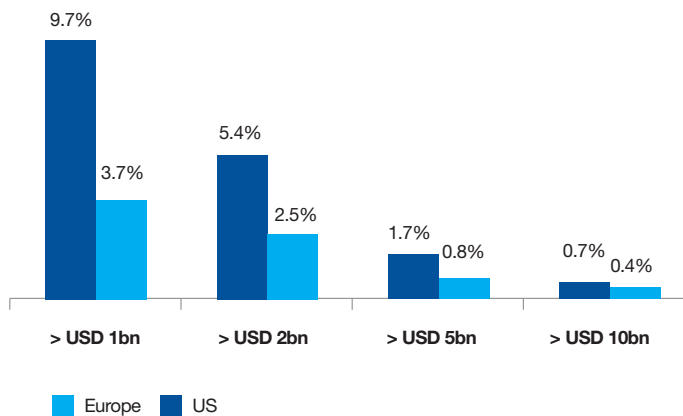
Europe also lacks liquid exit markets, whether in mergers and acquisitions (M&A) by other firms or in initial public offerings (IPOs) on a stock exchange. Figure 20 shows the number of IPOs in Europe and the United States, and the number of them raising over \$100 million. Given the differences, successful European start-ups often move to the United States to scale up their firms and access more vibrant exit markets (Figure 21).²⁶

Figure 20: Large IPOs (>\$100m), Europe and US



Note: Capital IQ for the period January 2002-May 2015
Source: Duruflé, Hellmann and Wilson, 2016: Figure 17

Figure 21: Post-IPO Growth, Europe and US



Note: Capital IQ for the period January 2002-May 2015
Source: Duruflé, Hellmann and Wilson, 2016: Figure 18

Practice: Tech City UK – Upscale programme

Launched by Tech City UK in November 2016, Upscale supports the next generation of scaling digital businesses in the United Kingdom. Upscale provides scale-up tech businesses with expertise from world-class Scale Coaches who have influenced the growth of some of the world's most successful digital companies. About 25 UK tech founders will be chosen to join the programme, which consists of a range of curated workshops, mentoring and panel sessions designed to provide selected founders with the knowledge to scale up their companies beyond potential barriers to growth. The Scale Coaches include, among others, Niklas Zennström (Skype, Atomico), Brad Feld (Techstars, Foundry Group), Alex Chesterman (Zoopla) and Saul Klein (LoveFilm, Kano, Seedcamp). Upscale builds on Tech City UK's commitment to support the country's digital businesses at every stage of their life cycle and growth trajectory – from the Digital Business Academy for very early-stage entrepreneurs to Future Fifty's networking and peer network. To participate in Upscale, businesses must have their headquarters in the United Kingdom, grow at a 40% month-on-month rate for the last three months, and be funded up to Series A.

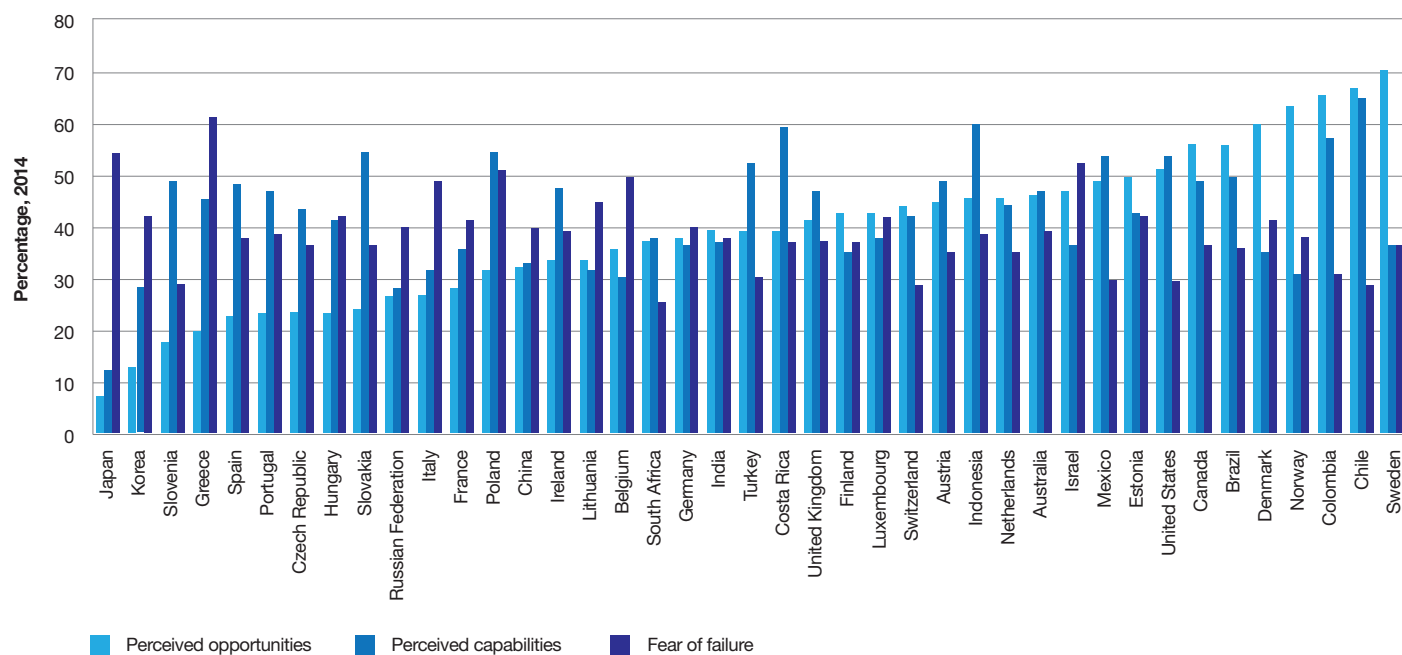
Sources: European Digital Forum, 2016; Upscale, <http://upscaleuk.com>

3.4 Address cultural attitudes towards risk

Entrepreneurial culture and fear of failure can be significant barriers to entrepreneurship. In many countries, the fear and cost of failure is higher than perceived opportunities and/or the perceived skills to pursue those opportunities (Figure 22).

Initiatives to create a more entrepreneurial culture can therefore be vital. Entrepreneurship in schools and universities, as well as mentoring and role models, can help change mindsets and encourage more young people to consider entrepreneurship as a future career path (Wilson et al., 2009).

Figure 22: Entrepreneurial Perceptions, 2014 (%)



Source: OECD, 2015

Practice: European Forum for Entrepreneurship Research (EFER) – European Entrepreneurship Colloquium teacher training

According to the EFER website, the European Entrepreneurship Colloquium (EEC) is “an intensive one-week residential programme, specifically designed for European professors and educators seeking to integrate more effective, appropriate and interactive approaches, and practical skills in teaching entrepreneurship”. By training teachers, EFER creates a leverage effect whereby each teacher trains hundreds of students per year. Such initiatives expose more students to entrepreneurship, develop entrepreneurial skills and help in shifting cultural mindsets.

Having conducted 14 successful training programmes since 2001, EFER has developed an alumni network of 638 professors from 239 institutions in 53 countries. The EFER EEC programme was supported by the European Commission for six years (2010-2015).

Source: European Forum for Entrepreneurship Research, Faculty Development, <http://www.efer.eu/faculty-training/eec/>

3.5 Build support schemes for migrant entrepreneurs²⁷

Whether as founders, owners of a small or medium-sized business, or self-employed as freelance professionals, people who have migrated contribute significantly to the diversity and competitiveness of SMEs in OECD economies. In 2014, their entrepreneurial activity accounted for more than 2 million people employed across Germany. Contributing increasingly to job creation and the internationalization of SMEs, they and their businesses also play an important role in integrating migrants into the economy and society, and in opening up ways for broader participation of the growing population with a migratory background.

Given fundamental and migrant-specific barriers in the business start-up process or during periods of prolonged self-employment, a set of recommended actions regarding migrant-run start-ups can aim to support new businesses overall or seek to reduce migrants’ disadvantages in a targeted way. A study of best practices in Germany shows that needs-based advisory schemes increase the sustainability and the contributions made by migrant entrepreneurs to the economy and societal integration.

Practice: Model of the Arbeitsgemeinschaft selbstständiger Migranten (ASM) – Hamburg, Germany

The most effective support schemes are based on multistakeholder cooperation, such as the model in Hamburg of the Arbeitsgemeinschaft selbstständiger Migranten (ASM), or “Working Group of Immigrant Entrepreneurs”, a consulting institution based on collaboration between the Hamburg Chamber of Commerce, an association of migrant entrepreneurs and the municipality.

The ASM offers multilingual informational events and individual counselling sessions, as well as flexibly scheduled and low-threshold offers that ease access and build trust between migrants and consultants. Moreover, support extends beyond the business-creation process itself, as problems may also emerge after a company’s founding. In this respect, phase-specific offerings that enable continuous and personal support and advice are useful.

Source: Contributed by Armando Garcia Schmidt, Senior Project Manager, Bertelsmann Foundation

4. Smart Infrastructure for a More Connected Europe

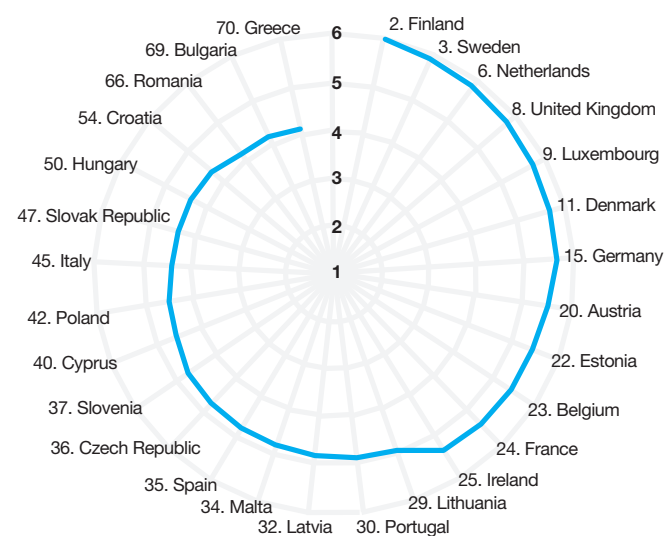
Infrastructure is a key enabler of economic competitiveness and inclusive growth through diverse channels. These include the access to markets and benefits of scale, availability of information, mobility of workers and matching of skills to opportunities, as well as the provision of secure and sustainable supplies of energy. Investment in infrastructure also has strong implications for socio-economic inclusion, particularly along rural-urban and inter-regional dimensions. Such investment also impacts the extent to which information, mobility and energy networks serve as public goods that help all people realize their potential, or become barriers that exclude many from participating fully. In the future, digital networks will form the backbone of the Fourth Industrial Revolution, and smart transport and energy networks will be key to spreading digitalization's wider benefits.

Digital technologies offer enormous potential for inclusive growth, but their rollout risks creating deeper exclusion. Digital technologies have brought rapid and fundamental changes to economic exchange in many areas, resulting in profound gains in productivity and user benefits. They allow for broad-based entrepreneurship by lowering the costs of accessing information, reaching out to potential customers and delivering goods and services. They can “reveal new sources of supply that were previously unknown or uneconomic to provide” (McKinsey Global Institute, 2016), opening up opportunities and improving efficiency. In addition, they give consumers more complete information. However, digital technologies and incomplete digital infrastructure can also widen socio-economic imbalances (Figure 23). For example, traditional non-digital information channels tend to be phased out before all segments of the population have full digital access, leaving those without such access less well served than before.

Efficient transport connectivity, increasingly through smart infrastructure, is a crucial enabler for competitiveness and geographically inclusive patterns of growth. The combination of fiscal challenges and the continuing agglomeration of economic activity in large cities has created a large investment backlog in the EU. The EIB has estimated that only about half of the €160 billion needed annually for transport and logistics infrastructure relative to global benchmarks is currently being met (EIB, 2016b). This also reflects Europe's performance on transport infrastructure compared to the world frontier on various indicators (Figure 24). Investment gaps can be identified in urban transport, which has major cost implications for European businesses, and in inter-urban, trans-European connections that are crucial for international competitiveness and economic development. Indeed, urban-rural connections are also of particular concern where high levels of extra-urban

unemployment coincide with urban shortages of skilled-labour due to the costs of relocating or commuting (OECD, 2012a; 2012b). Affordable and accessible urban transport systems improve the matching of skills to jobs.

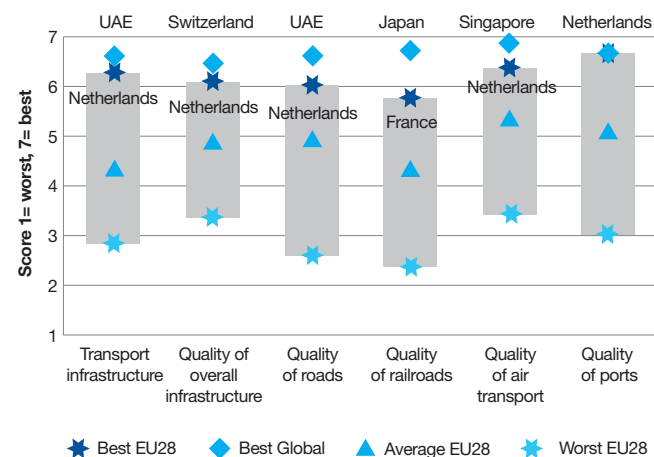
Figure 23: A Digital Divide in Europe? Performance Ranking of EU Member States in the Networked Readiness Index



Note: The Networked Readiness Index measures, on a scale from 1 (worst) to 7 (best), the performance of 139 economies in leveraging information and communications technologies to boost competitiveness and well-being. Source: World Economic Forum Networked Readiness Index 2016 (WEF, 2016c)

Figure 24: How Does Europe's Infrastructure Stand Compared to the World's Top Performer?

Performance on transport infrastructure, EU compared to the world frontier in each indicator, Score 1-7



Note: 1=worst, 7=best
Source: Global Competitiveness Index 2016-2017 (WEF, 2016b)

Smart, sustainable energy systems are becoming ever more vital for competitiveness. Europe's competitiveness depends on the secure supply of energy at reasonable prices to industry and households. Sustained and well-targeted investment is required in three main areas: energy security, smart networks and efficiency. However, this investment is not merely about securing a reliable and affordable energy supply; it will be essential to easing Europe's transition to a low-carbon economy. An energy-sector investment gap of about €100 billion per year results when comparing current investment levels to key investment needs identified by the European Commission. That gap comprises €18 billion for upgrading energy networks, €70 billion for energy efficiency savings in buildings and industry, and €12 billion for power generation, including renewables (EIB, 2016b). As part of the emerging internet of things (IoT), smart-grid energy infrastructure can continue to foster inclusive growth by allowing a larger number of smaller energy entrepreneurs ("prosumers") to participate in production and distribution, and by enabling energy-related entrepreneurship to serve new markets that need it to develop.

4.1 Roll out fast broadband for all

To expand, the digital economy needs fast broadband with sufficient geographic reach. A number of EU countries are close to the global frontier in this area, while many others, especially in Central, Eastern and Southern Europe, still have a notable gap to close. However, to fully realize the benefits of inclusion and competitiveness, certain enabling conditions are required for broadband infrastructure: appropriate regulation to ensure sufficient choice and competition among providers; a sufficient level of ICT skills among the wider population; and harmonized, EU-wide digital standards.

The European Commission has accelerated efforts to encourage a Digital Single Market, including key areas such as harmonizing consumer rights, electronic identification, value-added taxes and digital content rights, as well as abolishing extra data-roaming charges when traveling in the EU. These efforts will help to break a lingering fragmentation of e-commerce in Europe, with only 15% of EU consumers and 7% of SMEs engaging in cross-border business (European Commission, 2015a). An accessible Digital Single Market, without country boundaries, will provide innovative start-ups with a sufficiently large, accessible "home" EU market for swift scaling-up. This is needed to justify high and risky upfront investments, and has implications for business dynamism and investment finance.

Practice: Superfast Cornwall – high-speed broadband to connect rural firms to the greater economy

Cornwall, one of the poorest regions in the United Kingdom, is the landing point for one of the world's fastest high-speed transatlantic fibre optic cables. The Superfast Cornwall project (i.e. high-speed broadband to connect rural firms to the greater economy) brought together funding from the European Regional Development Fund (ERDF) and the telecom provider BT to achieve a long-term economic transformation and leave a lasting legacy for Cornwall and the Isles of Scilly. At the project's completion in 2015, 95% of households and firms had high-speed broadband connections, which helped about 12,000 firms to find markets, work smarter and cut costs.

This makes Cornwall the world's biggest test case for fibre broadband's impact on rural business, with some impressive initial results. Superfast connections are estimated to have contributed about £186 million to Cornwall's economy. Firms with fibre connections saw 400% higher turnover growth than those without, and almost 80% of the companies saw savings in both time and money. In addition, this highly visible project has encouraged business start-ups and has created or safeguarded an estimated 4,500 jobs. Moreover, it has helped kick-start employment growth and entrepreneurship in an economically depressed rural region. Superfast Cornwall is also an example of how digital technologies can help overcome geographical remoteness and enhance access to information and markets.

Source: SERIO and Buckman Associates, 2015

4.2 Accelerate investment in smart transport infrastructure

Accelerated investment in both urban and inter-urban transport linkages is needed to improve efficiency and sustainability, enhance global competitiveness and achieve more equal economic development across the EU. While some European countries benefit from world-class transport infrastructure, others still require substantial investment. But interventions need to focus not only on expanding capacity where possible, but also on optimizing the use of existing transport capacity.

Costly congestion continues to plague a number of large European cities and many inter-urban highways. The internet of things can enhance how transport is allocated, across both time and alternative pathways, by combining digital infrastructure with big data collection. By facilitating access based on real-time traffic information, the smart city allows citizens make better decisions at any moment, and equips mobility service providers with information needed to address supply bottlenecks as they occur. Beyond transport, smart cities also apply digital technologies to all types of infrastructure components – digital, transport, energy and social – to make them communicate with each other, as well as with citizens, firms and governments. Smart infrastructure can be more inclusive by improving connectivity for all areas of the city and encouraging broad-based entrepreneurship, which had been hampered by geographic exclusion and prohibitive costs of access and mobility.

Practice: Internet of things applied to urban mobility – Madrid, Spain

Empresa Municipal de Transportes (EMT), the municipal transport company in Madrid, Spain, has been a pioneer in Europe in deploying information systems that collect, process and disseminate real-time passenger information. The system permits the operator to match fluctuations in demand in real time by adjusting the frequency of buses or trains, improving reliability and punctuality while reducing overcrowding or underutilization, and achieving efficiency gains that can be translated into lower fares. The results point to a material impact on passengers' perception of quality of service, and to a shift from personal cars to using public transportation.

For passengers, access to information on arrival times and crowding empowers them to make real-time decisions about the best mode of travel. Alongside lower fares and better quality of service, such information encourages people to switch to public transportation by reducing uncertainty. More efficient transport systems with greater public use can free up resources for other investments and reduce the costs of congestion, thus improving the overall productivity and competitiveness of urban centres. Further, better urban public transport has significant economic benefits as well as a positive impact on the quality of life for urban and peri-urban residents, and particularly for lower-income groups who are less able to afford private cars. This example also points to digital transformation – namely, advancing adoption of state-of-the-art digital technologies and the internet of things in the context of transport infrastructure.

Source: Monzon, Hernandez and Cascajo, 2013

4.3 Invest in smart grids as the backbone of the coming energy transition

Smart and flexible power grids are needed for decentralized production of renewable energy from solar and wind power plants. This includes vast numbers of small-scale producers who could benefit through investment opportunities from this transformation in energy production. On the demand side, smart grids and smart meters would make for more efficient use of the energy system by providing the information and price incentives needed to even out electricity consumption over time. They would thus reduce unnecessary peak loads from home appliances and charging of electric vehicles. Using the power networks more efficiently would lead to a more secure energy supply, with less investment in new peak capacity.

The future points to commercial-scale demonstrations for experimenting with pricing, security and sustainability, while also engaging all stakeholders in the system covering generation, transmission, distribution and end use. A key objective of this process is the ability to respond to increased demand, thereby reducing peak demand and improving average capacity utilization. An active government role is also needed to help establish standards for equipment, transport and interoperability, which would reduce costs and risks for private-sector participants. Moreover, it would help drive higher private-sector investment levels and faster engagement.

Practice: Enexis – smart grids for electric cars as part of Digital Energy System 4.0

Enexis, a utility company in the Netherlands, is coordinating a smart-grid pilot project for a network of electric car recharging sites. It uses smart information and communication technology applications to allow the existing power network to cope with additional demand from vehicle charging. The project pools contributions from Enexis and other network operators, energy companies, ICT equipment and software providers, universities and research organizations to find workable solutions for both the charging of vehicles and its payment.

The charging infrastructure for electric vehicles is an important aspect of the smart grids. An open source IT system allows the user, supplier and grid operator to communicate effectively to optimize vehicle charging while avoiding peaks in demand. In addition, Enexis participates in the Stichting e-laad (e-charge foundation), which installs and maintains public charging points for electric transport. The foundation terminated the intake for new charging points in September 2012, with the total number of installed public charging points having reached 2,821 by the end of 2013.

Innovation in such a critical technology as electric cars is expected to create commercial opportunities and enhance the competitive edge of the actors involved. Creating networks of public charging points not only eases the use of electric vehicles, but also leads to more inclusive use of technology. In turn, that will encourage use of sustainable mobility for all urban residents and businesses in the future. This initiative further shows how different public and private actors can collaborate to advance digital technological innovation in smart grids.

Source: Atos, 2014

Practice: NordBalt– integration between the Nordic and Baltic electricity markets

The joint Swedish-Lithuanian project NordBalt, a 700 megawatt-capacity power cable stretching 453 km under the Baltic Sea floor and in operation since February 2016, is the first high-voltage direct current power connection between Lithuania and Sweden. NordBalt is providing higher energy security to 6 million electricity users in the Baltic region, leading to reduced electricity prices for companies and households. The project contributes substantially to integrating Nordic-Baltic electricity markets. During the first ten months of 2016, the price in the Nord Pool Lithuanian bidding zone fell 13% compared to the same period in 2015, and 30% of the electricity consumed was imported from Sweden.

Integration of electricity markets and increased competition have resulted in electricity cost savings, boosting regional firms' competitiveness. They have also led to household savings, which serve as an indirect source of extra income for families (and which are particularly advantageous for those at lower income levels). In addition, digital technologies have played an important role throughout the project's design and implementation, given the delicate nature of working in the Baltic Sea. They are also crucial for monitoring and maintaining the NordBalt link and its connections to the Nord Pool Spot commodity exchange.

As this practice shows, modern regional energy interconnection projects, using innovative technologies and international cooperation, can promote reliable energy supply, competition and inclusive growth.

Source: Contributed by Osvaldas Smitas, Director, Economic Development, Ministry of the Economy, Lithuania

5. Labour Market and Human Capital

Europe must make major adjustments to its population's skills if it is to fully leverage digital advances and the Fourth Industrial Revolution as a source for inclusive growth. As the social costs of failing to manage this transition will be great, much care and resources are needed to getting this right. Arguably, the transitions to increasingly liberal trade regimes and the implementation of new technologies have been insufficiently managed in many instances. Moreover, those who were displaced in import-competing sectors and through technological change, and who suffered from unemployment or wage declines, were often not systematically supported in transitioning to a new job. Meanwhile, the results of the EIB Investment Survey (EIBIS) from 2016 show that the availability of appropriate skills is already the second most frequently cited obstacle to investment (after uncertainty), and is the pre-eminent issue in some countries, such as Germany and some East European countries engaged in catching up with the frontier.²⁸

The digital revolution is challenging the labour market in two ways: first, in trying to anticipate which jobs, tasks and skills will likely become obsolete over the medium term; and second, in predicting areas for expanding labour demand and the corresponding skills required. However, the pace of technological advancement makes it difficult to develop predictions for the second part of the challenge (World Economic Forum, 2016a). Two important basic mechanisms will drive labour market dynamics more generally as the digital revolution takes full hold: (i) automating routine jobs (Acemoglu, 1999; Autor et al., 2006; Goos and Manning, 2007; Goos et al., 2009; Autor and Dorn, 2013; Jaimovich and Siu, 2012; Brynjolfsson and McAfee, 2011); and (ii) moving to on-demand work relationships facilitated by online job platforms (Sundararajan, 2016). Both contain intrinsic, polarizing forces that threaten the stability of the European middle class. Automation drives a wedge between workers doing routine and non-routine jobs, and on-demand work creates a divide between freelance workers and employees. As the Fourth Industrial Revolution will likely reinforce these mechanisms, they will need to be managed very carefully and urgently.

Given the major uncertainty around the actual demand for skills in the future, this section focuses on initiatives that can help increase labour-force flexibility in responding to changing demands for skills, and that foster skills that are broadly complementary to emerging technologies (Darvas and Wolff, 2016; Bell, Chetty et al., 2016). Two important areas in this context are: (i) early childhood education; and (ii) (re)skilling employees to complement emerging technologies. These two areas of focus may provide some direction on how to foster Europe's labour market resilience.

5.1 Equip young children with the best possible cognitive abilities

The importance of early childhood education in developing cognitive abilities cannot be emphasized enough. Not only one of the most robust results from recent academic literature (for an overview, see Heckman et al., 2014), it is also one of the clearest examples of an intervention that increases both inclusion and competitiveness. Cognitive skills are critically shaped between birth and the age of five; research shows that early interventions to develop children's cognitive skills contribute in major ways to both reduced inequality and increased productivity over the course of adult life. Some have gone so far as to state that "the returns [of early childhood education] are much higher than those found in most active labour market programmes in Europe" (Heckman et al., 1999).

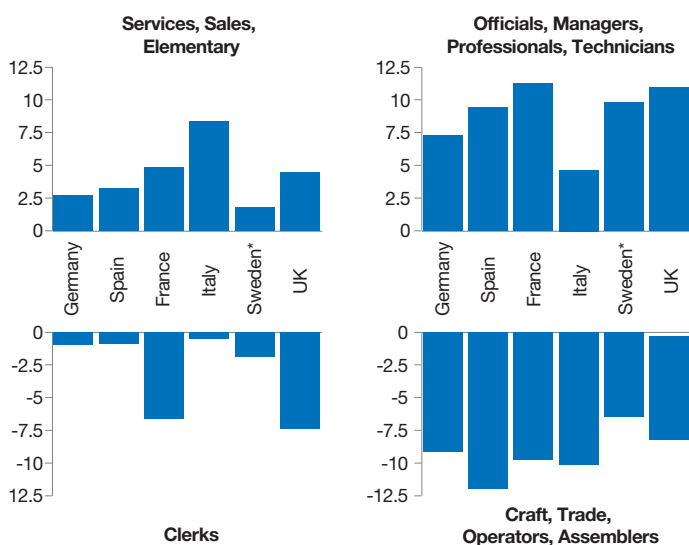
A critical ingredient in preparing children for any future technological changes is to equip them with the best possible cognitive abilities. While systematic coverage of early childhood programmes is still missing in Europe, a series of programmes have been implemented. The Education Endowment Foundation's meta study of programme effectiveness provides important insights on potential approaches to be adapted and/or scaled.²⁹

This emphasis on early childhood interventions to foster cognitive skills echoes the discussions in the Innovation and Technology Diffusion chapter, which makes the case for early exposure to creative thinking and environments encouraging innovation.

5.2 Create a coherent strategy for teaching advanced digital skills

Technology can negatively affect social mobility because automation polarizes skill levels needed in the labour market. While data and analysis has long been scarce for Europe, increasing evidence shows that these forces are indeed at work in the region. For the EU28, medium-skill jobs have declined while low- and high-skilled jobs have grown between 1995 and 2015 (Figure 25). In fact, the only job categories that have grown in the United States and the EU since 2008 are those requiring tertiary-level education; this is true even for countries where the financial crisis had a severe impact (Darvas and Wolff, 2016).

Figure 25: Employment Growth by Occupation, 1995-2015 (%)



Note: *Data for Sweden starts only in 1997

Sources: Darvas and Wolff, 2016; Eurostat data

While it is difficult to predict exactly when tasks will be automated over time, educational systems can best prepare the future labour force by teaching skills that complement the processes of algorithms. At the same time, basic digital skills must be ensured. While digital skills initiatives exist, these efforts would benefit from more coordination. Furthermore, in going beyond the skills directly relevant to the labour market, the OECD identifies a broader set of global competencies that will help citizens cope with and thrive in a rapidly changing world and safeguard a sense of human dignity (OECD, 2016a). This includes developing social and emotional skills, as well as values such as tolerance, self-confidence and the ability to develop a sense of belonging.

Practice: European Institute of Innovation and Technology – Knowledge and Innovation Community

EIT Digital, a Knowledge and Innovation Community (KIC) of the European Institute of Innovation and Technology (EIT), brings together entrepreneurs from a partnership of over 130 top European corporations, SMEs, start-ups, universities and research institutes in different locations. With headquarters in Brussels, it has co-location centres in Berlin, Eindhoven, London, Helsinki, Paris, Stockholm and Trento (Italy); offices in Budapest and Madrid; and three pan-European schools with over 1,500 students in entrepreneurial digital education programmes.

The aim of Knowledge and Innovation Communities is to create a vibrant and inclusive regional ecosystem of innovation and education in and around co-location centres. There, students, researchers, engineers, business developers and entrepreneurs come together to drive the digitalization of society and connect to the regional economy. Importantly, the initiative works by adjusting educational curricula to achieve skills that match industry needs, with relevant implications for regional-level inclusive development and bridging the innovation divide. It puts in place technical programmes with education in innovation and entrepreneurship, and educates innovators and knowledge workers in digital technologies. This has important and direct implications for upgrading education and skills at the regional and local level, and empowering individuals through education.

EIT/KIC has supported the creation of 66 new companies and provided support for over 200 scale-ups as well as facilitated more than 80 transfers of technology; €68 million in external investment were raised.

Source: Contributed by Roman Arjona Gracia, Chief Economist, Directorate-General for Research and Innovation, European Commission, Brussels

6. Access to Finance for Innovative Firms

Europe's financial sector must improve how it meets the financing needs of young, small and innovative firms (YSIs). Access to appropriate finance must be well targeted, but also made more inclusive, reaching more firms in more localities both within national economies and across Europe. Moreover, the benefits of technological development need to be shared more widely. Small firms require support to become more investor-ready, while new emerging financial technologies (FinTech) could become a game changer for YSIs by democratizing finance and thus unlocking a global customer base.

Employment and productivity growth in Europe depends on YSIs and the successful diffusion of innovations. The main source of job creation in Europe and the United States are young high-growth firms, known as "gazelles". High-output-growth firms are disproportionately young and make outsized contributions to productivity growth (Criscuolo et al., 2014; Haltiwanger et al., 2016; Stangler, 2010). Meanwhile, growth in European productivity also suffers because many European firms are slow to adopt new technologies and practices (OECD, 2016b). Financial constraints partly explain this. Policies therefore must ensure that finance works for all firms – irrespective of size, location or stage of business development or innovation – so that all firms can realize their potential, and a broad base of innovative firms can emerge across Europe. Special attention is needed to ensure that YSIs in particular are not financially excluded. While policy-makers often focus only on technological innovation, innovation also has a social aspect. Social enterprises, for example, follow a market-driven approach to provide innovative solutions to social issues and are an important element of inclusive growth strategies. However, like YSIs, social enterprises face significant challenges with external financing (see Torfs and Lupoli, 2017).

YSIs face difficulties in accessing appropriate finance. Europe's economies are strongly based on banks. While banking-sector assets make up only 115% of US GDP, they reach 316% of GDP in the EU, with equity and debt securities playing a comparatively smaller role. Bank loans make up about 80% of debt financing by non-financial corporations (Valiante, 2016). Bank finance is important for innovation, but mostly for more mature firms and technologies (Kerr and Nanda, 2014). By contrast, YSIs suffer from constraints in accessing traditional bank finance (Figure 26) due to several factors: a lack of useable collateral, difficulties for banks in assessing the risks of innovative counterparts and young firms without a history, intrinsic risks associated with small size, fixed costs of small-scale lending and a lack of available external risk assessments. This may also reflect their preference for other financial instruments (Figure 27). YSIs are

often rich in intangible assets, such as specialist knowledge or technology, but lack the type of tangible assets needed to access bank loans (Veugelers, 2011; Wilson, 2015). As a result, YSIs are more likely to face financial market failure (Kraemer-Eis et al., 2016; Moritz et al., 2015; Masiak et al., 2017).

Figure 26: Firms Facing Access to Finance Difficulties, EU28

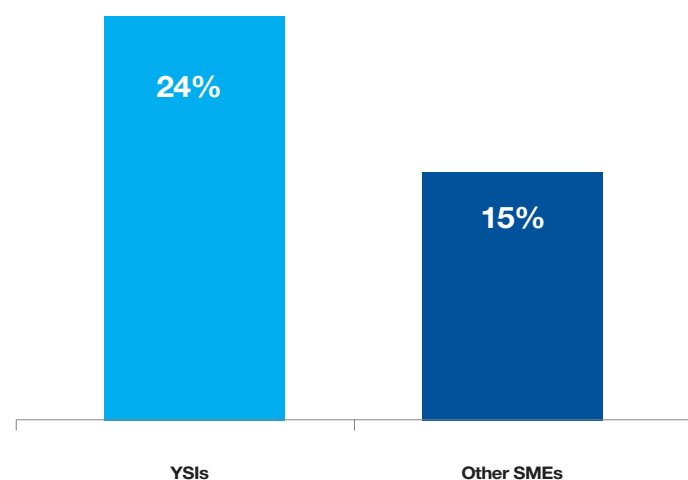
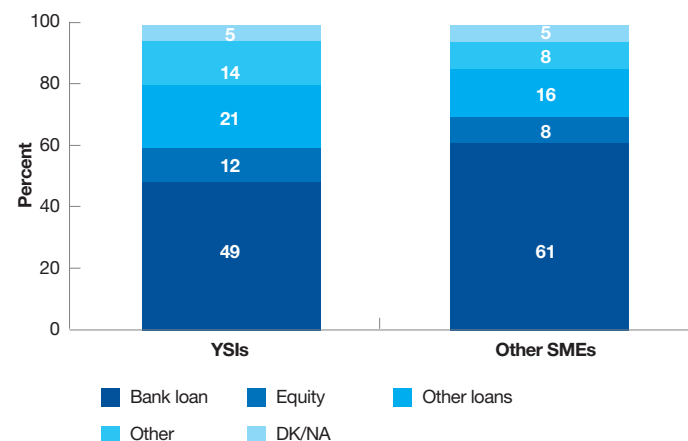


Figure 27: Preference for Different Financial Instruments, EU28

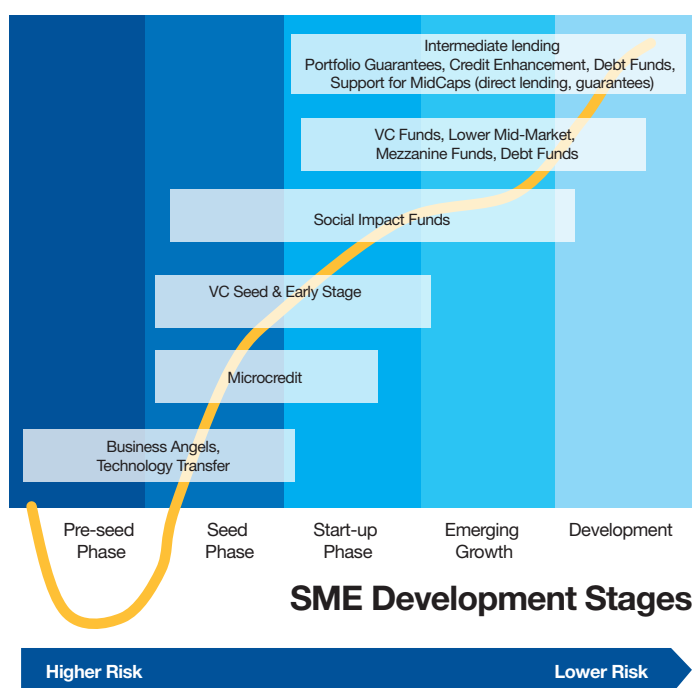


Note: YSIs – Young (<5 years old), small (<250 employees), innovative firms (related to product, process, organization or sales innovation); Other SMEs – all other SMEs, excluding YSIs
Source: EC/ECB, 2015

External equity financing is particularly important for innovative firms. Such financing is better suited to the risks associated with innovation, where returns are highly skewed to a small number of successes (Scherer and Harhoff, 2000) and to younger firms that lack sufficient collateral and have uncertain, or even negative, cash flows (AFME, 2015a). YSIs often must rely on internal finance, such as their own cash flows or founders' contributions (Magri, 2009), but for young firms, retained earnings are typically scarce. External finance, particularly equity, is therefore needed to facilitate innovation and a dynamic, entrepreneurial economy. Debt providers are less well placed to offset the high-risk structure of innovative projects by potentially higher returns, whereas equity investors can benefit from a successful innovation and, thus, compensate higher risks by a potentially higher return.

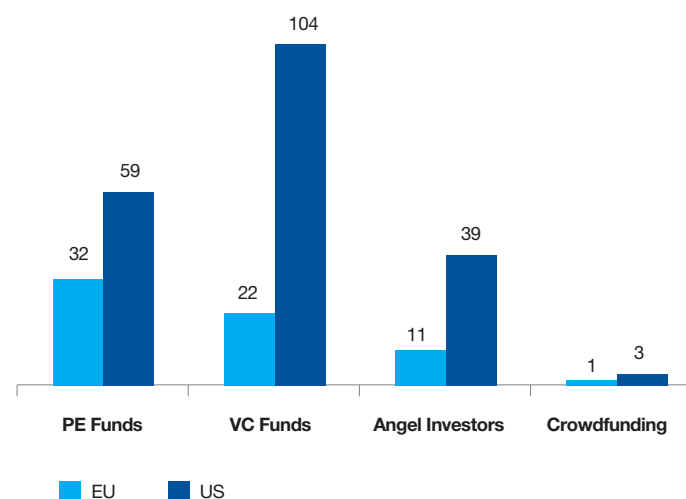
European equity markets, however, are structurally underdeveloped. They represent only about 64% of GDP, compared to 127% in the United States (Valiante, 2016).³⁰ US private equity and venture capital fund volume is about double that of the EU, with the share of non-bank financing of SMEs approximately four times larger in terms of total new financing (AFME and BCG, 2015). Reasons include market fragmentation, thin markets, differences in pension systems, insolvency, corporate governance frameworks and the tax treatment of debt and equity. Population ageing, new capital adequacy standards for insurers (Solvency II) and new banking regulations (Basel III) could all contribute to worsening this situation over time (Brutscher, 2014). Firms need different types of equity financing at different growth stages (Figure 28), and the EU lags the United States at all stages (AFME and BCG, 2015). The gap seems particularly severe in venture and growth capital funding that is vital for growth financing and scaling up innovation (Figure 29).

Figure 28: External Financing Needs along the Business Life Cycle



Note: VC = venture capital
Source: Based on Kraemer-Eis et al., 2016b

Figure 29: Sources of Financing for SMEs (Stock of Outstanding Financing in € Billion, 2013 Data)



Note: PE = private equity
Source: AFME and BCG, 2015

Moreover, Europe also seriously lacks growth (follow-on) funding needed to accelerate its international expansion (Kraemer-Eis et al., 2016b). Duruflé et al. (2016) identify the creation of larger venture funds and a venture debt market, a reinvigoration of technology IPOs, improved markets for secondary shares, and avoidance of prematurely selling companies as main elements of a strategy that would help Europe to catch up with the United States in scale-up funding.

Europe needs progress on the Capital Markets Union to break down barriers and improve exit opportunities for investors in innovation. For it to function, the single market needs free movement of capital. However, EU capital markets remain fragmented along national lines (EIB, 2016b), and differences in capital market depth are much larger than the EU-US gap (Wright and Bax, 2015). More integrated capital markets will complement the EU's strong banking sectors, connect financing more effectively to investment projects, deepen financial integration and increase stability in the financial system (EC, 2015c). Larger, more integrated capital markets will improve exit opportunities for venture capital investors and help to develop the exit market.

This White Paper sets out the following recommendations for more targeted interventions to expand access to finance for innovative firms:

- **Promote equity financing**, in particular venture and growth capital funding
- **Mitigate the effects of market failures for YSIs** and other SMEs, including through greater use of guarantee instruments
- **Encourage greater readiness among investors to support start-ups** and the development and spread of successful venture capital systems
- **Build non-bank intermediation of small business finance, including FinTech and non-bank lending**,³¹ to provide financing alternatives and widen access to finance

6.1 Promote equity financing, in particular venture and growth capital funding

Governmental venture capital (VC) investments can help to increase the deal flow in those parts of the European VC markets marked by comparatively little activity. This would attract additional private investors and trigger “the virtuous cycle of market development” (Bertoni et al., 2016). However, public intervention to support the European VC market should go beyond merely supporting VC funds and aim to attract equity financing from other sources as well, such as angel investors (Hellmann et al., 2015; Wilson, 2015). Indeed, angel investments are made typically in the early stages of establishing a business; their transaction costs are relatively low, allowing them to invest on a lower scale (Kraemer-Eis and Schillo, 2011). Moreover, seed-stage VC investments and equity investments in technology transfer (TT) activities can contribute to reducing early-stage (pre-seed, seed and post-seed) funding gaps. These investments can also sustain viable TT structures while generating financial returns for investors over time (Kraemer-Eis et al., 2016b). TT activities encourage collaboration between research organizations and industry, the licensing of intellectual property rights and the creation of start-up businesses and university spin-out companies. This, in turn, contributes to supporting innovation and forming human capital (EIF, 2016).

Public investment should always act alongside private investors, such as a fund-of-fund set-up or co-investments (see Kraemer-Eis et al., 2016b, for an overview of related research findings and policy implications.) In all, Europe needs an integrated portfolio of instruments that supports its start-up, SME and Midcap landscape. This will help foster recovery from the financial crisis and unleash the full potential of EU companies’ competitiveness and their contribution to Europe’s economic growth and innovation (Kraemer-Eis et al., 2016b). Such an approach will contribute, among others, to the EC’s new Start-up and Scale-up Initiative, which maintains that both start-up and scale-up businesses face a lack of appropriate financing opportunities (EC, 2016b).

Practice: European Angels Fund

According to the European Investment Fund website, the European Angels Fund (EAF) is an initiative advised by the EIF that “provides equity to Business Angels (BAs) and other non-institutional investors for the financing of innovative companies in the form of co-investments. EAF works hand in hand with BAs and helps them to increase their investment capacity by co-investing into innovative companies in the seed, early or growth stage. The activity of EAF is adapted to the BAs’ investment style by granting the highest degree of freedom in terms of decision making and management of investments. EAF has a current volume of €280 million, with approximately €120 million already committed to selected BAs which have already built a portfolio of more than 150 SMEs.

EAF is currently operational in Austria, Denmark, Germany, Ireland, the Netherlands and Spain. In the future, EAF will be extended to other European countries and/or regions. EAF will foster and support cross border collaboration between

BAs. It will also contribute to the establishment of European BAs and Family Offices as an attractive alternative asset class”.

Source: European Angels Fund, http://www.eif.org/what_we_do/equity/eaf/index.htm

Practice: European Investment Fund – National Promotional Institutions Equity Platform

In order to strengthen European private equity (PE) markets, the EIF strongly contributes to a new equity platform that seeks to facilitate cooperation between the EIF and national promotional institutions (NPIs) or banks across EU Member States. “The EIF-NPI Equity Platform aims at helping EIF and NPIs to promote and share knowledge and best practices amongst themselves. Its ultimate goal is to enhance access to funding for SMEs and Midcaps, support defragmentation of equity markets, and match national, EU and private sources of funding. This initiative is established on the occasion of the Investment Plan for Europe, and as a response to priorities set by EU stakeholders and NPIs. It will guide EIF and NPIs in implementing equity investments, including EFSI-related [European Fund for Strategic Investments] activities. In doing so, EIF and NPIs active across the EU will both contribute to the objective of supporting a well-functioning European Venture Capital and Private Equity market for the ultimate benefit of European SMEs and Midcaps.”

Source: Kraemer-Eis et al., 2016b

Practice: European Innovation Council – the Start-up and Scale-up Initiative

Looking to find “Europe’s winners of tomorrow”, the EC announced in November 2016 that it intends “to provide bottom-up support targeting breakthrough innovation projects with the potential for scaling up” as part of the Horizon 2020 work programme 2018-2020, and would also consider establishing a European Innovation Council (EIC). Acknowledging that the number of European start-ups is on par with the United States, the EIC will tackle Europe’s lag in disruptive innovation and in scaling start-ups into world-leading businesses. A High Level Group of Innovation Advisors will be created to advise on the design and implementation of an EIC pilot for 2018-2020, and on the future design and delivery of EU funding and other support for market-creating innovation. Further, the EIC should enrich the innovation landscape in Europe, complementing other initiatives to increase risk capital.

The Start-up and Scale-up Initiative will deal with three issues that particularly constrain start-ups and scale-ups in their growth potential: regulatory and administrative barriers, the shortage of partners and opportunities, and difficulties in accessing finance. Addressing these could help to significantly improve the competitiveness of European businesses.

Source: The European Innovation Council and Europe’s Winners of Tomorrow: the Start-up and Scale-up Initiative, COM 733, 22 November 2016, <https://ec.europa.eu/research/eic/index.cfm>

6.2 Mitigate the effects of market failures for SMEs with credit guarantees

The most important assets of YSIs are often intangibles such as human capital and intellectual property. But such assets do not typically qualify as collateral, and banks are reluctant to extend uncollateralized credit (especially to young firms lacking credit history), leading to “credit rationing” (EIB, 2014; Kraemer-Eis et al., 2016b; Chatzouz et al., 2017). Tightening financial conditions since the financial crisis have made this problem worse. Results from the new EIB Investment Survey (EIBIS) of 12,000 European firms shows that collateral requirements are the most frequently mentioned cause of dissatisfaction with external finance. Two approaches can be taken to alleviate this constraint: easing the collateralization of intangible assets by developing secondary markets where intangible assets can be traded; or, addressing the risk-bearing capacity of banks by providing guarantees that reduce the risk on their balance sheets, thus allowing less strict collateral requirements. The focus here is on the latter recommendation, as one that can be rapidly implemented on a large scale.

Credit guarantee schemes (CGSs) help to alleviate financial constraints from the supply side by enhancing banks’ capacity to take on increased risk, substituting collateral with credit protection provided by an external guarantor. They can be highly effective for mitigating the effects of market failures in the financing of YSIs, and their economic benefits have been widely analysed (OECD, 2013a; Asdrubali and Signore, 2015; Kraemer-Eis et al., 2016b). To be effective, however, they need to be appropriately designed and involve public and private stakeholders, with the guaranteed intermediary still carrying a portion of the risk (EBCI, Vienna Institute, 2014; Chatzouz et al., 2017; EIB, 2014).

Practice: InnovFin SME Guarantee Facility

According to the EIF website, “the InnovFin SME Guarantee Facility – managed by EIF – is, in addition to InnovFin Equity, part of ‘InnovFin – EU Finance for Innovators’, an initiative launched by the European Commission and the EIB Group in the framework of Horizon 2020.

The InnovFin SME Guarantee Facility will be deployed by eligible local banks, leasing companies, guarantee institutions, etc., which are selected after a due diligence process following the launch of a Call for Expression of Interest. Once selected by EIF, these local partners act as financial intermediaries. EIF, acting ... as the implementing body, covers a portion of the losses incurred by the financial intermediaries on loans, leases and guarantees between EUR 25,000 and EUR 7.5 million which they provide under the InnovFin SME Guarantee Facility. In this way, the EU and EIF allow the provision of more debt financing to innovative SMEs and Small Mid-caps (up to 499 employees).

The InnovFin SMEG Facility is a demand-driven, uncapped instrument that builds on the success of the Risk Sharing Instrument (RSI), developed under FP7, the 7th EU Framework Programme for Research and Technological Development (2007-2013) managed and implemented by EIF”.

Source: InnovFin SME Guarantee Facility, http://www.eif.org/what_we_do/guarantees/single_eu_debt_instrument/innovfin-guarantee-facility/index.htm

Practice: EaSI guarantee financial instrument and the Social Impact Accelerator

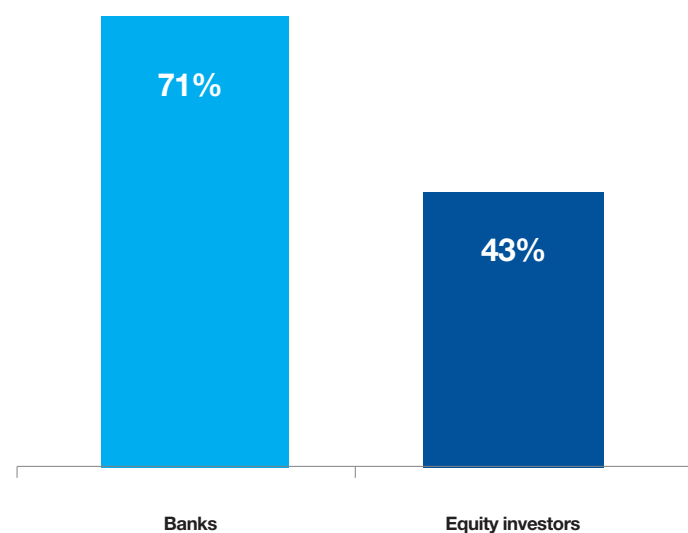
The European Commission’s new programme for Employment and Social Innovation (EaSI) aims to facilitate finance to micro-enterprises in general and social enterprises in particular. Through the EaSI Guarantee financial instrument, the EIF, which does not provide any type of finance to social enterprises directly, offers guarantees and counter-guarantees to financial intermediaries. These are selected by the EIF after applying under a Call for Expression of Interest followed by a due diligence process. Once selected, these partners act as EaSI financial intermediaries. Thanks to the risk-sharing mechanism between the financial intermediaries and the European Commission, the EaSI Guarantee enables selected microcredit providers and social enterprise investors to expand the range of enterprises they can finance. This facilitates access to finance for target groups who may have difficulty accessing the conventional credit market.

The EIF website explains the Social Impact Accelerator (SIA) as “the first pan-European public-private partnership addressing the growing need for availability of equity finance to support social enterprises. SIA is a first step in the EIB Group’s (European Investment Bank and EIF) strategy to pioneer the impact investing space and respond to the wider EU policy aim of establishing a sustainable funding market for social entrepreneurship in Europe ... SIA operates as a fund-of-funds managed by EIF and invests in social impact funds which strategically target social enterprises across Europe.”

This initiative takes a market-driven approach that enables social enterprises with a sustainable business plan to provide innovative solutions to social issues, hence boosting their competitiveness. In addition, targeted support allows these enterprises to contribute to social policy objectives in an accountable and transparent way, accounting for the interests of employees, customers and other stakeholders affected by their business activities.

Source: Social Impact Accelerator, http://www.eif.europa.eu/what_we_do/equity/sia/index.htm

Figure 30: YSI Confidence in Talking to Banks and Equity Investors



Note: Proportion of “yes” respondents out of those stating that bank and equity financing, respectively, are relevant financing options for their firms

Source: EC/ECB, 2015

6.3 Improve investment readiness

European VC markets have been described as “thin markets”, in which low supply and low demand reinforce each other (Deutsche Bundesbank, 2015). To address the equity gap facing YSIs in Europe and create a viable and vibrant risk-capital industry, it is therefore important to simultaneously improve markets’ institutional environment and foster a critical mass of potential investors and investee companies (Kraemer-Eis et al., 2016). While many policies focus on the supply side of providing equity, demand-side bottlenecks must be addressed as well.

One factor constraining the demand for equity products is the so-called debt-tax bias (de Mooij, 2011; EC, 2015b). Another demand-side bottleneck is the poor investment readiness of YSIs, comprising equity aversion, low “investability” and presentational failings (Wilson, 2015). Survey data confirm that only a small proportion of YSIs are confident in talking to equity investors, even among those that say equity financing is relevant for them (Figure 30). YSIs often struggle to identify and approach potential financial partners and remain confined to their local “house banks”, which may not be the most adequate partners for discussing their funding needs. Public policy can help by facilitating SME interaction with potential investors or through training.

Practice: InvestHorizon – Horizon 2020 work programme on access to finance

The European Commission’s InvestHorizon initiative has pilot instruments designed to address low investment readiness and awareness of financing options among entrepreneurs and SMEs. The initiative assists eligible public and private counterparts to improve the bankability and investment-readiness of large, complex and innovative projects that need substantial long-term investments. Making firms more aware of different options for obtaining financing increases their likelihood of receiving appropriate funding to unlock potential growth and increase competitiveness. Further, the initiative supports equality of opportunity by addressing some of the information barriers that lead to smaller firms being excluded financially. As a pan-European initiative that broadens awareness of options, it aims to help firms access finance beyond limited national markets.

Source: Horizon 2020: The EU Framework Programme for Research and Innovation, <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/access-risk-finance>

6.4 Increase the role of non-bank intermediaries in SME finance, including FinTech and non-bank lending

Diversifying sources of SME finance to include more non-bank intermediaries, such as asset managers, insurance companies and pension funds, could help to better match short-term funding needs with long-term capital requirements, achieve more efficient capital allocation (EFAMA, 2015) and improve resilience during crises (Kraemer-Eis, 2014). The aim should be to complement bank intermediation so that SMEs can benefit from a blend of financing solutions to suit their

circumstances in their stage of development, the structure of their balance sheets and plans for growth.

One important channel for diversifying is securitization, which needs a supporting, pragmatic regulatory approach that balances concerns about financial stability with the need for more effective SME financing. In fact, securitization provides SMEs with indirect access to the capital market as it creates a secondary market for SME loans (Kraemer-Eis et al., 2015). Another important channel is FinTech, or emerging digital financial technologies which could become a game changer for YSIs (World Economic Forum, 2015a). A new set of products tailored to YSI needs is unfolding: peer-to-peer lenders that connect risk-taking institutional investors with YSIs looking for funding; online platforms, payment processors and telecom operators that build on existing business relationships and use their customer knowledge; or invoice finance platforms that are effective tools for overcoming shortages in liquidity.

Taken together, these disruptive innovations can generate significant positive effects on firms’ balance sheets. They lead to more cash, improved working capital management, and more stable and secure funding. FinTech holds great promise for the true democratization of finance (TransferWise, 2015), and can help (or hinder) in harnessing the financial system to align financing with sustainable development outcomes (UNEP, 2016). While FinTech helps to further decentralize financial transactions through more seamless two-way communication, it already offers solutions for sustainability across the financial system’s five main functions: moving value, storing value, exchanging value, funding value creation and managing value at risk. Overall, while bad experiences will be unavoidable (Kraemer-Eis et al., 2016a), expectations for FinTech are high, and the financial system is starting to feel its impact.

Practice: Novo fund – supporting bank lending through SME securitization

Based on the French *Fonds Commun de Titrisation* (FCT) structure, the Novo fund is a publicly supported initiative, including a new type of financial vehicle to help non-bank institutions invest in SME bonds. Building on the success of a partnership between Société Générale and AXA, with whole loans being transferred from banks to the insurance sector, the Novo fund closed just above €1 billion and has 24 founders, of which 17 are insurance companies. The French government has taken strong action to support the Novo fund, including changing the law to allow insurers to invest up to 5% of their balance sheet in unrated bonds (as most of the Novo fund loans are not rated). Its FCT vehicle effectively enables French insurers to finance SMEs and mid-market companies. Due to its design, transparency is unusually high, thus helping to remove much of the uncertainty surrounding securitizations.

Unlocking finance from institutional investors for SMEs and mid-market companies complements the banking sector’s financing capacities. This, in turn, allows for more investments that enhance competitiveness and support broad-based growth in employment and productivity.

Source: Kraemer-Eis, 2014

Practice: SBOLT – Securitization based on peer-to-peer lending

Backed by the EIF and KfW (German Development Bank), SBOLT is the first European securitization transaction based on peer-to-peer lending. The £130 million SBOLT transaction in 2016 was a securitization of loans to UK SMEs and individual entrepreneurs originated via Funding Circle, a peer-to-peer lending platform. Funding Circle determines loan rates based on risk category and loan term. Individual or institutional investors can then purchase whole or fractional loans, while transaction and administration processes are kept lean.

In the current subdued bank lending environment, this business model reduces the dependence of SMEs and entrepreneurs on traditional bank loans, and also allows for much faster loan approvals. SBOLT enhances competitiveness because it improves access to finance for small businesses and new entrepreneurs. In addition, digital technologies reduce barriers to entry and enable investors and investees to participate in financing in more broad and diverse ways. In addition, SBOLT supports the scaling up and further evolution of innovative peer-to-peer lending solutions. The transaction supported two important elements of the Capital Markets Union: diversifying sources of financing for SMEs, and reviving the SME securitization market.

Source: EIB, 2016a

7. Conclusion

Addressing the twin European challenges of slowing productivity growth and the trend towards greater economic and social polarization as the Fourth Industrial Revolution unfolds will require a rethinking of our current economic model. It will mean moving away from treating growth and inclusion as two separate processes and instead working within the win-win space of initiatives that are good for competitiveness and inclusion at the same time. This paper has identified innovation and entrepreneurship as the key drivers for simultaneous improvements in competitiveness and social inclusion in Europe, enabled by well-functioning goods and service, labour and capital markets. In each case the paper makes recommendations for how to resolve current bottlenecks and provides practice examples that can offer ideas for implementation.

Key areas for action for innovation and entrepreneurship emerge as: (i) not just more open innovation systems but critically also increasing efforts to diffuse existing general-purpose technologies more rapidly across all types of firms – the objective of the Austrian Pilotfabrik 4.0, for example; (ii) not just the right framework conditions for entrepreneurship but also ensuring a successful transition from start-up to scale-up – as supported by the TechCity Upscale Programme in the United Kingdom; (iii) better enabling conditions for greater inclusion and competitiveness created through smarter infrastructure, including better connected digital, transport and energy networks – for instance through initiatives such as Superfast Cornwall, Real Time Passenger Information systems in Madrid and Enexis, the Dutch smart grids for electric cars; (iv) ensuring that the population is equipped with the best possible cognitive and digital skills, an outstanding challenge for Europe and one crucial to ensure that the largest possible number of people benefit from technological progress – as the European Institute of Innovation & Technology’s important ideas in this area attest; and (v) accelerating efforts to provide ready capital to innovative firms, tailored to their needs at different stages of the life cycle – such as more venture and growth capital funding for start-ups and credit guarantee schemes for small and medium-sized enterprises, such as the InnovFin SME Guarantee Facility.

The initiative offers a point of departure for the major challenge of building a more inclusive future for Europe across the chasms arising from ever more rapid technological change. The community of European stakeholders is called upon to collaborate in developing the initiative further.

Appendix

1. World Economic Forum Global Competitiveness Index

Competitiveness is defined as the *set of institutions, policies and factors that determine the level of productivity of an economy*, which in turn sets the level of prosperity that the country can achieve.

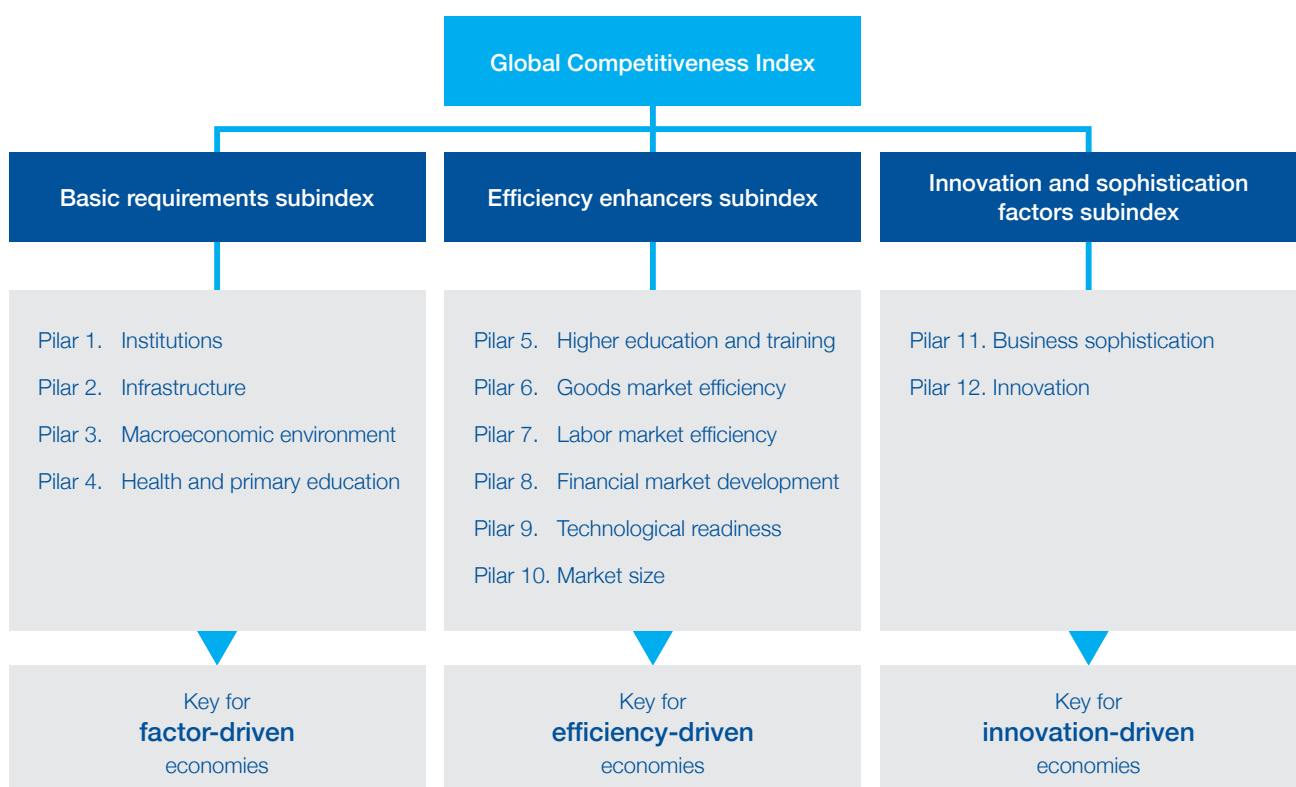
Since 2005, building on Klaus Schwab's original idea of 1979, the World Economic Forum has published the Global Competitiveness Index (GCI) developed by Xavier Sala-i-Martin in collaboration with the Forum. The GCI combines 114 indicators that capture concepts that matter for productivity and long-term prosperity.

These indicators are grouped into 12 pillars: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication and innovation. These pillars are in turn organized into three sub-indexes: basic requirements,

efficiency enhancers, and innovation and sophistication factors. The three sub-indexes are given different weights in the calculation of the overall Index, depending on each economy's stage of development, as proxied by its GDP per capita and the share of exports represented by raw materials. Appendix A of *The Global Competitiveness Report 2016-2017* presents a description of each pillar, a classification of economies by stage of development, the detailed structure of the GCI and a description of the various steps of its computation, including normalization and aggregation.

The GCI includes statistical data from internationally recognized organizations, notably the International Monetary Fund, the World Bank and various United Nations' specialized agencies, including the International Telecommunication Union, UNESCO and the World Health Organization. The Index also includes indicators derived from the World Economic Forum Executive Opinion Survey that reflect qualitative aspects of competitiveness, or for which comprehensive and comparable statistical data are not available for a sufficiently large number of economies.

Figure A1: Global Competitiveness Index Framework



Source: *The Global Competitiveness Report 2016-2017*

2. World Economic Forum National Key Performance Indicators for Inclusive Development

The dashboard of National Key Performance Indicators featured in the *Inclusive Growth and Development Report 2017* includes GDP per capita as well as the best available cross-country measures of other important facets of sustained, broad-based progress in living standards. Four such indicators have been chosen within each of the three pillars: growth and development, inclusion, and intergenerational equity and sustainability.

Growth and development

The first pillar captures four core metrics of economic growth and development: GDP per capita; labour productivity, which underpins wages that in turn account for the overwhelming majority of household income; employment, a proxy for the breadth of economic opportunity and ultimately family security; and healthy-life expectancy, a measure of the quality of life.

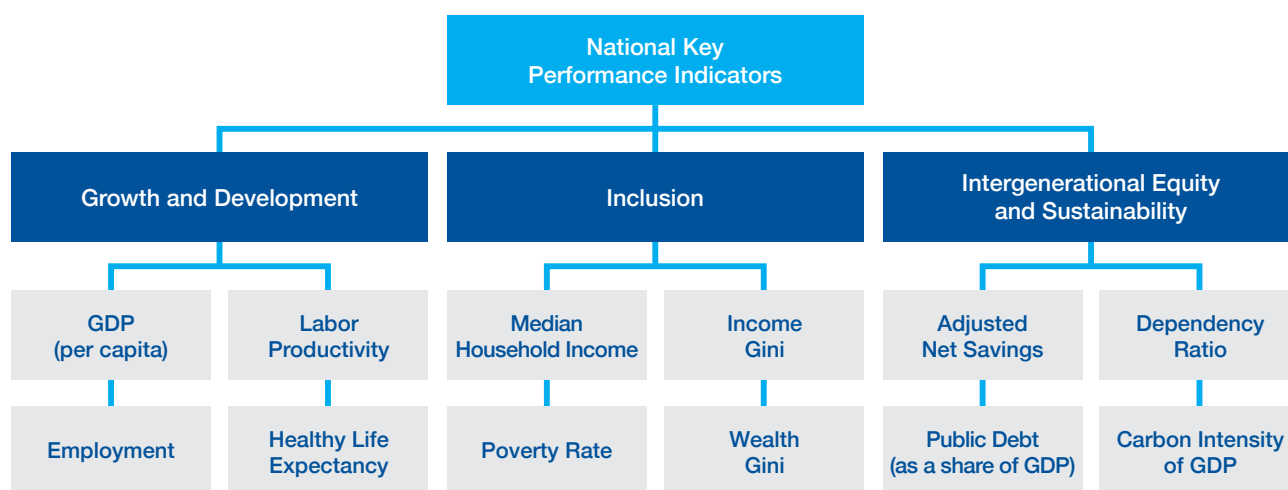
Inclusion

The second pillar includes four core measures of social inclusion: median household income, perhaps the single best proxy for the breadth of progress in living standards; poverty rate, a measure of the extent to which progress occurs at the bottom of the income scale; income Gini, the standard international measure of inequality; and wealth Gini, the analogous measure of wealth concentration.

Intergenerational equity and sustainability

The third pillar incorporates four measures of intertemporal equity and sustainability for the reason that growth and gains in living standards are not truly socially-inclusive if they are generated in a manner that unduly and unsustainably burdens younger and future generations. These are: adjusted net saving, which measures the true rate of saving in an economy after taking into account investments in human capital, depletion of natural resources and damage caused by pollution; public indebtedness as a share of GDP, which roughly illustrates the scale of borrowing by the current generation against the capacities of future ones; the dependency ratio or proportion of retirees and youth (under 15 years of age) to the working-age population, which is also a leading indicator of likely future pressure on a nation's finances; and carbon intensity of economic output, an indicator of the country's relative performance on climate change.

Figure A2: National Key Performance Indicators for Inclusive Development



Source: *The Inclusive Growth and Development Report 2017*

Endnotes

- 1 The EIB Group consists of the European Investment Bank (EIB) and the European Investment Fund (EIF).
- 2 *The Economist*, 2 May 2015, <http://www.economist.com/news/briefing/21650086-salaries-rich-countries-are-stagnating-even-growth-returns-and-politicians-are-paying>.
- 3 The Conference Board, Total Economy Database (TED), May 2016.
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- 11 *The Economist*, 2 May 2015, <http://www.economist.com/news/briefing/21650086-salaries-rich-countries-are-stagnating-even-growth-returns-and-politicians-are-paying>.
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- 14 eurostat, cited in Darvas and Wolff (2016), Figure 17.
- 15 Digital technologies will allow for ever more effective labour market matching through online platforms. They serve to integrate markets by reducing search costs, and can make market entry easier by allowing start-ups to cut their fixed costs if they market through platforms and share resources through the cloud (although they also make entry of online platforms more difficult due to network lock-in). They affect research and innovation directly and indirectly, providing new tools, making data gathering and storage cheaper, and increasing incentives to innovate where they increase competition (World Economic Forum, *The Global Information Technology Report 2016*). They allow for new ways of preventing and curing illnesses, thereby improving public health, and make a wider variety of educational resources accessible.
- 16 Heckman makes the case for equitable pre-distribution through the provision of early childhood education, an effort that simultaneously benefits competitiveness and inclusion. Chetty and co-authors are currently developing the idea of inclusive innovation through the Equality of Opportunity project.
- 17 See European Commission, Business, Economy, Euro: "Economic performance and forecasts", https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts_en.
- 18 Note that while the skill premium has been rising in the US, it has been linked with increasing rents from the protection of certain high-skill professions (lawyers, doctors, dentists) rather than technological change. In Europe, the top 1% of earners is mainly found in finance/ insurance and manufacturing, and the skill premium is not as high (and, indeed, is falling).
- 19 For example, the US lost about 5.6 million manufacturing jobs between 2000 and 2010, of which 85% have been attributed to technological change (largely automation) rather than to international trade. However, although there has been a steep decline in factory jobs, the US manufacturing sector has become more productive and industrial output has been growing; simply put, the sector is producing more with fewer people. Based on the *Financial Times* article by Federica Cocco, "Most US manufacturing jobs lost to technology, not trade", 2 December 2016.
- 20 Compiled by Doris Ritzberger-Grünwald, Josef Schreiner and Julia Wörz (all Oesterreichische Nationalbank), based on calculations by Konstantins Benkovskis (Latvijas Banka and Stockholm School of Economics in Riga).
- 21 Danish Board of Technology Foundation, <http://www.tekno.dk/?lang=en>.
- 22 European firms are currently absent from the global frontier in the key area of creating digital platforms. In fact, Europe is lagging significantly behind the US and China in the size of the platforms it has created (Roland Berger Strategy Consultants, 2015). Anecdotal evidence suggests that European companies use digital technologies mostly to reduce costs and increase efficiency, the effects of which are marginal compared to potential value creation from radically rethinking business models and production networks (Roland Berger Strategy Consultants, 2015).
- 23 See European Investment Bank, "EIB Investment Survey – Tracking investment needs and constraints across Europe", <http://www.eib.org/eibis>.
- 24 The four institutional levers emphasized in this context, and which need to be adapted, are goods market efficiency (openness, barriers to entry), labour market flexibility, graduate education/research as well as the organization of the financial sector (Aghion and Akcigit, 2017).
- 25 In this context, it is also interesting to look at different determinants of growth patterns of venture-backed companies. Evidence and a cluster analysis can be found in Signore (2016).
- 26 See further discussion on access to venture and growth capital in Section 6.1.
- 27 This section and the ASM case were contributed by Armando Garcia Schmidt, Senior Project Manager, Bertelsmann Foundation.
- 28 See <http://www.eib.org/eibis> for more information about the 2016 EIB Investment Survey.
- 29 Education Endowment Foundation, "Early years intervention", <https://educationendowmentfoundation.org.uk/resources/teaching-learning-toolkit/early-years-intervention/>.
- 30 See Kraemer-Eis et al. (2016b) for a recent overview of the current situation in the European PE market.
- 31 See Kraemer-Eis (2014) for an overview of the role of institutional non-bank lending and the role of debt funds. A brief market update is also available in Kraemer-Eis et al. (2016a).

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