

European Round Table for Industry

European Competitiveness and Industry

Benchmarking Report 2019

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Foreword

As we prepare to enter a new decade, the European economy is facing difficult times. The global economic environment is becoming weaker. World trade growth is diminishing and economic ripples from trade and geopolitical conflicts are increasingly evident.



Open and export-oriented European economies are suffering from weaker demand for investment goods and durable consumer goods such as cars. Homegrown problems are adding to this, most notably the uncertainty on the timing and final conditions of the British exit from the European Union.

But aside from the recent signs of a cyclical downturn and intensifying political interferences, many indicators of this new ERT Benchmarking Report illustrate that Europe's competitiveness is under threat. Unit labour costs are rising in major European economies as wage growth exceeds productivity growth. Global export market shares of European manufacturers are in decline in the long-term. Improvement and extension of Europe's digital and telecom infrastructure lag significantly behind international competitors.

While Europe remains a global center of research and development it has already fallen behind its peers – such as China, the US, Japan and South Korea – in terms of R&D expenditures relative to GDP. On top of that, the comparatively small global share of European unicorns points to barriers for scaling innovative businesses in the EU.

However, a changing market environment is also providing new opportunities for Europe. Climate protection and sustainability are rapidly gaining importance on the political and societal agenda. Europe has committed itself to ambitious targets for the reduction of CO₂ emissions, an increase of energy efficiency and a higher share of renewable energy. Regarding these ambitions, Europe is already a global leader. Now Europe must prove that sustainability and economic growth are not opposites, but two sides of the same coin. To reconcile both targets, a conducive environment for innovation and development of new technologies is extremely important. Many aspects are relevant here: a smart regulatory framework, e.g., applying the 'innovation principle' across all policy areas as a complement to the precautionary principle, as well as leveraging regulatory sandboxes to detect the best regulatory approaches. We need an open and sciencebased dialogue on the opportunities and risks of new technologies, as well as tax incentives for basic research and development. Finally, the availability of risk capital is crucial if new ideas are to truly gain the lift they need to make it to the market place.

So, there's quite a lot to be done and the decade ahead of us demands real progress, if Europe is to strengthen its place in the world. While pursuing the transition of the European economy and energy sectors towards circular and sustainable business models, the international competitiveness of the European industry must be improved. Among other factors, sufficient and cost-competitive supply of clean energy and raw materials is needed to keep long industrial value chains as a center of innovation and as a backbone for long term economic growth in Europe.

This report presents a comprehensive overview of key indicators and compares European economies with their international partners in the areas of macroeconomics, competitiveness, trade/investment, innovation/science, digital economy, energy/climate and employment/skills.

We are confident that you will find it useful.

Dr Martin Brudermüller

Chairman of ERT's Competitiveness & Innovation Committee Chairman of the Board of Executive Directors of BASF

Executive Summary

Key statistics of the ERT Benchmarking Report:

The ERT Position Paper on the future strategy for European industry ("Turning Global Challenges into Opportunities – a chance for Europe to lead") contains a broader analysis of the challenges which Europe industry is facing and an extensive list of recommendations for EU policy makers.



European shares in world manufacturing valueadded and in export markets **decreased by 4%** and 5% respectively between 2006 and 2016 Industrial **electricity prices in Europe are considerably higher** than in other regions, driven mainly by non-energy costs: for 2017 in €/MWh: 103.3 in EU vs. 61.3 in US and 74.3 in Canada



Expected **growth rates** in Europe are **significantly below** the world average

2.0%

EU **R&D spending intensity is falling behind** (2017): 2.0% in EU vs. 2.1% in China, 2.8% in the US and 2.4% is the OECD average



The share of **European companies in the** Fortune 500 has declined from 32% in 2010 to 23% in 2019



Unit labour costs in the EU have **decreased slightly**, but not as significantly as in the US. Overall economic productivity in the EU is only 75% of US productivity

Executive Summary

Competitiveness

Observations

Industry continues to play a pivotal role in the EU economy as a major employer, supporting high value jobs, also indirectly. Europe's longer-term growth outlook remains tepid and uncertain. European manufacturing is continuing to lose global market share.

In the EU, labour unit costs have fallen slightly over the past 15 years, but much less than in the US, South Korea and Mexico. Europe is a region with high debt levels. After the sharp drop in investment since the financial crisis, private investment has begun to recover, while public investment remains subdued.

Recommendations

Strengthening the Single Market and support for new technologies should be key priorities in Europe. The EU must also nurture a context in which European companies can scale up. This should include a modernisation of competition policy that takes into account global market conditions and dynamics as well as the protection of consumer interests in the long-term.

All European countries must increase their productivity. This requires higher investment in skills and efficient labour markets.

Sustainable private and public debt levels are necessary to maintain macroeconomic stability.

At the same time, both the private and the public sectors have a role to play in strategic investments, which focus on productivity enhancing future technologies and critical infrastructure.

Innovation

Observations

R&D investment relative to EU GDP has flatlined significantly below the OECD average and lags major competitors, such as the US, South Korea and China.

The number of patent applications in the EU is lower than in the US and China in the ICT sector, and lower than in the US and Japan in the biotech sector. Europe performs worse than the US and China in terms of the share of unicorns.

European venture capital deals and capital invested fell back in 2018.

Recommendations

The EU needs an innovation-friendly fiscal environment and the new budget for Horizon Europe should be at least €120 billion. A smart regulatory framework should enable industry to drive innovation, including through R&D tax incentives for companies. The innovation principle should be operationalised to achieve riskproportionate, predictable and science-based technologies.

The EU should also stimulate interdisciplinary Public Private Partnerships and focussed missions. Better access to finance is also needed, in particular venture capital, by further developing the Capital Markets Union.

Benchmarking Report 2019 Executive Summary

Jobs & Skills

Observations

The proportion of young people not in employment, education or training has fallen, but remains extremely high in those member states that suffer the most from protracted economic problems. At the same time, there is a high demand for digital skills across sectors and many firms are finding it hard to recruit sufficient ICT specialists, not only in the ICT sector itself.

The EU and its Member States are leading in the implementation of the UN SDGs. Household income inequality in the EU is lower than in the US but has overall not fallen since the financial crisis. In comparison to the rest of the world, companies in Western Europe have more women in board rooms.

Recommendations

Europe cannot afford wasting talent and more efforts are needed to close the skills gap. Especially young people should get all opportunities to acquire skills and succeed in labour markets. More investment in digital skills, including ICT, is required.

In an economy where the pace of innovation and disruption to jobs is high, Europe must continue taking the lead in promoting inclusive and sustainable growth to the benefit of all. This is fully aligned with Europe's values and supported by European global companies represented by ERT. ERT Member companies have pledged to create an inclusive business culture with equal opportunities for all and share good practice to achieve this goal.

Digital Transformation

Observations

The US and China are ahead of Europe in the areas of artificial Intelligence (AI), telecom investment, 5G roll-out and the platform economy. Telecoms service revenues have fallen and are stagnating in Europe - and the gap to the US remains high. European operators are investing significantly less per capita than operators in the US and Japan.

The EU risks falling behind other major economies in providing 5G infrastructure and allowing the full potential of its commercialisation. In developing platform companies, the EU already lags behind other regions, especially for business-tocustomer (B2C) platforms.

Trust of Europeans in the tech sector is weak compared to the EU's main competitors.

Recommendations

The EU should assume leadership in industrial AI-technologies. Furthermore, the telecoms infrastructure needs more investment in Europe if the increasing demand for services is to be satisfied. Also, a harmonised framework for 5G spectrum, assignment and operation is decisive for early availability at pan-European scale. This should avoid fragmentation and enable 5G for B2B applications. Spectrum assignment procedures must prioritise investment in coverage and capacity over upfront fees. Finally, the EU should promote the free flow of machine data standards globally.

Policymakers, public research institutions and businesses must work together to ensure the necessary confidence in new technologies as well as a sense of urgency and investment to catch up. Europe cannot afford to fall behind in their development if it wants to ensure its industrial competitiveness

Benchmarking Report 2019 Executive Summary

Energy Transition & Climate Change

Observations

The European economy is substantially less energy-intensive and less CO2intensive than the Chinese, Russian or American economies. The European share of global CO2 emissions has fallen to just 10%. By international standards, it is mainly taxes and levies which now in the EU account on average for 38% of the electricity price and contribute to sustaining prices at high levels.

Europe remains a global leader in renewable energy investment, but China is now the world's biggest investor. The composition of final energy consumption has shifted towards cleaner electricity and biofuels in the EU. China is also moving to electricity but remains heavily dependent on coal.

Recommendations

The EU should continue to support the pricing of carbon outside Europe (at least at G20 level) to create a level playing field and enable low carbon technologies for industry to be competitive.

Energy and industrial policies must be closely aligned to boost competitiveness. EU industrial policy should facilitate the transition of EU industry by creating an investment-friendly environment. The EU should ensure sufficient and competitive clean energy supply while enabling future energy markets to cope with this trend.

Trade & Investment

Observations

European companies increasingly face barriers to trade and investment in a wide range of economies due to spiralling protectionism seen in recent years.

The EU's two biggest trade relationships are with the US and China. There is a strong mutual dependence among manufacturers on both sides of the Atlantic, as the US remains the single most important trade and investment partner for the EU. Chinese producers are increasingly competitive on international markets, and China is the largest source of imports for a significant number of countries worldwide. Although the Chinese outward foreign direct investment (FDI) in the EU has risen, and China is taking advantage of the EU's openness, foreign investors continue to face many restrictions in China.

The EU remains the single most important region for both outward and inward FDI, but its relative share has declined in recent years. Foreign investors from outside the EU have created eight million jobs in the Union.

Recommendations

It is essential that the EU works with all other major economies to reverse the trend towards protectionism and to open each other's markets. The EU should ensure free, fair and rules-based global trade, and in particular strive to address the challenge of the WTO dispute settlement system. The EU furthermore needs an active trade policy to strengthen the level playing field for European companies while European Economic Diplomacy should pro-actively promote the EU's industrial interests.

The EU should work together with the US to further strengthen the trade and investment relationship and accelerate the negotiation of an investment agreement with China. The EU and Member States need to implement effective national FDI screening mechanisms. Distortions of a level playing field should also be tackled through effective use of the EU's modernised Trade Defence Instruments and adoption of an International Procurement Instrument based on reciprocity.

The EU needs to remain competitive as a destination – and a source – for FDI. Bilateral investment treaties and/or strong investment chapters in future free trade agreements should thus be a priority.

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Industry remains the cornerstone of the EU economy

Observation

Industry continues to play a pivotal role in the EU economy as a major employer, supporting high value jobs. Industrial companies also indirectly support jobs and value added in other sectors.

Recommendation

Ensuring the competitiveness of EU industry while continuously promoting our social market economy should be a top priority for politicians and policymakers. The EU should incentivise industries' value creation for society beyond profit generation.

Industry share of total employment in 2018



Industry share of total gross value added in 2018



Note: Industry includes mining, manufacturing and utilities, but excludes construction Source: OECD, Global Counsel calculations

The growth outlook is uncertain

Observation

Europe's recovery has become more uneven and the longer-term growth outlook remains tepid and uncertain. At the same time, growth is expected to pick up in many emerging markets, even as growth slows in China, the US and Japan.

Recommendation

Europe needs to make sure that it reaches its full growth potential. This requires a conducive environment that allows business to grow. Strengthening the Single Market, support for new technologies and a smart regulatory framework should be key priorities.

Average GDP growth rates of major economies (% p.a.)



Average GDP growth rates in advanced and emerging economies (% p.a.)

20192020-2022



The nature of global competition is changing

Observation

The global corporate landscape is changing rapidly and European firms risk losing out to their competitors, especially from China. The European Commission's European Political Strategy Centre recently noted the speed and force with which foreign firms, especially from China, are taking market share in previously European-dominated markets

Recommendation

Europe must develop a more conducive environment for companies to grow. This should include a modernisation of competition policy that takes into account global market conditions and dynamics, the wider EU industrial ecosystem and a more long-term appreciation of consumer interest.

Fortune Global 500 representation by country Source: Fortune The ten largest manufacturers of solar panels

Source: European Political Strategy Centre 2019



The ten largest manufacturers of solar panels/cells by country/region



Manufacturing competitiveness is under pressure

Observation

European manufacturing is continuing to lose global market share and export share due to strong growth of Chinese and other Asian producers. While the lost share of manufacturing value added is comparable to the US, the lost share of manufactured exports is much greater.

Recommendation

European manufacturing has many strengths, particularly in medium and high-tech sectors. But European governments and businesses must invest massively in the technological fields of the future, including artificial intelligence, circular economy and critical infrastructures, with a focus on industrial applications, to maintain Europe's industrial base.

Manufacturing sector performance

Share in world manufacturing value added:
2006 2016 Share in world manufactured exports:
2006 2016



Technological complexity of manufacturing

• Medium and high tech share in total manufacturing value added • • Other



Manufacturing sector performance Source: UNIDO Note: *EU4 = France, Germany, Italy and UK Technological complexity of manufacturing Source: UNIDO

Labour productivity needs to rise

Observation

Labour unit costs in France and Germany are increasing, while they are shrinking in Greece, Poland and Spain. In the EU as a whole, as well as in Japan, labour unit costs have fallen slightly since 2004, but much less than in the US, South Korea and Mexico.

Recommendation

All European countries must increase their productivity if European economies are to remain competitive. This requires higher investment in skills and capital as well as the design of efficient labour markets. Focus should be on employment security via lifelong learning rather than job security.

Change in real unit labour cost





Labour productivity

200420122018



Change in real unit labour cost Source: Ameco

Labour productivity Source: The Conference Board, Global Counsel calculations

Debt levels remain high

Observation

While household debt has fallen marginally in the EU as a whole and significantly in the countries hit by the real estate crisis and connected to the global financial crisis, corporate debt and public debt have edged up in many countries. This makes Europe a region with high debt levels, although the pace has been faster in some emerging markets in recent years, such as in China.

Recommendation

A sustained rise in confidence, consumer spending and investment requires that the finances of both households and companies are healthy. Sustainable private and public debt levels are also necessary to maintain macroeconomic stability, a key prerequisite for economic growth.



Private debt in 2018 Note: EU corporate debt levels are eurozone only Source: CEIC, BIS Public debt in 2018 – Source: IMF

15

Low investment is constraining competitiveness

Observation

There has been a sharp drop in investment since the financial crisis, particularly among the countries worst affected by the debt crisis that followed. While private investment has begun to recover, public investment remains subdued.

Recommendation

In some countries investment rates were unsustainable before the crisis, but investment rates are now too low if Europe is to remain competitive. Both the private and the public sectors have a role to play in enabling productive, strategic investments. The focus should be on future technologies and critical infrastructure.





EU gross fixed capital formation, % of GDP Source: AMECO, Global Counsel calculations

Gross fixed capital formation 2008-2018, % of GDP Note: Latest available data for the US, China and Japan is from 2017 Source: World Bank

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R&D spending needs to increase

Observation

China is investing more in R&D as a share of GDP than the EU already since 2012. Investment in R&D in the EU has flatlined significantly below the OECD average and lags behind major competitors. The gap for business enterprise R&D is even higher than other sources of R&D.

Recommendation

Investment in technology must be increased. The EU needs an innovation-friendly fiscal environment and the new budget for the Horizon Europe programme should be at least €120 billion and fully utilised in the implementation. A smart regulatory framework should enable industry to drive innovation, including through R&D tax incentives for companies. The innovation principle should be operationalised to achieve risk-proportionate, predictable and science-based technologies.

Gross domestic spending on R&D, % of GDP

Spending on R&D by type in 2017, % of GDP



Business enterprise R&D Other R&D



Note: Business enterprise R&D includes activities conducted by private and public enterprises. Other R&D includes activities from government, higher education and private non-profit organisations.

Source: OECD

The circular economy offers great potential

Observation

The circular economy is already creating jobs, investment and value added. Almost two in every 60 jobs in the EU are now related to the circular economy. But available data shows that not even a third of municipal waste is being recycled in the EU, despite some Member States performing well in international comparison.

Recommendation

The EU should create a common market for Waste as a Resource by harmonising End of Waste rules and it should acknowledge chemical recycling as a supplement to other types of plastic recycling. The EU should also encourage innovative solutions and new circular business models.

Treatment of municipal waste as a % of total waste generated in 2017 Source: OECD , Global Counsel calculations Note: *EU & OECD countries, excluding Ireland. Total EU28 investment was €175bn in 2016

Size of the EU's circular economy in 2016 Source: Eurostat

Treatment of municipal waste as a % of total waste generated in 2017 (%)

Recycled
 Composted
 Incinerated for energy recovery



Size of the EU's circular economy in 2016 (Share / € Billion)



2.5

What is the Circular economy?

A circular economy aims to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimising the generation of waste. The fewer products we discard, the less materials we extract, the better for our environment.

This process starts at the very beginning of a product's lifecycle: smart product design and production processes can help save resources, avoid inefficient waste management and create new business opportunities.



The EU must better leverage its position in science

Observation

Europe is a leading global centre for scientific research, employing almost 2m scientific researchers. However, China has more business enterprise researchers. The number of patent applications in the EU is lower than in the US and China in the ICT sector, and lower than in the US and Japan in the biotech sector.

Recommendation

Scientific research in universities, research foundations, public bodies and by the private sector is essential if the European industry is to remain competitive. The EU should provide the Horizon Europe programme with a strong mandate for scientific excellence, interdisciplinary Public Private Partnerships (PPPs) and focussed missions.

Number of scientific researchers, 2017 Note: US data is from 2016 Source: OECD

Number of patent applications under the Patent Cooperation Treaty in 2017 Note: The data on patent applications can be considered as a proxy for the output of R&D in the form of inventions. Source: OECD



Number of patent applications under the Patent Cooperation Treaty in 2017

● 2006 ● 2017





• Business enterprise researchers • Other researchers

Europe needs more venture capital

Observation

European venture capital deals and capital invested fell back in 2016, with the European share of the global total continuing to decline. While the US dominates the global market, Asia has emerged as a major centre for high-value investment.

Recommendation

The EU should improve access to finance by developing the Capital Markets Union. Venture capital financing is important for a vibrant, innovative economy, both because it allows the most innovative businesses (in particular deep-tech start-ups) to get access to capital and because of the experience that investors bring to those businesses.

Number of venture capital deals Rest of the world EU US China 20,000 2,459 965 553 10,550 880 513 10,468 15,000 992 799 9.489 339 9.326 645 787



Capital invested in venture capital deals, USD billion

Rest of the world EU US China

2,154

813



Source: KPMG

European start-ups are being left behind

Observation

The European share of unicorns, either by number or value, is very low, and far short of what should be expected of the European economy, if it is to remain competitive with China and the US.

Recommendation

The Digital Single Market should shape an environment in which European tech start-ups can grow to compete at scale and in sufficient number with other major economies.

The EU should facilitate access to finance in a way that takes into account the longer development cycles of disruptive technologies.

The number of unicorns created by year and by country/region (Circle refers to EU share)

● EU ● US ● China ● Rest of the world



Total unicorns and their valuations by country/region



Note: Bubble size indicates total value. Source: CB Insights



Jobs & Skills

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European economies are ageing fast

Observation

The old-age dependency ratio is set to remain higher than in many other large economies. The size of the problem varies significantly across member states, with some of the worst affected also having high public debt.

Recommendation

A combination of migration, productivity improvement, reskilling, lifelong learning and social security reform is required to address the challenge presented by an aging population. Many policy changes have long lead times before they have impact.



20

+10.9

+7.1

30

+7.1

+4.7

+3.7

40

50

+4.7

Poland

Romania

0

10

Czech Republic



Economic inactivity among the young remains high, but is falling

30

25

20

Observation

The proportion of young people not in employment, education or training has fallen, but remains extremely high in those member states that have suffered the most protracted economic problems.

Recommendation

Europe cannot afford to waste talent. More efforts are needed to close the skills gap to make sure that a higher share of young people remains in either education, training or employment.

The proportion of young people, aged 15-29, not in employment, education or training (%) • 2018 - 2015 15 10 5 0 Portugal Finland Ireland Germany Sweden USA Greece Spain France Hungary Belgium Estonia Poland Czech Republic Netherlands Italy Great Britain Japan* Youth unemployment rate (EU28: 15.2%) Total unemployment rate (EU28: 6.8%) 7.0 6.3 3.8 10.6

Note: *Japan - Only 2014 data available Source: OECD

There is no room for complacency on income inequality

Observation

Income inequality in the EU is lower than in the US but has overall not fallen since the financial crisis. Wage polarisation due to technological changes as well as a growing share of elderly who often have low retirement incomes are important factors.

Recommendation

Income inequality has been linked to the rise in populism that has been seen on both sides of the Atlantic. In an economy where the pace of innovation - and disruption to jobs - is high, it is essential to safeguard inclusive growth and boost prosperity for all.



● 2009 ● 2016

Cini coefficient for disposable household income after taxes and transfers

Change in employment in the EU by social-economic group, 2013-2018, millions



Cini coefficient for disposable household income after taxes and transfers Source: OECD

Change in employment in the EU by social-economic group, 2013-2018, millions Source: Eurostat

ICT skills investment needs to increase

Observation

ICT proficiency varies across Europe. There is a high demand for digital skills across sectors and many firms are finding it hard to recruit sufficient ICT specialists, and not only in the ICT sector itself.

Recommendation

The need for ICT skills is acute in some sectors. More investment in overall digital skills, including ICT, is required. Business and government have a shared responsibility to ensure the pipeline of skilled staff is strong, e.g. by regularly updating curricula and applying a targeted approach based on skills needs.

Share of digital intensive jobs in 2017 Note: * Data from 2015 Source: OECD

EU enterprises that recruited or tried to recruit ICT specialists in 2018 Source: Eurostat



EU enterprises that recruited or tried to recruit ICT specialists in 2018 (%)

Share of digital intensive jobs in 2017



• ICT Specialists • Other ICT intensive occupations

Gender equality is the goal, but there is still much room for improvement

Observation

Companies in Western Europe have more women in board rooms and the proportion of board seats held by women has increased sharply. But there is still a wide gap between the proportion of women and men in European board rooms.

Recommendation

ERT Member companies have pledged to create an inclusive business culture with equal opportunities for all and share good practice to achieve this goal. The proportion of women in board rooms is one measure of diversity.

2012



Female board participation in 2018 Boards with at least one woman Board seats held by women



2016

2018

2014

Source: EgonZehnder Global Board Diversity Tracker

Europe is leading in the implementation of the Sustainable Development Goals

Observation

The EU and its Member States are leading in the implementation of the UN SDGs. But other countries are catching up, allowing them to develop a better educated, healthier and as a result, more productive workforce and a more conducive business environment.

Recommendation

Europe must continue taking the lead in promoting inclusive and sustainable growth to the benefit of all. This is fully aligned with European values and supported by the European global companies represented by ERT.



Selected metrics from SDG index 2019

Score is 0-100 and 100 is completed





Digital Transformation

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Trust needs to be built in providers of technology & government strategies

Trust in the tech sector

% of general population who trust the tech sector

Observation

Trust of Europeans in the tech sector is weak compared to the EU's main competitors. One reason is that privacy concerns in Europe are greater compared to other markets.

Recommendation

There is a risk that businesses and consumers refrain from adopting and using new technologies that allow Europe to compete internationally. Policymakers and business should partner to engage citizens in active dialogue that builds confidence and acceptance of new technologies and implementation of national cyber security strategies.

100 **Total Trust** 90 80 76 75 73 73 70 60 50 40 30 20 10 0 Australia Germany France Spain Russia Vetherlands Canada Japan USA Italy Korea Ч India Brazil China

Strong trust Weak trust

Trust in digital security

Self-driving vehicles

Trust in new technologies: % of general population who trust...

100 80 60 Distrust* 40 20 0 Malaysia Hong Kong S. Africa China India Mexico Brazil Russia Italy Spain Japan France Australia UAE Turkey S. Korea Singapore Canada Ч SU Ireland Indonesia Colombia Argentina Netherlands Germany

Artificial Intelligence (AI)



Note: *Defined as trust of below 50%. Source: 2019 Edelman Trust Barometer

Vigilance on cybersecurity needs to be maintained

Significant cyber Incidents since 2006

Number of cyber attacks on government agencies, defense and high tech companies, or economic crimes with losses of more than a million dollars



Observation

Data breaches are costly, averaging over \$150 per head globally, although the average cost in the US is considerably higher than in large European states.

Recommendation

Governments and companies should invest more in cybersecurity and collaborate more closely to prepare for and respond to attacks. There is room for all countries to assess the effectiveness of cybersecurity investments, particularly as threats are constantly changing. Public policy frameworks should offer the right incentives (and a sound horizontal approach to security policy) to invest in cybersecurity. Users need to trust that their digital technologies are safe and secure. Digitalisation and cybersecurity must evolve hand in hand.

Significant cyber Incidents since 2006 Note: *EU3 = France, Germany and UK Source: CSIS as of June 2019

Data breaches - cost and preparedness Note: *measured by the ITU Global Cybersecurity Index 2018 Source: IBM, Ponemon Institute, ITU

Europe needs to seize more of the opportunities provided by AI

(USD billions)



29%

Observation

Artificial intelligence (AI) offers a big opportunity for Europe, but achieving this requires large investment in the companies that develop AI in the first place as well as in AI adoption by companies across all industries. Other regions are leading in this area, notably the US and China.

Recommendation

Policymakers, public research institutions and businesses must work together to ensure the necessary sense of urgency and investment focus in industrial AI-technologies and applications, specifically in domains of strength where Europe plays a leading role. The EU should also in this area assume leadership in global standard-setting based on its values.

Total estimated private equity investment in AI startups, by start-up location Notes: VC = venture capital / PE = private equity / Numbers listed are absolute values.

Source: Center for Data Innovation

EU telecoms infrastructure needs investment

Observation

Telecoms service revenues have fallen and are stagnating in Europe - and the gap with the US remains high. European operators' capital expenditure as share of sales has been growing and is higher than in the US. At the same time, European operators are investing significantly less per capita than operators in the US and Japan.

Recommendation

Telecoms infrastructure needs more investment in Europe if the increasing demand for services is to be satisfied. A more investment-friendly framework in the EU is urgently required.

Telecom services revenue in the EU and the US Source: IDATE

Capex as a share of total sales Note: EU5 = France, Germany, Italy, Spain and UK Source: IDATE

Telecom capex per capita in 2017 **Note:** Europe = members of the European Telecommunications Network Operators' Association (ETNO) Source: Analysys Mason





Ratio US vs. EU5 total capex

20

18

16 14 12

10 8 6

4

2

0



189.9

Europe must be competitive in 5G

Observation

Success in 5G will be a great driver of economic leadership in the 21st century. 5G will be the key for the digital transformation and for the internet of things, artificial intelligence and other technologies to work. The EU risks falling behind other major economies in providing 5G infrastructure and allowing the full potential of its commercialisation.

Recommendation

A harmonised framework for 5G spectrum, assignment and operation is decisive for early availability at pan-European scale. This should avoid fragmentation and enable 5G for B2B applications on top of enhanced mobile broadband. Spectrum assignment procedures must prioritise investment in coverage and capacity over upfront fees. Europe should also introduce measures that instil trust in 5G.

Forecast 5G penetration Source: GSMA intelligence

5G Leadership Index ranking Note: *Simple average of EU countries excluding Malta Source: Arthur D. Little

Forecast 5G penetration in 2025 - Percentage of total connections



5G Leadership Index ranking

Index 1-10 (10 = best) measuring 5G commercialisation and infrastructure



Data is essential for industrial digital transformation

Observation

The EU lags behind other regions in developing platform companies. This is especially the case for business-to-customer (B2C) platforms. The development of business-to-business (B2B) platforms is still at an earlier stage and Europe cannot afford to fall behind in their development too if it wants to ensure its industrial competitiveness. More businesses across the EU are now performing big data analysis and integrating this into their approaches to innovation and growth. This is essential if productivity is to increase and the full potential of digital transformation is to be realised.

Recommendation

A wealth of valuable data is being created in Europe by governments, industry and citizens. Data availability should be fostered, on a voluntary basis, for innovative use in industrial digital platforms and Al while safeguarding intellectual property rights, security, data protection, confidentiality and any applicable contractual arrangements. Especially for Al it is key to ensure the availability of good quality training data for Al algorithms as these will present a critical success factor for effective Al offerings. As there is a general trend towards the development of 5G networks and IoT worldwide, we need to make sure that consumers and businesses are seamlessly connected, and data flows are undisrupted. The EU should assume its role as a global leader by promoting its free flow of machine data standards globally.

Market valuation of online platforms

Source: Dr Holger Schmidt (TU Darmstadt/Netzoekonom.de), adopted from European Political Strategy Centre 2019

The WEF's nine best factories of the world in 2018 by location and origin of operating company - Source: World Economic Forum

Markert valuation of online platforms Note: *No 2018 data for the UK. Source: Eurostat

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The WEF's nine best factories of the world in 2018 by location and origin of operating company

Origin of operating compnay • US • EU • China







Energy Transition & Climate Change

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Europe is leading in reducing energy intensity and emissions

Observation

The European economy is substantially less energyintensive and less CO₂-intensive than the Chinese, Russian or American economies, while the European share of global CO₂ emissions has fallen to just 10%.

Recommendation

Europe has shown global leadership in reducing energy intensity and greenhouse gas emissions in the past – and must continue to do so. All countries will have to show similar commitment to ensure the Paris Agreement is fully implemented.



14%

Russia

China

(Years of Comparison: 2000-2018) • 2000 • 2018









Note: *Million tonnes of oil equivalent of primary energy consumption/GDP (PPP constant 2011 USD billion) Source: BP, World Bank, Global Counsel calculations

Carbon pricing mechanisms continue expanding worldwide

Observation

Carbon pricing continues to be adopted as a key policy tool to meet climate targets, with at least 11 new initiatives implemented in 2018 and 2019. In 2020 with the national ETS in China becoming active, total emissions covered by carbon pricing will increase from about 15% to 20%.

Recommendation

The EU should continue to support the pricing of carbon outside Europe at least at G20 level to create a level playing field and enable low carbon technologies for industry to be competitive. The share of global greenhouse gas emissions covered by carbon pricing initiatives*

- EU ETS Carbon Tax in the EU Japan Carbon Tax California Cap & Trade
- China ETS Chinese pilot cities ETS Korea ETS Other



Note: *Only the introduction or removal of an ETS or carbon tax is shown. Emissions are given as a share of global GHG emissions in 2012. Annual changes in global, regional, national, and subnational GHG emissions are not shown in the graph. If emissions that are covered by multiple carbon pricing initiatives shown in the graph, these are attributed to the carbon pricing initiative that was introduced first. Due to the dynamic approach to continuously improve data quality, changes to the graph do not only reflect new developments, but also corrections following new information from official government sources.

Source: Ecofys, World Bank. This is an adaptation of an original work by The World Bank. Responsibility for the views and opinions expressed in the adaptation rests solely with the author or authors of the adaptation and are not endorsed by The World Bank.

Taxes, levies and policy cost are leading to disparity and distortions in electricity prices

Observation

Tax now accounts on average for 38% of the electricity price for industrial users in the EU and contributes to sustaining prices at high levels by international standards.

Recommendation

Energy prices, including electricity prices for industrial users, are a major driver of competitiveness in many industrial sectors¹. Energy and industrial policies must be closely aligned to boost competitiveness.



Structure of industrial electricity prices in the EU Percent of total price

Energy
 Network
 Taxes

1 For example, outside Europe, because of different design of the electricity markets, industries are not charged for the carbon content in the electricity cost.

Note: Data for the EU and member states is collected by DG ENER. Data for Japan, Korea, Canada and the US is from the UK Department for Business, Energy and Industrial Strategy derived from the International Energy Agency (IEA) publication, Energy Prices and Taxes. The IEA's data collection methodology is not fully consistent across countries and also differs slightly from DG ENER.

Source: DG ENER, UK Department for Business, Energy and Industrial Strategy derived from the International Energy Agency publication, Energy Prices and Taxes

Source: Global Counsel calculations.

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European leadership in renewables investment is being challenged

Observation

Europe remains a global leader in renewable energy investment, but China is now the world's biggest investor. Within Europe there is a significant variation in the level of investment across countries.

Recommendation

The global energy transition and the deployment of new renewable technologies, including batteries, is a major opportunity for European industry. EU industrial policy should facilitate the transition of EU industry by creating an investment-friendly environment and support global competitiveness as industry seeks to take advantage of these opportunities.



The European countries that saw the largest investment in 2017 (USD billions)



Source: UN Environment, Bloomberg New Energy Finance

The energy mix is changing

Observation

The composition of final energy consumption is shifting towards more electricity and biofuels in the EU. China is also moving to electricity but remains heavily dependent on coal.

Recommendation

The EU should ensure a sufficient and competitive clean energy supply while enabling future energy markets to cope with this trend.



Final energy consumption 2000 and 2017, share by source



Source: IEA



⊂≿. Trade & Investment

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The global trade outlook is uncertain

Observation

The period 1987-2007 saw a near doubling of the openness of the global economy to trade, but over the past ten years that trend has stopped, as goods trade, in particular, has become more volatile. Europe's share of global trade is declining.

Recommendation

The EU should ensure free, fair and rules-based global trade. It should also help to address the key challenges the multilateral trading system is currently facing, touching on areas such as the WTO dispute settlement system, services, digital trade, investment, subsidies, competition and technology transfer.





Global trade as a share of GDP Source: World Bank

Share of total world merchandise trade Source: WTO, Global Counsel calculations

China is the largest source of imports for a significant number of countries

Observation

Chinese producers are increasingly competitive on international markets. It is not only the largest source of imports for many countries in the Asia-Pacific region as well as in Africa, it is now the largest source of imports into the EU and – tied with Europe – into the US.

Recommendation

The EU needs an active trade policy to strengthen the level playing field for European companies while simultaneously proactively advocating for European business interests in the face of geo-political and geo-economic challenges.

Share of Imports from EU, US or China into international markets in 2018



The transatlantic relationship is essential

Observation

There is a strong mutual dependence among manufacturers on both sides of the Atlantic. The US remains the single most important trade and investment partner for the EU, with each highly dependent on the other as a source of investment, as an export market, and a source of intermediate inputs into production.

Recommendation

The EU and US should work together to further strengthen their trade and investment relationship. The ability to invest in production in each other's market and draw on transatlantic supply chains is essential for maintaining global competitiveness in all manufacturing sectors.

The EU's top investment partners in 2017 Source: Eurostat

Intermediate goods exports as share of total goods exports in 2018 Source: $\ensuremath{\mathsf{OECD}}$

The EU's top investment partners in 2017

Share of total extra-EU outward FDI stock



Share of total extra-EU inward FDI stock





Protectionism is rising

Observation

European economies remain among the most open in the world for trade in goods and in services. However, European companies face barriers to trade and investment in a wide range of advanced and emerging economies. Spiralling protectionism will end up harming all sides involved.

Recommendation

It is essential that the EU works with all other major economies, especially via the G20 and WTO, to reverse the trend towards protectionism seen in recent years and to open up each other's markets.

Trade and investment barriers by number of discriminatory interventions imposed







Trade and investment barriers by number of discriminatory interventions imposed Note: Showing EU Average Source: Global Trade Alert Implemented tariff measures on goods imports

Source: Global Trade Alert

EU trade looks east and west

EU trade in goods and services balance (EUR billions)

• Energy • Agriculture • Manufacturing • Services • Other



EU trade in goods and services balance (EUR billions)

● Russia ● China ● US ● RoW*



Observation

The EU's two biggest trade relationships are with China and the US. They are also the most unbalanced relationships, with the EU running a surplus with the US, but a deficit with China. Overall the EU enjoys a surplus in manufacturing and services, with a deficit in energy.

Recommendation

Europe has a largely healthy set of bilateral trade relationships, with a combination of surpluses and deficits that mostly reflects relative consumption preferences and production strengths. The EU should pursue and enforce ambitious trade and/or investment negotiations with major economies like the US, China and other emerging market economies.

Fair competition between the EU and China requires a level playing field

Observation

The rise in Chinese outward foreign direct investment (FDI) in the EU brings many benefits for Europe. At the same time, the state's involvement in many of them poses the risk that China might be exploiting the EU's openness while foreign investors continue to face many restrictions in China. The competition extends beyond FDI.

Recommendation

European policymakers need to ensure a level playing field with China in terms of market access and regulatory treatment and protect key European interests, including through a transparent and targeted FDI screening mechanism. The EU and Member States should remain open to FDI that complies with common market rules, while implementing effective national FDI screening mechanisms based on the new EU framework. The EU should accelerate the negotiation of the EU-China investment agreement. Distortions of a level playing field should also be tackled through efficient and effective use of the EU's modernised Trade Defence Instruments and possibly new measures aiming at reciprocity to open Chinese markets for European companies (such as the International Procurement Instrument).

FDI restrictiveness - Source: OECD

Cumulative value of China-EU FDI transactions since 2000

Source: Rhodium Group. Data represents the combined value of direct investment transactions by mainland Chinese companies, including greenfield projects and acquisitions that result in significant ownership control (>10% of equity).



EU leadership in FDI is being challenged

Observation

The EU remains the single most important region for both outward and inward foreign direct investment, but increasingly it is Asia and the rest of the world that account for the bigger share of flows. The EU's share has declined in recent years and its leadership in this area is under threat.

Recommendation

It is essential for European industry that the EU remains competitive as a destination - and a source - for direct investment. Bilateral investment treaties and/or strong investment chapters in future free trade agreements should be a priority, supplemented by the EU's economic diplomacy promoting European industrial interests.



Note: Without intra-EU FDI Source: UNCTAD, Eurostat, CEIC Data, Global Counsel calculations

FDI supports jobs

Observation

Foreign investment supports jobs, both in Europe and around the world. Foreign investors from outside the EU have created eight million jobs in the Union, while EU investment has created over three million American jobs.

Recommendation

Politicians in the EU, the US, and elsewhere, must continue to make a strong case for openness to foreign investment - and fair and equal treatment for foreign investors - because it supports jobs, makes businesses more competitive, and benefits consumers.

Direct employment in the EU and Member States by foreign, non-EU controlled companies, 2016



Direct employment outside the EU by affiliates of EU enterprises, 2016



8%

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