



MAASTRICHT  
WORKING  
ON EUROPE

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# Research agenda



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# 1

## Introduction



# 1. Introduction

## Europe in the globalising world

In a world characterised by ongoing crises (finance, migration, food, security, energy, geopolitics, climate change), the role of Europe on the global stage is a **key research theme at Maastricht University (UM)**. We have developed major interdisciplinary research programmes focusing on the role of the European Union (EU) in world affairs, the EU as a policymaking body economic, social, institutional and political functioning of the EU, its institutional organisation, its norms and values, its relationships with member states and international institutions such as the UN, OESO, IMF, WTO and WIPO, and its approach to sustainable development.

The **interdisciplinary research** undertaken at UM under the **strategic theme** 'Europe and a globalising world' necessarily entails a historical perspective: investigating the 'Europes' that predated the post-war and post-Cold War (Western) Europe of integration. The research explores the socioeconomic repercussions of tensions surrounding cultural memory and cultural diversity at the local and national levels as well as (pan-) European and global contexts. The interaction between European and other levels of government, from the local to global echelons, also raises pressing questions about accountability, legitimacy, human rights and other values. For instance, how can political and corporate actors engage in socially responsible behaviour (e.g. responsible investing, sustainable banking and green real estate)?

## The Europe of European integration

European integration has come about in bits and pieces, often in an ad-hoc manner, involving complex and cumbersome procedures and heated discussions on the nature and future of the EU. Indeed, chaotic decision-making and crises of identity have been constants in the history of the EU. While the legitimacy of the institution has long been an issue, it has become significantly more pressing in view of the current crises, polemic debates and urgent financial-economic and socioeconomic problems. Discontent about the EU has manifested itself in the rise of political parties and movements hostile to the institution, putting fuel on the fire of the so-called democratic deficit. However, not only are the democratic credentials of the EU at issue. Questions of justice, fairness and European solidarity have been raised too: for instance, it has been argued that the EU, as a predominantly free-market project, has undermined the ability of its member states to provide adequate social protection for their citizens.

The issues involved here concern a wide range of themes and concepts: social (market) Europe, identity, heritage, the 'Europe of citizens', the 'Europe of security' and 'cultural Europe', to name a few. For example, can we, at the EU level, develop a conception of social justice that is grounded in the history and practices of European integration and which can inform the debate on the role of the EU in social protection? Research that flows from this question should help to shift the debate from single socioeconomic issues to a more overarching reflection on what social-market Europe should look like, and how this may differ from social justice at the domestic level or outside Europe.

Various crises such as Brexit and the more recent COVID-19 crisis, as well as the rise of chauvinist and nationalist movements and new technological developments have made clear that existing theories are not up to the task of analysing the EU's day-to-day politics and policies, not to mention its haphazard approach to crisis management. These processes have turned out to be far more multi-layered than anticipated, involving multiple institutions, levels

of government, policies and identities. Existing theories, which were largely developed during the heydays of integration – either during the founding years of the integration process or during the 1990s – have proven ill equipped to fathom the evolutions, motivations and obstacles in the process of European integration, particularly since the Treaty of Maastricht was signed in 1992. In short, the EU and its member states are confronted with existential questions that need urgent and innovative answers. With the **Maastricht, Working on Europe (MWOE) Strategic Research Agenda** led by Studio Europa Maastricht, Maastricht University heeds the urgent need to renew and expand UM's research agenda on European integration, the EU and Europe more generally; and to do this through innovative multidisciplinary and interdisciplinary research collaborations.

**The MWOE research agenda is structured around four main themes:**

1. Democracy, Politics, Security and Rule of Law
2. Identity, heritage and citizens perspective
3. Prosperity, welfare and inequality
4. Knowledge, technology and digitalization

This research agenda provides a framework for future interfaculty and multi-disciplinary Europe-related research at Maastricht University and functions as a fundamental academic pillar with a visible outreach and citizen science component. UM researchers from the five participating faculties can apply: Faculty of Law (FL), Faculty of Arts and Social Sciences (FASoS), Faculty of Science and Engineering (FSE), School of Business and Economics (SBE) and Faculty of Health, Medicine and Life Sciences (FHML).





## Research theme

# 1

Democracy,  
Politics, Security  
and Rule of Law

# Research theme 1: Democracy, Politics, Security and Rule of Law

## Rule of law

Research undertaken in this theme will analyse how formal and informal institutions and legal and political instruments may shape the future progress of European integration and ultimately the rule of law. The recent situations in Poland and Hungary highlight the urgent need for deeper analysis of the protection of the rule of law and fundamental rights and the delivery of justice. Basic values such as the independence of courts and judges, as well as access to justice, need to be examined.

Research will also investigate whether the current EU institutional framework provides adequate guarantees for the effective implementation of the European Charter of Fundamental Rights. In recent years the safeguarding of fundamental rights of both migrants and EU citizens has become increasingly important. Further, the migration crisis and the (threat of) terrorist attacks have made protection from organised and transnational crime one of the EU's top priorities. The nature of crime today necessitates new forms of police cooperation across regional, national and European borders as well as potentially increased powers in foreign affairs and defence.

## Democracy, politics and decision making in the EU

Here the focus lies on systematic analysis of the role played by institutions at various levels of governance – European, national, regional and local – as well as the division of tasks and cooperation between them. These questions relate to the traditional separation of powers (or in EU terms, institutional balance) and, more generally, to the question of how integration can take shape in a way that respects the democratic nature and the legitimacy of decision-making processes. Viewing European integration as a process of multilevel governance also raises questions about the appropriate level at which decisions should be taken, highlighting the significance of subsidiarity as a guiding but also contested principle of EU decision making. A critical issue in this respect is the (in-)effectiveness of decision making. Questions revolve not just around who decides and at what government level, but also: how can we establish appropriate and effective voting and bargaining rules? What forms of coalition are beneficial or harmful?

Specific attention will be paid to the interaction between actors on the national and the European levels: the relationship between national parliaments and the European Parliament, national (constitutional) courts and the European Courts, and national executives and the European Commission. How are national law and politics influenced by EU law and politics, and vice versa? Equally, the issue of competences will be scrutinised, along with the options for introducing novel institutional arrangements so as to increase flexibility and promote respect for the heterogeneity of the EU and its member states. This involves wider questions about the boundaries of the EU and the changing nature of the concept of EU membership in light of Brexit and developments in the EU's neighbourhood.

Research will further address important institutional transformations in EU decision making. This includes studying the impact of the increasing empowerment of national executives in the European Council, the rise of *de novo* intergovernmental institutions and the creation of new legislative mechanisms, such as the European semester, to coordinate economic and fiscal policy. These reforms, occurring in the context of an increasingly powerful European Parliament and greater involvement of national parliaments in EU decision making, have intensified longstanding



tensions between the demands of democracy, sovereignty, the rule of law and fundamental rights. Important areas of study will be the appropriateness of current notions of democratic accountability and the balance of powers, and the functioning of multilevel governance in the EU. How can European, national, regional and local governments respond to dissatisfaction or scepticism among citizens while warding off populist challenges to the liberal state and the European project?

Beyond debates about political theory and legal doctrine, research is also needed on practical issues of EU governance, in particular electoral processes and the role of political parties, social movements and organised interests in channelling the preferences of citizens into the EU policymaking process. This builds on existing research on the promise and the limitations of the European Parliament as the cornerstone of democratic accountability in the EU, and the contribution that national and regional parliaments can make to the legitimacy of the European project. Going beyond the conception of representative democracy, we need to ask deeper questions about the participatory aspect of European democracy, with research into the effects of referendums at the national level and the impact of the European Citizens' Initiative at the European level. Research should also address debates on access to political rights and participation of mobile EU citizens (electoral registration, other obstacles to political participation) as well as of third-country nationals (e.g. acquisition of EU citizenship).

Today more than ever, a key topic on the political agenda on EU issues concerns the issue of (national) sovereignty and how it relates to EU membership. There are challenges to the credo of 'ever closer Union', which is still included in the Treaties and raises questions about the meaning of the motto 'unity in diversity'. This, in turn, ties in with the discourses on whether the EU needs a political union. There are also more concrete dimensions to the issue of the EU's legitimacy, however: the role of national parliaments, the division of powers between the EU and the member states, the shaping of economic policies, the relationship between the eurozone and the other member states. Furthermore, the EU has changed in the way it operates. It is no longer limited to being merely a regulatory organisation: new forms of governance (e.g. the EMU) have emerged and substantial parts of the decision-making process have become increasingly politicised, either on the European level or through democracy, or both.

This theme also involves research on institutional arrangements for the protection of fundamental rights and values. The EU's focus on economic integration, new technologies and innovation requires the study of fundamental rights and principles, such as non-discrimination, equality, privacy, personal data protection, legal certainty, legitimate expectations and effective judicial remedies, and non-economic values such as the protection of health, safety and the environment. It also raises questions about the institutional mechanisms established to balance the interests of effective decision making and democratic legitimacy. Digitisation offers additional opportunities for European cooperation in judicial affairs, democracy and the legitimacy of the EU.

## Security

The EU Global Strategy of 2016 states unambiguously that 'Our Union is under threat.' With the Russian annexation of Crimea, regular terrorist attacks, instability in North Africa and the Middle East, and the rise of China, Europe is facing a number of significant security crises. In addition, the EU is

increasingly confronted with non-traditional security challenges, such as climate change, cyber security and migration. All these areas require interdisciplinary approaches to better understand the threats and the capabilities of the EU and its member states to respond to them. The research in this area falls along three broad lines: security in the European neighbourhood, the internal–external security nexus, and multilateralism and security partnerships.

The neighbourhood of the EU is of critical importance in terms of security. Research focuses on the military and civilian missions deployed by the EU in its (wider) neighbourhood, but also the support it provides for the promotion of democracy and enhancement of societal resilience. Under a broad understanding of security, energy security and migration challenges are also of vital relevance in the relations between the EU and its neighbours. With respect to the internal–external security nexus, while internal and external security remain entirely different domains, it is clear that terrorists, refugees, pollution and diseases do not stop at borders. For the EU to develop an integrated approach to security, research must help us to overcome boundaries between internal and external security. Such research will encompass issues as diverse as the design of and compliance with information security policy and guidelines (ISPG) and external border control and third-country mobility partnerships. Lastly, with regard to multilateralism and security partnerships, while the EU is an important actor in the area of security (particularly in non-traditional security domains), it also works in partnership with other international organisations and supports multilateral approaches to security. The UN and NATO are natural partners for the EU, but it also increasingly works with the African Union, the OSCE and various other international organisations.

# Research theme

# 2

Identity,  
Heritage, and the  
Citizens' Perspective



## Research theme 2: Identity, Heritage and the Citizens' Perspective

Having kicked off the integration process through the establishment of the European Coal and Steel Community (ECSC) in 1951, the governments of 'the Six' were unable to escape the ensuing battles of ideas over the notion of European unification and the future of European integration. The issue of integration penetrated domestic politics and caused deep splits within cabinets and parliaments, cutting across conventional political camps and stirring up heated national debates between federalists, confederalists, eurosceptics and more.

At the same time, the lack of national control over this process prompted – as recent archival research underscores – the formation of unorthodox coalitions across national borders and transnational bureaucracies, lobbies and networks. European negotiations encompassed both state and non-state actors from the outset, including transnational lobbies, allowing for the formation of coalitions across national frontiers and state- and non-state institutions, such as the European Commission. Influencing the integration process thus presupposed a certain 'transnationalisation' of European policies right from its earliest days. There is an empirical reason why existing historiography has not paid sufficient attention to all this: the governments' convincing claim to be in control of the integration process. Research on the history of European integration aims to reinterpret and reanalyse this history from an interdisciplinary, transnational perspective, with due attention for non-state actors. The research will focus on primary sources of different kinds (archives, arts, heritage, etc.).

On a deeper level, we may find that European integration involves an ongoing 'battle of ideas' over what Europe could or should become in the future, with visions of the future and images of the past clashing and coalescing. This competition between concepts, plans and blueprints has largely been hidden from public and scholarly view, not least because the ideas of the 'losers' tend to disappear in the ex post facto depictions that dominate historiography.

Indeed, on this deeper level, European integration is not the result of a preconceived plan, but the product of never-ending struggles over images and concepts, which spring from ideas (both causal and principled), ideals and even emotions. This state of affairs makes research on the role of ideas, in all their different manifestations, an urgent matter for the European research agenda. Ideas, along with (geo-)economic and (geo)political facts, have been important drivers in the history of European integration. And these ideas run the full gamut from technical issues of economic governance to more normative and politicised debates surrounding legitimacy, new technologies, solidarity, diversity and identity on the local, regional, national, transnational and international levels.

### Identity, arts and heritage, and new technologies

Many European citizens are afraid of the Europe of integration, where things are not as they seem. European societies are simultaneously searching for their own identity while also trying to integrate newcomers. This leads to debates on matters such as civic integration and immigrant naturalisation. Research on citizenship has been predominantly quantitative, resulting in an urgent need for more qualitative and historically informed research into the changing practices and understandings of being a citizen, being European and shaping societies 'the European way'. The research will focus on the ways in which history and heritage are constructed, appropriated, enriched, promoted and transmitted in multicultural societies by a variety of actors, including politicians, governmental bodies and cultural organisations.



This research has a strong focus on the use of new technologies and digitalisation. Politicians and cultural institutions alike, seeking to enhance social and cultural participation at the local, national and transnational levels, have embraced digital technologies and digitalisation. Yet the development of legal and ethical frameworks lags behind. With its focus on citizenship, public participation and technological mediation, this research theme also addresses the question of how to reach and engage audiences in culture and heritage in new and responsible ways.

Comparable transitional developments can be observed in contemporary intersections between art, cultural heritage and the market, which are complicated by ethical, legal and financial issues tied up in complex global relations and informed by history. This research theme examines the ways in which artistic and cultural heritage values are constituted and legitimised by analysing past and present arts and heritage practices, paying particular attention to the interplay between the legal, cultural, socio-political and economic fabrics that make up these practices within and beyond European borders.

### The Euregion as laboratory

The Euregion can serve as a laboratory to investigate the changing practices and understandings of being a citizen, being European and shaping societies 'the European way' (whatever that may mean). Industrial regions such as Limburg, the Ruhr area, parts of the Saarland and Nord-Pas-de-Calais lay at the core of the European integration process at its inception. From 1951 onwards, the European Coal and Steel Community created a transnational legal framework that facilitated economic growth in these regions and the respective national economies. Historically, therefore, but also today, these trans-European and cross-border regions can be considered laboratories of European integration which continue to share crucial developments.

Past and present mining regions, for instance, are currently undergoing transformation from highly developed industrial monocultures to post-industrial regions. Across Europe, post-mining transition processes raise serious economic, social and cultural challenges, including economic decline, an often deeply felt loss of identity and social fragmentation. These regions have been working on ways to cope with such challenges. An early remedy, in the decades following the closure of the first mines in the 1960s, was to strengthen cultural institutions in these regions, by converting mining areas into heritage sites, museums, cinemas and theatres to promote tourism, and enhance the attractiveness of these regions as places to live and work.

The limitations of such 'heritage strategies' have since become clear. Participation in the new cultural activities by local communities and minorities is often low, and reconciling respect for the past with the creation of new opportunities turns out to be difficult. There is a clear need for research that examines heritage participation in post-mining areas as another dimension of European integration: investigating practices such as translation, negotiation, sharing and healing; developing and testing Euregional participatory heritage approaches; and conducting comparative analyses of participatory heritage practices.

Euregional identities are, to an important extent, constructed through local language (dialect and/or regional language) practices. 'Past' and 'heritage' do not alone account for contemporary language and culture. To understand how people perceive and construct Euregional identities linguistically, processes of place-making and a sense of belonging are key.

# *EU Agencies improve the of citizens in the EU?*



*Jukka Malm (ECHA)*

*Alber*

## Research theme

# 3

Prosperity,  
Welfare  
and Inequality



## Research theme 3: Prosperity, Welfare and Inequality

The EU seeks to promote the prosperity and welfare of its member states while maintaining cohesion and solidarity. Although integration has increased, the successes in terms of prosperity and equality remain mixed. This is partly attributable to the 2008 global financial crisis and the subsequent euro crisis, but even in the years prior, which were generally characterised by high economic growth and increases in average prosperity and wellbeing, less positive signals were already in evidence. Convergence in living standards, life expectancy and health remained limited. Labour mobility was discouraged by persistent differences in national settings with respect to social security, retirement, healthcare and the labour market. Increased integration means greater cross-country competition and higher trade and capital flows, which contribute to economic growth but also play a role in increasing inequality between and within countries. European integration, like globalisation in general, removed old certainties and gave the general public a sense of 'winners' and 'losers'.

The fact that integration and the creation of a level playing field mainly focused on harmonising legal and economic rules and neglected the cultural and social heterogeneity across countries only contributed to the rising tensions. Since then, popular dissatisfaction with globalisation and European integration has increased. Appropriate policies are needed to facilitate the transition and relocation of human capital across industries and countries. Further, an adequately functioning internal market requires a well-developed institutional and legal framework for matters such as competition policy, (intellectual) property law, contract and company law, consumer law, and mergers and acquisitions.

In future research, at least three new drivers of transformation need to be incorporated in any analysis of prosperity, wellbeing and inequality. First, Europe faces a demographic challenge: populations are ageing rapidly, which raises issues with respect to education and lifelong learning, labour and productivity, health and retirement, and migration. Second, Europe faces a technological challenge: innovations like robotics and automation are bound to impact on consumers' daily lives and lead to fundamental changes in the setup of labour markets, the determinants of success on an individual, organisational and macroeconomic level, and economic and social inequalities. Third, Europe faces the – global – challenge of sustainable development and a green transition, in which culture, ethics and leadership again play a significant role.

Both the UN's 2017 **Sustainable Development Goals** and the 2015 Paris Agreement highlight the importance of facing up to our sustainability and climate challenges. While these challenges are global in nature, Europe, with its existing institutional and supranational framework, is in a unique position to take the lead on a number of issues: energy transition and CO<sub>2</sub> reduction, intergenerational equity, the EU emissions trading scheme, the legal framework for climate change, the funding of social entrepreneurship and innovation, and the determinants and conditions for impact investing by both small-scale and institutional investors. With respect to the latter, the growing influence of shareholders of institutional investors (e.g. pension funds) on the design of asset management strategies is of particular interest.

These issues and topics raise a wide range of questions surrounding the challenge of striving for prosperity and welfare for all European citizens while reducing – or at least not promoting – inequality. Research is needed to understand the historical processes involved and the outcomes of these processes, to reflect critically on the goals and strategies, and to provide recommendations for future policies.

## Institutions and policies for shock resilience

The 2008 financial crisis and the subsequent euro (debt) crisis had severe consequences for European citizens, corporations and governments, their impact differing across countries and sectors depending on the initial conditions. At a certain point, the survival of the euro itself was at stake.

The European policy response has been to move towards further centralisation and increased control. Further research on this development is important. First, more technocratic centralisation runs the risk of further alienating large parts of the population from the European project. Second, important questions arise concerning the organisation and quality of supervision and control. For example, while banking regulations have been formally harmonised across Europe, their implementation and interpretation is largely delegated to national authorities. The ensuing heterogeneity may have led to risk-taking by banks and financial instability, in addition to raising legal questions. Third, differences in the implementation and interpretation of the common regulatory framework highlight another interesting research area: the meaning of rules and the degree to which they are followed may well be country or culture dependent, increasing the complexity of optimal institution building. Fourth, questions arise as to the economic consequences, both intended and unintended, of increased regulation. For example, to what extent has new EU regulation resulted in its intended effects on the level of audit market concentration and audit quality? Finally, an unresolved issue in the creation of a more shock-resilient Europe is the degree of risk sharing across countries. Consider the creation of a common euro bond to facilitate lender-of-last-resort facilities to national governments: while proponents stress the benefits for financial stability, opponents point at the perverse incentives and implicit transfers to weaker countries. Legacy problems play a major role in the trade-off between risk sharing and transfers. Again, popular support for structural transfers is low and national constitutional rules and principles may prohibit them. On the other hand, transfers can help to reduce inequality, and without them, labour mobility may increasingly become the adjustment mechanism.

## Labour market

Labour-market institutions and labour-market policy have remained largely under the jurisdiction of national policymakers. The EU and international organisations such as the OECD and the IMF have persistently called for labour-market reforms in order to increase flexibility and competitiveness. In practice, countries have responded very differently to these calls. In some countries, permanent employment contracts remain the norm; in others flex work has made a big impact. Social-security and taxation arrangements differ greatly, as do industrial structures, with some countries specialising in agriculture, others in manufacturing or services. Simultaneously, labour mobility has long been low due to institutional impediments such as the non-transferability of pension and social-security entitlements. Some labour mobility is transitory, while a certain proportion is permanent, giving rise to migration flows which in turn present challenges with respect to diversity and integration.

Beyond country-specific developments in the labour market and the spillovers from labour mobility, research is needed to investigate the impending impact of technological innovation. How will automation and robotisation affect national labour markets? How will this effect differ between member states? What impact will it have on the employability of the European labour force and on social and economic inequality? What type of education will promote the acquisition of crucial new skills? As yet, it is unclear whether national or supranational arrangements will be better equipped to deal with these issues.



While technology may soon lead to an excess supply of specific types of labour, the ageing of the population will be another major factor in the near future, potentially leading to an excess demand for labour in specific sectors. Ageing will also put pressure on social-security and pension systems across Europe, threatening the sustainability of these systems. The pressure on pension systems has already led to increases in retirement age, reduced retirement benefits and changes from defined-benefit to defined-contribution schemes. In general, risk is increasingly becoming an individual responsibility, and yet most individuals pay too little attention to retirement planning and may discover pension gaps too late. The prospect of lower unemployment benefits and retirement income is already causing social unrest in many countries.

## Social and health inequalities

Inequality is an important topic across Europe. The social and health inequalities within and between EU countries are large – and larger in some countries than in others. The factors that underlie these inequalities are better understood than ever, and yet the strategies to overcome them are becoming less effective due to a lack of political will, implementation deficits and different priorities in terms of resources. Health equity in particular is high on the EU's agenda. But even where resources are adequate and political will sufficient, evidence-based strategies for combating health inequities are often not implemented. Understanding the mechanisms underlying these failures is an important research field and one of UM's areas of expertise.

The case of the Patients' Rights Directive (2011/24/EU) highlights the need for research in this area. Following the signing of this directive, it was predicted that healthcare would improve – yet also that the number of patients crossing borders for healthcare would increase, with economic repercussions for both the home and the guest country. Still others predicted that the directive would have no measurable impact. Clearly, the effects and potential of cross-border care – especially here in the Euregion – need to be better understood.

Social-, health- and disability-insurance schemes differ across Europe, although they usually share the value of 'solidarity'. Job (re-)integration policies – for the reintegration of workers after an extended period of sick leave or the inclusion of workers with disabilities – also differ, complicating the EU's aim of increasing access to the labour market for people with disabilities. Changing demographics and the issue of declining cognitive health in older age present problems for health equity, highlighting the need to identify best practices to deal with the challenges of ageing (through e.g. dementia research).

## Lifelong learning

Both the rapid speed of technological innovation and the ageing of the working population due to pension reforms, which have postponed the retirement age, pose challenges for the employability of the working population in all EU countries. To remain competitive, all workers should have up-to-date skills that reflect the demands of the labour market. The Europe 2020 Strategy acknowledges lifelong learning as an important component of the EU's overarching growth strategy. An adequate lifelong learning strategy should, however, also take account of the growing inequalities between people with low versus high education levels in terms of adult training and workplace learning.

This sets the agenda for a broad array of Learning & Work policies, including preschool education to prevent developmental delays, labour-market-related study and career counselling, responsive vocational education, continuous

adult training and workplace learning, proactive retraining and improved learning climates in both the private and the public sector. In many of these areas, however, it remains unclear 'what works'. A broad range of field experiments are needed to evaluate the effects of public policies and HR practices, optimise these practices and develop an adequate lifelong learning strategy.

## Global value chains

Global value chains (GVCs) are spatially fragmented production chains, with different tasks (research, design, production of intermediate parts, assembly) taking place in different locations. This is both a global phenomenon (e.g. manufacturing in China) and a European one (production being relocated to Eastern Europe). Innovation plays a major role in this process because it changes local capacities, affecting the potential to add value in the GVC. Research seeks to identify those capacities and shed light on the effects of global competition on innovation and other factors in GVCs.



Research  
theme

4

Knowledge,  
Technology  
and Digitalisation



## Research theme 4: Knowledge, Technology and Digitalisation

Drivers of internationalisation and globalisation, like digitalisation, are transnational in nature: they connect different cultural, social and political processes in ways that cross national, European and other boundaries. To illustrate, digitalisation facilitates the mobility of people, goods and services, but also has a distinctive local character, and sometimes creates tensions with national and regional identities. As digital technologies cannot be understood within the confines of national frameworks, an international perspective is necessary to understand the production, governance and use of such technologies. We need to remain aware of the ways in which digitalisation constructs 'Europe' and 'the world', and how digital technologies adapt to local or national situations.

### Innovative economy

The business-enterprise sector plays a major role in generating new knowledge and technologies, accounting for roughly 65 percent of total investments in research and development (R&D) in the EU (Eurostat, 2017). To modernise and strengthen the EU economy, the European Commission has set out to stimulate higher levels of R&D spending and to improve the conversion of such spending by enterprises into new commercial products and services as well as new business activities (EC Innovation Union initiative). Research on the economic effects of these investments, including comparative analyses of the impact of European investments versus those of national governments, is in high demand. Partnerships with Eurostat, for example, are currently developing new indicators for measuring the interaction between universities and industry and different forms of innovation in private firms.

Research on the impact of science, technology and innovation (STI) on productivity and economic growth is often econometric in nature, estimating models either at the firm level or at the level of aggregate economies. Of particular interest against the backdrop of ongoing technological developments are those innovations related to automation and digitalisation (Industry 4.0). Research on machine learning and its relationship with international trade, for example, will provide insight into the expected impact for the labour market, employment and earnings. Beyond increasing the long-term competitiveness of the EU economy to face rising international challenges (e.g. the highly innovative economies of South Korea, Japan and the US), a stronger and more productive innovation base is central to building a greener society and improving the quality of life of EU citizens (see also research theme 3). Enabling the European business-enterprise sector to better realise and exploit its innovation potential is therefore of critical importance to the EU and its citizens.

To achieve these ambitions and increase the innovation capacity of the business-enterprise sector, research needs to address such questions as: Which factors are distinctly European (e.g. concentrated ownership, market fragmentation) in addressing the challenges faced by enterprises in generating new knowledge and commercialising technologies, such as blockchain?

### Health and wellbeing

Digital technologies and data-intensive biomedical research are typically accompanied by promises of improved health and healthcare, benefits which are particularly pertinent in view of the ageing population and increase in



chronic conditions. To keep these promises, it is important to engage not only with the technological and scientific challenges involved in the digitalisation of health and biomedical research, but also with the societal challenges that the digitalisation of health itself raises for patients, health professionals and other stakeholders.

## Citizen engagement and participation

Popular and scholarly accounts of the participatory potential of new digital technologies are usually enthusiastic. Twitter, blogs, YouTube, Facebook and Wikipedia are lauded for their capacity to harness people's creativity and knowledge. These web-based applications are claimed to have facilitated political uprisings, solutions to scientific problems and the development of new television storylines. The validity of such claims is sometimes questioned, with commentators highlighting the dangers of online hoaxes, misinformation and loss of privacy. The focus in this research area is on how social media (also referred to as Web 2.0, user-generated content and crowdsourcing) are used to support participation in knowledge production in different domains, including medicine, the economy, politics and science as well as to enhance citizen involvement in decision making. These are topical and hotly debated issues in present-day Europe.

Social media are used in areas in which citizens and fans have long participated, such as politics and popular culture, and in domains where the boundary between expert and amateur is more tightly guarded, such as medicine and science. This brings with it various tensions. Research has shown that digital tools provide opportunities to enhance citizen involvement in decision making and the work of parliaments, but also create dilemmas, such as how to balance the opinions expressed online by individuals and groups with the freedom that politicians need to form their own opinions on political matters. The current fascination with new forms of knowledge production may signal a desire for change in the traditionally hierarchical and increasingly commercialised institutions which produce and distribute knowledge. Research on how knowledge is created and distributed within and between digital social networks is necessary to gain a better understanding of the conditions that facilitate the sharing of expertise.

## Knowledge infrastructures

In the past, European integration has been facilitated by investments in international infrastructures, including systems for transportation, energy and communication, which connect European countries and regions both literally and figuratively. By the same token, research infrastructures are important for the competitiveness and quality of research conducted in universities throughout the EU, and there are many examples of world-leading infrastructures available to researchers throughout Europe (CERN being the most well-known). The European Strategy Forum on Research Infrastructures (ESFRI) coordinates investment in facilities, resources and services used by the academic community to conduct research and foster innovation. High-quality research infrastructures are needed to achieve excellence in research, and at the same time they contribute to the development of the European Research Area (ERA) and Innovation Union. Efficient European research infrastructures attract researchers from other parts of the world, enable the training of researchers and facilitate innovation and knowledge sharing by bringing people together, supporting distributed collaboration and facilitating new joint activities across fields, institutions and locales. They offer new opportunities for sharing and connecting information and resources: data, code, publications, computing power, laboratories, instruments and equipment. Further, they often bring together a diversity of actors, organisations and perspectives: academia, industry, business and the general public.

## Data-driven decision making

European organisations and institutions can use massive datasets of customer or client transactions and activities to target citizens, develop service innovations, predict demand, optimise logistical streams and improve scheduling. Governmental bodies are becoming increasingly cognizant of the potential of data, sharing data through 'Open Data' initiatives and developing innovative approaches to fight urban crime, optimise traffic flows and develop new services. To do so effectively, insights and techniques from the fields of operations, marketing and information systems need to be combined with ethical, legal and social considerations. Moreover, it is important to further our understanding of how to handle, analyse and interpret these rich datasets. The increased size of datasets is a blessing but also a curse for the development of decision-support tools and systems, as decision makers have to be able to react quickly to new information, which often arrives in the form of masses of unstructured data. Users are calling for methods that can analyse big datasets reliably, accurately, efficiently and ideally in real time, while also producing easily interpretable output.



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