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The Role of the State in the Innovation Triangle: Law and Policy Fostering the Optimal Regulatory, Business and Innovation Policy Environment

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This chapter will address the role of the state in the "Innovation Triangle" of regulatory, business and innovation policy; for example, in the area of fintech and related technologies that stretch beyond finance, such as blockchain/distributed ledger technologies (DLT). The economic competitiveness of the European Union and its Member States, and their ability to further develop and maintain a 'good society' that creates possibilities for citizens to thrive depend on a conducive environment for all types of innovation.

Joseph Schumpeter's theory of "creative destruction" describes how in capitalist economies, innovations provide new and often unforeseen sources of economic growth, while displacing existing companies and industries.[1] Professor Schumpeter wrote, "This process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in and what every capitalist concern has got to live in.[2]" In a dynamic economy, poorly managed companies with a lack of something new to offer should see their places taken by more innovative and productive competitors.

[1] Schumpeter, J. (2009). *Can Capitalism Survive? Creative Destruction and the Future of the Global Economy*, New York: Harper Collins Publishers, originally published as *Capitalism, Socialism, and Democracy* by Harper & Row, New York, 1942.

[2] Ibid., pp. 42–43.

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E. Kaili et al. (eds.), *New Models of Financing and Financial Reporting for European SMEs*,
https://doi.org/10.1007/978-3-030-02831-2_2

While manufacturing and the jobs it provides are an important part of an innovation ecosystem, policymakers should not try to preserve or subsidise all existing companies, industries or jobs at any cost, but to forge an economic and social environment conducive to innovation. As André Sapir and Reinhilde Veugelers of the Bruegel Think Tank have written, "Europe needs innovative firms that operate in activities with a high value-added and participate in European and global value chains."[3]

Many commentators and economists have stated that the rate of innovation in the "West" has fallen over recent years. For example, Professor Edmund Phelps, winner of the 2006 Nobel Memorial Prize in Economic Sciences, argued in his recent book that "Mass Flourishing"[4]—noting the financing being provided to new and innovative enterprises—is insufficient. Both Professor Phelps and Professor Mariana Mazzucato have noted the rise of short-termism in business and finance, with the result that private "patient capital" with a long-term view in finance has become increasingly rare.[5] Further, one can observe that many of innovation's "low-hanging fruits" in areas like ICT and transport, for instance, have already been plucked. Investor Peter Thiel has also argued that technological progress halted at the end of the 1960s,[6] saying "We wanted flying cars, instead we got 140 characters," speaking of the incremental nature and lower ambition of most recent innovations.

The areas that are most ripe for innovation today are those like finance, education, health and climate change/energy, which are often characterised by high levels of regulation, and in some cases by state provision, procurement (including public procurement of innovation—PPI, and pre-commercial procurement—PCP), the need for long-term planning and programmes. Therefore, in these areas, which are so promising for future innovation, substantial state involvement is inevitable and it is important that it be mobilised as a positive factor, supporting innovation.

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[3] Sapir, A., and Veugelers, R. (2013). *Manufacturing Europe's Growth*, in European Voice, 31 October 2013, p. 13.

[4] Phelps, E. (2013). *Mass Flourishing*, Princeton and Woodstock: Princeton University Press; and the Distinguished Lecture at the Sheldonian Theatre, University of Oxford on 17 October 2013. Politicians have also sounded this alarm; see George Osborne quoted as saying, "Look at innovation, where Europe's share of world patent applications nearly halved in the last decade", *The Guardian*, politics, "Reform EU or Britain quits - George Osborne lays down ultimatum", 15 January 2014.

[5] Mazzucato, M. (2013). *The Entrepreneurial State*, London: Anthem Press, pp. 26–27; and the Economics Department lecture at the London School of Economics on 8 October 2013, accessed at www.richmedia.lse.ac.uk

[6] Financial Times, *Lunch with the FT: Peter Thiel,* December 21/December 22, p. 3, Life & Arts.

Meanwhile the rate of innovation and related manufacturing is rising in the "development states" of Asia. Writing about competitors to the United States, Robert D. Atkinson and Stephen J. Ezell stated, "Other nations have put in place the tax, trade, talent and technology policies both to draw in and to grow innovation and productivity-enhancing investment.[7]"

From the 1940s to the 1960s, economists such as Friedrich Hayek and Joseph Schumpeter had to expend much energy and many pages of their tomes such as *The Road to Serfdom*, *The Constitution of Liberty*, and *Can Capitalism Survive?* to answer the claims made for the superiority of statist domination of the economy and to defend the vital role of the entrepreneur in a dynamic economy. It is indicative that even on the right of the centre of the political spectrum at that time, British Prime Minister Edward Heath stated, "I fear that to place one's faith in some invisible hand, rather than to grapple with problems with determination, is a failure of the human spirit. What distinguishes man from animals is his desire and his ability to control and to shape his environment.[8]" However, it is a vast oversimplification to say that Adam Smith himself believed only in an "invisible hand" regulating all. He said that according to the system of natural liberty, one of the duties of the sovereign was that of "erecting and maintaining certain public works, and certain public institutions, which it can never be for the interest of any individual, or small number of individuals to erect and maintain."[9] Regarding the topical issue of inequality, which is also of more than minor relevance to innovation policy, Adam Smith wrote, "No society can surely be flourishing and happy, of which the far greater part of the members are poor and miserable."[10]

Today the ideological pendulum often seems to have swung in the other direction to the extent that a discourse on the subject may start with the premise that the only role for the state in the economy of innovation is at the most in funding basic research, addressing "market failures" and lowering corporate taxes. It can be questioned whether the experience with innovation in

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[7] Atkinson, R., and Ezell, S. (2012). *Innovation Economics: The Race for Global Advantage*, New Haven and London: Yale University Press, p. 31.

[8] Ziegler, P. (2010). *Edward Heath*, London: Harper Press, p. 71.

[9] Smith, A. (2010). *The Wealth of Nations: The Economics Classic*, UK: Capstone, p. 298.

[10] Ibid., p. 88. Nobel Prize laureate in Economic Sciences, Amartya Sen, wrote in his introduction to the 250th Anniversary Edition of Adam Smith's "The Theory of Moral Sentiments", Smith "rejected *market-excluding* interventions but not *market-including* interventions aimed at doing those important things that the market may leave undone." Penguin Books, New York, 2009, p. xiii.

Europe and the United States in the past and today, and in Asia recently, would justify such a premise. It is important that policy rest on a foundation of evidence and facts, and not simply ideology.

Taking the example of the once fabulously innovative and now defunct AT&T's Bell Labs from the United States, often presented as a free market citadel state in the past and today, it is "the received wisdom that innovation and competitiveness are closely linked. Companies that are good at innovating are good at competing in the market; the uncompromising nature of the market, in turn, is a powerful force on companies to innovate. But Bell Labs' history demonstrates that the truth is actually far more complicated. It also suggests that we tend to misinterpret the role of markets."[11] To justify an ambitious state role in innovation, the examples of the government-developed technologies that make the iPhone "smart", namely, the Internet, GPS, SIRI and the touch screen,[12] the track record of the Pentagon's Defense Advanced Research Projects Agency (DARPA) in general,[13] and the funding of the Google algorithm by the National Science Foundation in the United States[14] can be cited.

Therefore, the role of the state in either fostering or hampering innovation is an important and timely subject in need of analysis, reflection and discussion. This chapter will focus on two aspects of state and private sector interaction: firstly, that of public/private collaboration in fostering innovation and, secondly, drawing out ways in which an innovation-friendly policy stance can be taken by regulatory bodies in regard to new initiatives being developed by private actors, such as in the area of fintech and blockchain/distributed ledger technologies. A sub-theme will be how the Internet has changed the context and framework of innovation policy in the public and private sectors and in the networks where they both are present.

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[11] Gertner, J. (2012). *The Idea Factory: Bell Labs and the Great Age of American Innovation*, New York: Penguin Books, p. 352.

[12] Mazzucato, M. (2013). The Entrepreneurial State in Chapter 5 – The State behind the iPhone, pp. 87–112.

[13] Dugan, R., and Gabriel, K. (2013). *Special Forces Innovation: How DARPA Attacks Problems*, in Harvard Business Review, October, pp. 74–76.

[14] National Science Foundation, *On the Origins of Google*. Available at http://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=100660, accessed on 27/12/2013.

What Is Innovation?

A definition of innovation and the type(s) of innovation under discussion is a good starting point; otherwise, the term can easily become a catch-all signifying everything and at the same time, little of practical applicability. Firstly, innovation discussed in this chapter is more than science or the production of new commercially marketed products.[15] Research is an input of innovation. The OECD defines innovation as "the implementation of a new or significantly improved product (good or service), process, a new marketing method, or a new organizational method in business practices, workplace organisation or external relations."[16] The observation of Eugene Gordon, Bell Labs development scientist, can supplement this definition: "If you have not manufactured the new thing in substantial quantities, you have not innovated; the second is that if you haven't found a market, you have not innovated."[17]

The scope of this analysis encompasses public sector and social innovation, so consequently if the "new thing" or new process cannot actually be implemented in a societal context or in public services then one has not innovated; if it cannot be replicated in other similar societal contexts or public services, then one has not innovated. This can be considered especially relevant in assessing the utilisation of the concept of "smart failure" in a public sector innovation context. If this approach is to be rolled out widely in order to endorse experimentation for better performance of public services it is essential that the freedom to act of the civil servants concerned is not simply at the whim of a benevolent superior but is structurally part of the system and is included in standard operating procedures.

There are problems faced by countries and their citizens that because of their size and complexity require a mobilisation of societal and economic actors beyond solely the state or the market and both a long-term strategy and long-term risky financing. They can be labelled societal challenges and include climate change/movement to a clean and green economy, financial inclusion, education and addressing the demographic changes that are putting the sustainability of health and social care in Europe into question.

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[15] Fagerberg, J., Mowery, D., and Verspagen, B. (2009). *The focus on the economic exploitation of knowledge. Innovation, Path Dependency, and Policy: The Norwegian Case*, Oxford University Press, p. 3.

[16] The OECD Innovation Strategy (Paris, 2010), Oslo Guidelines for Collecting and Interpreting Innovation Data (2005), accessed at www.oecd.org on 15/12/2013.

[17] Gertner, J. (2012). *The Idea Factory: Bell Labs and the Great Age of American Innovation*, New York: Penguin Books, pp. 18–19.

The State Leading Innovation

There are multiple examples where the public sector can take an active role in funding and supporting innovation. The EU multi-annual research and innovation programme Horizon 2020[18] has introduced instruments taking novel approaches to close the "innovation gap" such as inducement prizes, support to innovative procurement, the Fast Track to Innovation scheme, access to finance and the Open Disruptive Innovation Scheme. The European Commission supports the Startup Europe partnership to network Europe's leading innovation ecosystems, and links them to other markets such as Silicon Valley, and India, Latin America and Africa.

Business Policy

Additionally, business policy at the regional, national and European levels should foster innovation as part of a dynamic economy. Removing barriers to setting up startups, bankruptcy procedures to allow entrepreneurs to risk again, and initiatives like the Startup Europe programme and the European Commission's Communication on a Startup and Scale-up Initiative in 2016 serve to support a conducive business environment. The Communication underlines the role that instruments like regulatory sandboxes can play in ensuring that innovators can test new solutions while other public policy goals are achieved. This is discussed below in the section on the state as a regulator.

The network of law incubators to assist startups with the legal advice that they need to get their venture off the ground that was initiated and funded by the European Commission is another example of ways in which an innovation-friendly business environment can be encouraged and sustained.

This type of environment should be welcoming to SMEs and to larger industry as well as to consumer-innovators. Barriers should not be placed in the path of consumers creating in the new consumer-innovator paradigm, and the use of the Internet to harness this power should be actively encouraged.[19] The state can also best support worthy businesses directly using tools

[18] Europe Commission, *Horizon 2020*, Available at URL ec.europa.eu/research/horizon2020/, accessed on 17/12/2013.

[19] Hippel, E., Ogawa, S., and De Jong, J. (2001). *The Age of the Consumer-Innovator: Why It's Time to Rethink Product Development*, in MIT Sloan Management Review, Fall 2011, Vol. 53(1), p. 29. Their

like pre-commercial procurement and public procurement of innovation, rewarding those able to offer innovative solutions rather than simply supporting a class of businesses.

Innovating in the Public Sector

The state can foster innovation in the public sector itself, enabled by the possibilities of the Internet. An example is the proposal that was made by then Estonian Prime Minister, now European Commission Vice President, Minister Andrus Ansip to the European Council of October 2013 in his letter, "Sign up to a digital revolution".[20] He emphasised that the adoption of an EU regulation on digital signatures during the current mandate of the European Parliament was essential, underlining the importance of implementation by the STORK project. Further, the Prime Minister called for the creation of a framework for reusing and sharing data collected by EU public authorities. He cited the Estonian law, adopted in 2007, requiring citizens to submit their data to public authorities just once, after which, if the citizen has given consent, Estonian public authorities must share and reuse the data if they need it to deliver other public services.

Prime Minister Ansip proposed enshrining a similar right across the European Union starting in 2016, allowing European citizens and companies not to have to resubmit data to any public sector agency in the whole of the EU. He proposed "common EU-wide data exchange platforms—or at least administration-to-administration links—so that we can reuse the data." The aim is to "bring about the essence of the digital economy and the digital single market: seamless cross-border services in the whole of the European Union." This was already taking place in Estonia and Finland's collaboration on automated exchange of data in the cross-border version of Estonia's X-road.[21]

Such an initiative could serve to reduce the burden on small and medium enterprises (SMEs) and industry, and promote innovation utilising public sector data, with suitable privacy safeguards built-in, as well as simplifying the lives of EU citizens. If the tasks involved were in relation to institutions, offices, agencies or bodies of the European Union,[22] such an initiative could also be seen as

research also highlights a link with education policy and the importance of STEM fields of study. People with a higher educational background and a technical one are more likely to be consumer-innovators.

[20] European Voice, 24 October 2013, p. 14.

[21] Republic of Estonia, Information System Authority, www.x-road.eu, accessed on 25/12/2013.

[22] Though the ruling of the Court of Justice in *AMS* (15 January 2014) on whether the Charter of Fundamental Rights applies in a dispute between private parties is of relevance to whether such a distinc-

part of the implementation of Article 41 of the European Union's Charter of Fundamental Rights guaranteeing a right to good administration in relation to having "affairs handled impartially, fairly and within a reasonable time". It is worthwhile emphasising the wording on "reasonable time". When digital tools and platforms become available that can provide greater efficiency, time-savings and simplicity in providing public services, I would venture to say that the concept of "reasonable time" should evolve to take into account the availability of these technologies and their potential for efficiency gains and reducing administrative burden. Wasting citizens' time in asking them to repeatedly provide the same information to public authorities can be seen as bad administration and as a tax on their time, one which does not benefit state revenues either and if anything takes citizens away from more productive and interesting tasks.

The Internet and social media are enabling the public sector to maximise efficiency while actually increasing access to services and the possibilities for citizens to provide their inputs on policy and administration matters. Helen Margetts and Patrick Dunleavy observed in their influential article, "The second wave of digital-era governance: a quasi-paradigm for governance on the Web",[23] that three themes stand out already in the first wave of digital era governance: (1) reintegration; (2) needs-based holism; and (3) digitalisation. Reintegration amalgamates and "de-silos" public-sector processes, needs-based holism tries to design services around the citizen's needs and perspectives, not those of the administration, and digitalisation is the movement to a "digital by default" assumption.

The proposal by Prime Minister Ansip can be seen as taking this reintegration, needs-based holism and digitalization to the next, European, level of governance. The second wave of digital era governance, based on the power of social media, will continue the transformation of government.[24] This should be the point at which citizens do not simply provide inputs but are empowered to manage processes themselves (the eHealth example) and are given the possibility to socially or commercially innovate utilising open government data and social media networks.

The Ansip proposal, especially if related to efforts to move public services at the national or European levels, does presuppose attention being given to

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tion is relevant. The CJEU held that the Charter is applicable "in all situations governed by European Union law". Oxford Human Rights Hub, "The CJEU's Ruling in AMS and the Horizontal Effect of the Charter", www.ohrh.law.ox.ac.uk, accessed on 21/01/2014.

[23] Published on 18 February 2013 in Philosophical Transactions of the Royal Society, March 2013, Vol. 371, no. 1987 20120382.

[24] Ibid., p. 7.

digital literacy and digital access by policymakers and by those implementing policy. Without the tools of digital literacy and actual accessibility of the Internet to all, especially in vital areas like retail finance or digital health, there is a risk that some citizens will be disadvantaged rather than empowered by the introduction or wholesale move of public or private services to the digital sphere. As part of moving to its model of eGovernment on the national and local levels, Estonia invested in digital literacy and eInclusion.

The State as Regulator: An Innovation-Friendly Policy Stance

Turning to the second aspect of the state's role in innovation: where the state is not necessarily leading development itself, it can take an innovation-friendly policy stance in regard to a sector, technology, technological application or platform where the regulatory framework may be revised or adapted, therefore not hampering new products or approaches. John Pierce of Bell Labs stated that "Everyone faces the future with their eyes firmly on the past and they don't see what's going to happen next."[25] While the state can play an essential role in enunciating missions endorsed by the democratic process and in providing a long-term view in finance and development, it should not pretend to omniscience. It must allow space for the creativity of private enterprise and civil society to be released. Examples of some pertinent sectors that may be addressed in regulatory policy in the fintech and Digital Single Market space are blockchain, crypto currencies and Initial Coin Offerings (ICOs).

It is clear that the financial sector is vital as a motor for innovation across the economy and that fintech, being digital innovation in finance, is important in achieving this goal. While networks, legal frameworks and the dissemination of knowledge are essential, as the physicist, Phil Anderson, stated, "Never underestimate the importance of money".[26] Economic competitiveness and the prosperity of a nation or group of nations, namely the European Union, depend on the flow of loans, especially "patient" long-term finance from a banking sector possessing a sufficient industry and sector-specific skills base, depth and a plurality of views. Professor Edmund Phelps, wrote, "A country's dynamism also depends on the pluralism of views among financiers."[27]

[25] Ibid., p. 201.

[26] *The Idea Factory*, p. 154.

[27] *Mass Flourishing*, Edmund Phelps, p. 38.

Along with deepening the banks' industry-specific skills base and improving their credit evaluation mechanisms to better analyse enterprises' innovation potential, fintech, including crowdfunding and blockchain applications, could conceivably provide depth and a plurality of views supporting innovation in financial services and ideally in the broader economy. Mariana Mazzucato observed, "From a policy-making point of view, it is crucial to consider how the 'eco-system' of financial institutions can 'broaden out' the innovation landscape rather than close it down, as is currently the case in many sectors."[28] The European financial system is bank-dominated and characterised by lending a majority of its funds to households as well as by a depleted industry and sector-specific skills base in lending and risk management. Professor Mazzucato made the general observation: "As traditional profit maximizing banks fear the kind of fundamental uncertainty underlying innovation, innovation has often had to be funded by alternative sources, such as venture capital, business angels or public funding bodies, including state investment banks."[29] Concurrently, Professor Mazzucato noted the tendency of "financialisation"[30] of large private companies on both sides of the Atlantic, cutting investments in productivity and innovation while concentrating on raising their stock prices through buybacks of their shares.[31]

While there is, and was, a need for lending to finance the real economy and innovation in particular, the funds that flowed from north to south in the early years of the Eurozone were going primarily for real estate and consumption. Overall, the "boom" years saw a huge over investment in property, construction, financial services and consumption. This was not, and cannot be, the basis for sustainable growth in European economies. However, especially now, as a reaction to the markets having priced risk too low, risk is being priced too high in Europe and this is starving innovation efforts of private financing at a time when much public funding has been cut due to austerity efforts.

Professor Mazzucato has opined that "regulation of financial markets must go hand in hand with policies that are aimed at innovation and industrial policy."[32] That is to be considered when policy decisions are to be taken in this sector.

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[28] Mazzucato, M. (2013). *Financing innovation: Creative destruction* vs. *destructive creation*, in Industrial and Corporate Change, Oxford Journals, Oxford, Vol. 22(4), August, p. 856.

[29] Ibid., p. 852.

[30] Ibid., p. 853.

[31] "During the past decade, Fortune 500 companies have spent $3 trillion on share buybacks … such spending has occurred at the expense of innovation". Ibid., p. 856.

[32] Ibid., p. 863.

In general, SMEs in Europe go much less to the markets but to the banks, making classic banks much more important to financing the real economy in the EU[33] while venture capital investment is more prominent in the United States, for example. The *Financial Times* has stated, "The willingness to bet a lot on an untested venture is deeply rooted in the US business culture and start-ups in Europe often face a more sceptical investor climate."[34]

It is important that any legal frameworks developed and implemented aiming to prevent systemic risks and regulatory arbitrage do not serve inadvertently to cut off financing for innovative enterprises, especially new high-tech startups. It should additionally not magnify the retreat of capital behind national borders, one of the consequences of the financial crisis.

Considering crypto currencies, a monetary innovation made possible by the Internet and gaining in popularity because of it, there is much ongoing discussion whether Bitcoin,[35] for example, is truly becoming a viable alternative (fiduciary) currency or whether it is just a speculative bet.[36] If the answer is that it or one of its alternatives is a viable currency not issued by a central bank, then there are implications for the central banks, the sovereign model of finance, macroeconomic stability and the regulation of financial markets. Current regulatory guidance on crypto currencies is rudimentary and its actual implementation even where existing is no simple matter.

Money can be seen as a measure of value, a medium of exchange and a unit of account. Adam Smith wrote that, "every prudent man in every period of society, after the first establishment of the division of labour, must naturally have endeavoured to manage his affairs in such a manner, as to have at all times by him, besides the peculiar produce of his own industry, a certain quantity of some one commodity or other, such as he imagined few people would be likely to refuse in exchange for the produce of their industry."[37] After the choice of metals as the commodity that best served as a means of

[33] For instance, in the area of green technologies, global venture capital investment in 2011 went 76% to the U.S. while only 14% went to the EU. "Europe seeks to close funding gap with US," European Voice, 19 September, p. 16.

[34] Financial Times. (2014). *The long strive to reach Silicon Valley – other tech hubs will struggle to copy California's success*, January 4, January 5 2014 U.S. edition, p. 6.

[35] Started in 2008 with a pseudonymised white paper, published under the name of Satoshi Nakamoto, which can be found at http://bitcoin.org/bitcoin.pdf. The identity of its creators is still unknown. The first known purchase with Bitcoins took place on 21 May 2010.

[36] As written in FT Money, the question is 'whether the digital currency is an asset class, a means of trade or just an online pump-and-dump operation', FT Weekend, Saturday January 11/Sunday January 12 2014, p. 1.

[37] The Wealth of Nations, p. 39.

exchange, public stamps gained favour as an alternative to weighing and testing metals for their content, thereby facilitating seamless exchange. It can be deduced that the cryptocurrencies[38] are a step towards an even more seamless, common medium of exchange in the digital era, but may also introduce instability into the monetary system.

A pertinent point for our discussion is that Bitcoin's open source approach to its protocol has allowed for innovation on top of the existing project, now sometimes called the "blockchain revolution" across sectors, something that is also hoped for in relation to the cross-border eHealth data exchange infrastructure that epSOS prepared and that is being implemented in the Connecting Europe Facility.

Cryptocurrencies can be seen as a way to get around bad governance in many parts of the world, as a disruptive threat to debit and credit cards, as a mode to decouple the economy from politics or as an enabler for money laundering and other types of criminality. The ramifications can be negative as well as positive: creating new opportunities for innovation, creativity, and efficiency in transferring funds or destabilising currently beneficial arrangements for economic governance. In the EU for the time being, regulators are following developments and not moving to regulate yet.

If in the future, EU specific legislation in these three areas was to be considered because self-regulation and other alternatives had proven insufficient or because the current regulations were to be revised, it would be subject to the European Commission's impact assessment procedure. Impact assessment was introduced by the European Commission in 2003 to assess the potential consequences of an economic, environmental and social nature of initiatives it aims to propose. The impact assessment process collects evidence on the pros and cons of policy options under consideration on the basis of their potential impact.

Any legislation that might eventually be proposed should be "future proofed" and technology-neutral in that it should not lock in, or be predicated on, today's existing technologies, business models or processes.[39] Not only should room be left for change, in the form of innovation it should be encouraged by policy and legislative frameworks. In this context, the recent proposal of an "innovation principle" in a letter from 12 of the largest inves-

[38] 'Bitcoin is both a computer protocol and a digital asset or unit of account', Jonathan Levin, University of Oxford, Department of Economics, note prepared for the Cryptocurrency seminar at the Oxford Internet Institute, 21 November 2013.

[39] As the European Risk Forum notes in its Background Note 14, "Regulation of risk can also affect the creation and diffusion of ideas", p. 3, which is the main subject of this chapter.

tors in innovation in the EU to the Presidents of the Commission, Parliament and European Council under the auspices of the European Risk Forum[40] is pertinent. They proposed revising the European Commission's Impact Assessment Guidelines (2009) "to require formal evaluation of the impact on innovation and new technology development of new or amended legislation or administrative decisions".[41] The introduction of such a principle into impact assessment procedures could be evaluated as a part of European Union innovation policy as well as considered at national and regional levels.

The European Risk Forum noted that the European Union has concentrated more on funding than on the regulatory environment. While it can be conceded that a great deal of attention and resources were devoted to the programming and management of the Framework programmes, it cannot be denied that efforts to set up impact assessment and to institute better regulation procedures have aimed to improve the business environment in Europe, comprising that of the innovation-driven economy. However, in an activist role, using legislation and standards as enablers of innovation, as well as in a role aiming not to hinder developments utilising innovation-friendly policy stances and explicitly considering innovation impact during the impact assessment procedure, the European institutions could forge a more holistic innovation policy, comprising the aspects of regulation, business policy and promotion of innovation. If Europe wants to take the innovation-driven economy seriously, innovation needs to be consistently considered in the framework of other policies and initiatives, to evaluate the influence that policies have on the innovation potential of companies, social actors and the public sector.

Regulatory and Supervisory Innovation

An initiative to support innovation in regulated areas that was put forward in the European Commission Communication on Startups and Scaleups is that of regulatory sandboxes, with the Communication proposing exploring an enabling framework for them. A regulatory sandbox creates a "safe space" in which businesses can test innovative products, services, business models and delivery mechanisms in the context of regulation, with regulators. The sand-

[40] European Risk Forum Communication 12, The Innovation Principle – Letter to the Presidents of the European Commission, the European Council and the European Parliament, October 2013.

[41] European Risk Forum, Background Note 14, p. 4.

box framework enables firms to manage regulatory risks during the testing stage. The sandbox is intended for testing new solutions, in real-life situations, where a potential consumer or user needs to be demonstrated, as well as the need to manage potential risks and to respect binding legal rules. Regulatory sandboxes are not about "de-regulation", but rather an approach based on a *two-way regulatory dialogue* between an entrepreneur and an approachable regulator.

From a regulator's perspective, the largest advantage of a sandbox will be that anyone applying for a license will understand exactly what the process is before attempting to launch. This also allows regulators to guide the innovative company through the process, enabling (and accelerating) the speed of launching the new product or service.

Another advantage is the possibility of real-time impact analysis, which ensures that the innovation is not going to undermine the safety and robustness of a sensitive sector (e.g. financial services ecosystem, connected transport), as envisaged by the regulatory bodies. This is a feature that adds value from the regulator's perspective, as the process mitigates the overall risk.

Innovative firms, both startups and incumbents, often face disproportionate, inconsistent or over-cautious application of regulatory requirements. In the case of startups, their smaller teams may lack the experience to deal with regulatory compliance. Among established firms, current structures may be unable to efficiently respond to new developments emerging from their innovation teams or take an overly risk averse approach due to broad regulatory concerns.

Regulatory sandboxes are already considered to be a useful tool for areas such as fintech, blockchain, data, municipal services, automated transport and drones. It is in the financial sector—due to its intrinsic highly regulated nature—where sandboxes have primarily been tested.

Some European sandbox supervisors set up dedicated teams and departments to support fintech developments, via the so-called "innovation hubs" that aim to provide guidance to innovative firms (regardless of their size) and help them understand regulatory requirements. Other sandbox supervisors also started a more systematic monitoring of innovation by establishing a regular forum with relevant stakeholders.

Finally, some are setting up regulatory sandboxes to work with preselected firms in testing innovative technologies. Sandboxes are mainly supervisory tools for firms and supervisors to explore how regulation should be interpreted and applied in light of a firm's new solution, by running live tests. The sandbox framework enables ventures to manage regulatory risks during the

testing stage, even though more solutions may be trialled later and potentially introduced to the market.

Existing examples of regulatory sandboxes in the EU are in the Netherlands, Lithuania and the UK, where the Financial Conduct Authority in the UK has designed a regulatory sandbox program. Similar steps are being considered in Sweden and in Portugal (in other sectors). Another case is that of the Monetary Authority of Singapore, who have a dedicated page and materials.

The public consultation on *FinTech: A More Completive and Innovative European Financial Sector*, published on March 23 2017, asked stakeholders: "Are guidelines or regulation needed at the European level to harmonize regulatory sandbox approaches in the Member States? Would you see merits in developing a European regulatory sandbox targeted specifically at FinTechs wanting to operate cross-border? If so, who should run the sandbox and what should be its main objective?"

The Startup Nations Summit (SNS) in Tallinn has proposed that policymakers from outside Europe will test the approach hands-on via the SNS Policy Hack in order to provide feedback and adapt the process to their own ecosystems. This is an initiative of the Estonian Presidency of the EU and the European Commission.

Conclusion

As Jon Gertner wrote in *The Idea Factory*, in regard to innovation, "capitalism is more deeply intertwined with government than many of us realise."[42] This is certainly true in regard to the "development states" like South Korea, China and Singapore, Europe's competitors on the global stage, and as Mariana Mazzucato and Jon Gertner have shown, this is also true for the development of the innovation-driven economy in the United States.

An active and farsighted role of state institutions in shaping, regulating and financing innovation can benefit the whole of society both in allowing individual initiative to flourish and by strengthening the knowledge and innovation-driven economy. Public sector engagement alone is not sufficient but neither is leaving everything to the market. Mutually beneficial cooperation of the public and private sectors on the basis of holistic innovation strategies coordinated by competent and sufficiently resourced civil services taking full advantage of the game-changing possibilities offered by the Internet for

[42] *The Idea Factory*, p. 352.

enabling the digital economy and digitally transforming public services is necessary. Europe needs to be in the forefront of adopting and adapting to new approaches such as fintech and blockchain. Only such a shift in thinking and action can ensure the future competitiveness of European economies as a basis for fair and sustainable societies and the maintenance of our global role.