CEPOB
College of Europe POlicy Brief

12.18

SEPTEMBER 2018

Building a forward-looking EU policy strategy on blockchain

Lawrence Kerknawi & Alexander Mäkelä

Executive Summary

As the EU starts taking greater consideration of blockchain, competitors are rapidly catching up. To ensure its competitiveness, Europe faces near-term challenges in stimulating investments, developing skills, and creating legal and regulatory certainty.

This paper recommends that Europe's blockchain ecosystem could be bolstered by:

- **The European Commission and Member States taking steps to support blockchain R&D and commercialisation by expanding upon existing educational and research schemes, adopting progressive public procurement measures, and leveraging Europe's leadership in social innovation.**
- **Creating a technical multi-stakeholder organisation to represent blockchain interests towards the European Union, Member States, and civil society.**
- **Ensuring legal harmonisation and standardisation through an EU-wide, layered approach.**

While countries such as China and the United Arab Emirates (UAE) invest in leading blockchain capacity, the European Union (EU)'s actions in this domain point to an unclear ambition with large discrepancies among the Member States. However, given the technology's potential impact on the digital economy, early adoption of blockchain products and services will be crucial to ensure European competitiveness in the coming decades. This policy brief argues that while Europe is taking early steps to encourage a blockchain industry, more is needed to be at the forefront of global developments. To that end, it explores some of Europe's challenges and offers a set of recommendations.

A brief introduction to blockchain

Broadly speaking, blockchain technology is a subset of Distributed Ledger Technology (DLT), an umbrella term for technologies allowing users to securely transact assets through distributed and decentralized networks without necessarily operating in a trusted environment. What distinguishes blockchain from other DLTs is its unique data structure: transactions are bundled into blocks that are connected through cryptographic puzzles, making any attempts to tamper with the chain traceable and cost-intensive. With this capacity, blockchain has the potential to improve processes in a wide range of industries. Examples include digital identity facilitating citizens' secure access to their personal documents and the nearly instant clearing of cross-border payments.

From a programming perspective, a blockchain is composed of a development stack divided into three layers: (1) the protocol layer which establishes the 'rules of the game', (2) the network layer where transactions are processed and validated, and (3) the application layer where companies and consumers interact with the blockchain. This allows for entrepreneurs and developers to focus on different layers depending on client needs and potential use cases.[1]

Blockchain and the EU

The emergence of blockchain technology has neither gone unnoticed by the European Union nor has the EU been standing idle. In February 2018, the European Commission launched the Blockchain Observatory and Forum in collaboration with Consensys, a blockchain software company, showing the eagerness of the EU to gain a better

[1] For a technical overview of DLT and blockchain, the University of Cambridge's Centre for Alternative Finance has released a Global Benchmarking Study which serves as a valuable resource.

understanding of ongoing blockchain projects. Over the course of two years, regulators, industry leaders, and academics will engage in two different working groups, one on the regulatory aspects of blockchain and another on use cases and transition scenarios. The Commission has also launched a call for tender for a study on the opportunities and feasibility of EU blockchain infrastructure.

In addition to this, the Commission has allocated 83 million Euros to blockchain-related projects in its Horizon 2020 programme, with a potential to commit up to 340 million euros for blockchain investments until 2020. This also includes the recent European Innovation Council's Challenge Prize on Blockchain, which incentivises companies to come up with socially impactful blockchain-based solutions. Examples of these include enabling democratic participation, creating greater government transparency, and more generally leveraging decentralisation and disintermediation where it could be socially beneficial. The prize itself comes with a reward of up to 5 million euros.

On the side of the European Parliament, the role of blockchain in international trade and industry has been highlighted. Early reports show that the Parliament would like the EU to adopt an impartial approach to the technology and emerging business-models to support its growth (European Parliament 2018).

Moreover, 21 EU Member States and Norway have committed to the European Public Blockchain Partnership to prepare, in cooperation with the European Commission, the technical specifications and define appropriate governance models as well as identify other framework conditions which are essential compliance and regulatory requirements. The aim is to launch the first cross-border actions by the end of 2019. Meanwhile, several public authorities are involved in 'regulatory sandboxes', where private actors can experiment with blockchain technology without fearing legal repercussions. The Commission has the intention to scale up these projects. A detailed overview of EU and Member State actions can be found in the thematic report of the EU Blockchain Observatory and Forum (Lyons 2018).

Challenges ahead

While these early steps are promising, the EU faces both economic and regulatory hurdles. Its current measures fail to address a number of challenges including the lack of a clear regulatory environment and the need for competent digital skills to attain market leadership. With estimates of the blockchain technology market going as high as 12.48 billion USD by 2025 (Business Insider 2017), Europe has clear incentives to do more.

In solidifying European leadership, the following economic challenges would have to be addressed:

- **Fostering and using human capital:** In an emerging field talent is key. Europe risks failing to capture the market if it does not work proactively to support education and skills around blockchain. Furthermore, a more widespread understanding of blockchain is needed to appreciate where the technology can or cannot be used. Even if Europeans do succeed in developing the right skills, the EU also needs to be a competitive place lest it wants its talent to move elsewhere.
- **Supporting the entire innovation process:** With blockchain developers working across several layers and with many stakeholders, Europe must find ways to support basic and applied research, experimental development, and product development.
- **Stimulating early demand:** As with many technologies prior to widespread adoption and the emergence of an investment climate where private capital is willing to take risks, industries can face slow growth. For Europe to mature its blockchain sector, it must find ways to stimulate early demand.
- **Sending the right market signals:** While the EU has announced blockchain spending, its overarching vision is faint. There is little clarity as to what Europe's ambitions are and the extent to which the EU and its Member States are willing to support them. Even in Horizon Europe (Horizon 2020's successor), blockchain so far only attracts marginal attention. Without confidence, investors and talent might look elsewhere.

A friendly regulatory landscape is also crucial to encourage companies to experiment with blockchain technology, especially in traditional industries that are already heavily regulated and deal with compliance issues. The EU's Digital Single Market strategy has the objective of removing online barriers and unleashing Europe's digital potential. But as the Juncker Commission's mandate nears its end, the strategy has seen mixed outcomes, following several setbacks such as delays and political backlashes from the Council due to too high ambitions on part of the Commission. Prior to action from the next European Commission, the EU faces the following challenges:

- **Legal uncertainty:** The distributed nature of blockchain technology and new features, such as smart contracts, were not fully understood by policy-makers when drafting and adopting legislation on data protection, or other civil

society aspects. It is important that start-ups active in emerging and heavily regulated industries can explore and experiment with blockchain without fearing legal uncertainty and repercussions.

- **Legal fragmentation:** Failing to deliver on a standardised approach towards blockchain could lead to a fragmented regulatory landscape, as national rather than European guidelines and laws shape the industry. Start-ups and SMEs, the backbone of the European economy, could see their growth and competitive potential hampered within the blockchain space.
- **Becoming a 'standardising laggard':** As the world's largest economic bloc, one of the EU's greatest strength is its ability to set global norms and standards. Stalling the launch of modern legislative proposals regarding blockchain implies a risk of lagging behind other powers.

With these challenges in mind, this paper recommends three courses of action: stimulating blockchain economically, involving multiple stakeholders in the deployment process and providing legal certainty on the matter.

Blockchain stimulus

For Europe to become a serious blockchain player, it needs to match other emerging blockchain destinations in investments and research capacity. This is a story of both creating demand and fostering European supply for blockchain solutions. To achieve this, a three-track approach is needed:

First, the EU needs to complement its commitment to digital skills with funding and programmes dedicated to blockchain development. With there being general talent shortage, this will be crucial. A talent pool able to develop and utilise blockchain technology will be the foundation for European blockchain companies and future consumers of blockchain solutions. The EU still has the time and potential to develop a first-mover position by, for instance, encouraging blockchain-specific university programmes with the help of EU co-financing and research cooperation schemes. The EU's next budget has already highlighted an 'Advanced Digital Skills' pillar, focusing on data analytics, robotics, Artificial Intelligence (AI), blockchain and more. This would include specialised courses and internships at high-tech companies. However, action needs to be taken sooner rather than later.

Second, with blockchain being a relatively new research area, public sector support is vital in creating a vibrant blockchain ecosystem. Mariana Mazzocato (2015), a prominent innovation economist, has shown that setting early foundations of market dominance is done through strategic public support of basic and applied research. Successful strategies work if they cover the entire innovation process from basic and applied research to product and process development to eventual market introduction. In relation to blockchain, the protocol and application layers could be supported with funding aimed at basic and applied research. This would also help alleviate a common investment gap into early-stage and often risky research, which private capital tends to avoid. Existing innovation-friendly schemes such as the European Investment Bank's European Fund for Strategic Investments (part of the wider Juncker Investment plans) could be further positioned as a possible means for SMEs and start-ups to fill these gaps. Funding could even be earmarked specifically for blockchain to highlight the EU's commitment to the emerging industry.

Third, the public procurement of blockchain is essential for bolstering demand and covering the rest of the innovation process. As Europe's public sector represents nearly 46% of total spending across the EU, it is an incredibly impactful consumer of innovation. Based on several global best practices, this could be achieved in a multitude of ways:

- **Dual purpose funding**: The US Defence Advanced Research Projects Agency has, with its Small Business Innovation Research (SBIR) programme, shown an effective way of supporting innovative SMEs whilst striving towards larger national strategic objectives. The early stages of SBIR evaluate potential innovations on technical and scientific merit, feasibility, and commercial potential. The programme offers generous grants and even supports networking with private sources of funding and possibilities for public procurement via the US government. This directly enables high-potential companies to experiment and scale-up safely. In Europe, such funding schemes could support blockchain in strategic sectors (such as logistics and shipping, energy, etc.), and create an investor-friendly environment.
- **The EU and Member States as early adopters:** The EU should leverage its advanced public administrative needs by setting blockchain-related public procurement criteria. EU institutions and Member States could strategically phase in blockchain-based solutions when updating processes and digital systems. As land registers, public authorities could ask service providers to offer a blockchain-based solution for other areas. The UAE's "Emirates Blockchain Strategy 2021" for instance aims to transform 50% of government transactions into the blockchain platform by 2021 and estimates saving up to 2.5 billion euros. French President Macron's recent

approach to AI could serve as a blueprint for how such an initiative could look like in Europe. Among other things, the French government seeks to leverage public procurement to better support innovation, competition across European borders, and early stages of research.

- **Leveraging blockchain for the social good**: While the EU has signalled blockchain as a means for promoting the social good with its recent Horizon Prize, the EU's history of challenge prizes shows a mixed picture, with both low visibility and participation. However, leveraging the EU's social dimension with these types of initiatives is essential to create a blockchain industry able to export potential solutions to both public and social challenges globally. As such, the EU and its Member States should seek to expand support for blockchain and its potential for social good.

By covering the entire innovation process, Europe's blockchain sector would be given more space to grow. In this way, Europe could signal to the world that it is blockchain-ready, responsible, and open for business.

Multi-stakeholder organisation

While blockchain discussions have arisen in several European institutions and adjacent organisations, the technical dimension of blockchain remains under-represented, with no organisation holding clear thought leadership or political clout.

Despite the EU Blockchain Observatory and Forum being a welcome initiative, it is, in its current form, limited in size and scope. Even newly emerged blockchain organisations, such as Blockchain Alliance Europe or the European Blockchain Foundation, have a limited geographical scope, membership, and presence in the European policy-making process.

As discussions around blockchain evolve, regulators and their concerns about the sector will not be far behind. Interest representation will quickly become an important consideration for many blockchain companies, many of whom lack the knowledge or expertise to engage with the EU. With the EU's power to legislate and shape Europe's Digital Single Market, it is of paramount importance to include the widest range of stakeholders contributing to the blockchain ecosystem and allow them to engage with policy-makers in Brussels and national capitals on a consistent basis.

There is a clear need for a technical association representing multiple stakeholders working with blockchain. A source of inspiration for such a multi-stakeholder association can be the Partnership on AI, which has support from the private (Facebook, IBM, Amazon), the public (UNICEF), and the non-profit sectors (Amnesty International). Drawing inspiration from the Partnership on AI, a European Blockchain Partnership could gather industry and public actors from across the blockchain ecosystem to better grasp the technical, economic and societal implications.

Among its members, such a partnership should serve to develop and share best practice in the research and development of blockchain technology. It would need to supply policy-makers with the technical expertise needed to come to a sound and forward-looking regulatory environment wherein stakeholders can thrive, as well as explain blockchain to the public in order to transcend the current superficial understanding of the technology, hampering its wider adoption.

As blockchain is still emerging and interested parties are seeking technical expertise, the time before the next European Commission mandate represents fertile ground to develop such an organisation. A "Blockchain Partnership" established to study and formulate best practices, to advance the public's understanding of blockchain, and to serve as an open platform for discussion and engagement about blockchain and its impact on people and society is worth considering.

Standards and regulatory certainty

With the EU's lengthy legislative procedure, it can take years before legislative proposals materialise in concrete measures. For blockchain developers facing legal uncertainty this represents a real challenge. At the same time, rushed legislation could do more harm than good. This is a delicate situation: initiating legislative processes too soon risks laws and guidelines being outpaced by technological developments, whereas inaction risks legal fragmentation if Member States choose different approaches. Another concern that needs to be addressed is the lack of standardisation and interoperability within the industry. As shown by Cambridge University, only one out of four DLT networks run by operators are interoperable with other DLT networks and applications, blocking larger adoption of blockchain technology.

To overcome these challenges, the EU should adopt a layered approach that aims to prevent legal fragmentation and foster legal certainty at the international, supranational and national levels.

- **International level - the EU as a norm setter:** Global blockchain standardisation is currently being explored within the ISO framework (Technical Committee 307), chaired by the Australian standardisation office and including China and the US as key members. With 16 of the

35 committee members being EU Member States, the EU has the potential to be a driving force. ISO norms in line with EU norms could benefit European blockchain companies and their business processes by reducing uncertainty. Ensuring interoperability could reduce costs of production and maintenance of infrastructure, allowing businesses to scale up faster and provide a more user-friendly experience, thereby supporting adoption and export of blockchain products.

- **EU level - avoiding contradictory legal frameworks:** With blockchain technology having many implications for industries ranging from finance to energy, each having their own bulk of applicable legislation, the Council of the European Union, European Parliament and Commission should seek to establish an internal coordinating body that investigates legislation and ensures legal consistency. More concretely, this would mean that initiatives, whether legislative proposals or economic programmes, are conceived by a single Director-General and discussions led under the supervision of a Parliamentary Committee or Council Working Party, while ensuring close cooperation with relevant departments within their respective EU institution.
- **National level - harmonising guidelines**: A near-term European Commission Recommendation could support legal certainty by setting out guidelines for Member States. This could include the EU encouraging Member States to consult and cooperate with the EU and other Member States on blockchain-related initiatives. In this respect, the European Public Blockchain Partnership is a first step. Moreover, SMEs and start-ups, which constitute a large part of the blockchain ecosystem, should be given the space to grow with limited constraints. Finally, the EU should develop further guidelines to encourage Member States to incorporate blockchain solutions in their public administration tools, thus forging a strong demand and stimulating their respective industry.

Conclusion

While the EU has launched several blockchain initiatives, both to gain expertise of the emerging industry and help it grow, more needs to be done. To become a driving force, the EU will need to translate its early momentum into lasting support of the development of human capital, creation of economic incentives through an ample public demand of blockchain services, and a fostering of legal certainty. If successful, the EU stands to take the forefront in what appears to be a multi-billion-euro industry in the making holding promises of positive social impact.

Further Reading

Bashir, Imran, *Mastering Blockchain*. Birmingham, Packt Publishing Ltd, 2017.

European Commission, *How can Europe Benefit From Blockchain Technologies?,* Brussels, available at: http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=49649.

European Parliament, *Draft Motion for a Resolution on Distributed Ledger Technologies and Blockchains: Building Trust with Disintermediation,* Brussels, European Parliament, 2018.

Hileman, Garrick & Michel Rauchs, *2017 Global Blockchain Benchmarking Study*, 22 September 2017, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3040224.

Lyons, Tom, "Blockchain and Innovation in Europe", *EU Blockchain Forum and Observatory*, Brussels, 2018, available at: https://www.eublockchainforum.eu/reports.

Nakamoto, Satoshi, *Bitcoin: A Peer-to-Peer Electronic Cash System*, 2008, available at: https://bitcoin.org/bitcoin.pdf.

Verhelst, Jean-Luc, *Bitcoin, the Blockchain and Beyond*, Scotts Valley (CA), CreateSpace, 2017.

About the Authors

Lawrence Kerknawi is an EU Regulatory Affairs consultant working on European digital affairs and a graduate of the Blockchain Strategy Programme at the Oxford Saïd Business School. He previously worked at DG EMPL of the European Commission. Lawrence holds two master degrees from the University of Ghent (Public & Business Administration) and Antwerp (International Relations).

Alexander Mäkelä is a public policy professional working within the tech industry. He studied European Public Policy Analysis at the College of Europe. Alexander's academic work has focused on innovative SMEs, public procurement of innovation, and European industrial strategies. Some of his work has been featured by McKinsey, ETNO, and Research Europe.