

EU Blockchain Ecosystem Developments

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About this report

This is the sixth of a series of reports that will address selected topics in line with European Commission priorities. This report presents the latest updates and developments in the EU blockchain ecosystem.

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Note

While we have done our best to incorporate the comments and suggestions of our contributors where appropriate and feasible, all mistakes and omissions are the sole responsibility of the authors of this paper. This report utilizes data obtained from Crunchbase. The information regarding companies, their funding rounds, and other financial metrics was sourced to support the analysis presented.

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Executive Summary

In recent years, the European landscape for blockchain and cryptocurrencies has undergone significant transformation. This report represents the third update in a series that began in 2020, meticulously charting the evolution of blockchain technology across Europe. The 2024 edition encompasses a comprehensive analysis of 32 countries, including all EU member states as well as Liechtenstein, Norway, Switzerland, the United Kingdom, and Ukraine. This extensive coverage provides a panoramic view of the blockchain ecosystem within Europe, illustrating both the progress and the diverse approaches of different nations.

Regulatory and Legal Frameworks. One of the most notable advancements since the last report is the strides taken in regulatory and legal frameworks. The European Union has been at the forefront with landmark legislations such as the Markets in Crypto-Assets (MiCA) regulation and the Digital Operational Resilience Act (DORA). MiCA has been pivotal in setting a harmonized regulatory standard for crypto-assets, issuers, and service providers, focusing on consumer protection, transparency, and market integrity. This legislation represents a significant step toward legal clarity and operational safety in digital finance. Similarly, DORA has addressed the critical aspects of digital operational resilience, ensuring that the financial sector can effectively respond to ICT-related disruptions and threats, thus safeguarding market stability and integrity. These legislative frameworks have not only enhanced the robustness of the financial and technological infrastructure but have also fostered an environment conducive to innovation and growth within the blockchain domain.

Business Environment and Innovation. Following the regulatory enhancements, the business environment across Europe has seen a dynamic expansion. New startups and established enterprises are increasingly engaging with blockchain technologies, leveraging the stable regulatory conditions to innovate and expand. The report details significant growth in blockchain applications across various sectors including finance, education, government services, and supply chain management. Particularly noteworthy is the adoption of blockchain in national infrastructures and public services, where countries like Estonia and Lithuania have emerged as leaders. These nations have integrated blockchain technology into government operations to enhance efficiency, transparency, and public trust.

Blockchain Attention Index. A novel feature in this year's report is the "Blockchain Attention Index", which analyses search engine data to measure public interest in blockchain technology across the surveyed countries. This index is particularly useful in understanding how public perception aligns with major developments and events in the blockchain space. The data suggests that public interest has seen notable fluctuations, which often correlate with regulatory changes, significant business developments, or economic events impacting the crypto market.

Academic and Research Contributions. The academic sector has substantially contributed to the blockchain ecosystem, with numerous universities across Europe offering specialized courses and degrees in blockchain and cryptocurrency technologies. Institutions like the University of Nicosia and the University of Liechtenstein are pioneering comprehensive educational and research programs that not only foster future professionals but also contribute to foundational research that drives the industry forward.

Future Outlook. Looking ahead, the European blockchain ecosystem appears poised for continued growth and innovation. The regulatory frameworks established by the EU are likely to evolve further, potentially setting global standards for blockchain and cryptocurrency regulation. The ongoing engagement of the academic sector and the increasing integration of blockchain technology into various industries suggest that blockchain will remain a key area of development in Europe.

Strategic Insights. The report's findings underscore that regulatory maturity often trails behind ecosystem developments, suggesting that legislation tends to react to advancements within the private sector. This observation is crucial for policymakers, indicating that proactive regulatory approaches may foster more rapid and harmonious ecosystem development. The EU's strategy of using regulatory sandboxes to pilot blockchain applications exemplifies a forward-thinking approach that could serve as a model for other regions.

Conclusion. In summary, the European blockchain landscape in 2024 reflects a sophisticated and maturing market, characterized by strategic regulatory initiatives and vibrant ecosystem growth. The 2024 report underscores a maturing European blockchain ecosystem characterized by robust regulatory frameworks, vibrant business activities, and a strong commitment to research and education. This comprehensive overview serves as both a reflection of the current state and a blueprint for the future trajectory of blockchain technology in Europe. This progression not only underscores the EU's leadership in blockchain technology but also highlights the potential for blockchain to become a cornerstone of digital economic strategies across the continent.

COUNTRY-LEVEL SUMMARY

Austria is not only one of the wealthiest countries in the world, but also has a thriving crypto ecosystem given its small population. While parts of more generic regulations (such as the Austrian Alternative Financing Act, the Austrian Banking Act, the Austrian Electronic Money Act, and the Austrian Capital Markets Act) are applicable to crypto assets, it is the first country in the EU to introduce crypto-specific tax legislation, providing much needed legal clarity and certainty in this regard. State-sponsored innovation and research activities, such as the Austrian Blockchain Center, pave the way for spearheading innovation through a public-private partnership model, which objective is also exemplified by the lively cooperation of regulators with national players.

Belgium can boast a vibrant crypto-assets community, with a distinct focus on FinTech startups. Due to its proximity to European Union decision-making headquarters, the country is an attractive location for international companies, and several well-established companies and VC funds serve the continuous growth of the cryptocurrency ecosystem in the country. The number of blockchain startups in Belgium has slightly increased. Belgium was the first country in the EU to spin up a second EBSI node. Cryptocurrency adoption in Belgium got a serious blow when the only Belgian crypto exchange ceased all activities in April 2023, but by the end of 2023, KBC Bank & Insurance, a Belgian-based European bank and insurance group, released two blockchain-based solutions to their retail customers and the general public, an act that may lead to true mainstream adoption.

Bulgaria has emerged as a thriving destination for FinTech, blockchain, and crypto startups, offering a range of benefits to such businesses. The country is part of the European Blockchain Service Infrastructure (EBSI), with five technology companies developing the node. No specific national regulation or guidance is in place for the sale and promotion of crypto assets. This excludes transactions with derivatives on crypto assets which should comply with the MiFID II requirements. Bulgaria has also seen an increase in the number of blockchain-related educational courses.

Croatia has a small but growing ecosystem of blockchain startups and communities. There are a handful of cases for adopting cryptocurrencies as a payment method in Croatia, including a supermarket that has been accepting crypto for groceries since late 2021. The legislation around blockchain and cryptocurrencies incorporates European actions around the topics. Croatian universities have incorporated blockchain courses into their curriculums, and there are also organised research initiatives related to blockchain.

Cyprus remains one of Europe's blockchain hotspots. It is among the few early adopters of the EBSI and has developed a pre-production national EBSI node and diploma verification pilot use case, which has received special recognition by the EBSI. The country boasts the first-ever academic course and full degree in the subject, offered by the University of Nicosia (UNIC) since 2014. In 2022, UNIC launched the first 100% on-chain university course 'Introduction to NFTs and the Metaverse' and, in 2023, the world's first MSc in Metaverse. Additional blockchain courses are being offered by other research institutions.

Czechia boasts a vibrant crypto asset community, including some notable European blockchain startups. The adoption of cryptocurrency is on the rise, but cryptocurrency regulations are not yet fully formed and there are no specific laws in place, besides KYC/AML compliance requirements.

Denmark is one of the few countries globally where the government has engaged in comprehensive research on the potential economic impact of blockchain on industry and the labour market. Danske Bank, the largest bank in Denmark, laid out its official position on cryptocurrencies in June 2021, not taking any practical stance against cryptocurrency. Cryptocurrencies are acknowledged as a valid means of payment in Denmark but are not recognised as a currency or legal tender. The government has established transparent and comprehensive regulations to safeguard both consumers and businesses participating in cryptocurrency transactions. The number of blockchain companies has increased in the past year as the country shows an emerging ecosystem of startups and universities working on blockchain-related applications and research.

Estonia initially adopted a receptive approach towards blockchain and cryptocurrencies. Regulatory certainty, coupled with the country's digital first approach and e-residency programme, allowing for the registering of companies remotely, resulted in a large number of blockchain businesses in the country. While the country remains a proponent of public sector blockchain initiatives on national and European levels, recent tightening of its positive policy and outlook on blockchain and cryptocurrencies has slowed down the expansion of the private sector. In 2022, amendments to the Estonian Money Laundering and Terrorist Financing Prevention Act (RahaPTS or MLTFPA) resulted in a significant reduction in the number of active virtual asset service providers (VASPs).

Finland has a small but robust and growing blockchain sector as evident from the increasing number of applications to register as blockchain service provider with the country's financial regulator, Finanssivalvonta. The country has a strict but favourable regulatory environment towards cryptocurrencies and blockchain technology. There are specific rules for virtual asset service providers (VASPs) under the Act on Virtual Currency Providers of 2019. The Finnish government has been actively involved in the blockchain field since 2015, and in 2023 Finland's communications minister also urged the EU to develop legislation to govern DAO.

France is at the forefront of crypto asset recognition in Europe, having passed a legal framework for initial coin offerings (ICOs) as early as 2016, followed by further legislative initiatives in 2017 and 2018. France's proactive stance on legislation has borne fruit, as many crypto asset businesses have sought to place their EU headquarters there. The country has worked to position itself as a blockchain hub by hosting several large conferences and events such as Paris Blockchain Week and the Ethereum Community Conference.

Germany has a very active blockchain ecosystem of companies and enthusiasts, especially in Berlin. As of 2020, Germany has included a new financial instrument in its banking laws: the crypto asset. In line with the governmental 2019 blockchain strategy, the German parliament issued a law on introducing electronic securities, including a blockchain register, in the summer of 2021. According to newly drafted legislation introduced by the German finance ministry on 5 April 2023 under the Future Finance Act, the German government is advocating for more accommodating regulations for startups involved in financial innovation. The Association of German Banks along with the European Commission have co-founded the Tokenise Europe Initiative to address the importance of tokenisation. The country has seen a 3% increase in blockchain

funding and an all-time high share of global funding, totalling USD 355 million across 34 deals. Universities offer specialised degrees and professional training programmes, as well as engaging in research and technology development activities.

Greece is a signatory to the European Blockchain Partnership (EBP), and in July 2022, the Ministry of Digital Governance introduced a bill that includes provisions for the way in which emerging technologies such as AI, IoT, blockchain and drones will be used. Following its approval by the Hellenic Parliament, the law came into force in March 2023. Firms give careful consideration as to whether their activities constitute regulated activities according to the guidance from the European Securities and Markets Authority (ESMA). The overall size and maturity of the blockchain and cryptocurrency business ecosystem remains small despite the efforts of some initiatives to raise awareness and promote blockchain in the country. However, the number of blockchain courses offered by different institutions has increased.

Hungary aims to create a legislative package that facilitates the preparation of MiCA and addresses the different aspects of blockchain technology. Providers of exchange services between virtual currencies and fiat currencies and between different types of virtual currencies and custodian wallet providers fall under the scope of the Hungarian AML Act. The public's interest in the blockchain is clear as the community engaging with blockchain subjects grows. There are events and workshops to strengthen the ties between members of the blockchain community. The Magyar Nemzeti Bank (MNB) is issuing its own digital instrument on a private blockchain to exploit hands-on experience of the technology and set value parameters in the tokens themselves. Notable initiatives to capitalise blockchain technology are the NFT and CBDC initiatives of the Hungarian National Bank.

Ireland has an active blockchain industry, as the business ecosystem and community grows in number each year. There have been public initiatives for blockchain adoption, such as the Irish Government's hackathon in 2023. The Central Bank of Ireland (CBI) and the government's approach to crypto have been relatively conservative compared to other jurisdictions. The government has not issued any legislation outside the EU regulations, while the CBI prefers that entities seeking 5AMLD authorisation have a strong presence in the country, potentially holding another licence such as an e-money authorisation. Public and private initiatives to promote blockchain adoption are increasing, as are blockchain education initiatives. Blockchain companies in Ireland have collectively raised tens of millions in funding.

Italy has a number of state-sponsored pilot initiatives aimed at testing blockchain applications in government, as well as a large number of private pilots, mostly by financial institutions, while football fan tokens are on the rise and are significantly contributing to blockchain adoption in the country. The country was one of the first in the world to recognise the legal validity and enforceability of smart contracts in 2019. Following the enactment of Italy's Ministry of Economy and Finance Decree of 13 January 2022, enrolment in the special section of the OAM (Organismo Agenti e Mediatori [Register of Agents and Brokers]) has become mandatory for all natural and legal persons providing services related to virtual currency. Italy's 2023 Budget Law regularised the taxation of cryptocurrencies, setting a tax rate on digital currencies of 26% on capital gains if the value is more than EUR 2,000 in a tax year. Politecnico di Milano is currently offering several courses on blockchain technology through the Blockchain & Web3 Observatory. Additional blockchain courses are being offered by other universities.

Latvia has a blockchain-friendly business and regulatory climate, characterised by an active community of enthusiasts and a willingness to experiment (for example, airBaltic, the country's nationally owned air carrier, became the first airline to accept digital assets for payments). Latvia's regulations on cryptocurrencies are mainly based on legislation aimed at preventing money laundering and the financing of terrorism. Blockchain academic qualifications in Latvia are not established, as Latvian universities do not offer a degree in blockchain-related technologies.

Liechtenstein has managed to establish a growing blockchain community, despite being Europe's fourth smallest country. The blockchain ecosystem in the country is supported by a constellation of organisations, such as the Office for Financial Market Innovation and Digitalisation, the Financial Market Authority, and the Entrepreneur Service. Since early 2020, Liechtenstein has put in force the Blockchain Act in an effort to provide a comprehensive regulatory framework for the token economy. The ongoing revision of the Blockchain Act (TVTG) prepares for alignment with the EU's MiCAR. In addition, the University of Liechtenstein acts as a major player for the country's blockchain ecosystem, offering two certified blockchain programmes and participating in several projects and programmes.

Lithuania became an epicentre of ICO activity in Europe during 2017 and 2018, combining a blockchain-friendly regulatory approach with an abundance of local engineering talent. Despite its small size, it is among the top EU countries for blockchain adoption. Over the years, the blockchain space in Lithuania has expanded, with several home-grown startups and domestic and foreign VASPs applying for licensing, and even several foreign businesses moving their headquarters or establishing a strategic presence in the country. Lithuania has created GovTech Lab which is a public sector team that identifies innovative solutions that use emerging technologies like blockchain for challenges faced by the government and the public sector.

Luxembourg is one of Europe's financial centres and, as such, has been at the forefront of developments in the financial applications of blockchain. Luxembourg has enacted three laws related to blockchain technologies. These three laws have positioned Luxembourg as a global leader in blockchain finance. They have provided a robust and stable legal infrastructure that fosters innovation and the adoption of blockchain technologies in the financial sector. The country is the European leader in international securities listings. The government, which was elected in 2023, prominently included blockchain in their coalition agreement, stating that they aim to continue developing the country into a prime location for blockchain technology.

Malta has been called the 'blockchain island', as it became one of the first countries in the world to have a comprehensive regulatory regime for crypto assets in 2018. The country has made significant progress in the past 2 years, as it became the first country to install a blockchain-based IP register and transfer 60 000 records using the blockchain network. In addition, the Malta Gaming Authority has announced a digital asset focused sandbox, while the Malta Digital Innovation Authority launched a technology assurance sandbox. Malta has attracted a large number of prominent crypto asset-related companies and is one of Europe's most successful countries in attracting investment capital in the field. Following the University of Malta, which launched its Master of Science in Blockchain and DLT in 2019, the Leadership and Management Institute has launched several additional blockchain courses. The blockchain community has also seen improvements with new initiatives such as the Crypto-Hub, a weekly crypto meet-up.

The Netherlands boasts very strong blockchain communities, being amongst Europe's top performers when measured by the amount of funding secured by crypto asset and blockchain startups. The Dutch government has adopted a proactive yet cautious stance towards cryptocurrencies. The De Nederlandsche Bank (DNB, the central bank) is exploring the potential of CBDCs; cryptocurrencies are not recognised as digital money in the Netherlands, which aligns with the stance of the DNB. The regulatory framework for cryptocurrencies in the Netherlands is principally governed by the amendments to the Money Laundering and Terrorist Financing Prevention Act in 2020, in response to the EU's 5th Anti-Money Laundering Directive (AMLD5). These amendments have provided a clear regulatory stance compared to some EU nations. The supportive stance of the Dutch government, the culture of collaboration, and the well-structured infrastructure are instrumental in fostering a favourable landscape for blockchain development and adoption.

Norway has joined the EBP, and the country has seen rapid growth in the virtual asset and currency market in recent years. While the Financial Supervisory Authority of Norway (FSAN) has repeatedly cautioned against the risks of investing in cryptocurrency, the government has shown a positive attitude towards exploring and

harnessing blockchain technology. Norway lacks specific legislation or regulatory guidelines pertaining to cryptocurrencies and blockchain technologies, but the Ministry of Finance is expected to assess Norwegian implementation once the MiCA regulations are adopted in the EU. There is limited but notable activity regarding blockchain in academia in Norway.

Poland permits the use of digital currency, recognising the potential benefits for the country. The Polish Financial Supervision Authority (KNF) published a warning in July 2021 on the Binance platform, which was gaining popularity. Bitcoin mining is permitted in Poland, and discussions are ongoing to determine whether Bitcoin will be officially recognised as a form of payment in the country or remain classified as a digital asset. Indeed, the KNF will start supervising digital assets by the end of 2024. This means creating clear legislative frameworks and be able to impose financial penalties on companies in the cryptocurrency sector. The cases of blockchain adoption in private and public sectors are increasing. The most notable case is the virtual sandbox and Innovation Hub by the UKNF. The KNF launched a virtual sandbox in 2021. The virtual sandbox was intended to simulate several banking operations and test solutions in interaction with Open API for innovative payment services.

Portugal has friendly legislation towards cryptocurrency holders, as the Portuguese Tax & Customs Authority announced that cryptocurrency exchange is tax-free. There is legislation to support innovation via the blockchain application. The presence of crypto companies in Portugal has increased significantly, changing the way the Portuguese perceive and engage with the cryptocurrency industry. The startup ecosystem and community have grown significantly.

Romania passed a law in 2021 that establishes national standards for the direct application of the EU Regulation on European crowdfunding service providers for business. The Romanian legal landscape does not specifically cater for FinTech with a distinct regulatory framework, with the exception of crowdfunding services. Over the past few years, there has been a notable increase in public awareness and acceptance of blockchain and cryptocurrency. Elrond, a Romania-based blockchain startup, achieved unicorn status in early 2021. The country implemented blockchain to safeguard the integrity of parliamentary elections in November 2020.

Slovakia boasts Europe's first Bitcoin ATM, installed in Bratislava in 2013. The country is home to a Bitcoin mining facility which converts human and animal waste into Bitcoin hash rate, securing the network while mining Bitcoin. Slovakian lawmakers voted in mid-2023 in favour of a law that approves lower crypto taxes, with other measures affecting cryptocurrency holders, while the startup scene is still at early stages of development.

Slovenia has a very active crypto asset ecosystem, combining government support and active business development. Public awareness has improved substantially in the last 5 or 6 years. The country was the first EU Member State to launch a national test blockchain infrastructure (SI-Chain) in 2019. In 2023, the EU Crypto Initiative was established with founding members from Slovenia, members of Blockchain Think Tank Slovenia. The Interservice Working Group was established in 2023, led by the Ministry of Finance, to prepare the national framework for piloting DLT as an option for SMEs to increase access to finance.

Spain is among the leaders in blockchain education in Europe, with no less than sixteen universities already offering degrees on the subject. The country is also home to several blockchain companies and, although it does not have its own local regulation on crypto assets, the Bank of Spain has set up a registry of service providers for exchanges, wallets, and custodians of digital currencies, but has neither regulatory nor supervisory competencies over these instruments. In 2023, the new Securities Markets and Investment Services Law was published, which incorporates new features regarding blockchain technology and crypto assets and includes the rules for the implementation of MiCA when it comes into force. One notable initiative

is Alastria, which was formed in 2017 by a consortium of Spanish banking, energy, and telecom companies, and has grown to more than 500 industry members today.

Sweden has developed a diverse blockchain ecosystem with notable initiatives. The Riksbank, the country’s central bank, was amongst the world’s earliest examples of research on a CBDC, called the e-krona. The Riksbank has asked the parliament to invest SEK 30 million yearly for five years to make the country an innovation hub for digital currencies. Other notable pilot projects of public interest include a blockchain-based land registry and a number of applications in the financial services industry. The country is also in the forefront of cryptocurrency adoption, with several domestically developed virtual asset service providers (VASPs). Crypto-related activities are currently not regulated in Sweden, but VASPs with a physical presence in the country must register with Finansinspektionen (FI). With MiCA coming into effect, Swedish VASPs will be subjected to a robust regulatory framework and will be required to get authorisation from FI to continue operating in the country.

Switzerland remains one of the most advanced nations when it comes to blockchain and crypto assets, not just in Europe but globally. It has been called the ‘crypto nation’ and is home to the world-famous ‘crypto valley’ of the Zug canton. The country is home to a very large number of blockchain companies, amongst them some of the most well-known industry names, such as the Ethereum Foundation, Polkadot, Cardano, Solana, Cosmos, and Tezos. Switzerland is home to the first two blockchain banks, SEBA and Sygnum, with a banking licence from the Swiss Financial Market Supervisory Authority. The country moved early to clarify the legal situation of crypto assets, with the earliest report by the federal government published in 2018, analysing the applicability of the existing legal framework on blockchain. The DLT-Law, which came into effect in 2021, constitutes ‘umbrella legislation’ that introduced a comprehensive list of adaptations of existing laws to crypto assets. Blockchain education consists of single courses as well as comprehensive educational programmes, often concerning blockchain in addition to other transformative technologies, offered by both companies and universities.

The **United Kingdom** maintains its great interest in blockchain, with the first report commissioned by the government published in 2016. The country remains an epicentre of business activity in the space today, with many startups and significant capital-raising success. The UK government has a positive stance towards the crypto industry. In 2023, the Financial Services and Markets Bill (FSMB) was approved, recognising crypto as a regulated activity. The AI and cloud computing industries are among the emerging sectors in terms of blockchain applications.

Ukraine is one of the world's most active blockchain nations. It has the highest crypto adoption index in Europe and the fourth globally. Ukraine’s parliament has adopted the Law on Virtual Assets. In March 2022, Ukraine’s parliament adopted the Law on Virtual Assets, which will allow crypto exchanges to legally operate in Ukraine, Ukrainian banks will be able to open crypto accounts, and crypto consumers will be entitled to expand the use of such assets and enjoy legal protection for them. The country has an observer status in the European Blockchain Partnership (EBP). Ukraine’s blockchain startup scene is impressive, with more than 80 Web3 startups, which have attracted over \$1 billion in the past four years. Over 50 Ukrainian blockchain development companies provide services to clients worldwide.

Country	Summary
Austria	Austria, a nation known for its wealth and innovation, boasts a dynamic cryptocurrency ecosystem. The country has enacted crypto-specific tax legislation, enhancing legal clarity for digital assets under the Austrian Alternative Financing Act, Banking Act, Electronic Money Act, and Capital Markets Act. Austria’s Blockchain Centre exemplifies state-sponsored innovation, fostering collaboration between regulators and national entities through public-private partnerships.

Belgium	Belgium features a thriving crypto-assets community, especially within its Fintech startups. Proximity to EU decision-making bodies makes it a strategic location for international firms. Despite the closure of its sole crypto exchange in April 2023, the subsequent introduction of blockchain solutions by KBC Bank & Insurance suggests a movement towards mainstream adoption.
Bulgaria	Bulgaria is a burgeoning hub for fintech, blockchain, and crypto startups, partially due to its inclusion in the European Blockchain Service Infrastructure (EBSI). Despite lacking specific national regulations for crypto assets, Bulgaria's educational sector has responded by increasing blockchain-related courses, signaling a growing interest in this field.
Croatia	Croatia's blockchain ecosystem, though modest, is expanding with increasing adoption of cryptocurrencies for commercial transactions. The country aligns its legislation with European standards, and its educational institutions are actively integrating blockchain courses into their curricula.
Cyprus	Cyprus stands out in Europe's blockchain landscape, being one of the early adopters of the EBSI and fostering innovation through educational initiatives like the University of Nicosia's blockchain and metaverse courses. The country's proactive approach has positioned it as a leader in blockchain education.
Czech Republic	The Czech Republic hosts a vibrant community of crypto asset enthusiasts and blockchain startups. The adoption of cryptocurrencies is increasing, though the country currently lacks comprehensive regulations beyond KYC/AML requirements.
Denmark	Denmark's government actively researches the economic impact of blockchain. The country recognizes cryptocurrencies as a valid payment method and has implemented clear regulations to protect participants within the crypto space. Its growing ecosystem of startups and academic programs supports this innovative technology.
Estonia	Estonia, known for its digital-first approach and e-residency program, has been a pioneer in public sector blockchain initiatives. Recent regulatory tightening, however, has curtailed the expansion of its private sector blockchain enterprises.
Finland	Finland maintains a robust, albeit small, blockchain sector, characterized by a favourable regulatory environment. The country has specific rules for virtual asset service providers and has been proactive in blockchain adoption since 2015.
France	France leads in recognizing and regulating crypto assets, having established a legal framework for ICOs as early as 2016. Its strategic legislative moves have attracted numerous crypto asset businesses, positioning it as a blockchain hub in Europe.
Germany	Germany boasts a thriving blockchain ecosystem, particularly in Berlin. Recent legislative developments, like the Future Finance Act, demonstrate its commitment to facilitating financial innovation and supporting the blockchain industry.
Greece	Greece, a signatory to the European Blockchain Partnership, recently passed legislation that incorporates emerging technologies into various sectors. The country is actively working to increase public awareness and acceptance of blockchain technologies.
Hungary	Hungary aims to align its legislation with the upcoming MiCA regulations, enhancing the legal framework for blockchain technology. Notable initiatives include the Magyar Nemzeti Bank's exploration of NFT and CBDC technologies.
Ireland	Ireland's blockchain industry is growing, with increased public and private initiatives to promote blockchain adoption. The conservative stance of the Central Bank of Ireland contrasts with the dynamic growth of the blockchain community and educational initiatives.
Italy	Italy demonstrates a strong commitment to blockchain technology, evidenced by state-sponsored and private initiatives exploring its applications. The country's legal framework supports the burgeoning blockchain ecosystem, particularly in the financial and sports sectors.
Latvia	Latvia's blockchain-friendly environment is supported by a community eager to explore digital innovations, such as the acceptance of cryptocurrencies by national carriers like airBaltic.
Liechtenstein	Despite its small size, Liechtenstein has a growing blockchain community, supported by comprehensive legislation like the Blockchain Act and educational initiatives led by the University of Liechtenstein.
Lithuania	Lithuania has emerged as a hub for ICO activity and blockchain adoption, supported by a favourable regulatory environment and innovative public sector initiatives.
Luxembourg	Luxembourg, a key financial centre, has enacted laws that strengthen its position as a leader in blockchain finance, supported by a robust legal infrastructure and government endorsement of blockchain technology.
Malta	Dubbed "the blockchain island," Malta has established a comprehensive regulatory regime for crypto assets and continues to attract significant investment in the blockchain sector.

Netherlands	The Netherlands features a robust blockchain community, supported by a proactive government and a clear regulatory framework that fosters development in the blockchain and crypto asset sectors.
Norway	Norway's blockchain market is growing rapidly, though it currently lacks specific legislation. The government's positive stance is expected to evolve as EU regulations like MiCA are implemented.
Poland	Poland remains a strong advocate for blockchain technology. Regulatory frameworks are being developed to accommodate digital assets, enhancing oversight and consumer protection. The most notable innovation is the virtual sandbox, allowing for the simulation of banking operations and fostering innovative payment solutions.
Portugal	Portugal has emerged as a crypto-friendly environment, with the Portuguese Tax & Customs Authority declaring cryptocurrency exchanges tax-free. Legislative support for blockchain innovations continues to foster a vibrant crypto community and a growing startup ecosystem.
Romania	Romania has demonstrated a proactive approach to blockchain technology, implementing national standards for crowdfunding and securing elections via blockchain. The country has seen a significant rise in public awareness and acceptance of blockchain, underscored by Romanian startups achieving notable market valuations.
Slovakia	Slovakia was an early adopter of blockchain with the installation of Europe's first Bitcoin ATM. Recent legislation has lowered crypto taxes, fostering a favorable environment for cryptocurrency holders, although the startup scene remains nascent.
Slovenia	Slovenia supports a robust crypto asset ecosystem, enhanced by government initiatives and significant public engagement. The establishment of a national blockchain infrastructure and an EU Crypto Initiative highlight Slovenia's commitment to integrating blockchain into financial accessibility for SMEs.
Spain	Spain leads in blockchain education, with numerous universities offering specialized degrees. Recent legislative updates have integrated blockchain more deeply into the financial system, and the Alastria consortium has become a major player in the European blockchain landscape.
Sweden	Sweden's diverse blockchain ecosystem includes significant public and private sector projects, such as a blockchain-based land registry and a central bank digital currency, the e-krona. Sweden's approach to regulation is evolving, with upcoming EU directives expected to provide a more structured framework.
Switzerland	Switzerland, known as "crypto nation," hosts a dense network of blockchain enterprises and has established legal frameworks early to support the industry. It is a global leader in blockchain innovation, supported by comprehensive educational programs and regulatory clarity.
UK	The UK continues to be a significant hub for blockchain activity, with a positive regulatory stance and substantial investment in the sector. Recent legislation has formally recognized cryptocurrencies, underpinning the UK's commitment to fostering innovation in blockchain technology.
Ukraine	Ukraine ranks among the top nations for blockchain adoption globally. The recent Law on Virtual Assets has legitimized the operations of crypto exchanges and banks' involvement with cryptocurrencies, enhancing the legal protections for users.

Country Profiles

Key Figures

57+

Dedicated blockchain solution providers

2.6b

Total funds raised.

1.31%

Population that owns crypto

The Austrian blockchain ecosystem at a glance

Austria is one of the most prosperous countries in the world, ranking 15th globally and 10th in Europe in [gross domestic product \(GDP\) per capita](#). It has a highly industrialised economy and high levels of education coupled with a generally receptive regulatory approach to digital currencies and blockchain, thus making Austria a welcoming place for those transformative technologies.

As a result, approximately 50 global companies and startups, including national champions Bitpanda and Blockpit, as well as more than 35 research initiatives are currently established in the country. Companies are active in a wide range of verticals, while research mainly concentrates on the energy, mobility, and financial technology (FinTech) sectors.

The Austrian state has adopted a generally proactive approach to digital currencies and blockchain, with Vienna spearheading the country's efforts through '[Smart City Vienna](#)', an initiative to foster social and technical innovations, while improving quality of life for citizens and conserving resources. State-sponsored initiatives can also be identified in the areas of [public administration](#), contact tracing to [combat the spread of COVID-19](#), [heat waste management](#), and even a [citizen rewards programme](#) in the form of a 'culture token' developed in partnership with the Vienna University of Economics and Business.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

Austrian policymakers and financial regulators are generally receptive to transformative technologies, especially those that apply to the FinTech sector. For example, the Financial Market Authority (FMA) established a registry for virtual asset service providers in Q4 2020. Correspondingly, regulators have adopted an overall non-restrictive approach towards digital currencies and blockchain to avoid hindering innovation. Indicatively, during the 2019 [ANON Blockchain Summit](#) discussion panel, the Austrian Federal Minister for Digital and Economic Affairs, Margarete Schramböck, remarked that, 'Europe has a strong tendency to overregulate. [...] And then we are surprised that there are no European companies in the top 10 worldwide. [...] We do not need regulation for blockchain.'

In November 2019, the [Austrian Blockchain Centre \(ABC\)](#) was established to explore blockchain applications in the fields of finance, energy, logistics, public administration, and the internet of things (IoT). ABC, currently involving more than 21 institutions and 54 companies in its public-private partnership model, aspires to become the world's largest blockchain research centre. Blockchain is also a key facilitator of the Smart City Vienna and Open Government Data initiatives. Vienna aims to utilise blockchain technology to reinforce transparency, openness, trust and citizen participation in its operations, and has conducted numerous successful pilot releases to date.

Digital currency legislation that applies to blockchain



UNIVERSITY
of NICOSIA



CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS



Crystal

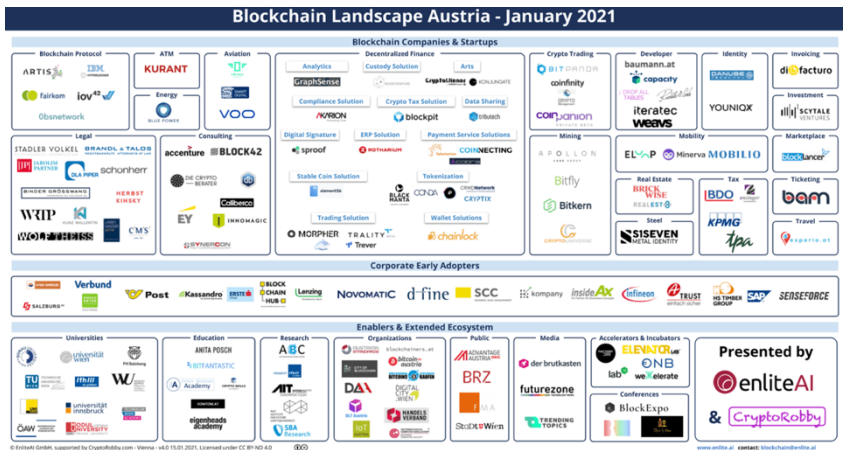


OpenForum
Europe



The Austrian Financial Markets Authority (FMA) has warned the public and investors of the risks associated with digital currencies, with many unlicensed business entities active in the space included on the Authority’s warning list. FMA closely monitors the developments in the field of decentralised financing, including initial coin offerings (ICOs), initial exchange offerings (IEOs) and security token offerings (STOs). Digital currencies are generally treated as commodities in Austria. However, depending on their specifics, various business activities involving blockchain and digital currencies may provoke licensing requirements under the Austrian Alternative Financing Act (AlfFG), the Austrian Banking Act (BWG), the Austrian Electronic Money Act (E-Geldgesetz), and the Austrian Capital Markets Act (KMG).

Digital is VAT case in most countries. payment for is treated no currencies. their sale are gains tax rate taxable only if in fiat or



profit realisation (i.e. crypto-to-crypto transactions are non-taxable events). Anti-money-laundering (AML) and know-your-client (KYC) regulations apply for payment service providers that use digital currencies. Apart from tax law, digital currency mining remains largely unregulated in Austria and no specific restrictions apply.

Academic Courses & Professional Qualifications

The Vienna University of Economics and Business (Wirtschaftsuniversität Wien, or WU), a research partner in ABC, provides a [professional certification course](#) on blockchain, titled ‘Certificate in Blockchain Transforming Business’. The same university has also launched the [Institute of Cryptoeconomics](#), dedicated to the research of transformative technologies and offering two undergraduate courses on blockchain topics: [Introduction to Blockchain](#) and [Blockchain and Token Economy](#). Moreover, the university offers a master’s degree programme in the [digital economy](#), which includes some blockchain courses.

Blockchain across key industries

While Austria-based startups are active in a wide range of business verticals, the state has concentrated its efforts to exploit blockchain technology on specific sectors. Various initiatives have been exploring blockchain technology to facilitate the country’s digitisation plan, with Vienna leading the charge. Blockchain technology is expected to be implemented in data management and e-governance sectors, with the energy sector following next.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

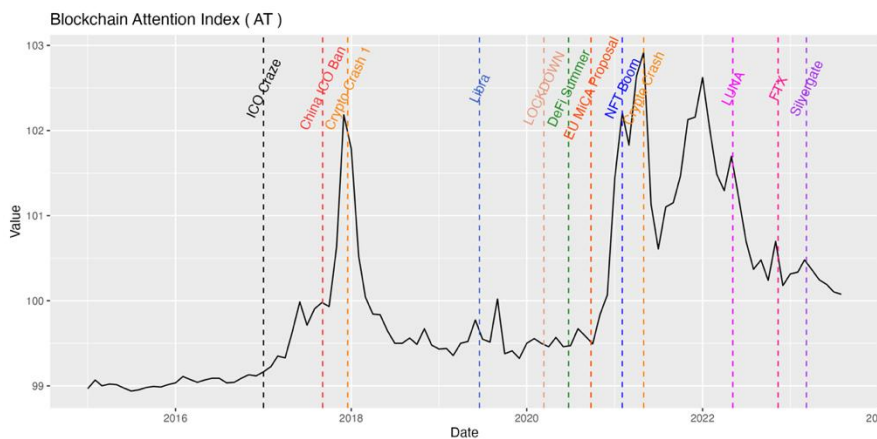
Relative to its size and population, Austria counts a high number (50) of startups that are active in the blockchain space. However, apart from a few global-reaching national champions, most initiatives are in a very early stage. This is evident from the relatively small number of employees per company (1-10 on average), as well as the wide range of verticals in which companies are active. Specific geographical or sector clusters

could not be identified, although Vienna concentrates the highest number of company headquarters, being home to 8 out of the 10 largest companies.

As of December 2021, Austria-based blockchain companies have approximately EUR 50 million, with business opportunities in the space identified as early as 2012. In total, 7 companies have secured funding with an average number of 2.5 investors per funded company. Notable startups and companies in the country include: Bitpanda, a digital assets investment platform responsible for more than EUR 510 million traded in 2017; Blockpit, a solution provider for the taxation of digital assets; Coinfinity, a digital currency broker; and Conda, a crowd-investing platform for Austrian startups.

THE BLOCKCHAIN COMMUNITY

The COVID-19 pandemic had a clear impact on Austria’s blockchain community. Annual events and get-togethers were postponed, others turned virtual, while others were cancelled. Concurrently, measuring the growth of the Austrian blockchain community over the past years in a meaningful manner is hard. Yet, 11,000 individuals make up Austria’s blockchain community.



Insights from experts

Dr Max Bernt, chief legal officer, Blockpit, board member, INATBA, co-founder, ValueVerse

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Austria? Has the recent growth of the cryptocurrency markets facilitated familiarity?

Assessing public awareness and acceptance of blockchain and cryptocurrencies in Austria is challenging, as valid data/studies are scarce. Overall, however, there is a general increase in public awareness and interest in these technologies in general, reflecting the global trend. However, this growth was often fuelled by negative news in the cryptocurrency markets (including FTX, Terra/Luna, Celsius), which often attracted media attention and thus did not necessarily raise awareness in a positive way. One advantage that Austria has is that the country is home to, on the one hand, Bitpanda, one of the most regulated and reliable crypto exchanges, and, on the other hand, Blockpit, the leading European provider for crypto tax solutions. Both put the general image of crypto in a very positive light.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Austria?

There is a growing number of blockchain startups, crypto exchanges, and businesses accepting cryptocurrency payments. Vienna, in particular, is a hotspot for such activities. Additionally, blockchain-focused educational programmes at universities have also contributed to the growth and maturity of the ecosystem. Measured by the size of the population, the Austrian blockchain community appears very well developed.

What measures has Austria taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

As of now, Austria has taken several measures to regulate and promote blockchain and crypto-based technologies. The Austrian Financial Market Authority (FMA) has issued guidelines for initial coin offerings (ICOs) and cryptocurrencies, providing clarity for businesses in the sector. Furthermore, the Ministry of Finance (BMF), in close cooperation with players from the private sector, such as Bitpanda and Blockpit, drafted the first crypto-specific tax regime in the European Union, bringing more legal clarity and certainty to the market. The Austrian National Bank (OeNB) is also stepping up its efforts to research the benefits of central bank digital currencies (CBDCs).

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

To promote the adoption of blockchain and cryptocurrency at both national and European levels, governments could take several measures. Firstly, fostering an environment of regulatory clarity and stability is crucial. Entrepreneurs are more likely to invest in these technologies if they understand the regulatory landscape and can predict its future direction. Secondly, public education campaigns could increase public familiarity and trust in these technologies. Lastly, governments could themselves adopt blockchain technology in public sector services, which would not only increase public familiarity but also demonstrate the government's confidence in the technology.

What does the future hold for the Austrian blockchain and cryptocurrency ecosystem?

The future of the Austrian blockchain and cryptocurrency ecosystem most likely lies in continued growth and development, though the exact trajectory is hard to predict. Blockchain and cryptocurrency technologies (especially the tokenisation of real-life assets) could continue to permeate various industries and sectors, leading to a more integrated and widespread adoption. The government's stance on regulation will play a significant role in shaping this future.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

The integration of AI and chatbots has the potential to significantly impact the blockchain and cryptocurrency industry. AI and machine learning algorithms can be used to predict market trends and improve trading strategies, thereby contributing to the growth of the industry. Chatbots, on the other hand, can streamline customer service in the sector, making it easier for consumers to access information and conduct transactions. Both technologies could, therefore, increase the accessibility and usability of crypto-assets, promoting their adoption.

Key Figures

58+

Dedicated blockchain solution providers

156m

Total funds raised.

1.40%

Population that owns crypto

The Belgian blockchain ecosystem at a glance

Belgium has one of the highest GDPs per capita and robust science and FinTech sectors. This combination has fostered the creation of an active blockchain ecosystem nationwide. As one of the most important financial centres in the world, the Belgian blockchain startups and enterprise ecosystem are primarily centred around applications for the banking and financial sector. More recently, a growing understanding of the benefits of tokenisation fostered the growth of several startups in this area. The lack of specific legislation did not hamper the issuance of utility and even security token offerings. With the EU Green Deal and the CSRD, blockchain solution providers with a focus on the supply chain have received extra impetus. Finally, several well-established companies and VC funds serve the continuous growth of the cryptocurrency ecosystem.

Most blockchain startups focus on business-to-business (B2B) and business consumer (B2C) projects that, apart from the financial and banking sectors, cover diverse domains, such as law, logistics, the supply chain, fashion, festivals, and corporate governance, among others. Several blockchain companies also offer consultancy services for corporations, which helps to highlight why existing companies investigate the applicability of blockchain technologies in their business.

Belgium is also characterised by regional disparities when it comes to blockchain companies. The region of Flanders has approximately 60% of all blockchain-related startups, followed by Brussels with 30%, while Wallonia is home to the remaining 10. With initiatives like [DigitalWallonia4.Trust](#), the support for Web3 technologies for startups and corporations in Wallonia is gaining speed and traction.

Belgian companies are also heavily involved in research and innovation activities around blockchain technology, mainly in Horizon 2020 and Digital Europe projects funded by the European Commission. This number is relatively high compared to other European countries of larger size and population.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

Belgium, together with 20 other Member States from the European Union, was a committed participant in the European blockchain services infrastructure (EBSI). The first EBSI nodes were created in Belgium in 2020. In collaboration with KU Leuven and BOSA (a government agency), Belnet and Smals founded BelBlock, an EU CEF project.

Belgian Secretary of State for Digitalisation Mathieu Michel aims to operationalise the work previously done by the EBSI. In January 2024, Belgium assumed the presidency of the Council of the EU, which gives Mr Michel a timeslot for his vision of 'Europeum'. Several EU countries joined his initiative to work towards impactful and working applications on a shared, EU-driven, blockchain-based infrastructure.

Brewers and farmers from the Belgian Barrels Alliance (BBA) have partnered with Zeromint to offer nonfungible tokens (NFTs) to preserve the UNESCO-recognised Belgian beer culture and heritage, according to Cointelegraph. The Belgian Barrels Alliance aims to launch NFT initiatives to promote tree planting and learn specialised artisan skills and traditions in addition to building engagement and reward opportunities for beer fans and enthusiasts.

Cryptocurrency adoption in Belgium received a serious blow when Bit4you.io, the only Belgian crypto exchange, ceased all activities in April 2023. As Bit4You was deeply embedded in the Belgian cryptocurrency ecosystem, its demise had a ripple effect on the community.

Antwerp, one of the worldwide fashion hotspots, is known for 'The Antwerp Six', a group of fashion designers who were trained at Antwerp's Royal Academy of Fine Arts between 1980 and 1981. Recently, the digital fashion network MUTANI launched [The Antwerp Cyber-Six](#), a digital homage to the original designers. In 2023, MUTANI developed several physical fashion items, combining a purpose-driven physical value chain with a digital representation of these items as NFTs. Along with a [speedwear shirt](#), which co-existed on RTFKT as a NFT, MUTANI also released a [keychain](#) with an AR experience.

For true mainstream adoption, we had to wait until the end of 2023, with solutions from KBC and Euroclear.

KBC Bank & Insurance, a Belgian-based European bank and insurance group, released two blockchain-based solutions to their retail customers and the general public. Based on KBC's proprietary stablecoin solution, their loyalty coin (baptised KateCoin) was pushed to their retail customers and enabled, amongst other things, a back fee when buying through the KBC app on Amazon. Furthermore, KBC Securities' Bolero crowdfunding solution was migrated to a blockchain-based platform, relying on KBC's stablecoin platform.

Euroclear, a major player in financial markets, [launched the first part of its digital financial market infrastructure project](#). The DSI (digital securities issuance) service enables the issuance, distribution, and settlement of fully digital international securities - digitally native notes (DNN) – on distributed ledger technology (DLT). As a first and outstanding example, the World Bank (International Bank for Reconstruction and Development, IBRD) issued a DNN, raising EUR 100 million to support the financing of the World Bank's sustainable development activities. The digital security was listed on the Luxembourg Stock Exchange.

These solutions (KateCoin, Bolero Crowdfunding, the DLT-based issuance of securities) clearly demonstrate how blockchain technologies become a technical component of a solution that adds business value and improves a process.

Virtual currency legislation that applies to blockchain

According to a report on the [regulation of cryptoassets by Burges Salmon](#), there are currently no specific laws or regulations in Belgium. In 2017, the country's Financial Services and Markets Authority (FSMA) published a communication on initial coin offerings (ICOs) that provides an overview of the legislation and regulations that may apply to ICOs and crypto assets. As early as 2014, the Belgian National Bank and the Financial Services and Markets Authority [issued public warnings](#), informing consumers and potential investors of the risk associated with virtual currencies. The latter authority actively maintains a list of fraudulent virtual currency sites. Nevertheless, in 2021, the FSMA approved a real estate token [project](#) and an (art) security token [project](#).

According to the financial regulator of Belgium, the characteristics of crypto assets may be similar to investment instruments: they may provide rights to revenues or returns; be used as a means of storage, calculation, or exchange, given their convertibility into other crypto assets; or as tokens or fiat money and/or a utility token if they provide access to certain products or services.

It should be mentioned, however, that the Anti-Money Laundering (AML) regulations and Know Your Customer (KYC) policies are still applicable to crypto exchanges operating in Belgium. The National Bank of Belgium keeps its finger on the pulse of the latest developments in the broad blockchain ecosystem. From organising seminars on DeFi, to writing [their own blogs](#) on the topic, it is clear that digital assets are considered a part of their business.

Belgium has cryptocurrency taxes of 33% on any cryptocurrency income, depending on how the tax subject is investing. If it is merely an increase of value over time, there is no taxation, but the tax subject has to prove the holding. This is considered an investment as *a bonus pater familias*. Contrary to other countries, there is specification on the required holding time. The intention must be proven. If the profit results from speculation and market trading, the tax is 33% (taxed as other income). However, if the tax subject acts as a professional trader (i.e. buys hardware, subscribes to paid info sources, etc), then the income from the trading will be taxed as regular income. Belgium has one of the [highest taxes on income](#), from EUR 42,370, you pay up to 50% on taxes.

Blockchain Regulation for Crypto Exchanges and Custodial Wallets

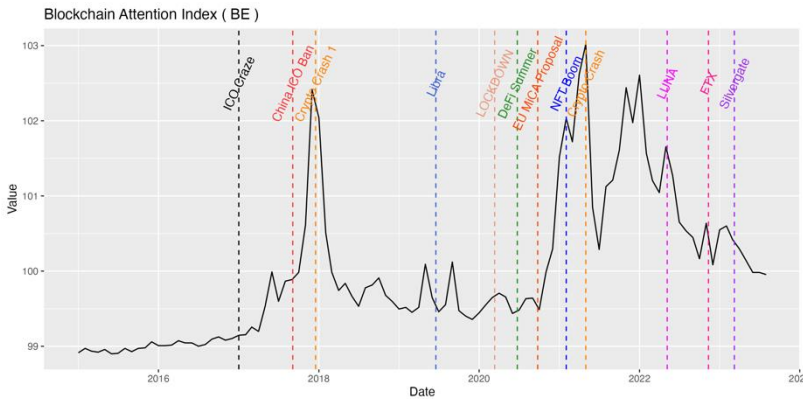
As of 1 May 2022, the Financial Services and Markets Authority (FSMA) requires the region's crypto exchanges and custodial wallet services to register. Crypto businesses in Belgium that were already operating before this official announcement were required by law to notify the FSMA of the 'exercise of their activity' within the following two months, before 1 July 2022. In addition to disclosing operations, existing businesses were given four months, i.e. before 1 September, to register as a regulated business with the financial regulator. Crypto service providers must fulfil seven conditions, which include being constituted in the form of a company with a minimum capital of EUR 50,000. This requirement resonated in 2023, when the board of directors of Bit4You, Belgium's only crypto-exchange, resigned, followed about a month later by Bit4You ceasing operations due to a non-disclosed liability with a Lithuanian company holding Bit4You assets, losing its licence in Lithuania.

Blockchain in academia

Professional training courses on blockchain technology are available in Belgium through independent training and certification providers. Recently, dedicated and organised programmes that lead to a degree associated with blockchain or other decentralised technologies are offered in [Howest](#) and the Université de Liège. Vlerick Business School offers a course focused on the Metaverse.

Furthermore, academia has adapted its curricula to include specific blockchain-related topics to meet the public's increased interest in blockchain and cryptocurrencies.

Blockchain across key industries



On analysing the startup ecosystem in Belgium, it becomes evident that most active startup companies focus on applications and services around the banking and financial sectors. This can be attributed to the fact that Brussels is the financial capital of Europe and the seventh most important financial centre worldwide. Additionally, the legislative and regulatory frameworks do not pose any specific restrictions or hurdles that would prevent the development of the FinTech and blockchain ecosystem in Belgium. The presence of financial

knowledge also fosters the growth of companies focusing on cryptocurrencies and decentralised finance.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Belgium is home to a fast-growing startup scene, thanks to its strong service economy, and the fact that most people are proficient in English. Adding to this, the number of newly incorporated companies in the country is constantly on the rise, and numerous Belgian cities host startup weekends, hackathons, meetups, and open cafes. This startup ecosystem is supported by many diverse acceleration programmes and incubators across the country. The blockchain/cryptocurrency scene, nevertheless, went to its own winter, with a sharp decline in the number of public events. The FPS BOSA (Federal Public Service Policy & Support) aimed to revive the ecosystem with #blockchain4belgium, but refocused (rightfully) on the aforementioned plans of Mathieu Michel with Europeum.

Moreover, being the financial centre of the European Union, along with its diverse and innovative startup scene, Belgium is an attractive location for international companies looking for a place to set up their excellence centres. With IntellectEU and SettleMint, Belgium has two companies providing blockchain-related services, worldwide.

The number of blockchain startups in Belgium, according to Crunchbase, is 5. According to data retrieved by LinkedIn, the number of blockchain professionals is 1,200. The slowdown in the influx of VC money hit the Belgian startup scene, as well.

THE BLOCKCHAIN COMMUNITY

After several smaller initiatives with a similar aim, #Blockchain4Belgium launched. Inspired by the Dutch, German and French blockchain associations, it aims to bring together all blockchain professionals, regardless of their expertise or work in the blockchain space. The aim is to contribute on 7 axes through working groups. Belgian Federal Secretary of Digitalization Mathieu Michel supports the initiative and wants to launch several blockchain-related ideas and projects during Belgium’s presidency of the EU.

Brussels, as well as other Belgium cities, hosts an active and diverse ecosystem of blockchain-related startups that are developing applications and services for various sectors. This ecosystem is supported and further promoted by various associations incorporated in Belgium with, in some cases, pan-European or global influence and presence.

Founded in 2019, the [International Association of Blockchain Trusted Applications](#) (INATBA) is driven by DG Connect of the European Commission. INATBA serves as a joint platform for various industrial players and startups, as well as regulatory and policymaking and standardisation bodies that support and promote blockchain and distributed ledger technology (DLT) by encouraging public and private sector collaboration.

[Blockchain for Europe](#) represents international blockchain industry players at EU level, with a primary focus on proactively contributing to the regulatory debate by supporting European decision-makers in their goal to make blockchain technology a success.

Supported by the Wallonian (French/German-speaking part of Belgium) [Government](#), [WalChain](#) aims to unite blockchain startups to position their digital solutions as drivers for the development of new digital ecosystems, and the further economic development of the region.

NOTABLE BLOCKCHAIN COMPANIES

[Keyrock](#): a cryptocurrency market maker, building scalable, self-adaptive algorithmic technologies to support efficient digital asset markets. Through a combination of in-house algorithmic trading tools, high-frequency trading infrastructure, and industry expertise, Keyrock provides unparalleled liquidity services to tokens, exchanges, and brokerages within the cryptocurrency ecosystem.

[Delta](#): a Bitcoin and cryptocurrency portfolio tracker app. Delta allows users to keep track of all crypto coins, including Bitcoin, Ethereum, Litecoin, and over 2000 altcoins. The company has been acquired by eToro.

[Playtreks](#): PlayTreks is an artificial intelligence driven music tool which provides full transparency to anybody who is keen to understand about the performance of songs & albums released on a large number of digital streaming platforms. With PlayTreks any artist, artist manager, media company, record label can SAVE big time on managing their music by replacing individual tools with ONE platform.

[SettleMint](#): founded in 2016, it has one goal: to make blockchain applications accessible for organisations and companies. With their platform, they reduce the complexity of blockchain technology, making it easy, fast, and seamless for an organisation to turn a business concept into a working blockchain application in a fraction of the time.

[Venly](#) (formerly Arkane): provides a wallet and NFT products that seamlessly integrate with your blockchain project.

[IntellectEU](#): combines a blockchain middleware solution (Catalyst) with other cutting-edge technologies to solve complex challenges in the (financial) industry.

[UNOVA](#): focused on the supply chain, Unova develops its own blockchain technology to obtain the ultimate multi-layered Web3 infrastructure for supply chain and real-world asset use cases.

[NGRAVE](#): started as a crowdfunding project on Kickstarter, Ngrave now provides 'the coldest wallet', a hardware solution to keep your digital assets safer than ever before. Be your own bank!

Key Figures

54+

Dedicated blockchain solution providers

29m

Total funds raised.

2.18%

Population that owns crypto

The Bulgarian blockchain ecosystem at a glance

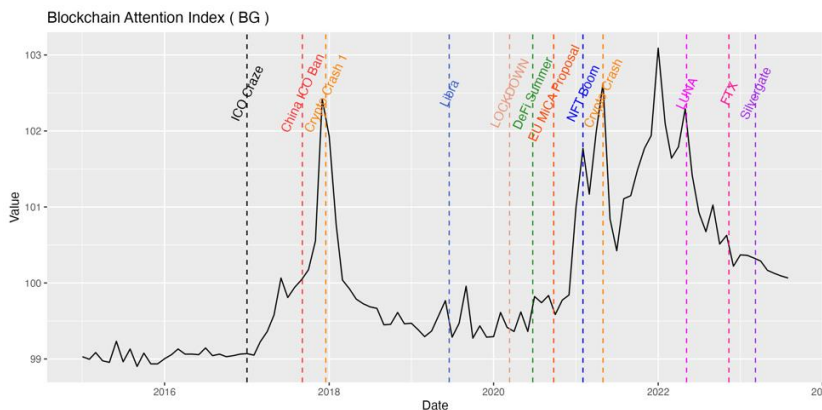
Bulgaria has emerged as a thriving destination for FinTech, blockchain, and crypto startups, offering a range of benefits to these businesses. The favourable regulatory environment, skilled workforce, strategic location, low operating costs, favourable tax system, supportive ecosystem, and modern infrastructure make it an attractive destination for startups looking to expand their business globally.

The country hosts a vibrant blockchain ecosystem. Moreover, the ecosystem is continuously growing, as indicated by the number of startups. Bulgaria participates in European initiatives on blockchain, such as hosting nodes for the EBSI.

There are regulations, mainly focused on the financial aspect and cryptocurrencies. These regulations are relevant to taxation and investor protection. Moreover, academia fosters the blockchain ecosystem by establishing courses and certifications. Private entities are also quite active in providing educational material.

Bulgaria's startup ecosystem consists of small and medium entities, focussing mainly on the financial services sector.

TOWARDS MAINSTREAM ADOPTION



Blockchain Adoption

Until recently, the Bulgarian financial services regulators, the Bulgarian National Bank (BNB), and the Financial Supervision Commission (FSC) were of the opinion that crypto assets should not qualify as financial instruments. Transactions involving crypto assets remain outside the scope of Bulgarian financial services regulations and are not subject to a licence, registration, or any other form of authorisation in Bulgaria. As Bulgarian regulators follow the EU approach to crypto asset regulation, these positions will change with the implementation of MiCAR on 30 December 2024. The FSC has stated that crypto asset derivatives may qualify as MiFID financial instruments, in which case, the local MiFID legislation (i.e. the Bulgarian Markets in Financial Instruments Act)

should apply. In 2021, the FSC published its strategy for monitoring financial innovations in the non-banking financial sector (2021-2024). The strategy aims to achieve common European goals regarding the development of the local financial services market, as well as consumer attitudes and protection. No asset classification framework has been adopted at national level.

Crypto assets are not specifically regulated in Bulgaria. The EU DigFin package (MiCAR, DORA and the DLT Pilot Regime) apply directly in Bulgaria as primary EU legislation. No specific framework for stablecoins has been adopted at national level. After 30 December 2024, the provisions of MiCAR will apply directly in Bulgaria as primary EU legislation.

The Bulgarian National Bank has made no plans to issue a CBDC. Bulgaria is not part of the Eurozone.

No licensing regime has been adopted at national level. Virtual asset service providers (VASP) providing services in Bulgaria are subject to registration with the National Revenue Agency for AML/CFT purposes. After 30 December 2024, the authorisation regime under MiCAR will apply.

Since December 2019, crypto-asset exchanges and custodian wallet providers have been covered by the Bulgarian AML Act (transposing the EU's AMLD V, which extended the scope of its financial crime prevention rules to crypto asset exchanges and wallet providers). With amendments to the AML Act, effective as of 10 October 2023, VASPs providing services of exchange or transfer of virtual assets (VA), safekeeping and administration of VAs enabling control over the assets, or public offering of VAs, are also covered by the Act. Since VASPs are not subject to authorisation or registration in Bulgaria, all VASPs providing any of the abovementioned services in Bulgaria should register with a special registry administered by the Bulgarian National Revenue Agency (NRA). The registration documents and steps are regulated in an ordinance of the NRA. As obliged persons under the Bulgarian AML Act, VASPs are required to implement effective risk management to prevent money laundering and terrorist financing. This includes adoption of an internal AML/ CFT risk assessment, implementation of internal policies and procedures on the prevention of money laundering and terrorist financing, rules on the conduct of customer due diligence (CDD), including enhanced CDD for clients and transactions flagged with a higher level of risk, nomination of an AML officer, specific AML trainings for categories of employees whose work is exposed to the risk of money laundering, reporting of suspicious activities to the Financial Intelligence Unit of the State Agency of National Security.¹

Legislation on blockchain

The regulatory environment is quite supportive of FinTech, blockchain, and crypto startups. The tax system, the low-cost business environment, as well as a range of initiatives are directly aimed at supporting the growth of these industries.

No specific national regulation or guidance is in place for the sale and promotion of crypto assets. This excludes transactions with derivatives on crypto assets which should comply with MiFID II requirements (transposed into the Bulgarian Markets in Financial Instruments Act). Sale and promotion of crypto assets may also be subject to general Bulgarian legal requirements (including no unfair commercial practices, no distortion of competition, general rules on advertising, and general rules on electronic commerce). After 30 December 2024, all MiCAR requirements will be directly applicable in Bulgaria as primary EU legislation.²

Blockchain in academia

¹ Source: <https://www.pwc.com/gx/en/industries/financial-services/assets/navigating-the-global-crypto-landscape-with-PwC-2024.pdf>

² Source: <https://www.pwc.com/gx/en/industries/financial-services/assets/navigating-the-global-crypto-landscape-with-PwC-2024.pdf>

There is a scarcity of information relevant to educational initiatives on blockchain in Bulgaria. Blockchain impacts numerous business sectors, and it is included as a subject in FinTech-related masters. In detail, the Faculty of Economics and Business Administration (FEBA) collaborates with the Bulgarian Fintech Association (BFA) for a FinTech master, including blockchain. The initiative has been covered by the [media](#) and [university](#). The university accommodates individual courses such as [Blockchain Changing Digital Strategies](#) and [others](#). The Technical University in Varna is another institute with individual blockchain courses like [Blockchain Technologies](#) as part of artificial intelligence (AI) systems.

Moreover, there are initiatives from the private sector to educate the public on blockchain. The last report on national ecosystems included a couple of training programmes that are still active. Another initiative in education comes from the private company, LimeChain, with the introduction of [LimeAcademy](#). For example, there is educational material for blockchain developers with eight modules to guide them.

Blockchain across key industries

Blockchain activity spans a diverse range of industries and sectors in Bulgaria. The prevalent industry for blockchain use is in finance, as the majority of entities are concentrated. The finance sector has a higher degree of maturity, and the [Bulgarian Fintech Association](#) is active in the national ecosystem. Another use for blockchain is to support applications and software, and this is the second most prevalent use of the technology. The services make use of blockchain attributes to deliver functionalities with their services.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

A robust startup scene is closely related to the investment of aspiring innovators and entrepreneurs and funding opportunities.

As venture capital is interested in blockchain technology, startups in the early stages can explore the option of the [New Vision 3 Fund](#). The portfolio fosters some entities with blockchain applications, such as Phyre, Klear, and others. Similarly, LAUNCHHub Ventures is active in supporting the blockchain ecosystem, with companies such as [Quantive](#), [FintechOS](#), [Giraffe360](#), [OfficeRnD](#), and others. They are currently investing out of their third fund, with a [sum of EUR 74M](#), dedicated towards ambitious early-stage founders. Other venture capital options with blockchain projects in their portfolio include [Vitosha Venture Partners](#) and [NEVEQ Management](#).

Apart from venture capital, there are accelerator programmes to support innovation in the Bulgarian blockchain ecosystem.

Accelerators can provide a wide range of benefits to participants:

- from idea validation to preparation for funding rounds, the [Bulgarian Innovation Hub](#) hosts accelerator programmes for startups, with last year's cohort covered in a [news article](#).
- [innovation capital](#) provides another option for related accelerators, with different options to select depending on the startup's needs.

The blockchain startup ecosystem is vibrant, with small and medium-sized companies. Most of the entities were established between 2017 and 2019, as Bitcoin hit the news and popularised blockchain technology. There are entities that Swift their operations and adopt blockchain, as indicated by entities established earlier, before the 2010s. Finally, startups cover a wide range of business sectors, with the most prevalent being the financial sector.

There are organisations and incentives in Bulgaria to support and boost the participation of the public in blockchain. The last version of the report included the [Balkan Blockchain Association](#) and [Bulgarian Fintech Association](#). The first association participates in [INATBA as a member](#) as announced in 2019. The Bulgarian Fintech Association is active in publishing reports on the [Bulgarian FinTech ecosystem](#), with the 2022 report available [online](#). Blockchain is a subject for FinTech, as the technology can disrupt the financial sector and the traditional business model.

Conferences are another opportunity for people active in the blockchain to participate. During conferences, participants can learn from experts about the state-of-the-art on the subject and expand their network. Blockchain and Crypto Conf'23, held on 24 April 2023, in the Aula Magna at Sofia University 'St Kliment Ohridski', marked a significant milestone in the collaboration between the Bulgarian Fintech Association (BFA) and Sofia University. The conference, a key component of the joint master's programme on finance, investments and FinTech at FEBA, Sofia University, brought together renowned professors from the university and experts from the blockchain and crypto sectors.

The Bulgaria Fintech Association continued to work with its academic partners from Sofia University by launching the master's programme in finance, investments and FinTech for a fourth consecutive year. BFA has also built a strong partnership with VUZF, where the association will be working on three master's programmes. The association also reached the Black Sea coast by visiting the University of Economics – Varna, establishing new valuable connections with the community there.

Apart from associations, private companies aim to support the community by organising events. Such events share the passion and experience of experts active in the field. For instance, the private entity hack.bg has organised [meetups](#) for blockchain developers. Similarly, another entity, [DEV.BG](#), has a user group on [blockchain](#) where events take place for learning from and socialising with people with similar interests. While most events are concentrated in the capital, other cities accommodate events and meetups for the community.

Notable Blockchain Companies

[Ambire](#): a company established in 2017 involved in digital advertising. The solution aims to boost transparency for advertisements while respecting users' privacy. Advertisers are recognised via cryptographic identities, as personal data are in off-chain storage. A dedicated wallet to handle tokens and permissions is part of the suggested solution.

[Coinpanda](#): an application launched in 2018 for tracking cryptocurrency portfolios and the resulting taxes. The idea emerged from the frustration of trying to track transactions and calculate the taxes. Digital wallets can be used for this purpose, by using their public keys to query blockchain transactions via APIs.

[Credefi](#): introduced its idea to connect crypto lenders with SME borrowers in 2020. The roadmap for the project includes the adoption of Polygon and the future migration to Solana. The project includes three distinct phases. The platform makes use of the Ethereum blockchain and the matured Solidity language to deploy smart contracts.

[Deriveum](#): a startup founded in 2019 which was funded by Block.IS. The startup's idea is to use crypto commodities as credit-default swap (CDS) collateral and to manage risk-sharing. The idea involves locking value into a smart contract to cover the case of inability to pay. The startup seems to be implementing the Corda blockchain for its application.

[Qaisec](#): a company that states it offers custom solutions in the banking sector. One of the solutions is the introduction of the quantum encrypted blockchain (QEB). The application of QEB offers a

greater level of security to safeguard blockchain from vulnerabilities stemming from the proliferation of quantum computing.

[Ricoto](#): a company established in 2018, with expertise in content writing for blockchain projects. The proliferation of ICOs necessitates the presentation of a coherent plan for the suggested solution of a project.

[TokenGet](#): a platform to launch ICOs in a secure and manageable way, established in 2017. It permits companies to focus their efforts on marketing and promotion of an ICO, since the platform delivers functionality across the different actions involved in an ICO. The company is part of the Balkan Blockchain Association.

[Tresaro](#): a blockchain marketplace that focuses on three sectors: e-commerce, crowdfunding, and charity. The decentralised marketplace is a trustless environment for peer-to-peer trading without the arbitration of a centralised authority. The marketplace uses a SWARM network deployed on Ethereum.

Key Figures

24+

Dedicated blockchain solution providers

11m

Total funds raised.

1.23%

Population that owns crypto

The Croatian blockchain ecosystem at a glance

Croatia is a country located in central and southeast Europe and part of the EU since 2013. Croatia's economy has been affected negatively by the pandemic, but the European Commission [forecasts](#) that the economy will recover and grow. The recovery after the pandemic is an indicator of the reforms in the economy in the years prior. The Startup Europe Network includes an [overview](#) of the startup ecosystem in the country. A notable element of the startup ecosystem is the range of sectors it operates within.

There is interest in adopting blockchain in Croatia, as there are public activities like the introduction of a crypto exchange by Croatian Post and a crypto stamp. Moreover, the [Croatian energy strategy](#) mentions blockchain as an example of a technology that could act as a mechanism to foster smaller market segments in the energy sector. Blockchain adoption is continuous in the public sector, as Croatia joined the Blockchain Partnership in [2019](#).

The legislation around blockchain and cryptocurrencies incorporates European actions on the subjects. Activities related to cryptocurrencies, like trading and mining, are considered taxable in Croatia. Moreover, entities supporting cryptocurrency activities must be registered with the Croatian Financial Services Supervisory Agency to adhere to the regulations.

The private sector seems to be growing, with a variety of blockchain applications being introduced. Private companies are trying to facilitate transactions with cryptocurrencies as their popularity grows.

Moreover, Croatia attracts tourists who wish to use their cryptocurrencies in their commercial exchanges with the local community. There are a handful of cases of cryptocurrencies being adopted as a payment method in Croatia.

The blockchain community seems to be growing and has the support of academia and associations. There are training and courses for the community to learn about blockchain. Research on blockchain matters is being facilitated, as there is an established laboratory dedicated to the technology. The community can attend large-scale events and network during these events.

TOWARDS MAINSTREAM ADOPTION

Blockchain adoption

Cryptocurrencies are not equivalent to traditional money, but their popularity is undeniable, with more citizens owning a crypto token. After launching a crypto stamp, Croatian Post introduced a service to exchange cryptocurrencies with the introduction of [Crypto Centres](#). This action was covered in [articles](#), as the service is

available in over 50 locations. It should be noted that a handful of the popular cryptos are selected to be available through the service.

As previously mentioned, cryptocurrencies are not equivalent to money. In contrast, people are eager to hold digital tokens, and companies are adjusting to this trend. For example, Tesla shook the world in 2021 by announcing crypto payment availability. In a similar fashion, one of the largest cooperations in the Croatian cryptocurrency space is between Konzum, one of the biggest retail giants in the Western Balkan region, and Electrocoin, a crypto-payments processing firm. Indeed, since December 2021, Konzum has been accepting crypto for groceries, as covered on *Coinculture*. There are 9 crypto payment options: Bitcoin (BTC), Ether (ETH), Bitcoin Cash (BCH), EOS, DAI, XRP, Stellar Lumen (XLM), Tether (USDT) and USDC. It should be noted that the company does not receive or hold cryptocurrencies in their ledger but fiat money, the exchange of cryptocurrencies for tokens is the responsibility of Electrocoin. Similarly, there is another service that is structured to accept cryptocurrencies. This service is for paying for petrol (see: [CoinTelegraph](#)) and is a service to improve tourists' experience of the country.

Blockchain adoption should not be limited to cryptocurrency payments, as blockchain structures facilitate various functions. For example, NFTs were one of the trends in 2021 for blockchain. These trends reshape business models and interactions between stakeholders in an ecosystem. An example from Croatia is the music event [Circus Maximus](#), which envisions establishing a DAO and minting NFTs for ticketing. A distributed autonomous organisation (DAO) can democratise participation in events, as the organisations could be run on logic with the application of code.

Legislation of blockchain

There are no major updates in the regulations from the previous report. Cryptocurrencies and related activities are regulated as part of the [Personal Income Tax Act](#), which handles the general tax policy. Entities that are active in providing exchange services for digital currencies are obliged to apply measures and procedures for anti-money laundering. The Croatian Financial Services Supervisory Agency (HANFA) is the supervisor for the implementation of the regulation. HANFA provides a list with the [registered entities](#) on their site, as a means for the public to avoid fraudulent entities.

Blockchain in academia

Universities have incorporated courses into their curriculums for blockchain and its applications. An example is the University of Pula, with a course titled [Blockchain applications](#). The course is part of a master's degree programme and includes suggested literature on blockchain. A [summer school](#) in June 2022 was held in Šibenik on the subject of crypto in real-world applications and privacy. The summer school was organised collectively by Radboud University, ETH Zurich Information Security and Privacy Center, and the University of Zagreb.

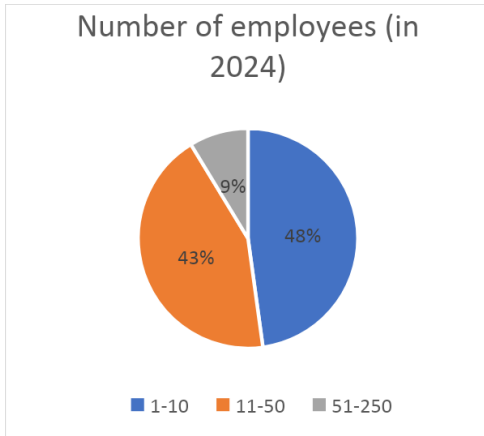
Academia in Croatia is taking action in the form of organised research initiatives to research and innovate on blockchain. For that reason, the [Laboratory for Applications of Blockchain Technology](#) aims to test innovative methods and applications with the implementation of blockchain and DLT technology, led by Prof. Kristijan Lenac. Additionally, research projects lay the groundwork for blockchain applications and innovations. There is [IoT4us](#), funded by the Croatian Science Foundation, which is currently working and producing publications.

Blockchain across key industries

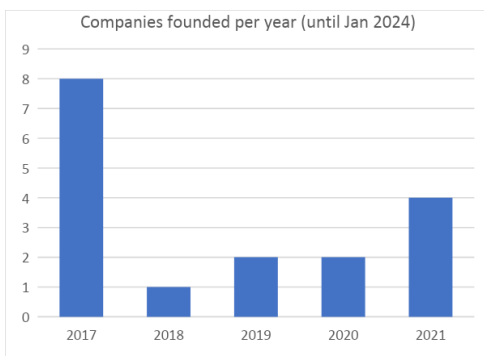
The adoption of cryptocurrencies as a payment method seems to be popular in Croatia. The incentive for this adoption is to facilitate a method for tourists to use their cryptocurrencies during their stay in the country. The data gathered about the startup ecosystem in Croatia indicate that the majority of services are adopting blockchain as a part of their software application. Blockchain is a general technology with use in different sectors, and developers make use of it to incorporate it as a component of their service.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Croatia’s ecosystem has significantly grown in the past few years, as recorded by [Startup Europe Networks](#). There are initiatives that have gone further than the borders and have been funded by various sources. An example is [Revuto](#), which introduced a digital token, REVU, to facilitate its financial services.



Startups can select from venture capital and incubators to assist their growth, depending on their strategy. [Fil Rouge Capital](#) is an investment fund manager established in Zagreb with different options for entities to choose from, depending on their situation. There are incubation, acceleration, and growth programmes for entities to participate in. Additionally, there is [ZICER](#), the Zagreb Innovation Centre, which has a list of options, such as incubation and acceleration programmes, available. Another option is the tech company incubator [SPOCK](#), which helps students, researchers, and scientists shape their ideas into startups. Also, in early 2021, [Bird-incubator](#) was founded with the aim of helping startups with software ideas.

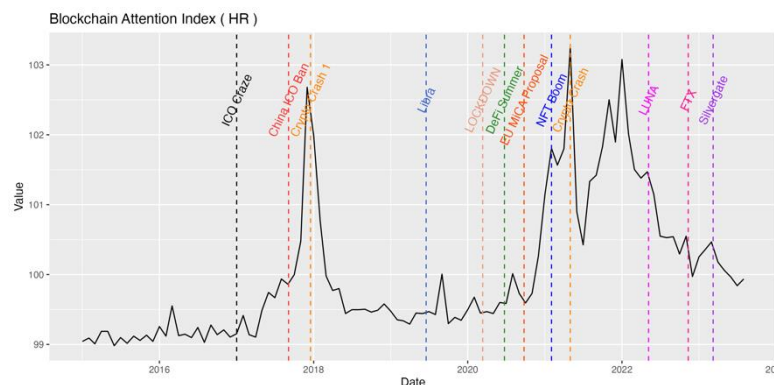


Most entities in our startup data set for Croatia were established in 2017. Lately, there have been new additions to the startup ecosystem, with the inclusion of newly formed entities. Blockchain is used predominantly in software applications and IT services, but other sectors, like leisure and sports, have adopted blockchain. The size of the entities is small and medium, as is normal for technology companies that develop software.

THE BLOCKCHAIN COMMUNITY

The community can participate in associations for blockchain that promote the technology and its applications. One example is the Croatian Association for Blockchain and Cryptocurrencies, [UBIK](#), with a range of activities. The activities include organising workshops, updates on blockchain, and even an [NFT collection](#).

Large-scale events were hindered by the pandemic, but conferences and events gradually returned. Indeed, two events were organised in May 2022 for members of the community to interact with each other. On 27 May 2024, [BlockSplit](#) will be held. It will include workshops and general panels, and more than 600 attendees and



over 300 businesses will participate. This event will take place in Split, with workshops and talks on numerous

subjects. Another event was [Blockdown Croatia](#) held in Sibenik in 2022, with the focal point being NFTs and Web3.

There are smaller-scale events held in Croatia from time to time that are of interest to the community. For example, a virtual panel hosted by the University of Dubrovnik discussed the contemporary issues in money, digital euro, and other subjects. The panel consisted of blockchain practitioners in business with university professors as moderators. More details and a video recording are available in the university's [blog post](#). There are events on blockchain and related subjects organised by universities. For example, the University of Rijeka and the Croatian Academy of Sciences and Arts held a [conference on the COVID-19 messages](#), where Prof. Kristijan Lenac presented blockchain solutions for the post-pandemic period.

NOTABLE BLOCKCHAIN COMPANIES

[Beyondi](#): a development company active in different technologies, established in 2014. Their expertise in blockchain lies in Hyperledger and its frameworks, which allow the creation of decentralised systems.

[Cosmos Eleven](#): a football manager game on the WAX blockchain.

[Katalyo](#): the next-generation SaaS no-code digital transformation platform for the decentralised world.

[Revuto](#): an active subscription management app supporting debit cards and crypto to help people save and earn money on their subscriptions.

[Spiritus](#) introduced itself in 2021 as a platform based on blockchain for the creation of digital memorials. The platform is currently in its initial stages, as fundraising is live. The platform's goal is to ameliorate oblivion, where deceased relatives are forgotten with the passage of time. Users of the platform can upload images and stories about their loved ones.

[Unify.io](#): a multi-chain infrastructure platform that enables creators to decentralise no-code solutions. It provides services connected to the NFT space. Through the platform, creators can buy, sell, swap, and create NFTs and NFT farms. It was founded in 2020 and is based in Zadar, Croatia.

Key Figures

72+

Dedicated blockchain solution providers

191m

Total funds raised.

1.19%

Population that owns crypto

The Cypriot blockchain ecosystem at a glance

The island state of Cyprus has emerged as one of Europe's blockchain hotspots, further confirming the trend of small European nation states, such as Malta and Estonia, embracing transformative technologies early.

In terms of public sector initiatives, the positive outlook for blockchain and distributed ledger technologies (DLTs) is reaffirmed by state-backed initiatives, such as the [Innovation Hub](#), a unified [national strategy](#) to regulate and exploit blockchain for the public and private sectors. The existence of strong private initiatives in the space, as well as the country's attractive framework and set of policies on foreign direct investment (FDI) for technology companies, have further propelled blockchain growth in the country. As a result, Cyprus, counts more than 20 startups and companies active in the blockchain and digital currency space, while the country's largest private educational institution, the University of Nicosia [has spearheaded blockchain education](#) and research on a global level since 2014.

As was the case in neighbouring Greece, the debt crisis following the events of 2008 was a major facilitator for the rising interest in digital currencies as self-custodian stores of value. Digital currencies and blockchain first surged in popularity as discussions over the [2013 Cypriot bank deposit haircut](#) unfolded. In fact, the events in Cyprus are largely assumed to have caused [one of the biggest rises in Bitcoin price at the time](#).

Cyprus today is primarily concerned with the transformative effects of blockchain technology in its public and private sectors and continues to work towards a common national framework to use blockchain at a national level.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

While no specific references to digital currencies and blockchain technologies exist in the country's legal or regulatory framework, the state's increasing interest in blockchain and relevant technologies is evident in the [collection of warnings](#) and advice to potential investors and firms, issued by the Central Bank of Cyprus (CBC) and the Cyprus Securities and Exchange Commission (CySEC) from 2014 to date. The CBC and CySEC have warned the public of the risks that digital currencies pose, including volatility, their potential use for money laundering and terrorist financing, and the possibility of unrecoverable loss of funds, among others.

In pursuit of remaining in sync with international developments in the space, [CySEC launched an Innovation Hub in 2018](#). The hub aims to serve as a two-way communication channel between regulators and companies to foster innovation and an informed regulatory landscape on the topic of transformative technologies. The hub has since partnered with the University of London to research blockchain applications in automating compliance and regulation. The CySEC regulatory sandbox project was included in Cyprus' resilience and recovery plan to 'enable FinTech, startups, and other innovative companies to expand their offering in new

products or services, by regulators establishing a “testing ground” that would allow them to conduct live experiments in a controlled environment under their supervision’. Cyprus is also among the few early adopters of the EBSI, working on developing a fully operational national EBSI infrastructure under the Deputy Ministry of Research, Innovation, and Digital Policy. A two-year project funded by CEF was implemented in collaboration with academia (University of Nicosia) and enterprises (TALOS, Goldman Solutions). The project was completed in April 2023, developing a pre-production national EBSI node and a diploma verification pilot use case in collaboration with the Cyprus Scientific and Technical Chamber. The developed use case received special recognition from the EBSI as one of the most successful in the field of diplomas and was used as a showcase for other projects.

The government of the Republic of Cyprus and the Deputy Ministry of Research, Innovation, and Digital Policy aim for the transition of the national EBSI node into production mode and in the implementation of full blockchain applications in the public sector for the benefit of citizens, while the private sector has also expressed interest in developing and hosting applications on the national node.

Cyprus has also submitted a proposal under the initial call for expressions of interest in the Digital Decade Policy Programme 2030, intending to establish a European digital infrastructure consortium (EDIC) on blockchain.

Legislation of blockchain

Besides the CySEC AML directives for crypto assets service providers, there are currently no specific references to digital currencies or other digital assets in Cypriot legislation.

Blockchain in academia

Since 2014, [the University of Nicosia \(UNIC\)](#) has emerged as a major facilitator of blockchain and digital currency education, not only in Cyprus, but also globally. By leveraging the country’s favourable view of transformative technologies, the university has achieved global impact through online courses, a full academic degree (MSc in Blockchain and Digital Currency), and professional certificates. [UNIC’s Massive Online Open Course](#) (‘Introduction to Digital Currencies’) has been attended by close to 40,000 students from 100+ countries since 2014. The university has also established the [Institute for the Future](#), a research centre focused on transformative technologies, and actively supports one global blockchain conference, [‘Decentralized’](#). In 2021, UNIC introduced the [first MOOC on decentralised finance \(DeFi\) in the world](#) as well as the [UNIC Open Metaverse Initiative](#). In 2022, UNIC launched the [first 100% on-chain university course, ‘Introduction to NFTs and the Metaverse’](#) and has recently introduced the [world’s first MSc in the Metaverse](#).

Other executive and professional certificates are also offered, while some consulting firms have integrated blockchain courses into their curriculums. Following the same path, Frederick University’s Mobile Device Laboratory is working on an [online learning platform for the use of blockchain technologies in SMEs](#). An online self-study course, titled [‘Introduction to Blockchain & Cryptocurrency’](#), is also provided by the School of Certified Professionals (SCP) Academy. The European University Cyprus has also introduced some courses on [digital assets](#) and [Web3 and NFTs](#).

Blockchain across key industries

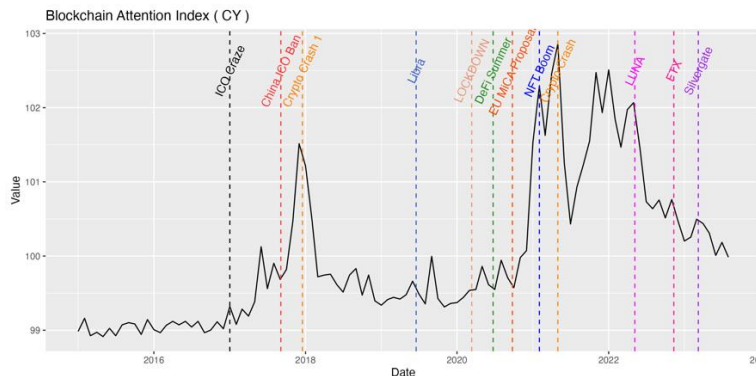
The Cypriot economy is primarily driven by services that support its ever-growing tourism. Private education, especially at higher levels, is enjoying great growth, mainly benefiting from the lack of private higher education institutions in neighbouring Greece. Cyprus is the world’s 11th maritime power and a major exporter of agricultural products and pharmaceuticals. In June 2020, VeChain [announced](#) that the Mediterranean Hospital of Cyprus employed their blockchain-based solution to store COVID-19 results. The country’s national strategy on blockchain technologies suggests 11 primary areas in which blockchain applications will yield significant benefits: land registry, customs and taxation, [National Betting Authority](#), educational certification/digital certification, KYC, energy, e-invoicing, AML, medical records, supply chain, and company registry.

The [State General Laboratory of Cyprus launched an initiative](#) that focuses on developing and implementing a food traceability platform using blockchain technology. This project stands out as the first in the public sector of Cyprus to integrate Amazon Web Services (AWS), signifying a substantial leap in the embrace of innovative technologies and cloud-based systems. A key feature is the integration with the [European Blockchain Service Infrastructure \(EBSI\)](#), aligning the project with European standards.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Cyprus is home to several small and medium-sized blockchain and digital currency companies and startups. Cyprus-based companies and startups are active in a wide range of verticals. Payment and banking services are by far the most popular category, with compliance and legal, digital currency exchanges, and entertainment/gaming following. Due to the country’s favourable tax treatment, many startups from Greece, central Europe, and even the United States of America choose to establish their business and operations on the island.

THE BLOCKCHAIN COMMUNITY



One of the most prominent and far-reaching community initiatives from Cyprus is the decentralised chapters community. Decentralised chapters are independent communities of practice and enthusiast groups organised under the sponsorship of the Decentralized conference. To date, there are more than 35 such chapters, 7 of which are based in EU Member States, while the rest hail from the United Kingdom, the US, Latin America, the United Arab Emirates, and even Venezuela. The chapters are responsible for independently organised events and workshops, spanning a wide range of interest areas that relate to blockchain and cryptocurrencies. Besides the decentralised chapters, 102,500 individuals interested in blockchain, and cryptocurrencies could be identified. This amounts to 11.5% of the total population.

INSIGHTS FROM EXPERTS

Philippos Hadjizacharias, Deputy Minister to the President for Research, Innovation and Digital Policy, Republic of Cyprus*

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Cyprus? Has the recent growth of the cryptocurrency markets facilitated familiarity?

There is growing awareness and interest in blockchain and cryptocurrency in Cyprus. The country hosts numerous blockchain and digital currency startups and SMEs, and even the public sector is exploring the

technology through proof of concepts (PoC). While adoption is still relatively moderate, with ongoing growth in terms of awareness and adoption, the recent surge in the global cryptocurrency markets and the implementation of our national blockchain strategy, has indeed contributed to increased familiarity among the public. However, we acknowledge that there is more work to be done to educate the public about the benefits and risks of these technologies.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Cyprus?

The blockchain and cryptocurrency business ecosystem in Cyprus is at an evolving stage of development and we have witnessed positive initiatives from both the private and public sectors. To foster a mature ecosystem, we are actively working on creating an enabling environment that attracts more blockchain companies, investments, and talents. To this end, we have been implementing Cyprus' national strategy on blockchain and distributed ledger technologies (DLT), which has been approved by the Council of Ministers in 2019. The strategy offers a structured approach and a roadmap for exploring the use of the technology across various sectors, to enhance process optimisation and cost-effectiveness. It focuses, among other things, on enhancing the application of blockchain by the government and the private sector, and promoting DLT in the financial sector

What measures has Cyprus taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Over the past year, Cyprus has taken further significant steps to promote blockchain and cryptocurrency adoption, on the basis of its national strategy. In collaboration with RTD Talos Ltd, the University of Nicosia, and Goldman Solutions & Services, we have just concluded in April, a two-year project funded by the Connecting Europe Facility (CEF), which successfully developed a pre-production national European blockchain services infrastructure (EBSI) node as well as a diploma verification pilot use case. Our project received special recognition from the EBSI and was used as a showcase for other projects in Member States. The Deputy Ministry of Research, Innovation and Digital Policy, as the owner of the national node, is sustaining the deployed node after the end of the project. We plan for the transition of the node into production mode and in the implementation of full blockchain applications by the public and private sector for the benefit of citizens, in order to exploit blockchain's efficiency and transparency benefits.

CySEC has also published AML directives for crypto assets service providers, while CySEC's envisaged regulatory sandbox has been included as a project in Cyprus' resilience and recovery plan. The sandbox aims to enable FinTech, startups, and other innovative companies to expand their offering into new products or services, with regulators establishing a testing ground that would allow them to conduct live experiments in a controlled environment under their supervision. It will facilitate the development of a suitable and attractive regulatory regime on FinTech and innovative technologies and strike a balance between the seamless deployment of innovative products or services and ensuring investors are protected.

Cyprus supported the preparation and adoption of the Markets in Crypto Assets Regulation which aims to protect investors and preserve financial stability while allowing innovation and fostering the attractiveness of the crypto asset sector.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

At European level, the adoption of the EU Regulation on Markets in Crypto Assets (MiCA) and the launch of the European Blockchain Regulatory Sandbox were significant steps to promoting blockchain and cryptocurrency adoption. Cyprus actively engaged in discussions that led to the adoption of these measures.

Additionally, we believe that the formation of a European blockchain partnership (EBP) digital infrastructure consortium (EDIC) would be an important step towards this end. Cyprus is one of the Member States that submitted a proposal for the expression of interest in the creation of the abovementioned multi-country project, which, with the cooperation of the European Commission, envisages the development and deployment of the EBSI on cross-border public services.

At national level, we will continue collaborating with industry stakeholders and academia to promote innovation while ensuring consumer protection.

What does the future hold for the Cypriot blockchain and cryptocurrency ecosystem?

The future for the Cypriot blockchain and cryptocurrency ecosystem looks promising. The EU MiCA Regulation entered into force in June, creating a transparent and supportive regulatory environment. We aim to further develop Cyprus' ecosystem by nurturing innovation, attracting investment, and fostering a talented workforce. We envision Cyprus becoming a regional hub for blockchain and cryptocurrency technologies, driving economic growth and technological advancements.

**At the time of conducting the interview featured in this report, Philippos Hadjizacharias held the position of deputy minister and provided insights representing the Deputy Ministry. Since the interview took place, there has been a change in the office, and Dr Nicodemos Damianou is the new deputy minister.*

Key Figures

74+

Dedicated blockchain solution providers

66m

Total funds raised.

1.86%

Population that owns crypto

The Czech blockchain ecosystem at a glance

The blockchain sector in Czechia is represented by a variety of entities including exchanges, wallet providers, and blockchain-centric projects. Specifically, there are 2 exchanges, 1 wallet provider, and 24 blockchain entities operating in the country as of 2023. The country ranks 48th on the basis of the total number of blockchain entities, and 60th on a per capita basis, illustrating a relatively active blockchain sector.³ Moreover, the Czech Blockchain Association embodies a spectrum of blockchain projects, early-stage investors, and infrastructure providers, indicating a structured and collaborative ecosystem.⁴

Czechia recognises blockchain technology for its potential to bring innovation and efficiency in various fields. This decentralised and immutable ledger technology provides secure and transparent transactions, which are crucial in areas such as intellectual property, financial services, and supply chain management. The application of the technology in intellectual property is one of the notable examples of its application in the country, providing reliable proof of ownership and the time of creation of intellectual property assets.⁵

In 2018, regulatory mandates were introduced to foster the growth of the blockchain and cryptocurrency industries.⁶ Czechia mandates cryptocurrency and blockchain enterprises to comply with anti-money laundering and counter-terrorist financing (AML/CFT) regulations. Cryptocurrencies are categorised as commodities and are not regarded as a monetary unit by the government.⁷

³ Source: <https://blockspot.io/country/czech-republic/>

⁴ Source: <https://www.czechblockchain.cz/en/>

⁵ Source: <https://www.roedl.com/insights/intellectual-property/2023-2/czech-republic-blockchain-intellectual-property>

⁶ Source: <https://www.finder.com/global-cryptocurrency-regulations>

⁷ Source: <https://freemanlaw.com/cryptocurrency/czech-republic/>

TOWARDS MAINSTREAM ADOPTION

Regulation

In Czechia, cryptocurrency regulations are not yet fully formed and there are no specific laws in place, besides KYC/AML compliance requirements. The Czech National Bank (the central bank) and the Ministry of Finance have provided some guidance, suggesting that cryptocurrencies can be seen as financial instruments and fall under existing financial market rules.

Cryptocurrencies

The adaption of cryptocurrency is on the rise in Czechia, with about 11.6% of the population, or over 636,607 individuals, having invested in cryptocurrencies. The country has a growing number of businesses and individuals investing in digital currencies, showing a broader acceptance, especially for cross-border payments.^{8,9} Cryptocurrency must comply with existing laws and regulations on financial markets, including AML and CTF requirements. Income received in the form of cryptocurrency must be reported to the tax authorities and applicable taxes must be paid.¹⁰

VASPs

The regulatory framework for virtual asset service providers (VASPs) is overseen by the Czech Trade Licensing Office, aligning with EU anti-money laundering and know your customer (AML-KYC) standards. Obtaining a crypto licence, essential for VASPs, is a straightforward process, with a one-time fee of EUR 1,500. This regulatory setup provides a legal foundation for blockchain and crypto ventures. The framework supports the growth of the blockchain and crypto sectors while ensuring compliance with broader EU financial regulatory norms.¹¹

Public-Private Partnerships

The significance of public-private partnerships in Czechia can be seen through initiatives like the Blockchain Connect Association formed in 2018, consisting of entities like IBM and PwC, both major contributors to blockchain developments. This alliance aims to leverage blockchain technology to combat fraud, representing a collaborative effort between governmental and private sectors to harness blockchain technology for societal benefits.¹² This partnership provides a way to explore and implement blockchain solutions, address regulatory concerns, and develop effective use cases.

Blockchain application

In Czechia, blockchain technology has been applied for intellectual property protection, providing a reliable solution for establishing ownership of creative work.¹³ Additionally, there are several startups developing blockchain applications and services. Acropolis specialises in blockchain, mobile app, and enterprise app modernisation. BusyXChain facilitates blockchain implementation for companies, reducing associated risks and aiding mainstream adoption. Circularo employs blockchain to streamline digital contract processing,

⁸ Source: <https://prague.bc.events/en/news/chehiya-i-bitkoin-kak-respublika-stala-krupneyshim-kriptoalyutnim-habom-evropi-85399>

⁹ Source: <https://investingintheweb.com/crypto/crypto-ownership-by-country/>

¹⁰ Source: <https://bitcoinczechia.com/czech-republic-crypto-laws-explained/>

¹¹ Source: <https://legalbison.com/service/crypto-blockchain-crypto-czech-republic/crypto-license-in-czech-republic>

¹² Source: <https://medium.com/adel/ibm-partners-blockchain-connects-czech-alliance-to-fight-fraud-drive-digitization-9a22bf1cdb83>

¹³ Source: <https://www.roedl.com/insights/intellectual-property/2023-2/czech-republic-blockchain-intellectual-property>

ensuring security and verifiability. Oxyio uses blockchain and satellite data to promote transparent carbon offset ownership and trading.¹⁴

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The blockchain sector in Czechia is witnessing steady growth, attributable to several factors, including support from the government and the EU. Currently, there are four well-known companies offering blockchain services in the country.¹⁵ Blockchain startups are innovating in areas, including but not limited to smart contract development, FinTech, and the digitalisation of industries. A variety of blockchain projects, early-stage investors, exchange platforms, and other infrastructure providers are part of this burgeoning ecosystem.¹⁶

In Czechia, several companies are engaged in cryptocurrency and Web3 technologies. For instance, Oxyio, a Prague-based startup, is developing a platform for offsetting carbon emissions, indicating a blend of digital finance and ecological initiatives. Additionally, in Brno, the Signals Network operates as an algorithmic hub on crypto exchanges and foreign exchange, exemplifying the integration of blockchain technology with traditional finance sectors.¹⁷

Moreover, the formation of organisations such as the Czech Blockchain Association is evidence of collective efforts to create a blockchain policy framework. The association is committed to resolving existing barriers and complex regulatory issues encountered by innovators and ensuring a favourable environment for the development of blockchain networks in the country. These efforts mark a proactive strategy to manage consumer protection and security issues associated with blockchain.¹⁸

Furthermore, there are many investors and VC funds in Czechia that have shown a strong interest in blockchain startups. There is a compilation of 15 angel investors and VC funds investing in blockchain startups, reflecting the strong interest of investors in this area.¹⁹ As an example, Tatum, a Czech blockchain app developer, recently raised USD 41.5 million in funding, demonstrating that the country has a vibrant, supportive ecosystem for blockchain businesses.

¹⁴ Source: <https://www.f6s.com/companies/blockchain/czech-republic/co>

¹⁵ Source: <https://techbehemoths.com/companies/blockchain/czech-republic>

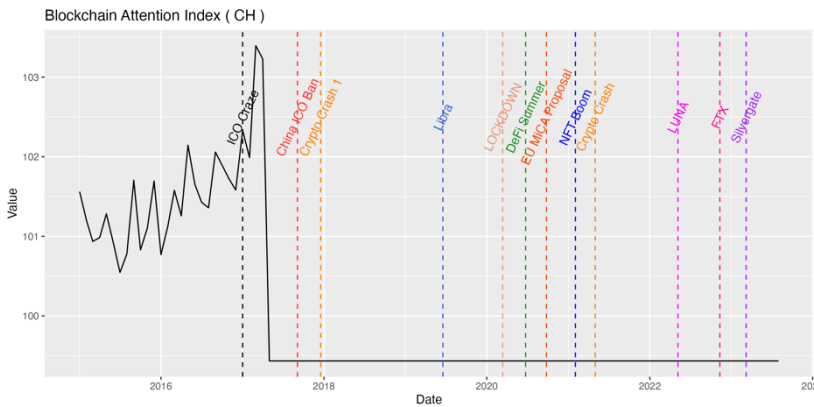
¹⁶ Source: <https://www.f6s.com/companies/blockchain/czech-republic/co>

¹⁷ Source: <https://www.f6s.com/companies/cryptocurrency/czech-republic/co>

¹⁸ Source: <https://www.czechblockchain.cz/en/>

¹⁹ Source: <https://shizune.co/investors/blockchain-investors-czech-republic>

THE BLOCKCHAIN COMMUNITY



The blockchain community in Czechia is active with several events and conferences taking place. One such event is the Blockchain & Bitcoin Conference Prague, which sees experts from companies like IBM and PwC sharing insights with blockchain enthusiasts.²⁰ Another notable event is the Cosmos ATOM: Conference & Hackathon in Prague, which gathers blockchain industry leaders for discussions and collaborative work on

ecosystem advancements.²¹

Annually, Prague Blockchain Week hosts a mix of conferences, workshops, and hackathons, offering a decentralised hub for blockchain enthusiasts to learn and network. The event series allows attendees to delve into various blockchain topics in both formal and informal settings, enriching the blockchain community. Also, the BTC Prague Conference & Expo in June 2024 is a major event that will bring Bitcoin enthusiasts, experts, and stakeholders together to share the knowledge and build a stronger Bitcoin community in Czechia.

The Bitcoin Mining Conference in June 2023 in Prague focused on Bitcoin mining, gathering influential individuals and businesses from the mining industry.²² These events collectively reflect a vibrant blockchain community in Czechia, promoting a conducive environment for knowledge sharing, networking, and advancing blockchain technology adoption across multiple sectors.

Insights from experts

Barbora Greplova, INATBA Executive Team (Institutional Relations)

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Czechia?

Czechia, particularly Prague, stands out globally as a centre for decentralised technologies, boasting a vibrant community engaged in various business and cultural activities related to blockchain and cryptocurrency. Prague's recognition by Forbes in 2018 underscores its significant role in the initial adoption phase of blockchain and distributed ledger technology within the cryptocurrency field. The city's infrastructure supports a thriving cryptographic community, with one of the highest number of cryptocurrency-accepting merchants globally and numerous cryptocurrency ATMs. Notable innovations, including the world's first hardware wallet (Trezor by Satoshi Labs) and the development of mining pools, have further solidified Prague's position in the blockchain landscape. There are also a variety of groups and promoters that raise awareness about the topic in society, including Holky v kryptu (<https://holkyvkryptu.cz/>) and KryptoVláda (<https://kryptovlada.win/>).

²⁰ Source: <https://www.pragueconvention.cz/hot-news/blockchain-bitcoin-conference-prague-the-main-blockchain-event-of-the-czech-republic-is-here-againr>

²¹ Source: <https://coindar.org/en/event/cosmos-atom-conference-hackathon-in-prague-czech-republic-70756>

²² Source: <https://paxful.com/university/bitcoin-events-crypto-conferences/>

The city hosts prominent blockchain events and conferences, such as the Hackers Congress and the world's first crypto-banking conference, attracting industry leaders and fostering knowledge sharing within the blockchain community. The most significant organiser of these events is Paralelní Polis. Prague's technological infrastructure, coupled with the presence of international companies with advanced development centres, enhances its attractiveness as a technological hub. Additionally, the emergence of scientific groups in universities and private incubation centres indicates growing support for blockchain application development.

Overall, the blockchain ecosystem in Czechia exhibits significant public awareness and adoption, fuelled by a strong community, innovative spirit, and supportive infrastructure. (Source: [Česká FinTech asociace, z.s. Blockchain Republic Institute, z.ú.: Potenciál decentralizovaných technologií pro rozvoj české ekonomiky](#))

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Czechia?

The blockchain and cryptocurrency business ecosystem in Czechia shows promising signs of growth and maturity, albeit still in its developing stages. With tens of companies engaged in prototyping services based on blockchain and distributed ledger technology, including startups like Bloknify, Veridity, eDelivery, Simplifate, Genu.in, and Frangaria, as well as traditional companies like TopMonks and Rockaway Blockchain, there is a notable presence in the market. These entities are supported by private financing sources, such as venture capital, indicating investor confidence in the potential of blockchain technology. Moreover, the increasing interest from traditional industries suggests a growing adoption rate. However, the ecosystem's size may still be relatively small compared to more established markets, and further use of public funding to support research could accelerate its growth. (Source: [Česká FinTech asociace, z.s. Blockchain Republic Institute, z.ú.: Potenciál decentralizovaných technologií pro rozvoj české ekonomiky](#))

What measures has Czechia taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Focusing on 2023, in November, Czechia proposed legislative amendments to regulate cryptocurrency and blockchain as investment instruments, aligning with EU regulations. These measures aim to expand market infrastructure, enhance transparency, and integrate these technologies into both investment and everyday life. ([Source](#))

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

The measures can include (at both national and European levels):

a) Legislative Framework:

- Implementing legal frameworks that support the development and use of decentralised technologies across various sectors.
- Establishing regulations that provide clarity and consistency while avoiding overly restrictive measures that could stifle innovation.

b) Regulatory Environment:

- Maintaining appropriate regulations to address concerns, such as anti-money laundering, while ensuring they do not inadvertently hinder blockchain development.

- Fostering a supportive regulatory environment that encourages innovation and experimentation while safeguarding consumer protection and market integrity.

c) Research and Education:

- Investing in research and education programmes focused on blockchain and distributed ledger technologies to cultivate a skilled workforce and attract talent.
- Creating test environments and funding mechanisms to support DLT projects, particularly those involving small and medium-sized enterprises.

d) International Cooperation:

- Collaborating with European partners through initiatives such as the European blockchain services infrastructure to strengthen involvement in blockchain development.
- Coordinating international activities related to blockchain within organisations like the OECD, ISO, and EU to ensure alignment with global standards.

e) Awareness and Promotion:

- Increasing awareness of Czechia as an attractive destination for DLT projects through international conferences and promotional activities.
- Developing an action plan for decentralised technologies to guide future initiatives and coordinate efforts across government agencies and international partners.

(Source: [Česká FinTech asociace, z.s. Blockchain Republic Institute, z.ú.: Potenciál decentralizovaných technologií pro rozvoj české ekonomiky](#))

What does the future hold for the Czech blockchain and cryptocurrency ecosystem?

The future of the Czech blockchain and cryptocurrency ecosystem holds significant potential for economic growth and technological advancement. By leveraging decentralised technologies in conjunction with automation and digitalisation, the Czech economy could experience a substantial increase in productivity, GDP, and wages. Key sectors, such as trade, transportation, and industry, which account for a significant portion of the Czech economy, stand to benefit from the adoption of DLT platforms to enhance automation and efficiency. Moreover, with automation projected to impact a significant portion of job roles in various industries, Czechia's open economy presents opportunities for companies to stay competitive by embracing DLT systems. By embracing these technologies, Czechia can address labour shortages and position itself as a key player in modern business and transportation networks. (Source: [Česká FinTech asociace, z.s. Blockchain Republic Institute, z.ú.: Potenciál decentralizovaných technologií pro rozvoj české ekonomiky](#))

Key Figures

51+

Dedicated blockchain solution providers

222m

Total funds raised.

1.16%

Population that owns crypto

The Danish blockchain ecosystem at a glance

Denmark has been progressive by establishing strong foundations for the mainstream adoption of blockchain technology. Such initiatives are not just limited to attracting new startups, but also focus on the use of the technology in governmental operations, too. As described by the Ministry of Foreign Affairs of Denmark: 'A buzzing ecosystem of startups is bringing blockchain to practical application in e.g. finance, where FinTech is delivering savings and improved transactional experience. Danish universities complement the early-stage application, by bringing world-class research to the domain of the blockchain technology.'

The country is constantly achieving high ratings in the Digital Economy and Society Index (DESI Index) and is amongst the global leaders in digitalisation. The DESI index is a composite metric that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU Member States in digital competitiveness.

Denmark is one of the few countries for which comprehensive research has been done on the economic impact of blockchain on the Danish industry and labour market. The report is a joint achievement of the European Blockchain Centre at the IT University of Copenhagen, the Fraunhofer Institute for Industrial Engineering, the Confederation of Danish Industry, Statistics Denmark and the Danish Industry Foundation. It focuses on the application of blockchain technologies in different industry sectors in Denmark.

The survey conducted by Statistics Denmark had a 44% response rate from a total of over 3,000 interviewed corporations and organisations. The outputs of the survey demonstrate a dynamic potential for the adoption of blockchain activities within the Danish industry and market. The most prominent blockchain related sectors include FinTech, the professional services industry, IT, and the maritime shipping and transportation industries. According to the report, and despite the fact that there are only very few blockchain initiatives in the Danish banking and insurance industry, the FinTech and blockchain startup scene in Denmark is nevertheless quite active. Furthermore, the report noted that around 15% of large companies and 12% of medium-sized companies use blockchain technology. The greater Copenhagen region appears to host quite a large number of startups and established companies involved in blockchain activities.

The Danish blockchain ecosystem is currently grouped into four general business groups: FinTech, the professional service industry and IT, and the maritime shipping and transportation industry.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

In October 2018, during the International Anti-Corruption Conference (IACC), the Danish government, through the Ministry of Development Cooperation, published a report that highlighted the importance of blockchain technology in combating government corruption. The government trusts that the digitalisation of public services and procurement through blockchain technology can facilitate transparency in the administration of financial transactions and land ownership, while averting corrupt practices in governmental institutions. According to Ulla Tørnæs, the Minister for Development Cooperation: 'With digital technologies, we now have new tools to fight corruption. With this report, we wish to start a discussion about potentials and dilemmas. On the one hand, there are enormous possibilities and on the other hand, we should not forget the risk that comes along with them.'

The Danish state-owned energy company, Energinet, has examined how to use Iota Tangle to develop IoT-based products and services. The two entities have been working together on a data marketplace initiative since late 2017.

In line with the digitisation efforts of the maritime industry, the DMA created a project in 2017 that uses blockchain to register ships by owners. Around 6,000 ships are registered in the Danish shipping register, and they all had to be handled manually up until now ([Smart Maritime Network](#)).

Legislation of blockchain

Cryptocurrencies are acknowledged as a valid means of payment in Denmark but are not recognised as currency or legal tender. The government has established transparent and comprehensive regulations to safeguard both consumers and businesses participating in cryptocurrency transactions (see article).

Overall, Denmark is considered friendly to cryptocurrencies and blockchain, with the Danish Central Bank reportedly contemplating a blockchain backed E-Krone. As reported by [CoinTelegraph](#), one of the key concerns arises when failing to anonymise a currency, introducing concerns if the central bank should monitor and track the transactions of its people.

Digital currency legislation that applies to blockchain

According to the industry's media references, the Denmark Tax Authority has been authorised by the country's Tax Council to obtain information from three domestic crypto exchanges. On another note, Denmark-based cryptocurrency users have received letters from the Danish Tax Agency requesting traders to submit a full list of their cryptocurrency transactions for the fiscal years 2016-2018 with respect to first in first out principles.

Blockchain in academia

Universities in Denmark have identified the need for education at all levels, especially at the executive level, as evident by their academic offerings.

The University of Copenhagen: The university offers an 'Introduction to Blockchain Technology' with a subsequent focus on the hands-on implementation of a blockchain prototype. Students engage in a 'blockchain summer of code', 4 weeks of software development where they have a solid introduction to state-of-the-art blockchain technology, followed by the implementation of a prototype in a team to solve a real-world problem using blockchain technology. Examples of potential projects are contract management languages, identity (know-your-customer, data mining), reporting, and applications such as backup, bill of lading, and resource tracking. Each team can choose a blockchain platform (e.g. the Ethereum network or R3 Corda) that is suitable for the particular use case.

[Blockchain Summer School](#): Organised by the European Blockchain Centre, the summer school is a collaboration between the IT University of Copenhagen, the University of Copenhagen, and the Copenhagen

Business School. The summer school premiered in 2016 as the first of its kind in the entire world. Since then, blockchain technology has become significantly more mature, providing new challenges for the participants to work on, says Roman Beck, professor at ITU and head of the European Blockchain Centre.

[ITU research – tools to investigate crypto crime](#): A new research project at the ITU aims to develop new methods that will allow authorities to investigate suspicious transactions, while at the same time guaranteeing anonymity for law-abiding users. Bernardo Machado David, associate professor in the Department of Computer Science at the IT University of Copenhagen, has received DKK 2.9 million from Independent Research Fund Denmark for a research project that may pave the way for a wider implementation of cryptocurrencies.

The project enables authorities to investigate suspicious crypto transactions while solving another fundamental problem: securing the anonymity of law-abiding users.

[Aarhus University – Concordium Blockchain Research Centre](#): The Swiss non-profit behind the Concordium blockchain network announced the establishment of the Concordium Blockchain Research Centre, in partnership with Aarhus University's Department of Computer Science. The Centre's mission is to provide the foundational research to support the development of energy-efficient, scalable blockchains that are provably secure. The Concordium Blockchain Research Centre's goal is to build on decades' worth of research to create new blockchain technologies. The Centre will focus on areas such as consensus protocol efficiency, sharing and state-flattening, as well as new cryptographic techniques supporting privacy-preserving identification, KYC, and AML, better zero-knowledge techniques and formal verification of smart contracts.

[Blockchain Academy Network](#): A new research project at the Department of Engineering has received a total of EUR 0.9 million in funding from the Danish Industry Foundation to help Danish companies. Called the Blockchain Academy Network, the project aims to bring together Denmark's brightest minds in blockchain technology to teach and advance the Danish business community, organisations, and the political system so that they can better understand the technology's opportunities and challenges.

Blockchain across key industries

An empirical analysis based on a comprehensive survey amongst Danish companies was performed in January and February 2019. The goal was to gain insight into the current assimilation state of blockchain technologies in Denmark, as well as of drivers and hurdles to future developments.

The selection of the specific sample and the implementation of the survey were carried out by Danmarks Statistik, the Danish national statistics office. From the national industry register, 28 sectors were selected for the survey and clustered into six groups, namely trade, information and communication, transportation, knowledge-based services, manufacturing, and financial and insurance. These six sectoral groups comprise the most important private industries in Denmark. The data sample, with a response rate of over 44% of the 3,000+ companies surveyed, allows for a very robust empirical analysis of the innovation dynamics and blockchain activities within Danish industry.

Some of the key insights are [outlined here](#):

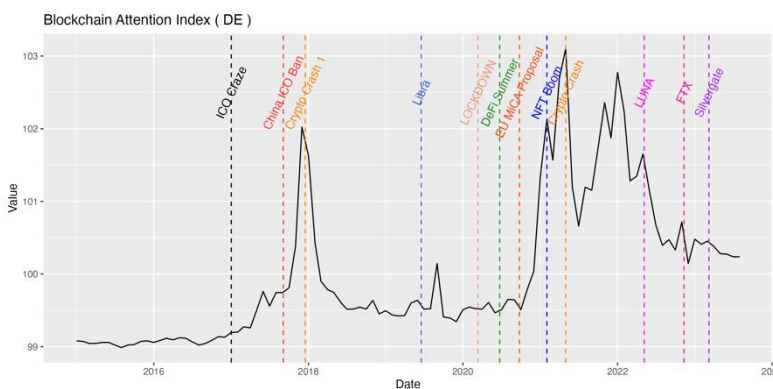
The financial services industry had the most knowledge about blockchain, with around 77% reporting to have experience with it. However, a similarly high percentage was found for the information and communication technology sector in Denmark. At the same time, the logistics and shipping industry has taken great interest in implementing use cases to showcase how the shipping industry could benefit from blockchain by registering and issuing certificates on blockchain.

There are two major blockchain initiatives in the supply chain industry: Tradelens, with the bill of lading on blockchain, and Blockshipping, improving the turnaround and management of containers to reduce costs. Considering Denmark's advanced maritime industry and long history, it is fair to assume that more initiatives in this domain will increase.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

An overview of the Danish blockchain cluster illustrated that most blockchain-related entities identified can be classified into three main sectors: FinTech, the professional service industry and IT, and the maritime shipping and transportation industry. According to the Crunchbase database, 51 blockchain startups operate in Denmark. This list is not exhaustive, since major endeavours and blockchain startups, such as Chainalysis, Blockshipping, and MakerDAO were established in Denmark, but are registered in countries outside Danish territory.

THE BLOCKCHAIN COMMUNITY



The Danish blockchain ecosystem is prominent, featuring high-growth opportunities due to the active engagement opportunities of the scene and the large number of organisations advocating to support the blockchain technology. However, only a small portion of the Danish population has used crypto-assets for payments and investments, and therefore, there are limited interconnections between the traditional financial sector and the crypto-assets

market.

Large blockchain related events are also organised in Copenhagen, such as the [Nordic Blockchain Conference](#) on 19 and 20 June 2024, with more than 100 speakers from the Nordic blockchain industry. Another event will be the [ACSIT 2024](#) to be held on 27 April 2024, which will discuss blockchain related topics and more (Big Data, Distributed systems, IoT, etc).

Notable blockchain companies

[Sepior](#): enables trust in online financial transactions and enterprise data protection applications, such as cryptocurrency custodial wallets, public or private blockchains, and cloud-based SaaS offerings, using threshold-based multiparty computation (MPC).

[Partisia](#): pioneering privacy preserving software solutions with multiparty computation and blockchain technology.

[Northstake](#): secure and compliant digital asset investments for institutional investors.

[Coinify](#): helps businesses accelerate growth by accepting cryptocurrency payments and buying crypto.

[Januar](#): a provider of infrastructure for cryptocurrency businesses.

[NewBanking](#): a company founded in 2015 to provide a user identity platform that allows end users to verify their identity easily and securely across businesses, while having control and ownership of their data and identity online. The platform also solves the regulatory challenges that financial institutions face, especially in regards to the 4th European Anti-Money Laundering (AML) directive and the General Data Protection Regulation (GDPR), amongst other relevant regulatory legislation.

[Clearhaus Holdings](#): as the parent company of the Clearhaus Group, Clearhaus A/S performs its operational activities. It is a payment institution regulated by the Danish Financial Supervisory Authority, as well as a Visa and Mastercard principal member that offers payment solutions to e-commerce across Europe. The company has managed to reduce friction in online payments by offering a fast sign-up online, using modern technology in the form of developed APIs and assisting merchants through a dedicated support team.

[Aryze](#): issues fully redeemable stable coins backed by and pegged to traditional assets. By creating the bridge between conventional fiat money and digital cryptocurrencies, it aims to be the primary payment infrastructure, enabling individuals, businesses, and IoT devices to make instant payments globally in a modular ecosystem with no transaction fees. MAMA is the name of its multi-asset wallet application, which will allow users to send, receive, and store currencies with near-zero transaction fees.

[Nets](#): a provider of payments, credit and debit cards, and information services. It helps financial institutions, businesses, and merchants make tomorrow a little easier for customers while providing unrivalled security and stability. Turning a complex reality into easy, intuitive, and customer-oriented solutions and guarantees, it remains a reliable hub of the payments industry by building on unmatched connectivity. It was founded in 2003 and is based in Ballerup.

[InPAY](#): delivers real-time cross-border transactions in 60+ countries. This enables customers across the banking, travel, B2B, and financial services sector to improve efficiency, reduce costs, and create new revenue streams.

[AMAZIX](#): operates as a turnkey crypto-consultancy firm with a large and rapidly growing client base.

Key Figures

375+

Dedicated blockchain solution providers

407m

Total funds raised.

1.86%

Population that owns crypto

The Estonian blockchain ecosystem at a glance

Between in 2017 and 2018, Estonia facilitated the advancement of the European blockchain ecosystem by being the first country to embrace clear legislation for blockchain and digital assets. Moreover, the country's existing digital infrastructure, receptive culture to new technologies, e-Residency programme allowing for business registering remotely, and low corporate tax served as a bedrock for the establishment and developed of a blockchain ecosystem in the country. Specifically, almost 2,000 digital assets licences were granted to virtual asset service providers by 2019.

The country has since backtracked on its receptive attitude towards blockchain and cryptocurrency initiatives from the private sector. New legislation expanding the definition of virtual asset service providers, [coupled with AML requirements, the revocation of over 1,000 licences](#) from crypto companies, and regulators calling for the [revocation of all licences](#) have discouraged private blockchain and cryptocurrency activity in the country.

However, Estonia remains a proponent of public sector initiatives. The country uses a highly scalable, privacy-focused [keyless signature infrastructure \(KSI\) Blockchain](#) developed in the country, which is also used by NATO and the US Department of Defence. Today, healthcare, property, business, and succession registries, along with the state gazette and the country's digital court system, are largely powered by this KSI blockchain. e-Estonia's backbone is a state-backed solution known as 'X-Road', also implemented by Finland, Azerbaijan, Namibia, and the Faroe Islands. X-Road facilitates data transfers between public and private databases and, [while officially not a blockchain](#), shares many of the same principles, including a decentralised architecture, immutability, high security, standardisation, and availability. Additionally, besides examining the launch of its own CBDC in the past, the Bank of Estonia [finds 'Unlimited' potential in the Digital Euro](#).

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

Verified digital identities in the form of digital signatures, X-Road, and the e-Residency programme, largely paved the way for 'blockchain' use in the country. Estonians and e-Residents can use their electronic identifications (e-IDs) as an all-in-one solution to interact in a cryptographically verifiable way with authorities online, with only marriage, divorce, and real-estate transactions requiring physical presence. X-Road, a technology that draws from blockchain, enables secure internet-based data exchange between information systems, whether private or public.

The blockchain-enabled e-Residency programme has proven a significant facilitator of blockchain business activity in the country. It allows anyone to start and manage an EU-based company completely online. [Estonia's e-Residency site](#) is also home to a marketplace of services in the areas of virtual offices, finance,

tax, law, and payment/banking. The combination of the country's digital ambitions, the ease with which one can start a business remotely, coupled with clear digital currency legislation, constitute a compelling case for aspiring entrepreneurs, digital nomads, and businesspeople active in the blockchain space.

Digital currency legislation that applies to blockchain

Estonia was the first European country to provide clear regulation and guidelines for digital currencies. Estonian law recognises digital currencies as 'value represented in digital form that is digitally transferable, preservable, or tradable, and that natural persons or legal persons accept as a payment instrument.' However, digital currencies are not considered legal tender and do not otherwise possess the legal status of money. The country was the first European state to adopt the [5th Anti-Money Laundering European Directive](#) to subject digital currency exchanges and custodian wallet providers to anti-money laundering and counter terrorism financing regulation. Additionally, the [Estonian Money Laundering and Terrorist Financing Prevention Act](#) defines cryptocurrencies and introduces safeguards to prevent illicit activity.

On 15 March 2022, changes to the Estonian Money Laundering and Terrorist Financing Prevention Act (RahaPTS or MLTFPA) were implemented. These adjustments refine and modify the existing process for licence applicants, especially for virtual currency service providers.

Estonia's Financial Intelligence Unit (FIU) [announced](#) that, following the amendments to the Money Laundering and Terrorist Financing Prevention Act that took effect on 15 March 2022, the validity of 389 authorisations for providing virtual asset services in the country has expired, effectively reducing the number of active virtual asset service providers (VASPs) to 100. The [main amendments](#) relate to various aspects, such as the magnitude of the company's share capital, the existence of personal funds, stipulations for a contact person, restrictions on management board membership (a single individual can only serve as a board member in two virtual currency companies), and enhanced criteria for higher education and professional experience, among other things. In addition, the state fee associated with evaluating the application for a virtual currency provider's activity has been increased.

In terms of digital currency taxation, as is the case in most countries, their use is VAT exempt. Tax liability arises only when cryptocurrency is converted into fiat, exchanged for another cryptocurrency, or used to pay for goods and services. Digital currencies are treated as property when it comes to personal income tax purposes and thus their exchange is subject to a capital gains tax of 20%.

Blockchain in academia

Despite the prominent blockchain ecosystem in the country, only a few relevant academic courses or professional qualifications could be identified. More specifically, the University of Tartu (UT) recently conducted a research seminar on cryptography and cybersecurity. It has also launched the BLISS – Blockchain Skills for ICT Professionals project and the BlockNet – Blockchain Network Online Education for Interdisciplinary European Competence Transfer project, both focused on the subject of blockchain technology applications. UT is also a consortium member of [CHAISE](#), a project aiming to develop a strategy and curriculum to teach people about blockchain. Moreover, the Tallinn University of Technology (TALTECH) offers an MSc in Cybersecurity, which includes the subject of cryptography.

Blockchain across key industries

The Estonian Investment Agency (EIA) invites investors and entrepreneurs to use the country's established digital infrastructure in order to invest or start a business in the country focusing on any of those areas. The [agency's website](#) explicitly lists blockchain as a facilitator under the categories of FinTech, Cyber-Security, Industrial Digitalisation/Industry 4.0, Blockchain and Blockchain-as-a-Service, and e-Health

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The state's actions and its adoption of what was seemingly a blockchain-friendly regulatory framework, the country's e-Residency programme, in combination with a [marketplace of service providers](#) to facilitate establishing a company online, are largely responsible for attracting thousands of blockchain entrepreneurs from all over the world. By 2019, approximately 1,500 digital assets licences were issued by the [Estonian Financial Intelligence Unit \(EFIU\)](#), with hundreds of other companies active in the blockchain industry without requiring one. Due to the ease of setting up a company and obtaining a digital assets licence until recently, it is impossible to pin down the exact number of active businesses and startups in the space, as many of them were registered, issued a licence, and never operated. The task of quantifying active blockchain businesses is complicated further by recent licence revocations.

The sharp increase in blockchain companies established between 2017 and 2018 was followed by an equally sharp decline, a result of the aforementioned adjustment in policy. Estonia-based blockchain businesses have collectively raised a total of EUR 285 million through a combination of traditional financing and ICOs. Most companies (37%) have received over EUR 16 million in total funding. They are closely followed by companies that have received between EUR 1 and 15 million (33%) and under EUR 1 million (30%).

Activities are concentrated in the financial services sector, which accounts for 60% of blockchain businesses. 7% of businesses are active in commerce and shopping, 5% in IT, and 5% in apps. Other sectors include AI, advertising, and gaming.

THE BLOCKCHAIN COMMUNITY

Estonia's remote and digital-first approach was catalytic in shaping the local blockchain community, or lack thereof. While the general public is interested in transformative technologies, and the number of registered companies is high, no prominent official or unofficial enthusiast groups or communities of practice could be identified, as Estonia constitutes primarily a 'virtual' home for most of the businesses. Some community initiatives exist in the form of local discussion groups, but they do not qualify as a quantifiable sample.

Key Figures

41+

Dedicated blockchain solution providers

57m

Total funds raised.

1.51%

Population that owns crypto

The Finish blockchain ecosystem at a glance

Finland was one of the early adopters of blockchain technology, evident from the fact that Europe's first Bitcoin ATM was installed in Helsinki, the capital of Finland, in December 2013.²³ The country is home to several funded Web3 startups, including Membrane Finance, a FinTech firm that launched an EU-regulated stablecoin named EUROe.²⁴ In 2015, the Finnish Immigration Service partnered with a Helsinki-based startup to use blockchain to support refugees and asylum seekers.²⁵ However, a recent survey by the Finnish Information Society Development Centre (TIEKE) has shown that opportunities offered by blockchain technology are not yet widely recognised.²⁶

Finland has a small but robust and growing blockchain sector, as evident from the increasing number of applications to register as blockchain service providers with the country's financial regulator, Finanssivalvonta (Financial Supervisory Authority, or FIN-FSA).²⁷ Nine per cent of the Finnish population has invested in cryptocurrencies,²⁸ bringing the country into the lower rungs of the EU. Profits from investments are taxed at 30-34%, and mining income is taxed up to 31.25%.²⁹

The country has a strict but favourable regulatory environment towards cryptocurrencies and blockchain technology.³⁰ There are specific rules for virtual asset service providers (VASPs) under the Act on Virtual Currency Providers of 2019,³¹ which makes it mandatory for them to be registered with FIN-FSA. There have been a growing number of blockchain- and cryptocurrency-related projects and startups driving market development.

TOWARDS MAINSTREAM ADOPTION

Regulation

²³ Source: <https://www.coindesk.com/markets/2013/12/18/europes-first-bitcoin-atm-installed-in-finland/>

²⁴ Source: <https://theFinTechtimes.com/finnish-FinTech-unveils-eu-regulated-euroe-stablecoin/>

²⁵ Source: <https://reliefweb.int/report/finland/how-finland-using-blockchain-revolutionise-financial-services-refugees>

²⁶ Source: <https://tieke.fi/en/boosting-circular-solutions-with-blockchain/>

²⁷ Source: <https://www.finanssivalvonta.fi/en/financial-market-participants/banks/FinTech--financial-sector-innovations/virtuaalivaluutan-tarjoajat/frequently-asked-questions-on-virtual-currencies-and-their-issuance-initial-coin-offering/>

²⁸ Source: <https://www.visualcapitalist.com/cp/crypto-popularity-in-europeans-union-nations/>

²⁹ Source: <https://divly.com/en/guides/crypto-taxes-finland>

³⁰ Source: <https://cathcarttechnology.com/insights/how-finland-is-leading-the-charge-in-FinTech/>

³¹ Source: <https://www.finanssivalvonta.fi/globalassets/fi/FinTech/virtuaalivaluutat/sk20190572.pdf>

Finland has specific regulations for virtual assets designed to support the detection of suspicious activities and transactions. Section 4 of the Act on Virtual Currency Providers of 2019 makes it obligatory for VASPs in Finland to register with FIN-FSA and obtain the regulator's authorisation before providing virtual asset services or issuing virtual currencies. The regulations, however, are in early stages³² and the definition of what constitutes as virtual currency is also considered imprecise by many.³³ FIN-FSA also launched an Innovation Help Desk in 2019 to advise FinTech businesses on authorisation, registration and licence matters.³⁴

Government initiatives

The Finnish government has been actively involved in the blockchain field since 2015 and has been supporting funding and trials for different initiatives, including working towards strengthening EU-wide regulatory environment. The Bank of Finland (the central bank) has been actively involved in the development of the digital euro, the European Central Bank's CBDC.³⁵ In January 2023 Finland's communications minister also urged the EU to develop legislation to govern DAO.³⁶ The law enforcement agencies are equipped to handle crypto-related cases, and in 2022 the Finnish customs sold around 1,890 bitcoins seized during drugs-related investigations for EUR 46.5 million, with the proceeds donated for humanitarian aid for Ukraine.³⁷

Since 2015, the country's immigration department has explored linking the digital identities of refugees and asylum seekers with prepaid Mastercards to better track their spending needs and other requirements in an anonymised way. In 2018, the governmental authorities worked with private companies to jointly develop a 'blockchain technology-based business network that enables establishing limited liability companies fully digitally'.³⁸ In the same year, the government also conducted two blockchain-based pilot projects, first to track production chains and reduce unemployment and second to implement smart logistics as part of Finland's corridor as a service (CaaS) ecosystem.³⁹ The government has also commissioned a project to evaluate how blockchain and smart contracts can support social and healthcare reforms.⁴⁰

Cryptocurrencies

As previously mentioned, 9% of the Finnish population have invested in virtual assets. The central bank views them as high-risk assets and has issued warnings about them. There are few stores or businesses that accept crypto payments. The cryptocurrency market revenue is projected to be EUR 125 million for 2023.⁴¹ Virtual assets are subject to 30% capital gains tax up to EUR 30,000, after which the rate goes up to 34%. Bitcoin mining capacity stands at 40MW in 2023, generating only 0.3% of Bitcoin's hashrate.⁴²

Businesses

While most traditional players have been reluctant to enter the blockchain sector, some FinTech labs of major players are exploring the opportunities that blockchain technology provides.⁴³ Northcrypto and Coinmotion are well-known Finland-based cryptocurrency exchanges. The country is also home to several successful startups

³² Source: <https://www.finanssivalvonta.fi/en/publications-and-press-releases/annual-reports/annual-report-2021/themes/crypto-assets-attract-investor-interests--risks-to-be-reined-in-through-regulation/>

³³ Source: <https://www.sitra.fi/app/uploads/2023/02/sitra-6-and-1-recommendations-for-finland.pdf>

³⁴ Source: <https://www.finanssivalvonta.fi/en/FinTech--financial-sector-innovations/innovation-help-desk-advises-on-licence-issues/>

³⁵ Source: <https://bittiraha.fi/digieuron-kehittamisen-seuraava-vaihe/>

³⁶ Source: <https://www.coindesk.com/policy/2023/01/17/finnish-minister-calls-for-eu-law-to-recognize-daos/>

³⁷ Source: <https://yle.fi/a/3-12545017>

³⁸ Source: <https://www.tietoenvy.com/en/newsroom/all-news-and-releases/press-releases/2018/05/blockchain-technologies-enable-new-businesses-to-have-a-fully-digital-identity/>

³⁹ Source: <https://www.financemagnates.com/cryptocurrency/news/finland-partners-esentia-one-build-blockchain-solutions-logistics/>

⁴⁰ Source: <https://www.lidonation.com/index.php/es/proposals/blockchain-innovation-hub-finland-f8>

⁴¹ Source: <https://www.statista.com/outlook/fmo/digital-assets/cryptocurrencies/finland>

⁴² Source: <https://hashrateindex.com/blog/bitcoin-mining-around-the-world-finland/>

⁴³ Source: <https://practiceguides.chambers.com/practice-guides/FinTech-2023/finland/>

working in the blockchain industry, like Membrane Finance, well known for launching the EU-regulated EUROe stablecoin, and Phaver, a Web3 social platform that recently secured USD 7 million in seed funding. On the other hand, some businesses, for example Suomen Autokiertäys, a car scrapping company, evaluated and decided against using blockchain technology as it offered limited benefits.⁴⁴

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

There are many startups active in Finland that work on blockchain technology. Despite the country being a major FinTech player and a having favourable regulatory environment, the number of firms working on digital assets and blockchain remain relatively small,⁴⁵ as also reported by FIN-FSA in April 2022.⁴⁶ There are strict rules that govern the crypto sector, such as only Finland-registered businesses are allowed to market virtual currencies and related services in the country.⁴⁷

Finland is one of the founding members of the European Blockchain Partnership, which focuses on using blockchain technology for public services, and the country has partnered with businesses to test various solutions. However, as Finnish regulations are mostly designed to prevent money laundering, there is no specific set of rules for the Web3 industry. Companies working in the blockchain and Web3 space have been demanding regulations to support responsible development of the sector.⁴⁸

The regulator launched the Innovation Help Desk in 2019 to advise startups on authorisation, registration, and licensing, though it caters to the FinTech sector in general and not specifically for the crypto industry. The government has set up initiatives and supports innovation through grants and directly working with startups to implement blockchain-based solutions. Examples include partnership with MONI, an online payments startup, to support digital payments to refugees; and with Essentia, a decentralised interoperability protocol, to implement smart logistics.

Finland is also home to some well-known crypto exchanges, like Northcrypto and Coinmotion, which are authorised by FIN-FSA. Coinmotion also received authorisation in Spain in January 2023. LocalBitcoins, a famous P2P Bitcoin exchange that recently shut down, was launched in Finland in 2012. There are several other Finland-based startups, like Membrane Finance, Phaver, SPYCE.5, and Kleoverse that have received millions of euros in seed funding.

Apart from startups, there are also established businesses that are working on blockchain-related projects. Notable firms include Suomen Asiakastieto, a major business and consumer information provider, Nordea and OP Financial, both banking giants, and Tieto, an IT company. VTT Technical Research Centre of Finland Ltd is a state-owned research and technology company that is working on blockchain research projects.⁴⁹

THE BLOCKCHAIN COMMUNITY

Finland's blockchain community includes several startups, established businesses, and developers as well as enthusiasts and is quite active in terms of meetups and conferences. Finland also has an established gaming

⁴⁴ Source: <https://tieke.fi/en/boosting-circular-solutions-with-blockchain/>

⁴⁵ Source: <https://cathcarttechnology.com/insights/how-finland-is-leading-the-charge-in-FinTech/>

⁴⁶ Source: <https://www.finanssivalvonta.fi/en/publications-and-press-releases/supervision-releases/2022/thematic-review-of-the-use-of-new-technologies-and-related-risks/>

⁴⁷ Source: <https://www.finanssivalvonta.fi/en/publications-and-press-releases/Press-release/2021/virtual-currencies-may-only-be-marketed-in-finland-by-providers-registered-here/>

⁴⁸ Source: <https://www.sitra.fi/en/blogs/web-3-0-regulation-would-boost-fairer-development-of-the-sector/>

⁴⁹ Source: <https://www.vttresearch.com/en/news-and-ideas/vtt-moves-public-blockchains-streamr>

and game development community, which is enthusiastic about blockchain as a technology that offers new avenues for the sector.

Blockchain Forum Finland has been a major forum promoting collaboration and development in the blockchain sector. It was established in 2017 and has seen continued growth to become more community-based and open. The Blockchain Forum and the City of Helsinki partnered up in 2021 to launch the Helsinki Blockchain Centre, which now serves as a hub for distributed ledger technology development in the country.⁵⁰

Blockchain Innovation Hub Finland serves as a testbed for blockchain-powered cross-sectional solutions. It does so by bringing together creative problem solvers with different backgrounds and partnering with the existing blockchain research and technology ecosystem to ensure blockchain adoption and use for real-world value creation. It also collaborates with Blockchain Forum Finland and the Helsinki Blockchain Centre to organise monthly face-to-face innovation meetups.⁵¹

Web3 Summit Helsinki organises annual summits and other events for blockchain and crypto enthusiasts in the country, where they bring together experts and thought leaders to discuss developments, challenges, and opportunities in the sector. Open Protocol Helsinki is another annual Web3-only conference, which sees participation from hundreds of crypto enthusiasts over two days.

⁵⁰ Source: <https://www.linkedin.com/company/blockchainforum-eu?originalSubdomain=fi>

⁵¹ Source: <https://www.lidonation.com/fr/proposals/blockchain-innovation-hub-finland-f8>

Key Figures

410+

Dedicated blockchain solution providers

2b

Total funds raised.

5.90%

Population that owns crypto

The French blockchain ecosystem at a glance

France remains at the forefront of blockchain adoption across the European Union, with numerous initiatives across the private and public sectors to advance the adoption of the technology. In particular, the country has worked to position itself as a blockchain hub, with clear policies regarding crypto assets for financial services, as well as hosting several large conferences and events such as Paris Blockchain Week and the Ethereum Community Conference.

However, there have been some protests from policymakers regarding delays in legislation who claim that this has stifled growth within the Web3 sector more broadly. Though France remains at the lead of blockchain technology adoption in many ways, the general downturn in the overall Web3 marketplace, particularly in NFTs, has proved challenging, though there remains significant overall commitment.

TOWARDS MAINSTREAM ADOPTION

Regulation and Policy

The French influence on the Markets in Crypto Assets regulation, which came into effect in 2023, can be seen in French legislation regarding crypto assets issued long before and shaping much of the regulation itself. France's proactive stance on legislation has borne fruit, as many crypto asset businesses have sought to place their EU headquarters there. In this regard, French policymakers hold a mature view of crypto assets, though they frequently lament that the passing of legislation cannot maintain pace with technical developments.

French officials have also criticised delays in with the US Securities and Exchange Commission's failure to provide clarity. That is not to say it has been all smooth sailing; several investigations have been launched into crypto asset and blockchain businesses over money laundering and privacy concerns at Binance and WorldCoin respectively. Furthermore, French policymakers have been proactive in clarification regulations for decentralised finance, DAOs and NFTs. Perhaps the most interesting has been France's creation of a 'Responsible Influence Certificate', initially introduced in 2021 but now amended to include a special course for financial influencers, advertising equities, bonds, exchange-traded funds, funds, derivatives, and other investment products, such as crypto assets.

Blockchain and Industry

French use of blockchain across the private sector continues to grow, with several announcements regarding the use of blockchain technology for cross border payments from Societe Generale, a major bank, and Banque de France (BdF, the central bank), which praised distributed ledger technology as a key enabler of wholesale central bank digital currencies (wCBDCs). Remarks from the BdF specifically noted the interoperability of DLT systems as a way of easing cross-border friction. Furthermore, Project Mariana, an initiative between BdF, the Monetary Authority of Singapore, and the Swiss National Bank tested cross-border trading and settlement of

hypothetical euro, Singapore dollar, and Swiss franc CBDCs between simulated financial institutions using decentralised finance (DeFi) technology concepts on a public blockchain.

Whilst the majority of DLT related activities in France remain centred around the provision of financial services, a growing market of Web3 companies has appeared in France, with many projects taking advantage of financial incentives and the legal clarity.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

France is home to many mature blockchain related businesses, fostered through its intelligent and forward-thinking policies on regulation, as well as an overall embrace of the technology. Many international companies that provide or use blockchain services have since established their European headquarters in France, including Binance, the world's largest crypto asset exchange. Though there has been much success in attracting businesses from across the industry, the journey has not been entirely smooth, with a major investigation into 'aggravated money laundering' practices by French authorities at Binance. Whilst this may appear to be a shortcoming, in fact it shows France is a competent regulator and is willing to reign in excesses.

With a rich history of art patronage, it is little surprise that many French startups sought to take advantage of the NFT market by providing content or marketplaces. Furthermore, most likely driven as a byproduct of France's more established large gaming studios, several Web3 gaming companies have established operations.

Notable Blockchain Firms include:

Cometh.io: offers a Web3 development platform empowering developers to build Web3 games and DApps with ease.

Ledger: a French company known for its hardware wallets and security solutions for cryptocurrencies and blockchain technology. They offer products like Ledger Nano S and Ledger Nano X, which are designed to securely store and manage digital assets like Bitcoin and other cryptocurrencies.

FlowDesk: provides a trading infrastructure for market making and other crypto-financial services.

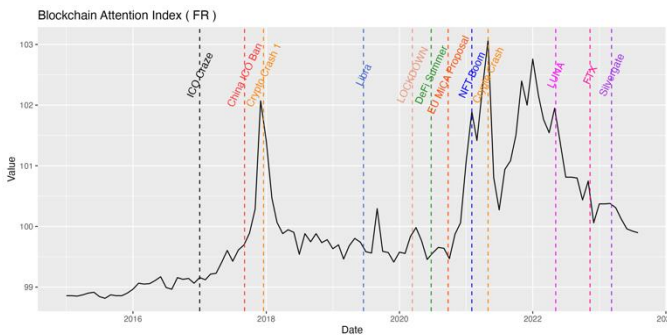
ZetaChain: both an L1 blockchain and a smart contract platform with built-in connectivity to all blockchains. It is the only public blockchain with smart contracts that can manage assets, data, and liquidity on any chain, even Bitcoin.

Sorare: a fantasy sports gaming experience and marketplace, featuring officially licensed digital player cards. With Sorare, you build legacy teams buying, selling, collecting, and trading player cards and compete with them in fantasy games to win rewards week over week and season over season, just like a professional sports owner.

Cohort: a digital advertising agency that partners with brands to enable a Web3 experience, for example, creating NFTs of items of clothing, and customer reward programmes.

Ariane: a blockchain-based platform that aims to provide a digital passport for valuable items, including luxury goods, collectibles, and high-end fashion. The platform uses blockchain technology to create a unique, tamper-proof digital identity for these items.

THE BLOCKCHAIN COMMUNITY



France’s thriving digital development community has led itself to have an equally large pool of blockchain developers and enthusiasts. Unsurprisingly, much of the French tech community is centred around the nation’s capital, Paris, and to a lesser extent, Marseille. Further to this, a growing number of enthusiast events, including Paris Blockchain Week, are seen as ‘must attend’ for international organisations, more so than in other EU states. Several industry groups now exist within France to champion the

use of the technology, including, Alliance Blockchain Professionals, and the association Blockchain for Good.

INSIGHTS FROM EXPERTS

Marina Niforos, affiliate professor, HEC Paris

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in France?

France is a sophisticated market with a high level of awareness regarding blockchain applications. It is also the home of a series of highly visible international conferences and developer community events (Paris Blockchain, ETHCc), bringing together global and local actors.

A ADAN/KPMG study found that nearly one in ten French people own crypto, and more than a quarter may acquire them in the next few years, representing a significant increase of 20% on the previous year and confirming the growing interest of the French in digital assets despite a tumultuous year in 2022 for the financial markets and the crypto-asset sector.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in France?

A fairly dynamic and robust ecosystem supported by an ex-ante regulatory system closely modelled on the European regulatory regime of MiCA, allowing for deployment across Europe.

According to the data firm Toluna, 10% of French adults currently own crypto assets, while 24% plan to buy, sell, or trade crypto in the next 12 months.

France has been positioning itself as a global tech hub with leadership in deep tech (mostly artificial intelligence and cloud computing but also Web3). The country has committed EUR 34 billion (USD 36.5 billion) for investments, including subsidies and state funding, over five years as part of its France 2030 plan.

In addition to regulatory predictability and healthy capital flows, France has also emerged as one of the top countries attracting blockchain talent, ranking sixth in the world for the most blockchain developers per country.

Decentralised finance (DeFi) protocols have significantly increased, with numerous innovative projects and platforms emerging across various sectors (Morpho Labs, Swaab Lab, Paladin, Mangrove, Dusa Labs, Atlendis and others).

What measures has France taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Public Financing: the French state-owned bank, BPI, has played a major role in the development of the tech ecosystem and has a specific pillar dedicated to blockchain projects. They have injected around EUR 80 million into the ecosystem, either through direct investments or through other funds. They still have 60 million to deploy. From their market survey, there are approximately 420 companies in the blockchain/crypto space, of which BPI has financed around 40%, covering NFTs, gaming, custodial wallets, financial services, etc, and they represent 3,000-5,000 jobs.

Regulation: France has been at the forefront of digital asset regulation, with the adoption, as of 2019, of a regulation dedicated to digital assets: the PACTE Act, which introduced a clear regulatory framework applicable to digital asset service providers (DASPs) and initial coin offerings (ICOs).

The registration framework for DASPs in France remains dynamic, with around 70 DASPs registered by the AMF, and many more applications are currently being assessed by the French regulator. There is a willingness to require crypto companies to conform with MiCA's upcoming requirements, by already adopting more rigorous internal procedures.

In response to the bankruptcy of FTX and the ecosystem disruption, members of the French parliament have recently adopted several amendments to the DASP framework to reinforce corporate governance and ensure appropriate safeguards. The supervisory and enforcement powers of the AMF have been strengthened to allow the regulator to 'take precautionary measures when it considers that a DASP is susceptible to becoming insolvent and may further suspend the registration of a DASP where its activity is deemed a threat to the stability of the digital assets market.'

In addition, a new reinforced registration statute has been introduced, which becomes mandatory as of 1 January 2024, and to which all new applicants must now submit.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

A convergence of regulatory requirements will make it easier for entrepreneurs to deploy their business model across Europe and achieve economies of scale. For example, the MiCA regulation has been closely modelled on the French legal regime, so obtaining a CASP licence under the Pacte Act in France will substantially facilitate obtaining a CASP licence under MiCA, providing companies with a significant competitive advantage in obtaining the European passport for their services.

What does the future hold for the French blockchain and cryptocurrency ecosystem?

Considering the strong government support, a favourable and stable regulatory environment, and an abundance of talent, the space is set to grow in the coming years. Web3, leveraging France's knowhow and strategic dominance over the luxury sector, will probably be one of the faster growing segments, considering they are also targeted for support from public financial institutions, such as BPI, which work to crowd source investment from private actors.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

Convergence seems to be a solid trend, particularly in financial services. The sector of crypto economy dedicated to artificial intelligence (AI) has been expanding steadily, with a market cap surging to USD 7 billion and the market capitalisation of AI-focused crypto assets surging by USD 1.75 billion since November 2023.

The question is not only how AI and IoT integration can help in the development of the blockchain industry, but also how blockchain can provide the missing link in the new models that increasingly rely on generative AI. The adoption of blockchain technology can bring increased openness, data consistency, and security. By integrating AI with blockchain, a more secure and intelligent system can be established to ensure transparency and custody of data sets.

Blockchain ensures the integrity of shared information and models used by AI, while AI enhances fraud detection capabilities. The combination of AI and blockchain creates a more resilient system that is resistant to attacks and fraud.

Key Figures

519+

Dedicated blockchain solution providers

3.1b

Total funds raised.

1.19%

Population that owns crypto

The German blockchain ecosystem at a glance

Germany has a broad ecosystem of active companies in the blockchain space, with Berlin being the blockchain capital of the country – and most likely the blockchain capital of Europe. The German government has realised the impact of blockchain technologies on Germany’s technology and economic life. It is their view that the vibrant blockchain ecosystem should be preserved and fostered to continue its growth and render Germany an attractive opportunity for investments in this sector. To support this goal, in 2019, the German government [adopted a national blockchain strategy](#),⁵² showing its commitment to supporting the use of the technology. This strategy provides, among other things, guidelines for funding blockchain-related projects and considers various application areas, including financial services and digital identity.

Overall, the strategy offers benefits for the whole German ecosystem of startups, as it aims to ensure stability, stimulate, and support innovation, disseminate blockchain knowledge, and contribute towards the country’s goal of becoming a world leader in this field. Striving towards this strategic goal, several state-backed projects have already been planned, such as a blockchain-based energy database for tracking power usage, a system for verifying educational qualifications, and a smart contract registry with the [Deutsche Energie-Agentur](#).⁵³ Perhaps the most important initiative in the country is a state-wide digital identity system, which focuses on keeping personal data safe and ensuring data integrity.

The German car manufacturer Mercedes has partnered with artists to issue an exclusive Mercedes-Benz [NFT collection](#).⁵⁴ The first core collection was called Maschine, and the artists Harm Van den Dorpel and Fingerprints DAO chose motion, velocity, and perception as core themes for this NFT drop. Every one of the 1,000 artworks features mesmerising radial patterns of illusions inspired by the wagon-wheel effect and is Harm’s first full work using a custom neural network, created entirely in 3D.

Enthusiasm for blockchain technology may have fallen off in 2022, with just 25 companies incorporated, but interest and

⁵² Source: [a national blockchain strategy](#).

⁵³ Source: [Deutsche Energie-Agentur](#).

⁵⁴ Source: [NFT collection](#)

expertise are being focused into fewer sectors. Digital assets, NFTs, gaming, and Web3 all led the way in 2022.

The [CV VC German Blockchain report](#)⁵⁵ for 2023 provides highlights of Germany's remarkable achievements in the blockchain sector, unveiling a 3% increase in blockchain funding and an all-time high share of global funding, totalling USD 355 million across 34 deals.

TOWARDS MAINSTREAM ADOPTION

The German government has recognised the importance and potential impact of blockchain technology on digital transformation. Virtual currencies were classified as financial instruments (in the form of 'units of account') as early as 2013. In September 2019, the German government published its blockchain strategy. The strategy emphasises the importance of blockchain-based solutions and their application for both the public and private sectors. As of 2020, Germany included a new financial instrument in its banking laws, the crypto asset. Germany further introduced a new financial service, crypto custody, which requires a licence from the German supervisory body BaFin.

In September 2020, the [Deutsche Energie-Agentur](#)⁵⁶ launched the [Future Energy Lab](#)⁵⁷. The lab, among other things, ran two pilot projects related to the application of blockchain technology in the energy sector, i.e., the [Blockchain Machine Identity Ledger \(BMIL\)](#)⁵⁸ and the [Smart Contract Registry \(SCR\)](#). The BMIL is a digital and decentralised directory for device identities. In addition to intelligent metering, it enables the integration of millions of decentralised generation systems into the energy system. The SCR will be developed with expert participants from all application levels. The project's purpose is to create a registry using blockchain technology to record and organise contractual issues in the energy industry, e.g. areas of law, types of contracts, parts of contracts, etc.

In line with the aforementioned governmental blockchain strategy, the German parliament issued a law on introducing electronic securities, including a blockchain register, in the summer of 2021. Following the 2021 election, the new coalition in its current agreement highlights 'crypto assets as digital key technology' and new financial innovation announces that 'the use of blockchain for land register shall be investigated and that the European supervisory body should not only take care of the traditional financial services industry but also monitor crypto assets.'

According to the newly drafted legislation introduced by the German finance ministry on 5 April 2023, under the [Future Finance Act](#), the German government is advocating for more accommodating regulations for startups involved in financial innovation. The primary objectives of this legislation include the digitisation of capital markets through the issuance of electronic securities on a blockchain, as well as the enhanced mobility of crypto assets. The aim is to modernise and streamline Germany's capital market to attract greater private capital for future investments.

On the initiative of FDP member of parliament Frank Schäffler, the promotion of blockchain technologies is to be included in the budget for the coming year 2023⁵⁹ are to support initiatives dealing with topics such as energy-efficient blockchain solutions, Web3 diffusion in the German economy, etc.

⁵⁵ Source: <https://www.cvvc.com/insights>

⁵⁶ Source: [Deutsche Energie-Agentur](#)

⁵⁷ Source: [Future Energy Lab](#).

⁵⁸ Source: [Blockchain Machine Identity Ledger](#)

⁵⁹ Source: [Promotion of blockchain technologies is to be included in the budget for the coming year 2023](#)

One example of a funded blockchain project in Germany over the past year is the project [Automated Ground-Air Networking of Mobility Actors to Improve Interaction and Collaboration - AVIK](#),⁶⁰ funded by the German Federal Ministry for Digitisation and Transport, started in December 2022. Within the framework of this project, a blockchain-based platform for the secure exchange of data from modern sensors (e.g. environmental data) between drones and vehicles is to be further developed.

Virtual currency legislation that applies to blockchain

Virtual currencies are not considered legal tender in the country and are generally treated as investment assets or 'substitute currencies (Ersatzwährungen)', partly due to consumer-protection concerns. On several occasions, financial authorities in Germany have issued statements warning the public and investors of the risks associated with [virtual currencies and ICOs](#)⁶¹. The Federal Financial Supervisory Authority (BaFin) also [discerns](#)⁶² between digital assets that share characteristics with securities or utility tokens.

In May 2022, Germany's Finance Ministry released new cryptocurrency tax guidelines with no tax payable on gains from BTC and ETH sold 12 months after acquisition.

The Bank for International Settlements (BIS), in collaboration with Deutsche Bundesbank and the Banque de France, inaugurated its latest joint research centre for financial innovation in Frankfurt am Main and Paris. Launched on 23 March 2023, the BIS Innovation Hub, located in these two major cities, will concentrate its research efforts on decentralised finance (DeFi), wholesale central bank digital currencies (CBDC), cybersecurity, and green finance.

Furthermore, the European Commission and the Association of German Banks have co-founded the [Tokenize Europe](#)⁶³ initiative to address the importance of tokenisation. The initiative has produced a report that evaluates the current situation of tokenisation in Europe and provides conclusions and recommendations based on consolidated individual views of European industry representatives participating in different working sessions and bootcamps, which have been organised by the Tokenise Europe 2025 initiative.

Blockchain in academia

Following the wide adoption of blockchain technologies in Germany, many organisations offer professional training on blockchain technologies. One of the most notable academic trainings is offered by the [Frankfurt School Blockchain Centre](#),⁶⁴ a think tank and research centre that investigates the implications of blockchain technology, digital assets, and distributed ledger technology (DLT) for companies and their business models. In addition to developing prototypes, it serves as a platform for managers, startups, technology, and industry experts to share knowledge and best practices.

⁶⁰ Source: [Automated Ground-Air Networking of Mobility Actors to Improve Interaction and Collaboration - AVIK](#)

⁶¹ Source: <https://www.bundesregierung.de/Content/DE/Artikel/2018/02/2018-02-02-kryptowaehrung.html>

⁶² Source: [BaFin - Merkblätter - Aufsichtsrechtliche Einordnung von sogenannten Initial Coin Offerings ...](#)

⁶³ Source: <https://bankenverband.de/en/tokenise-europe2025/>

⁶⁴ Source: [Frankfurt School Blockchain Centre](#).

The [EIT Digital Professional School](#)⁶⁵ also offers a [professional training course](#) on blockchains, developed in collaboration with [Fraunhofer FIT](#). The [European Blockchain Association](#) also offers courses that help to deepen participants' knowledge of blockchain and DLT technology.

Another example of project aiming to raise awareness is the [Chaise](#) project. Chaise is a sector skills alliance, funded by the Erasmus+ programme, dedicated to strategically advancing blockchain skills development in Europe. Its primary objective is to provide forward-looking training solutions to address current skill shortages and meet the evolving demands of the European blockchain workforce.

Blockchain across key industries

Blockchain startups in Germany span a spectrum of diverse use cases and sectors. More than 25% of startups focus on the finance and crypto domains, followed by entertainment, digital identity, and the Internet of Things (IoT) sectors. As previously mentioned, the energy sector is also highly interested in the German blockchain ecosystem. In September 2020, the [Elia Group](#), through its subsidiary, one of the four transmission system operators for electricity in Germany, announced a [multi-year strategic partnership](#) with [Energy Web](#) that will focus on testing and validating the technological promises of enterprise-grade, blockchain-based solutions that support the energy markets the Elia Group serves. The scope of collaboration will include understanding the potential of decentralised identifiers for a more decentralised electricity system, tracking green energy and services, and providing technical expertise and support for the Elia Group's new DLT Lab.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Following the rapid price rise of bitcoin in 2017, many startup companies were incorporated in Germany, with the majority being in Berlin – the blockchain hub of Germany. While most startup companies were founded after 2017, a significant number of early adopters can be traced back to as early as 2013. It should be highlighted that companies founded in 2016 conducted the highest percentage of ICOs. For the majority, ICOs were the preferred way of funding compared to traditional funding mechanisms, such as private or corporate funding and grants. The average size of an ICO was about EUR 10,000,000.

Startups are spread almost equally in many business verticals, including applications, infrastructure, and the provision of services, while a smaller portion of the companies place their focus on middleware.

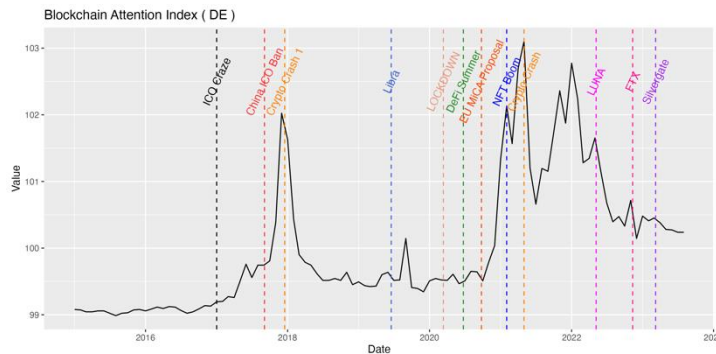
In the current phase, blockchain-related companies are almost equally split between revenue-making, product-ready, post-seed, and pre-seed. Most revenue-making companies that disclosed their revenues declared revenues of up to EUR 500,000, while the startups that generated the highest revenue were those providing business-to-business solutions. According to data from Crunchbase, 519 blockchain startups and enterprises are operating in Germany, with total funds raised standing at EUR 3.1 billion (Crunchbase, January 2024).

⁶⁵ Source: [Professional School](#)

BLOCKCHAIN COMMUNITY

The blockchain community in Germany consists of both professionals and enthusiasts, as well as associations targeting the promotion of blockchain-based solutions in a more organised and systematic manner.

Established in 2017, [Blockchain Bundesverband](#) is a non-profit association with more than 90 members. Members include leading startups in the blockchain sector based in Germany. According to its mission,



Blockchain Bundesverband believes blockchain and similar decentralised technologies based on cryptography are fundamental to digital infrastructure innovation. The association's initiatives focus on education for decision-makers in politics, industry-leading corporations, and the wider public. It maintains blockchain adoption is necessary to keep Germany competitive in an increasingly digital world and that the technology can only flourish if it is recognised by politics, society, and institutions and used by the latter two.

Based in Munich, the [European Blockchain Association](#) provides an independent, neutral platform for blockchain-related communities and organisations to discuss, develop, and elaborate on shared work.

[BerChain e.V.](#), i.e., the Berlin Blockchain Community was established on 25 January 2019, aiming at connecting and promoting the Berlin blockchain ecosystem between itself and other stakeholders. BerChain was established by 10 founding members (Ape Unit, Connect Global, Factory Berlin, Innogy Innovation Hub, Next Big Thing AG, Tupelo, Schwenke Schutx Rechtsanwälte, Ubirch, Aeternity Anstalt and Blockrocket). Currently, there are more than 1,000 slack members, more than 100 blockchain organisations, 35 associations, and more than 100 blockchain startups that have joined the community.

NOTABLE BLOCKCHAIN COMPANIES

BitsCrunch: a blockchain analytics company headquartered in Munich, Germany, which uses AI & ML to secure the NFT ecosystem.

peaq: a Berlin-based deep-tech company developing decentralised infrastructure for the Economy of Things.

BigchainDB: a database with blockchain characteristics. It has high throughput, low latency, powerful query functionality, decentralised control, immutable data storage, and built-in asset support.

Nuri (formerly known as Bitwala): offers the world's first banking experience combining fully protected German bank accounts with access to virtual currencies, digital assets, and blockchain-based finance. Through secure technology, Nuri helps customers reap the benefits of new financial technology by being the bridge between the old and new financial systems.

Energy Web Foundation: known as Energy Web (EW), this is a non-profit organisation focused on accelerating blockchain technology across the energy sector. EW focuses on building core infrastructure and shared technology, speeding the adoption of commercial solutions, and fostering a community of practice. In 2019, EW launched the Energy Web Chain, the world's first open-source, enterprise blockchain platform tailored to the energy sector. EW's technology roadmap has since grown to include the Energy Web Decentralised Operating System (EW-DOS), a 'blockchain-plus' suite of decentralised solutions.

IOTA Foundation: develops an open-source protocol that supports data and value transfer between devices and humans. IOTA also has an open-source distributed ledger and virtual currency designed for the IoT. It uses a directed acyclic graph to store transactions on its ledger, motivated by potentially higher scalability over blockchain-based distributed ledgers.

Finoa: a regulated custodian for digital assets offering custody and staking services to institutional investors and corporations.

Chainflip: a decentralised, trustless protocol that enables cross-chain swaps between different blockchains.

Aragon: a project that aims to disintermediate the creation and maintenance of organisational structures by using blockchain technology.

Unstoppable Finance is building a next-gen crypto wallet to bring DeFi to retail investors globally.

INSIGHTS FROM EXPERTS

Laura Kajtazi, Validvent (previously at IOTA Foundation)

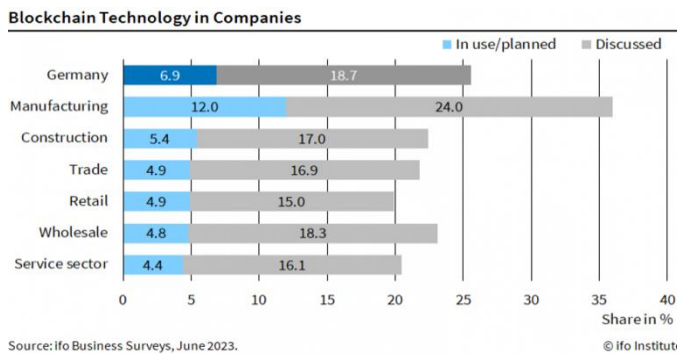
How would you evaluate public awareness and adoption of blockchain and cryptocurrency in Germany? Has the recent growth of the cryptocurrency markets facilitated familiarity?

Generally, the public awareness of blockchain and cryptocurrency is high. When talking to citizens in most cases they had heard of blockchain and cryptocurrency. However, not many know how exactly it functions, but generally, it can be said that the majority have heard of it. According to [the recent survey on Cryptocurrency adoption in Germany in 2022 of triple A](#) 86% of German adults have heard of cryptocurrencies. This rose across their data findings by 6 percentage points in 2022 – from 80% in 2021. In 2022, approximately 4.9 million people in Germany, which accounts for 5.8% of German adults within the survey, were found to be holding cryptocurrency according to triple A's survey. This represents more than a double increase when compared to their data from 2021, where cryptocurrency ownership in Germany was at 2.6%. This suggests to some extent that there may be a growing awareness among Germans regarding cryptocurrency. Furthermore, when it comes to node operations, Germany ranks second globally for [ethereum full nodes](#), just after the US, according to [Coincub's report on Coincub Global Crypto Ranking - Q4 2022](#). Generally looking at blockchain adoption, apart from the crypto area, we can observe adoption by [enterprises](#) and startups. In [Berlin for example, we find the majority](#) of startups that have adopted blockchain in Germany. Germany also boasts the highest number of Web3 jobs worldwide, totalling over 22,400 positions in the crypto and blockchain sector in the last quarter of 2022. To sum up, as cryptocurrencies are the best known use case for blockchain, one can assume that the growth of the cryptocurrency market has potentially raised familiarity with blockchain in general. Now, of course, we can see many other efforts for blockchain-based use cases in Germany – other than for crypto – and I imagine that other people may learn about blockchain through these, especially if we see at some point another large-scale pilot that gains mass adoption.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Germany?

When we compare Germany to the rest of the world it is not considered a leading player in blockchain technology compared to countries like Switzerland and the UK. However, Berlin stands out as a hub for blockchain expertise, drawing talent and investors from various countries including the UK, China, and the US. This raises the question of whether Germany should concentrate its efforts on cities like Berlin to amplify the advantages of existing regional blockchain ecosystems.

According to Crunchbase, there were [494 blockchain-based companies](#) in Germany as of 24 October 2023, the third highest in the Euro Region after Switzerland and the UK. With the majority of these located in Berlin, as mentioned before.



When looking at funding, German blockchain businesses have raised USD 217m across 20 deals YTD according to a report by CV labs.

Another aspect where we can observe some indicators of potential increasing maturity is the number of enterprises making use of blockchain and/or considering using blockchain. According to a [recent survey by the ifo Institute](#) conducted on behalf of the Hanseatic Blockchain Institute, which was based on approximately 9,000 monthly responses from businesses in the manufacturing, service, trade, and construction sectors, 6.9% of German companies are either currently using or considering implementing blockchain technology in their business processes. The adoption of this technology is a topic of discussion in 18.7% of the companies surveyed. Out of the sectors, manufacturing is notably ahead in adoption of blockchain, with 12% of companies using or planning to use it, and 24% discussing its implementation. The chemical industry leads the pack, with 14% of companies employing blockchain for their business processes. In the automotive industry, 13% of companies are using blockchain, with about one in five having plans to do so. In sectors such as food and animal feed production, printed matter, data processing equipment, electrical equipment, furniture, machinery, and equipment manufacturing, at least one in ten companies either use or plan to use blockchain technology. However, adoption rates are notably lower in the trade, construction, and service sectors.

So, in summary, there are already some indicators that give us an idea about the maturity of the blockchain sector in Germany. The more companies and startups that use blockchain, the more experience the industry gains, which can promote the possible uses of blockchain and thus the maturity of the German blockchain market.

What measures has Germany taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Different initiatives and activities to promote blockchain adoption have been identified in the past year. There are a few examples below.

According to the newly drafted legislation introduced by the German finance ministry on 5 April, under the [Future Finance Act](#), the German government is advocating for more accommodating regulations for startups involved in financial innovation. The primary objectives of this legislation include the digitisation of capital markets through the issuance of electronic securities on a blockchain, as well as the enhanced mobility of crypto assets. The aim is to modernise and streamline Germany's capital market to attract greater private capital for future investments.

On the initiative of FDP member of parliament Frank Schäffler, the [promotion of blockchain technologies is to be included in the budget for the coming year 2023](#). This is to be distributed among different ministries that are to support initiatives dealing with topics such as energy-efficient blockchain solutions, Web3 diffusion in the German economy, etc.

One example of a funded blockchain project in Germany over the past year is [Automated Ground-Air Networking of Mobility Actors to Improve Interaction and Collaboration - AVIK](#), funded by the German Federal Ministry for Digitization and Transport, started in December 2022. Within the framework of this project, a blockchain-based platform for the secure exchange of data from modern sensors (e.g. environmental data) between drones and vehicles is to be further developed.

The Bank for International Settlements (BIS), in collaboration with Deutsche Bundesbank and Banque de France, inaugurated its latest joint research centre for financial innovation, in Frankfurt am Main and Paris. Launched on 23 March, the BIS Innovation Hub, located in these two major cities, will concentrate its research efforts on decentralised finance (DeFi), wholesale central bank digital currencies (CBDC), cybersecurity, and green finance.

Furthermore, the European Commission and the Association of German Banks have co-founded the [Tokenise Europe](#) Initiative to address the importance of tokenisation. The initiative has produced a report that evaluates the current situation of tokenisation in Europe and provides conclusions and recommendations based on the consolidated individual views of European industry representatives participating in the different working sessions and bootcamps, which have been organised by the Tokenise Europe 2025 Initiative.

All these examples demonstrate to some extent that we have policy initiatives driving the advancement of blockchain on multiple fronts.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

One of the key measures that are of importance is dynamic exchange with regulators. As blockchain is still an innovative area, policy makers need to be cautious about what is regulated, as this might hinder motivation to innovate and produce business models. Unclear laws and regulations can hinder blockchain adoption, as organisations fear the unknown consequences of future regulation. Therefore, the willingness of government and regulators to direct and support blockchain adoption is of great importance to ensure that organisations and individuals feel encouraged to build on blockchain. Governments can provide (for example through regulatory sandboxes) a flexible regulatory environment to allow experimentation and use targeted regulatory enforcement. We can see this already in the [European blockchain regulatory sandbox for Distributed Ledger Technologies](#). However, only a limited number of projects are being accepted into the programme every year. More regulatory sandboxes that are, for example, country-related may promote adoption.

Moreover, promoting blockchain communities can be a helpful measure. An active community can contribute to increased adoption through valuable feedback and can create a space for empowering individuals to build innovative applications on top of a blockchain. Various blockchain associations are already trying to tackle this. More funding and support for these types of initiatives can support communities in their blockchain adoption.

Also funding programmes and more investment for blockchain-based startups in general could help increase adoption.

Lastly, as with any other technology, education can help foster the necessary skill set to enable professionals to adopt blockchain. Having well-documented and easy-to-follow instructions for applying blockchain increases

transparency and could ease adoption. When educating and building awareness, it is important to build content in a way that suits the target group.

We can see nowadays examples of educational programs and projects that aim to raise awareness, such as the [Chaise](#) project. Chaise is a sector skills alliance, funded by the Erasmus+ programme, dedicated to strategically advancing blockchain skills development in Europe. Its primary objective is to provide forward-looking training solutions to address current skill shortages and meet the evolving demands of the European blockchain workforce. There are more examples, such as dedicated master's programmes in blockchain, for example, the [Master's Programme in Blockchain and Digital Assets](#) at the Frankfurt School of Management and Finance. In the realm of education, a crucial consideration is understanding how blockchain can enhance our existing world and serve as a facilitator. This necessitates examining blockchain within the context of other technologies rather than viewing it in isolation.

Another important measure is the promotion of blockchain and use cases to promote awareness. When doing promotion, a suitable way of communicating must be used specifically when we talk to potential end users. Rather than using complex technical features, explaining the value proposition in the context of a use case can help remove barriers to adoption, especially when reaching out to end users in the future.

Lastly, nowadays we can still see interoperability and scalability challenges resulting from a lack of common alignment on standards. Seeking working groups that look for common standards may ease the process of adoption.

What does the future hold for the Germany blockchain and cryptocurrency ecosystem?

Germany has not always been perceived as the most digitised country. Promoting blockchain adoption may help position themselves better when it comes to digitisation. Berlin, as one of the startup and innovation hotspots, can provide the right environment for promoting blockchain cryptocurrency ecosystems, as already acknowledged in a study by [Frankfurt School Blockchain Centre](#).

In the study by the [Frankfurt School Blockchain Centre](#), they acknowledge that Berlin draws in a wealth of talent from all over Europe and attracts investors from the UK, China, and the United States (US), owing to its substantial community of blockchain specialists. Consequently, they raise the question of whether Germany should concentrate its main endeavours on Berlin and select other cities to amplify and expedite the already thriving advantages of these local ecosystems.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

Overall, the synergy between AI and chatbots can play a crucial role in advancing the blockchain and cryptocurrency industry. The transparency and security inherent in blockchain can bolster AI's decision-making process, while AI's sophisticated algorithms can elevate blockchain operations by offering insights, optimising data use, and minimising resource consumption.

Specifically, an area that could profit from combining AI and blockchain is data management. Blockchain's decentralised architecture ensures data is distributed across a network, minimising the likelihood of data loss and heightening security. AI can leverage this data efficiently to derive insights, streamline decision-making, and mitigate human error.

Furthermore, integrated AI models have the potential to execute tasks based on specific predefined conditions within smart contracts. For instance, they could identify a shortage in inventory and autonomously initiate an order with an external supplier.

What we can observe now is that blockchain enterprises are [developing AI-driven chatbots to assist developers in constructing applications](#) with greater speed and efficiency.

The integration of AI and blockchain technology presents significant potential benefits across various industries. However, several challenges need to be addressed for their full potential to be realised. These include data collection issues for AI models, the importance of interoperability between blockchain networks and AI platforms, the need for updated data privacy frameworks, and the necessity of public education regarding the benefits and risks of combining AI and blockchain. As these synergies become more evident, cryptographic safeguards may become standard in AI systems, increasing user trust and comfort with these technologies.

I think AI and blockchain complement each other very well, so, once you overcome the challenges, they can help each other grow. And we are just at the beginning. The more we try, the more experience we gain about where the combination of both technologies has an impact.

Key Figures

28+
Dedicated blockchain solution providers

21m
Total funds raised.

1.48%
Population that owns crypto

The Greek blockchain ecosystem at a glance

Greece, located in south-eastern Europe and [a signatory to the European Blockchain Partnership](#), is home to an emerging blockchain ecosystem, populated by companies and startups as well as official and unofficial communities of practice. More than 15 companies offer services in those fields exclusively, with many more expanding their offerings to accommodate the growing need for blockchain applications in the country, in Europe, and the rest of the world. Greek companies are active across a wide range of business activities in the blockchain space; however, geographical clusters or a specific industry focus were not identified.

Local authorities have adopted an overall passive approach, as there are no specific references to blockchain or digital currencies in Greek legislation apart from the transposition of the 5th AMLD, which introduces AML compliance requirements to all VASPs providing services in Greece, under the supervision of the Hellenic Capital Market Commission.

Approximately 5,000 people make up the core of the blockchain community in the country. Communities of practice constitute the primary facilitator of education and discussion in the field, due to the lack of relevant state-backed or industry initiatives.

Relevant bibliography and [extended media coverage](#) suggest that the Greek debt crisis has been a critical factor in the limited adoption of digital currencies as a self-custodian store of value, out of fear of a bank run, especially after 2013 (the year that a haircut was imposed on depositors in Cypriot banks). Bitcoin emerged as an alternative, with publications [reporting](#) an increase in the number of Greek citizens seeking to invest in digital assets. The capital controls imposed in 2015 proved to be a major hurdle in accessing digital currencies; a factor that prevented further adoption. Greece today constitutes an emerging player in the European blockchain scene.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

In July 2022, the Ministry of Digital Governance [introduced a bill](#) that included provisions for the way in which emerging technologies such as AI, IoT, blockchain, and drones will be used. The bill defines blockchain and smart contracts and sets the foundation for processing transactions with smart contracts. Smart contracts now bind contracting parties in accordance with the general provisions of the Civil Code on private contracts. Following its approval by the Hellenic Parliament, the law entered into effect in March 2023.

[According to guidance from the European Securities and Markets Authority \(ESMA\)](#), firms give careful consideration as to whether their activities constitute regulated activities. If their activities constitute a regulated

activity, firms must comply with the relevant legislation and any failure to comply with the applicable rules would constitute a breach. Namely, where the coins or tokens qualify as financial instruments it is likely that the firms involved in ICOs (or similar) conduct regulated investment activities, such as placing, dealing in, or advising on financial instruments or managing and marketing collective investment schemes. Moreover, they may be involved in offering transferable securities to the public. In this case, they need to contact the national competent authorities.

Both the Hellenic Capital Market Commission (HCMC) and the Bank of Greece (BoG) have committed to efforts to understand and eventually provide a regulatory framework for these assets. Both competent authorities have implemented their own innovation hub, while the BoG implemented a regulatory sandbox in mid-2021 in collaboration with EBRD, funded by the European Union. On two occasions, in 2014 and 2018, the BoG issued announcements warning the public of the potential risks associated with digital currencies. On the same note, on three occasions, in 2017, 2018 and 2021, the Hellenic Capital Market Commission communicated to the general public the warnings of ESMA on ICOs, of ESMA/EBA/EIOPA on virtual currencies, and of ESMA on non-regulated crypto assets, highlighting the potential risks associated with them. Greek Member of the European Parliament Eva Kaili is an active supporter of the development and use of blockchain technology in the digitalisation of the European economy. Over the past years, Ms Kaili has become one of the most prominent figures in the blockchain space.

Despite cryptocurrencies being largely unregulated in Greece, the Greek Minister of Finance, Christos Staikouras, had a first unofficial [meeting](#) with Binance CEO Changpeng Zhao, which demonstrated the Greek government's rising, yet slow interest in the crypto industry.

Digital currency legislation that applies to blockchain

Greece implements the 5th AML Directive; in July 2022, Greece announced a draft bill on 'Emerging information and communication technologies, strengthening digital governance and other provisions', introducing requirements for the deployment of artificial intelligence (AI), the Internet of Things (IoT), blockchain and other distributed ledger technology (DLT).

Blockchain in academia

Regarding academic qualifications, courses or degrees, Greek universities are an emerging power in the educational scene of blockchain. More specifically, the National and Kapodistrian University of Athens is currently offering two e-learning courses: [Blockchain and Energy](#) and [Blockchain Developer](#). Correspondingly, the Aristotle University of Thessaloniki offers a Master of Science in [Technologies of Interactive Systems](#), which includes a course about [Blockchain Technology and Applications](#). The University of the Aegean offers a blockchain course as well, named [Blockchain Technology](#), while the University of Thessaly currently includes in its curriculum a course named [Blockchain Technologies and Decentralized Applications](#). Likewise, the Panteion University provides the [Blockchain Economics: Introduction to Cryptocurrencies](#) course and the Athens University of Economics and Business provides the [Cryptocurrencies: Economic and Financial Aspects](#) course. The University of West Attica provides a course, named [Blockchain Technologies](#), and the Hellenic American College offers a 1-month [Certified Blockchain Professional](#) qualification. Lastly, the [Institute of Digital Finance](#) was launched in 2022, offering a programme in crypto-economics.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Founders of Greek blockchain companies are typically entrepreneurs or researchers with strong academic backgrounds and international experience. Due to the relatively small size of the domestic market for

blockchain, companies generally develop solutions that correspond to the needs of international customers and markets. Generally, Greece is home to small companies with employee numbers ranging between 1 and 20. Business opportunities in the space were identified as early as 2015, with many companies founded between 2017 and 2018. Most firms are headquartered in Athens and have not received any form of funding. However, there are some international blockchain companies with Greek founders, or with a team of engineers based in Greece. These include Rated Labs, a Greek-founded Web3 infrastructure project that [raised USD 2.5 million](#), and Mysten Labs (Sui), which decided to [create a hub](#) in Greece and hire teams of engineers in Athens and Thessaloniki.

The business activities of Greek blockchain startups vary greatly, from enterprise applications and research to consumer-facing rewards programmes, with a focus on digital currency wallets and portfolios as well as legal compliance services. As a result, no specific business verticals could be identified.

THE BLOCKCHAIN COMMUNITY

Relative to its size and business scene, Greece fosters a small but vivid blockchain community. Official and unofficial mid-size enthusiast groups, some of them active since 2011, amount to more than 6,750 active members and are concerned with a variety of aspects of blockchain and digital assets, from purely technological and social to speculative.

Approximately 391,500 individuals interested in blockchain and cryptocurrencies could be identified, a number that amounts to 3.6% of the total population.

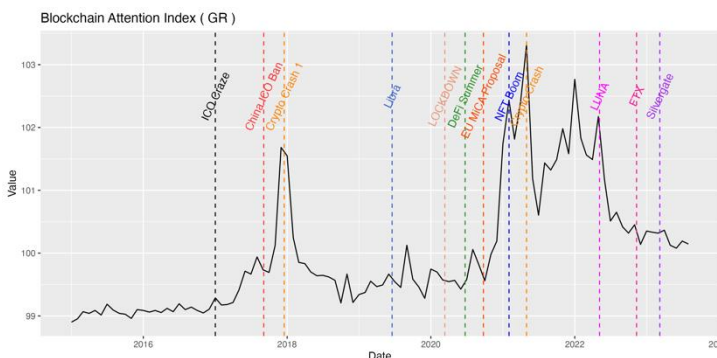
While community members are geographically dispersed, Athens and Thessaloniki, the second-largest city by population, have the highest concentration of communities of practice and are the epicentre of most major community meetups.

During the past few months, the blockchain community in Greece has grown throughout the country, with multiple meetups and events held in Athens, Thessaloniki, and Crete such as the [Binance event in Athens](#) which featured Changpeng Zhao in person.

INSIGHTS FROM EXPERTS

Dr John Soldatos, Prof, University of York, Europe Campus, Member of Hellenic Blockchain Hub

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Greece? Has the recent growth of the cryptocurrency markets facilitated familiarity?



There is quite good awareness about blockchain within crypto-investors and the scientific community. This awareness does not, however, extend to broader audiences in areas like IT and banking.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Greece?

The size and maturity are quite low. It is limited to some members of the research community and few (crypto)investors.

What measures has Greece taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Greece has developed a new legislation that aims at fostering the adoption of new technologies in the public sector, while boosting the creation of a market of digital services. The relevant law, [4961/22](#), specifies that:

- data records or transactions may be conducted through a blockchain or other DLTs (distributed ledger technologies), rendering valid the declarations of will exercised in such form;
- smart contracts bind contracting parties as per the general provisions of the Civil Code on private contracts;
- DLTs and smart contracts have validity of proof before the courts equal to that of private documents.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

Recommending the use of blockchain technology (including smart contracts) for certain types of transactions of public interest that can benefit from transparency and auditability. Training different stakeholders on distributed ledger technologies. Creating pilot projects and demonstrators that will demonstrate the merits of DLTs.

What does the future hold for the Greek blockchain and cryptocurrency ecosystem?

Following law 4961/22, an increased adoption of DLT for various types of transactions is expected. Likewise, this can give rise to innovation and startups.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

The proliferation of AI and chatbots could lead to more blockchain solutions for AI data and AI results provenance and traceability. Blockchain can be a very useful tool for ensuring the trustworthiness of AI technologies.

Key Figures

9+

Dedicated blockchain solution providers

1.4m

Total funds raised.

1.19%

Population that owns crypto

The Hungarian blockchain ecosystem at a glance

In 2022, the Ministry of Innovation and Technology and the National Data Economy Knowledge Centre established the [Blockchain Coalition](#). The goal is to contribute to the identification of opportunities for domestic economic utilisation and the development of an appropriate legal framework. Hungary aims to create a legislative package that facilitates the preparation of MiCA and addresses the different aspects of blockchain technology.

The National Bank of Hungary (NBH) supervises entities and persons subject to financial sectoral laws. The NBH also operates a dedicated, private, blockchain-based NFT issuance platform.

The Hungarian Financial Intelligence Unit (FIU) acts as the supervisory body for crypto exchange service providers and custodian wallet providers concerning the AML/CTF and sanctions-related issues. The FIU issued templates for drawing up internal rules and regulations for service providers falling under its supervision, to support them with the performance of the tasks falling within the scope of the obligations laid down in the AML/CTF Act and the Act on Sanctions.

The public's interest in blockchain is clear, as the community engaging with blockchain subjects is growing. There are events and workshops to strengthen the relations of the blockchain community. Intriguing news was the unveiling of a statue of Bitcoin founder Satoshi Nakamoto in Budapest.

Finally, the startup scene is moving forward as the number of companies increases. Entrepreneurs have several options to support their ventures in the blockchain ecosystem.

TOWARDS MAINSTREAM ADOPTION

Blockchain adoption

Through non-fungible tokens, the Magyar Nemzeti Bank (MNB) is issuing its own digital instrument on a private blockchain to exploit hands-on experience around the technology and set value parameters in the tokens themselves. By successfully participating in quizzes in the field of financial literacy, coin collectors and NFT enthusiasts in Hungary are being awarded central bank-issued tokens and then swapping and trading the NFTs on the Money Museum mobile application. This is part of a contest to win a set of limited-edition commemorative coins. The successful participants can then register their ownership of the limited-edition coins on the blockchain using a unique QR code that each product has on its packaging. Such an approach may well be described as a pilot 'test and deploy' approach. This is being copied by other central banks as user

adoption becomes more important when considering CBDCs and the value proposition for public digital money more broadly.⁶⁶

Other applications include companies from various sectors. For example, TE-Food, a Hungarian tech company, uses blockchain technology to help consumers, food companies, and governments to trace supply chains and gather knowledge about how they work. TE-Food's blockchain ledger is decentralised. This ledger tracks transactions, and can be accessed by the public, making it transparent. The application offers three benefits: it helps consumers track the supply chains of products they are buying, helps private companies keep track of their supply chains, and supports governments in better understanding the supply chains' operation within their own country.⁶⁷

Legislation of blockchain

Hungary is one of the countries that acknowledged the benefits of digital solutions quite early and has therefore been supporting the development of FinTech businesses through uniform and transparent regulation for many years; this has provided consumers with safety guarantees, as well as transparency of services, while at the same time allowing businesses sufficient freedom to evolve.

Hungary has been implementing the EU legislation relating to financial services and capital markets; therefore, most of the Hungarian law regarding FinTech companies derives directly from the regulations and directives issued by the European Commission. Fintech companies are not regulated separately in Hungary; therefore, they are subject to the general legislation applicable to the activity they conduct.

Providers of exchange services between virtual currencies and fiat currencies, between different types of virtual currencies, and custodian wallet providers, fall under the scope of the Hungarian AML Act (Act LIII of 2017 on the prevention and combatting of money laundering and terrorist financing). According to the Hungarian AML Act, 'Custodian wallet provider' means an entity that provides services to safeguard private cryptographic keys on behalf of its customers, to hold, store, and transfer virtual currencies.

The Hungarian AML Act also applies to financial services institutions, including but not limited to payment institutions, regarding their activities that fall within the framework of payment services and electronic money institutions, and their activities falling within the framework of the issuance of electronic money and payment services. Consequently, the AML Act applies to e-money token issuers. Cryptocurrencies and NFTs (non-fungible tokens) are not regulated by the financial services regulation in Hungary. Asset-referenced tokens and utility tokens are not regulated by Hungarian law.

However, security tokens can fall under the scope of the financial services regulation (securities) depending on what kind of rights are securitised in the tokens. This means that STOs can be deemed as securities in Hungary. STOs are currently unregulated, and it is decided on a case-by-case basis whether an STO-like scheme would fall under securities or investment regulations. In this case, the following Hungarian acts will apply:

- Act CXXXVIII of 2007 on investment funds (Hungarian Investment Fund Act); and
- Act CXX on capital markets (Hungarian Capital Market Act).

E-money tokens are regulated by:

- Act CCXXXV of 2013 on payment service providers (Hungarian PSP Act);
- Act LXXXV of 2009 on the provision of payment services (Hungarian Payment Services Act); and

⁶⁶ Source: <https://www.omfif.org/2023/05/hungary-takes-a-novel-approach-to-blockchain-testing/>

⁶⁷ Source: <https://www.foodnavigator.com/Article/2023/11/15/How-a-Hungarian-tech-company-is-using-blockchain-to-trace-food-supply-chains>

- Act CCXXXVII on credit institutions and financial enterprises (Hungarian Banking Act).^{68,69}

As there are updates to regulations at European level, preparations are made at national levels to accommodate regulations like MiCA and the Pilot Regime. In this fashion, the Central Bank of Hungary is included in an article by Dr Erika Csongrádi on Europe's digital finance package and future challenges. Other regulations mentioned in the article are the European digital strategy and the draft digital operational resilience for the financial sector ([DORA](#)).

Blockchain in academia

Blockchain is a subject included in academic courses. As the impact of blockchain grows, students can study the fundamentals of the technology. For example, the Budapest University of Technology and Economics has a course on '[Blockchain Technologies and Applications](#)'.

People interested in learning about blockchain can participate in mentorship programmes. There are multiple educational resources available about blockchain and its subjects for professionals. EIT Digital, an organisation for entrepreneurial education, holds a [course](#) for decision-makers in Budapest. As blockchain transcends the narrow definition of cryptocurrencies, more sectors are impacted by the technology. The course is relevant to CTO managers, product owners, and business solution architects. Another action by EIT Digital is the organisation of the [digital master](#) on FinTech, where Budapest's Eotvos Lorand University participates in the master's. Similarly, the Budapest School for Central Bank Studies organises courses on subjects of interest for central banks.

Blockchain across key industries

The technical literacy of the Hungarian community seems to be driving the adoption of blockchain as a service. In detail, most of the companies either deliver a service or offer computer software, and this indicates the adoption of blockchain as a component in the architecture of the solutions.

The financial sector has a keen interest in technologies, as FinTech is a subject of focus. Specifically, the Central Bank of Hungary has published [reports](#) on FinTech and digitalisation for the past 4 years.

Blockchain, DLT, and cryptocurrencies are referred to in the reports. The interesting takeaways on these subjects are the growing interest in and application of blockchain in FinTech.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The startup ecosystem in Hungary is robust and has success stories in technologies. For example, [SEON](#) aims to fight fraudulent events and is to be used on Sorare. It established a collaboration with Sorare, the sports blockchain platform, for this reason. It is anticipated that the startup's success will translate into the blockchain ecosystem. [TE Food's](#) upgrade in TONE token economics is one of the key success stories in the blockchain ecosystem.

Blockchain has a wide range of applications in business sectors. The Hungarian Chamber of Agriculture has established an incubator to promote the adoption of technologies in the agricultural sector. [NAK TechLab's](#) goal is to aid the enterprise's maturity with a 3-month programme. Another choice for entrepreneurs is [MKB Fintechlab](#), which works on digital products in the financial sector. [BnL Start Partners](#) works with startups providing accelerator and incubator services, but the entity has a general focus on technology.

⁶⁸ Source: <https://www.globallegalinsights.com/practice-areas/FinTech-laws-and-regulations/hungary#chaptercontent1>

⁶⁹ Source: <https://cms.law/en/int/expert-guides/cms-expert-guide-to-crypto-regulation/hungary>

There are venture capitalists active in funding and supporting the growth of entities in Hungary. The overview of venture capital investment has not significantly changed from the previous report. In detail, FastVentures, Hiventures Investment Fund, OXO Angels, and PortfoLion Ventures are active entities for startups in the technological sector.

The blockchain startup ecosystem consists of entities mainly established in the last 3-5 years. Blockchain is used as a component in services, as the technology is general and can be used in different ways. Finally, the startups are small and medium-sized companies, depending on the number of people employed in them. Technology entities can be composed of small and agile teams delivering applications bringing great impact.

THE BLOCKCHAIN COMMUNITY

The blockchain community in Hungary is active, and there is enthusiasm around technology subjects. A testament to the enthusiasm in the community is the unveiling of a statue to Satoshi Nakamoto in Budapest. There are events and associations to gather the community.

Hungary fosters events and workshops of a wide variety of magnitudes. Essentially, the community participates in events for education and networking reasons. In November 2021, an e-conference by [Eurasia Forum Budapest](#) took place, including blockchain for sustainable recovery. A conference hosted by Magyar Nemzeti Bank, the [Lamfalussy Lectures Conference](#), relates to financial subjects. As blockchain is a technology that disrupts the financial sector, it is one of the subjects that can be referenced during the conference.

Another event for the community, held in January 2022, was [Superweek](#), which covered various topics, and blockchain was a subject in a speech. Finally, the Slovenian-Hungarian Blockchain Business Forum was part of [European Blockchain Week](#) in 2021.

Hungary's community can disseminate their research through conferences, educate through associations, and hone their skills with hackathons. There are events coordinated by academia oriented towards research. In 2021, Debrecen University held the [Conference on Cryptology](#) in Debrecen. The [Blockchain Hungary Association](#) is an organisation related to blockchain active in the country. Such associations can foster the growth of the ecosystem around the technology. Moreover, there are teams coordinating frequent meetups on various blockchain subjects like [Hyperledger Budapest](#). Finally, there are opportunities in hackathons like NFT DEB for the community to test their skills.

AN INDICATIVE BUT NON-EXHAUSTIVE LIST OF BLOCKCHAIN COMPANIES, COMMUNITIES, CONFERENCES & OTHER BLOCKCHAIN ORGANISATIONS IN HUNGARY

Communities:

- [Polkadot Hungary](#): Community and meetup series around the Polkadot blockchain technology.
- [Ethereum Hungary](#): Community and meetup series around the Ethereum blockchain technology.
- [Hyperledger Budapest](#): Community and meetup series around Hyperledger's distributed ledger technologies.

Conferences:

- [Fintechzone](#)
- [Paytechshow](#)
- [Fintechshow](#)
- [Banktechshow](#)
- [BDAY](#)

Non-profit organisations:

- [Blockchain Hungary Association](#)
- [Blockchain Coalition](#)
- [Neumann Technology Platform](#)

Companies:

- [Coincash](#): a cryptocurrency brokerage that operates in Hungary and central eastern Europe. The company was established in 2016 and was reported to be running 13 Bitcoin ATMs in 2019.
- [Perfinal](#): core banking provider and digital banking consultancy company, supporting numerous financial institutions, including a central bank, in launching digital currency services. It also aids in the regulated introduction of crypto services, in line with upcoming regulations such as Europe's MICA.
- [Krypteus](#): advisor company for crypto taxation and regulated crypto usage.

INSIGHTS FROM EXPERTS

Daniel Szego, EU Blockchain Observatory and Forum Expert Panel

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Hungary? Has the recent growth of the cryptocurrency markets facilitated familiarity?

There has been a moderate but steady increase in the awareness of blockchain and cryptocurrency in the last few years. Recent surveys show that there is a segment of Hungarian retail investors who are very conscious about cryptocurrency as an investment and regard cryptocurrency as comparable to stock or bond investment.⁷⁰ Retail crypto investment was probably also accelerated by the introduction of a simplified and compact form of crypto taxation focusing purely on the retail segment.⁷¹

Another interesting example of the direction of mainstream retail adaptation is that of the biggest football clubs, which issued NFT tokens for fans with the help of Binance.⁷²

Besides regarding crypto purely as an investment, there are several significant communities on the retail level focusing more on the different technical and economic aspects of different blockchain platforms than on pure investment. Notable examples are Polkadot Hungary,⁷³ Ethereum Hungary⁷⁴ and Hyperledger Budapest.⁷⁵

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Hungary?

⁷⁰ Source: Survey on the Hungarian crypto-investors (in Hungarian), Portfolio <https://www.portfolio.hu/befektetes/20240131/itt-a-nagy-leleplezes-kiderult-kik-a-magyar-kriptobefektetok-666037>

⁷¹ Source: Crypto tax legislation & law in Hungary, <https://cms.law/en/int/expert-guides/cms-expert-guide-on-taxation-of-crypto-assets/hungary#:~:text=Gains%20from%20crypto%20transactions%20are, social%20security%20contribution%20is%20payable>

⁷² Source: Binance Teams Up With Hungary's Premier Football Club Ferencváros to Boost Fan Engagement Through NFTs <https://www.binance.com/en/blog/nft/binance-teams-up-with-hungarys-premier-football-club-ferencv%C3%A1ros-to-boost-fan-engagement-through-nfts-507980684737155778>

⁷³ Source: Polkadot Hungary <https://www.meetup.com/polkadot-hungary/>

⁷⁴ Source: Ethereum Hungary <https://www.meetup.com/ethereum-hungary/>

⁷⁵ Source: Hyperledger Budapest <https://www.meetup.com/hyperledger-budapest/>

The blockchain business ecosystem in Hungary overall still has the potential to increase. There are several non-profit initiatives and platforms supporting local business blockchain ecosystems, for example, organising conferences, business to business matchmaking, or education. Notable examples are the Blockchain Hungary Association,⁷⁶ the Blockchain coalition⁷⁷ and the Neumann Technology Platform.⁷⁸

Development in the SME segment is still a little chaotic, due to the volatile characteristics of the crypto market and to the challenges of the fast-evolving technology. A stable, supportive, and predictable regulatory environment is also yet to come. There are notable companies and initiatives on the market though; a detailed list is to be found at the end of this document.

There are also some initiatives from the public and - or enterprise segment to capitalize the technology. Examples are the NFT and CBDC initiatives of the Hungarian National Bank.^{79,80} Nevertheless, blockchain adaptation in the enterprise segment is yet to come. It is expected that the MiCA regulation will accelerate the adaptation in this segment as well.

What measures has Hungary taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

There is a progressive cryptocurrency taxation for retail investors and some publicly supported platforms to support the technology in the SME segment.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

This is actually a good question, until this point, I did not have the feeling that mainstream cryptocurrency retail adaptation or crypto entrepreneurs are about to be promoted in the EU. I mean, there is, of course, the EBSI initiative on the European level, however it is relatively far from being a crypto service. So, if cryptocurrency or crypto entrepreneurship are about to be promoted, on the one hand, there should be a clear and strong communication for that on the EU level. I think this is not the case at the moment.

On the other hand, regulation should be more encouraging to support retail crypto or crypto entrepreneurship. Examples might be a clear legal framework for the ownership of tokenised assets. At the moment, mostly MiCA is in the pipeline. It can surely create a very good legal framework for banks to issue their own regulated stablecoins. If banks are not interested in such business however, that might kill the crypto innovation potential and entrepreneurship on the whole market.

What does the future hold for the Hungary blockchain and cryptocurrency ecosystem?

⁷⁶ Source: Blockchain Hungary Association <https://blockchainhungary.org/>

⁷⁷ Source: Blockchain Coalition <https://blockchainkoalicio.hu/EN-Koalicio-1.html>

⁷⁸ Source: Neumann Technology Platform <https://neum.hu/en/>

⁷⁹ Source: The Money Museum mobile application, the MNB's new blockchain technology-based platform launched <https://www.mnb.hu/en/pressroom/press-releases/press-releases-2022/the-money-museum-mobile-application-the-mnb-s-new-blockchain-technology-based-platform-launched>

⁸⁰ Source: Central Bank of Hungary collaborates with Perfina to Launch the first Retail CBDC Pilot Project in the EU, Marking a New Milestone and Benchmark in Global Digital Currency Innovation <https://medium.com/@Perfina/central-bank-of-hungary-collaborates-with-perfina-to-launch-the-first-retail-cbdc-pilot-project-in-67b3884c37ff>

It is expected that EU legislation, like MiCA, will accelerate the Hungarian blockchain and crypto ecosystem as well.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

Chatbots will surely increase the adaptation of the field by providing better usability for end users. One of the biggest problems in the whole field is that it is relatively difficult to use for an average user, like setting up a wallet, handling keys, and ensuring security. AI driven chatbots might help a lot in mainstream use adaptation.

AI chatbots might have a negative impact on the market as well, because they can accelerate the automated generation of false information. It can cause easier market manipulation, resulting in more efficient pump and dump schemes.

I believe, generally, the combination of AI and blockchain has an enormous disruptive potential in the long run. One direction is the appearance of decentralised artificial intelligence having human level cognitive and reasoning capabilities. One such initiative is SingularityNET. Another interesting and disruptive direction might be the appearance of tokenised and decentralised machine learning services in the DEFI ecosystem.

Key Figures

223+

Dedicated blockchain solution providers

246+m

Total Funds raised.

1.08%

Population that owns crypto

The Irish blockchain ecosystem at a glance

Ireland is an island country in Northwest Europe, and the country's economy is robust, as described in the European Commission's report. The economy is forecast to grow over the following years. Generally, international and tech companies are present in Ireland.

The interest in blockchain is clear in Ireland, as the business ecosystem and community are growing in number each year. There have been public initiatives for blockchain adoption, such as the Irish Government's hackathon. Private entities adopt blockchain for solutions in different sectors. Digital identity, urban mobility, and the tracking of craft beer, are just a few of the use cases for applications adopting blockchain.

Finally, [Blockchain Ireland](#) is a community-led initiative that draws together and supports the blockchain ecosystem. It organises and hosts the annual Blockchain Ireland Week, responds to consultations with regulators such as the Financial Regulator and the Central Bank of Ireland, and acts as a compass point for businesses moving to Ireland or starting up there. In conjunction with the Department of Finance, the government's CIO, Enterprise Ireland, and the Industrial Development Authority (IDA), Blockchain Ireland issued a strategy paper in May 2022 outlining its vision to establish Ireland as a global Web3 Hub. It consists of six working groups including enterprise, events and communication, legal and regulatory, skills innovation and education, startups and Web3, and technical.

TOWARDS MAINSTREAM ADOPTION

Blockchain adoption

Ireland's history as a financial services hub and its deep financial services infrastructure and workforce has attracted the establishment of numerous large crypto platforms. This has driven wide recognition of digital assets among the general populace. The *Business Post* regularly reports on cryptocurrencies, while a popular banking app allows easy access to trading certain cryptocurrencies.

Blockchain Ireland aims to drive awareness and adoption by responding to government- and regulator-issued consultation papers as a way of ensuring that the benefits and features of blockchain-enabled technologies are considered when legislation and government strategy is being drafted. Some recent examples include their response to the Central Bank of Ireland's Consultation Paper CP156 'Approach to Engagement in Financial Services' (5 February 2024), and to the government's national payment strategy public consultation (14 February 2024).

Blockchain legislation

Legislation relevant to crypto and blockchain in Ireland is largely driven by EU initiatives.

On the blockchain side, the EU's digital and technology related regulations potentially impact some blockchain-based technologies. These include the Data Act, the Regulation on Digital Operational Resilience (DORA), the Data Governance Act, the Digital Services Act, the Online Intermediation Services Regulation, the Digital Content and Services Directive, among others.

On the crypto side, these include the Fifth Anti-Money Laundering Directive (5AMLD), the Markets in Financial Instruments Directive (MiFID), the Markets in Crypto-Assets Regulation (MiCA), the EU's Digital Finance Strategy, ECB Digital Euro, European Digital Identity (eID), among others.

Ireland's financial regulator, The Central Bank of Ireland (CBI), provides information about cryptocurrencies on its website, for example its explanation ['What are cryptocurrencies like bitcoin?'](#) It has also repeatedly warned consumers about the risks of investing in cryptocurrencies via consumer information podcasts such as their video on ['5 things you need to know about buying crypto'](#).

The CBI has authorised several virtual asset service providers (VASPs) under Section 106A of the Criminal Justice (Money Laundering and Terrorist Financing) Acts 2010 to 2021. It has also authorised several entities involved in the crypto industry, such as 'Electronic Money Institutions' pursuant to Regulation 9 of the European Communities (Electronic Money) Regulations 2011 (as amended).

The CBI and government approach to crypto has been relatively conservative compared to other jurisdictions. The government has not issued any legislation outside the EU Regulations, while the CBI prefers that entities seeking 5AMLD authorisation have a strong presence in the country, potentially holding another licence such as e-money authorisation.

Regulations defining the taxation on cryptocurrency gains are in place. The tax rates have not been significantly updated, as activities relevant to cryptos like exchange tokens and mining. An overview on the tax rates is in the Inland Revenue's report.

Blockchain in academia

People interested in learning about blockchain can seek ongoing training programmes from Technology Ireland ICT and ICT Skillnet. These organisations support webinars and short-duration programmes with certificates.

A joint project between Blockchain Ireland and Digital Futures commenced in 2021. In a call for participation, the initiative describes its purpose to be research on skills development around blockchain in the UK and Ireland and sets two objectives.

Blockchain Ireland published blockchain training learning pathways. The pathways aimed to provide knowledge on blockchain to two audiences: business practitioners and developers. The learning pathways involved IBM technology, as the business pathway awarded an IBM SkillsBuild badge, and the developers' one was focused on Hyperledger.

Universities are active in educating the public on blockchain subjects, as individual courses and dedicated programmes are available. Dublin City University facilitates a part-time master's on blockchain lasting two years with blockchain scalability and cryptography courses. Another choice is the diploma in blockchain introduced by the Dublin Business School, which aims to support learning and include CBDC and technical considerations. Similarly, the Dundalk Institute of Technology provides training on the fundamentals of blockchain and blockchain and distributed ledger technology. It is evident that programmes for blockchain education are increasing and are communicated to the public in Ireland.

Blockchain across key industries

Ireland’s technology sector is strong. The government’s tax strategy and historic investment in tertiary education focused on computers and technology led to numerous international technology organisations establishing entities in the International Financial Services Centre in Dublin and similar locations around the country. Blockchain has been applied in a handful of applications, while the most mature sector is the financial sector, gathering most of the startups. These include Kraken, Coinbase, Gemini, Ripple, Zodia, and Moonpay Technology Services Limited, each of which have been authorised by the CBI.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Ireland fosters an environment that has attracted well-known and established international technology companies, such as Twitter and Airbnb. The startup ecosystem is supported by research labs and academia to produce experts, and there are investment opportunities for technology companies to grow in Ireland. Blockchain Ireland has six working groups, two of whom directly support startups (enterprise, startups, and Web3).

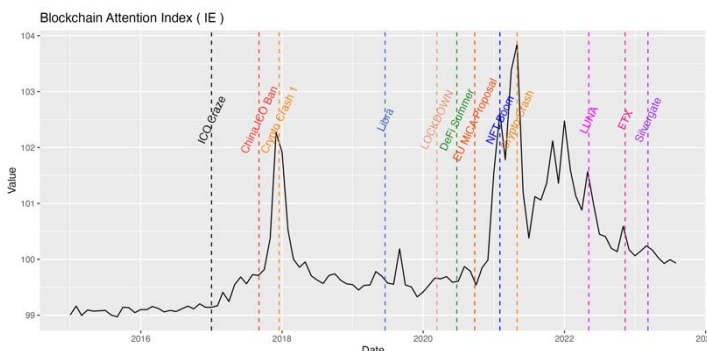
There are venture capitalists funding startups in Ireland that are keen to include blockchain startups in their portfolios. There are different activities established as options, such as funding, product, customers, and enterprise level. An interesting approach in Ireland is Cosimo X, a tokenised venture capital fund that aims to be active in the decentralised trust economy.

Techstars is collaborating with Alphabit and Launchpool to establish an accelerator programme focused on blockchain in Dublin. Another accelerator is NadiFin, which is present in Dublin and Luxembourg and aims to help entities providing financial services grow. If blockchain startups operate in the FinTech sector, they can approach this accelerator. In the past, the CorkBIC organised an accelerator programme for blockchain and its applications in different sectors.

Ireland fosters a growing ecosystem of startups on blockchain, with the wide majority established from 2015 onwards. The number of startups is an indicator of an ecosystem that is past its infant and early stage, as a moderate number of companies employ more than 50 professionals. Moreover, the wide range of industry sectors is an indicator of talent finding ways to adopt blockchain into sector-specific applications. Financial services use the most blockchain applications.

The ecosystem includes a good number of service providers, such as marketing boutiques specialising entirely in the crypto industry, such as The Bitcoin Marketing Team, who provide services to global organisations in the industry.

THE BLOCKCHAIN COMMUNITY



The blockchain community in Ireland is vibrant, with initiatives and associations to foster its growth. The initiatives are an indication that there is a community of experts on blockchain established in Ireland. This is to be expected, as big technology companies and technological hubs have been established around the country to research the adoption of new technologies. The experts in blockchain establish networks to support the community

and raise public awareness of the technology.

Blockchain Ireland hosts an annual conference called 'Blockchain Ireland Week' in May every year. It covers several days, with venues in Dublin and around the country, including Galway, Waterford, Kilkenny, Cork, Kerry and Belfast. It also hosts monthly meetups (accessible both online and in-person), and regular informal outings for networking purposes. More details and registration links are provided on the [Blockchain Ireland](#) website.

Other organisations, such as BlockW, organise events to promote awareness of the technology. Moreover, organisations like ICT's Skillnet have meetings and discussions on blockchain for the community to participate in. Finally, events on technology may include discussions on blockchain, like the Dublin Tech Summit, Tech Connect Live, the National Manufacturing Event Conference & Exhibition, and the [Supply Chain & Logistics Conference in May 2024](#)

The Central Bank of Ireland has established an innovation hub with a wide range of activities. It recently launched a consultation titled 'CP156 – The Central Bank approach to innovation engagement in financial services'. The deadline for responses was 8 February 2024. It outlined the CBI's current focus on engagement, including its innovation hub, and discussed the approaches adopted by other regulators when engaging with their communities. It also discussed enhancements of the innovation hub and engagement with the ecosystem, including a sandbox programme.

An indicative but non-exhaustive list of blockchain companies in Ireland

bloXmove: a company founded in 2021 with the vision of revolutionising urban mobility. The decentralised platform is the tool to revolutionise urban mobility. Blockchain brings the immutability of data and payments reliance to support a trustless environment between third parties. The vision for the future of mobility is described in the collaborative whitepaper with Orange Business Services and Ciklum. The company was selected to participate in SAP.iO's accelerator programme in January 2022.

The Crypto Climate Exchange has criteria in place for funding climate-change mitigation projects. These are the project's utility, service delivered by an established company, and the provision of long-term value. The marketplace has deployed nodes on the Binance and Tron blockchains.

Cryptoprocessing: a company providing API for secure and fast access to blockchains. The provided solution can aid merchants to accept payments in cryptocurrencies. The API handles incidents like double spending or the duplication of transactions.

NadiFin: an accelerator programme for FinTech ideas established in 2019. The programme is supported by MiddleGame Ventures, LHoFT, Brown Brothers Harriman, and Standard Chartered Ventures. Blockchain is one of the technologies included in the programme.

INSIGHTS FROM EXPERTS

Lory Kehoe, chair and co-founder of Blockchain Ireland, and Louise Hogan of A&L Goodbody LLP Solicitors.

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Ireland?

The awareness and adoption can be broken down into retail and institutional environments. On the retail side, there is good awareness among the general populace, primarily for speculative and trading purposes. On the institutional side, organisations are adopting technology that incorporates blockchain elements. Financial services organisations are increasingly using cryptocurrencies in their portfolios, such as [ETFs](#), spot Bitcoin ETFs, and crypto funds and feeder-funds. Others are undertaking staking or tokenisation and issuing stablecoins.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Ireland?

On the retail side, Ireland boasts strong representation of the European headquarters of the world's leading crypto exchanges. Several large financial services institutions, such as BNY Mellon, have teams dedicated to blockchain and crypto.

There are over fifty Irish-born Web3 and blockchain startups, and that figure grows year on year. While the number of startups is relatively small, it is representative of the country's size. The ecosystem, however, is mature.

What measures has Ireland taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Public sector initiatives include the blockchain Ireland strategy produced in conjunction with the Department of Finance, the government's CIO, Enterprise Ireland, and IDA outlining its vision to establish Ireland as a global Web3 Hub. The government previously a blockchain hackathon. The CBI launched an innovation hub several years ago and is currently engaging with industry stakeholders about enhancements. In 2023, Blockchain Ireland Week 2023 was opened by the Minister of Finance and closed by Minister of State Jennifer Carroll MacNeill.

In April 2023, the CBI released new enhanced guidelines for qualifying investor alternative investment funds (QIAIFs) intending to acquire digital asset exposure. The guidelines were published in response to growing interest and the participation of QIAIFs in digital assets, such as cryptocurrencies and tokens.

Members of the CBI involved with cryptocurrencies engage with the Blockchain Ireland meetings and informally attend meetings. Blockchain Ireland hosts podcasts with policy leaders from the CBI, the IDA and the government, including ministers such as Jennifer Carroll McNeil.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

Institutions at national and EU levels have taken pains to warn about the risks of cryptocurrencies and are strengthening consumer protection via numerous measures. On the flip side, education about the benefits of blockchain technology is critical. Cryptocurrencies are just one possible use case for blockchain technology. Better awareness of the technology and what it can enable will foster greater innovation and multiplication of use cases.

Improving the infrastructure available to entrepreneurs will encourage greater innovation and more successful startup launches. This infrastructure includes better banking facilities and greater access to funding. Different types of funding would also greatly help. For example, a way to encourage or reward large institutions in the industry who invest in and foster development and growth at grass-roots level.

Ideally, Ireland should implement blockchain-based projects within its own technology stack, as Germany, the USA, and the UAE have done. Germany has incorporated blockchain technology to transform their bond issuance process. Some states in the USA use blockchain-based technology to prevent fraud in their voting systems, while certain departments in the UAE have incorporated blockchain technology into their judicial systems.

What does the future hold for the Irish blockchain and cryptocurrency ecosystem?

The future looks bright. The numbers of blockchain based startups grow year by year.

On the crypto side, adoption and regulation of Bitcoin-based and other crypto financial service instruments is steadily increasing. On the blockchain side, blockchain-based supply-chains and online platforms are being launched.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

It is still early days for this type of type of technology. However, already we are seeing that some developers are using AI tools to write code to expedite app development.

Key Figures

314+

Dedicated blockchain solution providers

176m

Total funds raised.

2.43%

Population that owns crypto

The Italian blockchain ecosystem at a glance

The diffusion of blockchain-based technology solutions is advancing rapidly, and Italy has the potential to be an important player in this nascent market, according to a 2020 report by the Organisation for Economic Co-operation and Development (OECD) titled [Blockchain for SMEs and Entrepreneurs in Italy](#). The OECD research team concludes that the country features a plurality of use cases for which blockchain technology is being accelerated, namely supply chain management, copyright protection, HR, procurement, and payments reconciliation.

According to researchers from the Centre for Entrepreneurship, SMEs, Regions, and Cities (CFE), it is still too early to identify with certainty in which direction a possible Italian blockchain cluster could evolve. Despite the overall small size of venture capital investments (as a proportion of GDP, according to the OECD), there are a few emerging VC funds that have decided to focus specifically on blockchain companies. According to the same OECD report, 'Most Italian companies lack a detailed understanding of DLTs and blockchain applications.' Conducted in 2019, the survey indicates that 14% of large companies have a deep understanding of the technology, while another 23% know about it on a more superficial level. The percentages decrease when considering SMEs, as 4% and 16% have a deep and superficial understanding, respectively.

While blockchain adoption has been expected mainly from governmental or financial use cases, in Italy, it is proved that football might bring Italians closer to adopting blockchain technology. A use case that has evolved is fan tokens, focusing mainly on football fans, which grant supporters of football clubs with actual decision-making rights. For the most part, these decisions are on the periphery of a club's operations. At least six mainstream Italian football clubs (Lazio, Inter, Juventus, Milan, Roma, Napoli) maintain fan tokens, while smaller teams are also going in this direction. This trend has led many blockchain firms to sponsor major athletic events, such as the final of Italy's soccer cup competition, Coppa Italia. It is indeed interesting to note that the Italian football team Juventus FC announced in February 2024 that Zondacrypto would be the official sponsor and that Crypto.com was Coppa Italia's main sponsor in 2021.

TOWARDS MAINSTREAM ADOPTION

Public sector, regional governance and policymakers

The Italian government has showcased an innovative policy action at international level. In the Decreto Semplificazioni (DDL n. 989, 2019) the Italian Parliament approved a definition of DLTs and the legal validity of smart contracts. The legislators have introduced an innovative legal principle in Italy that recognises smart

contracts as legal contracts in the Italian legal system. There are no large-scale public sector initiatives in Italy attempting to establish a blockchain ecosystem for blockchain approaches or blockchain clusters.

In 2015, the Ministry of Economy and Finance launched two pilot projects to test the technology within the systems of the public administration. The first experiment was SUNFISH (Secure information sharing in federated heterogeneous private clouds). The Italian prototype used smart contracts on a blockchain infrastructure to ensure integrity and secrecy in the exchange of information between the MEF and the state police concerning the residence and status of Italian public security agents.

The second implementation initiative of a DLT technology, again by the MEF, is called PoSeID-on, a platform for personal data management and data protection. The initiative aims to create an ecosystem platform using permissioned blockchain and smart contracts for the management and protection of personal data, in compliance with the GDPR framework. The platform will become accessible in different phases. The first phase will onboard up to 2 million Italian public servants registered on NoiPA (legal-economic management service of the payroll within the Italian public administration), who will have the possibility to use an improved dashboard for the management of their data.

Both projects have been financed by the European Commission and from the Horizon 2020 programme.

In 2018, Italy was among the seven southern EU members to sign a declaration to promote distributive ledger technology. The Mediterranean Seven believes blockchain technology can be a game changer in boosting the efficiency of their economies.

Italy signed the declaration creating the European Blockchain Partnership on 27 September 2018. In 2019, the MiSE instituted a high-level expert group to discuss a national blockchain strategy. The expert group started work in January 2019, organised into sub-working groups, namely:

- SG1 - Use cases: infrastructure, mapping, and replicability conditions
- SG2 - Regulatory framework: sandboxes and vulnerability
- SG3 - Digital coins, payment system, and FinTech
- SG4 - Education, skills, and awareness
- SG5 - Strengthening of public administration services

The draft document has been finalised by the experts and it will provide the basis for the Italian national strategy on blockchain.

Documents leaked on the dark web revealed that Chainalysis cooperated with Italian law enforcement by providing meaningful leads related to IP data associated with a relevant cryptocurrency address. The original leak involved a cache of documents allegedly obtained from the Italian Guardia Di Finanza's Nucleo Speciale Frodi Tecnologiche's dark web team. The leaked materials identify the presentation as a component of an investigation into Berlusconi Market. Berlusconi Market was a darknet market that the Italian authorities took down in 2019.

Other public-private initiatives:

The Ministry of Economic Development (Ministero dello Sviluppo Economico) partnered with IBM in 2019 to develop a first case study focusing on the traceability of 'Made in Italy' in the textile sector in Italy. The objective of the feasibility study was to test a platform, based on the private permissioned infrastructure of IBM's Hyperledger Fabric, to provide a solution for the various stakeholders in the textile supply chain, one of the most important for the 'Made in Italy'.

A pilot project was launched by the Ministry of Agricultural, Food and Forestry Policies (MiPAAF) in 2017 for the traceability of the wine supply chain. The project, called Wine Supply Chain 4.0, also included Agea (the Agricultural Dispensing Agency), SIAN (the National Agriculture Information System), and Almaviva as a private partner. The system, based on Ethereum, was aimed at protecting the origin of Italian products in the wine supply chain, guaranteeing quality and safety in the production process.

In 2018, the Ministry of Education, Universities and Research (MIUR) prepared a white paper for *Diplome*, a system for the recognition of educational qualifications based on DLTs.

Legislation focused on blockchain and cryptocurrencies

Regulators such as the Bank of Italy, CONSOB, and the Tax Authority (Agenzia Delle Entrate) have issued various official documents to clarify issues related to cryptographic assets. The scope of those clarifications has been solely limited to cryptocurrencies, rather than the applications of blockchain in real-world applications.

A ministerial resolution of 2016 issued by the Agenzia Delle Entrate (Tax Authority) addressed certain aspects of the tax treatment of bitcoin and other cyber currencies. It implemented a European Court of Justice (ECJ) decision which held that no value-added tax (VAT) can be imposed on the exchanges of crypto to fiat and vice versa. But ‘for purposes of the corporate income tax (Imposta sul Reddito sulle Società, IRES) and the Italian regional production tax (Imposta Regionale sulle Attività Produttive, IRAP), profits and losses on such transactions constitute corporate income or losses subject to taxation.’ In short, all profits from crypto are taxable, except crypto transactions.

According to Italian Legislative Decree No 90 of 2017, regulations imposed on traditional money exchanges also apply to cryptocurrency exchanges, giving cryptocurrencies the same treatment as foreign currency.

On 7 February 2017, the Parlamento Italiano swiftly approved a bill submitted by the senate in January 23 defining blockchain technology and distributed ledger technologies, or DLT. The crypto regulation bill to be known as ‘Decreto Semplificazioni’ is now with the Agenzia per l’Italia Digitale, tasked with creating specific technical standards for the legal compliance of smart contracts.

Legislative Decree No 90 of 2017 subjected virtual currency providers to the regulations established for traditional money exchange operators. To that effect, Legislative Decree No 90 charged the Ministry of the Economy and Finance to issue a ministerial decree setting forth the modalities and timelines for the legal performance of such activities throughout the country.

On 7 February 2019, the Italian Parliament approved a law which provides a legal definition of both DLTs and smart contracts and recognises their full legal validity and enforceability.

As a result, Italy is one of the first countries to introduce legislation that rules that smart contracts are deemed by law to be equivalent for certain purposes (i.e. consensus formation and evidentiary value) to traditional written contracts to the extent of the digital authentication of the parties.

On 14 June 2021, the Commissione Nazionale per le Società e la Borsa (Italy’s securities market regulator) said the increasing use of cryptocurrencies outside of a regulated marketplace may have negative consequences: ‘If it takes too long at European level to come up with a solution, (Italy) will have to take its measures,’ it said.

In interpello n 788/2021, issued in November 2021 by the Tax Authority, the tax authorities reiterated the equivalence of cryptocurrencies to foreign currencies.

Following the enactment of Italy's Ministry of Economy and Finance Decree of 13 January 2022, enrolment in the special section of the OAM (Organismo Agenti e Mediatori [Register of Agents and Brokers]) has become mandatory for all natural and legal persons providing services related to virtual currency, to increase the transparency of transactions involving cryptocurrencies.

The 2023 Budget Law (the Italian law that approves the annual budget of the state) regularised the taxation of cryptocurrencies, setting the tax rate on digital currencies as 26% of capital gains if the value is more than EUR 2,000 in a tax year.

Academic courses & professional qualifications and research initiatives

According to the Edurank website, research publications on blockchain and cryptography amount to 253,000; there are 11,700 citations of relevant academic papers produced by 42 universities in Italy. Among the top three ranked universities are the Polytechnico University of Milan, the University of Bologna, and the University of Pisa.

[Politecnico di Milano - Blockchain & Web3 Observatory](#): the Observatory was founded in 2018 under the name of the Blockchain & Distributed Ledger Observatory and in 2023, to respond to the evolution of how these technologies are applied, the name was changed to the Blockchain & Web3 Observatory. The mission of the observatory is to generate and share knowledge about blockchain and Web3 and contribute to the development of Italian and international markets, creating opportunities for leading active players to meet and discuss. As a result of the collaboration between the Department of Management Engineering and the Department of Electronics, Information, and Bioengineering, the Observatory analyses these issues from both a business and technical point of view.

[University of Florence](#): the University of Florence has started a professional course on blockchain and blockchain technologies. The intent is to go beyond Bitcoin and understand the technology underlying the first cryptocurrency. Students will have the chance to update their competencies, tracking the innovations that blockchain will bring to the economy and society. This is the goal of the course in the economy and law of digital assets, which has been started by the Department of the Signs of Economy and Business of the University of Florence.

[Lewis Business School](#) has launched an advanced university course named Blockchain Business Revolution. It is aimed at executive directors, managers, and entrepreneurs as well as officials of public administrations. In addition, there are several other courses and master's courses on blockchain technology, blockchain innovation, and blockchain technology management at different private and public universities in Italy, amongst them the Link Campus University, Roma Tre University, associations, the University of the Italian Chambers of Commerce, several universities from the north of Italy including Verona and Padua.

[SDA Bocconi/ School of Management](#): the Blockchain Education Network (BEN) Italia was founded at the end of 2014 and became a non-profit in 2016. It promotes the study and use of Blockchain technology through conferences, courses, and project development. Oriented to the university environment, it collects memberships from students, teachers, and researchers, and collaborates with companies and public administrations. Scientific dissemination and education on the technology underlying Bitcoin and other cryptocurrencies constitute the mission of the BEN.

Blockchain across key industries: a key characteristic of the Italian economy is a large number of SMEs, and the advancement of the export-oriented industrial sectors.

Blockchain experimentation by large firms in Italy: key players in Italy include technology providers such as IBM Italy and Microsoft Italy. Solution providers are, in most cases, small startups. These players have formed several associations; Italia for Blockchain is one of them and has over 350 members.

Ten Italian enterprises are already using blockchain successfully: Ania, which is working with IBM and Reply has developed the Sandbox project. Ania is the association of insurance companies and Sandbox is a protected virtual space where a dispute resolution procedure is being experimented with, based on blockchain technologies. In short, parties have shown interest in taking part in the project, since this guarantees faster resolution of disputes.

Mediolanum Bank is using the Ethereum blockchain to certify the originality of non-financial declarations (a document which collects, for example, information on environmental and social policies), publishing the hash of the document on the institutional website of the bank. Mediolanum is also studying other possible applications for document authentication.

Carrefour Italy was the first Italian enterprise of large organised distribution to use blockchain for the traceability of products on their shelves. Information is also available through a smartphone app. The project was initiated with chicken in 2018 and was extended to citrus fruits in 2019.

The Municipality of Bari is collaborating with SIA and has started a project based on blockchain technology the aims to digitalise the process of managing guarantee policies in public procurement. This project allowed dematerialisation of the issue of guarantees by banks, financial intermediaries, and insurance companies, which are certified in an unambiguous and irrevocable way.

CREA is a body supervised by the Ministry of Agricultural Policies that has the task of undertaking research in the agribusiness field. It has adopted blockchain solutions by Microsoft to develop an application for the traceability of wood from the tree to the consumer. The entire supply chain has been simulated, starting with the planted trees to the final product, including the cutting and processing of the wood.

The Italian Post Office has already invested in Conio, the Italian wallet for the purchase and exchange of bitcoin. Furthermore, it has started the development of other projects with IBM and Hyperledger.

UniCredit is participating on the We Trade platform together with another eight Italian European banks to allow the use of crypto values within traditional banking activities. In March 2019, the ASA group (producer of metal packaging) purchased a batch of tin plates using bitcoin from its supplier Steel Force, supported by KBC Bank in Belgium.

Italy's ANSA newswire is trialling an Ethereum-based system to track every article it publishes to prevent impersonators from publishing fake news under its banner. ANSAcheck registers vital details, including an article's title, timestamp, content hash, ID, and publication on the Ethereum blockchain. It makes this information available through a little green graphic emblazoned at the bottom of nearly every newly published piece on the site.

Italian bank Banca Generali led the USD 14 million Series B for Bitcoin wallet provider Conio. As part of the investment, Banca Generali has also signed a commercial agreement with Conio, which will provide its Bitcoin trading and custody services to the bank's customers.

While not directly related to blockchain technology, the football club Inter Milan has signed a EUR 85 million sponsorship deal with a blockchain FinTech firm. As Inter's 'official global digital-banking partner', Zytara will

develop the club's mobile app to integrate directly with Zytara's banking technology and enable access to crypto-based products. A similar deal has been conducted with the AS Roma football club.

As disclosed in October 2021, European cryptocurrency exchange Bitpanda is collaborating with Italian open finance provider Fabrick to offer digital asset trading services to Italian banks and FinTechs. Fabrick is a part of Sella, Italy's largest group of banks, and has 510 application programming interfaces (API) available on its platform that allow banking applications to communicate with each other. The APIs connect over 500 Italian banks.

The Spunta Banca DLT solution, built on Corda Enterprise by SIA and NTT Data, and governed by ABI – the Italian Banking Association – is live with over 100 Italian banks, representing 91% of the nation's banks. In the first 6 months, the Spunta Banca DLT has processed 204 million transactions with an automatic match rate of 97.6%, transforming the interbank reconciliation process.

Supply chain management

Due to the characteristics of the Italian economy, the supply chain management industry is a highly relevant case study for the adoption of blockchain technologies.

The consortium of red Sicilian oranges has used blockchain to implement a tool to fight food fraud and enable consumers to recognise the originality of the citrus fruits by a simple scan of the IGP mark attached to each box or net of oranges with a smartphone. It is possible to check the fields for where the fruits have been produced, the date of harvesting, and the modes of conservation and distribution.

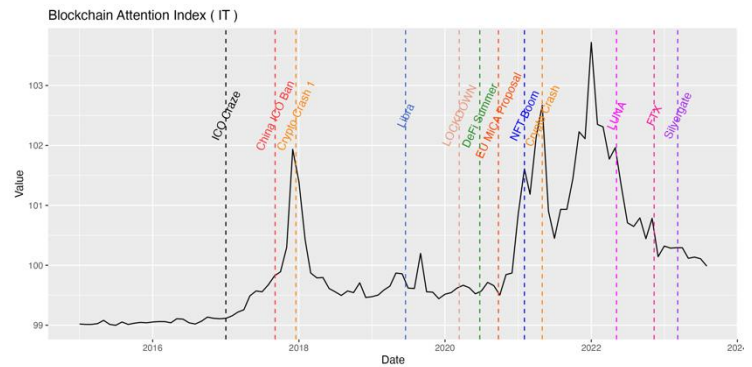
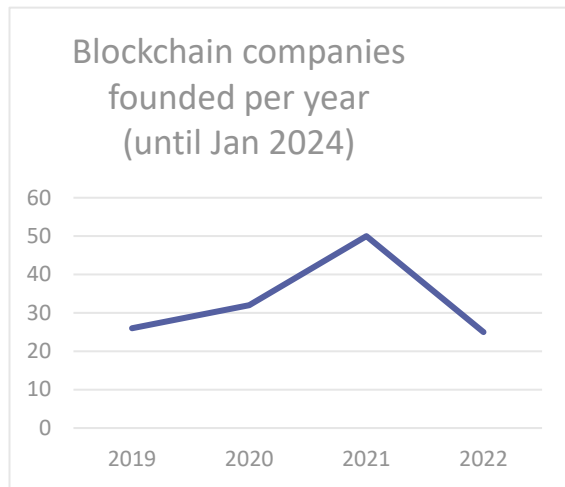
Barilla is working together with IBM to develop a pilot project that exploits blockchain technologies to guarantee the origin and quality of products and raw materials from the field to the table. The first application was developed for Italian fresh basil.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

There is a dynamic community of startups based in Italy that have deployed innovative blockchain-based projects. According to data collected by the [Osservatorio Blockchain and Distributed Ledger Technology of the Politecnico di Milano](#) and the innovative SMEs and startups registered on the database created by the MiSE, in cooperation with Infocamere and the Camere di Commercio d'Italia (the Italian Chambers of Commerce Association), 67 SMEs and startups active in the blockchain space could be identified. CoinATMradar counts 72 cryptocurrency ATMs installed throughout Italy.

According to Crunchbase, which is EUBOF's data tool for our cross-country benchmark, there are 313 blockchain-focused companies.

THE BLOCKCHAIN COMMUNITY



The Italian blockchain ecosystem is prominent, featuring a large number of professionals actively engaged in the blockchain technology community. The community consists of approximately 3.5 million to 4.1 million observers according to Facebook's audience metrics system.

NOTABLE BLOCKCHAIN COMPANIES

Young Platform: a new cryptocurrency exchange that allows you to buy and sell digital assets (e.g. Bitcoin, Ethereum) with fiat money (euro and pounds) safely, quickly, and easily!

One Trading: a centralised and European-regulated digital asset trading venue. Offering exchange, swap product, and wallet services.

Mintlayer: a cryptocurrency wallet that allows its users to store their Bitcoin and MLT tokens more securely.

Alps Blockchain: a company specialised in research and development in the sectors of blockchain and data mining.

Smiling: an innovation company with proprietary platforms for marketing in the blockchain, video, and social media environments.

Volvero: an app that provides access to a USD 200 billion market, enabling vehicle owners to earn by sharing them from day one by leveraging a secure DLT system and big data technologies for vehicle monitoring and user awareness.

EvenFi: a regulated peer-to-peer crowdlending platform that connects valuable SMEs interested in financing their growth projects with lenders looking for excellent investment opportunities.

Poleecy: with Poleecy you are always just a few clicks away from insuring your life events. Poleecy sells short-term policies using its digital channel that cover well-known risks with no paperwork, tailored to the customer's location, habits, and needs, recorded on blockchain and paid for by e-money.

Prosume Energy: a platform that aims to revolutionise the exchange of electricity from both renewable and fossil fuel sources. Prosume connects independent power producers, consumers, utility companies, and energy communities in a locally shared market where each peer is free to interact in a multi-tenant ecosystem.

The main goal of the project is to promote the decentralisation of power models and empower energy communities. In order for this to happen, the project focuses on the implementation of P2P energy exchange policies, targeting possible solutions for existing energy framework barriers (both from a physical and legal standpoint) and investing in continuous R&D in order to offer state-of-the-art hardware and IoT devices related to smart metering/billing, smart grids, energy routers and devices.

INSIGHTS FROM EXPERTS

Eugenio Reggianini, European Blockchain Association

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Italy? Has the recent growth of the cryptocurrency markets facilitated familiarity?

Italy, like many other countries, has witnessed an increasing level of public awareness and adoption of blockchain technology and cryptocurrencies in recent years. In terms of general awareness, the market started stabilising after difficult times and recently restarted growing slowly but steadily.

Led by regulators who enforced tax provisions and innovative frameworks, like the regulatory sandbox launched by the Italy's central bank, Italy is slowly focusing on institutional use cases and services. To this point, the main national reference is ABI, Associazione Bancaria Italiana, which recently launched Project Leonida, a wholesale CBDC pilot, among ABI members.

On the corporate side, other industries in retail, fashion, and luxury are experimenting with different use cases from NFT collection to supply chain data management and harmonisation, proof of attestations, and loyalty programmes, etc.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Italy?

I would say that, considering the country's previous position on ecosystem development, Italy, like Spain and Portugal, may fall just behind Germany and France and tier 2 in terms of market maturity. My personal opinion is that the majority of the economic sectors of industry are still maturing in terms of knowledge and experience, providers are mostly focusing on retail-oriented services.

What measures has Italy taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

I will mention a few of them:

- OAM registration for service providers and traders.
- The Bank of Italy regulatory sandbox to experiment with financial DLT-based use cases, implying for instance the tokenisation of financial assets.
- The tax regime for crypto assets under Law No 197 of 29 December 2022.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

I believe that a smart and effective move would be for infrastructural investment arms, like Cassa Depositi e Prestiti, to continue and extend favourable financing conditions for the funding of entrepreneurial activities implementing functionalities and services in line with the European strategy.

What does the future hold for the Italian blockchain and cryptocurrency ecosystem?

Personally, I see a great future for Italy due to its strong financial market segmentation in terms of traditional institutions and new intermediaries. At the same time, the Italian industry sector relies heavily on protecting intangible assets like 'Made in Italy' to compete on the global stage in exporting activities, and, as DLT & blockchain in general have shown concrete improvement in terms of auditing, anti-counterfeiting, and customer profiling, I believe that many more companies will interact with blockchain technology in Italy in the future.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

AI integration into blockchain-based applications regarding chatbots can help to streamline user interaction with the application itself. At the same time, it can help to build more a qualitatively oriented data registry for offchain data bases.

Key Figures

27+

Dedicated blockchain solution providers

5m

Total funds raised.

1.27%

Population that owns crypto

The Latvian blockchain ecosystem at a glance

The Latvian blockchain ecosystem is characterised by the presence of both local and international blockchain projects. The country hosts several blockchain companies, with a notable mention going to Crypton Studio, a leading player in the custom blockchain development segment in Europe, operating out of Riga, Latvia.⁸¹ Additionally, the implementation of blockchain technology extends to the aviation sector, with Latvia's national airline, AirBaltic, being one of the pioneers in accepting bitcoin as a form of payment. This adoption not only signifies a progressive approach toward digital currencies but also highlights the potential of blockchain technology in revolutionising traditional sectors.⁸²

Blockchain technology in Latvia is gaining attention in the FinTech sector and will account for 12.6% of overall industry by 2023. This indicates a growing recognition of the potential of blockchain to enhance financial systems and processes, particularly in peer-to-peer transactions and crowdfunding campaigns. The country's engagement with blockchain is aligned with broader FinTech advances, demonstrating a conducive environment to the development and application of the technology.⁸³

In Latvia, the popularity of cryptocurrency trading platforms and the introduction of Bitcoin ATMs reflect the emerging interest in cryptocurrencies, despite the central bank's cautious approach to cryptocurrency investments.^{84,85} In addition, the popularity of global trading platforms such as Coinbase, Coinmama, and eToro in the Latvian market is indicative of the growing recognition and acceptance of cryptocurrency trading in the region.⁸⁶ These developments in the cryptocurrency space are in line with the wider blockchain ecosystem in Latvia.

TOWARDS MAINSTREAM ADOPTION

Regulation

Latvia's regulations on cryptocurrencies are mainly based on legislation aimed at preventing money laundering and the financing of terrorism. The Law on the Prevention of Money Laundering and Terrorism and Proliferation Financing (or AML Law) is the principal legal framework governing anti-money laundering (AML) activities, and

⁸¹ Source: <https://techbehemoths.com/companies/blockchain/latvia>

⁸² Source: <https://eng.lsm.lv/article/economy/business/5-things-to-know-about-blockchain-in-latvia.a279080>

⁸³ Source: <https://FinTechLatvia.eu/news/latvian-FinTech-landscape-update-2023/>

⁸⁴ Source: <https://cryptomode.com/investors-in-latvia-limited-their-exposure-to-cryptocurrency-in-2022/>

⁸⁵ Source: <https://cryptoglobalcapital.com/countries/latvia>

⁸⁶ Source: <https://cryptoglobalcapital.com/countries/latvia>

it has been updated to incorporate directives 4MLD and 5MLD (Directives (EU) 2015/849 and 2018/843) from the European Union.⁸⁷

Latvia currently has no specialised legislation directly aimed at crypto assets. Activities related to cryptocurrencies, such as exchange, safekeeping, lending, and proceeds/collateralisation, are largely unregulated and only specific provisions and definitions of the AML Law apply to these activities. The AML Law recognises the term ‘virtual currency’, defining it as a digital representation of value that can be digitally transferred, stored, or traded. However, Latvia does not recognise virtual currencies as legal means of payment.⁸⁸

National initiatives

In Latvia, the government is actively supporting the development of blockchain technology. The EU has allocated EUR 93 million for a new venture capital fund aimed at supporting startups, including those in the blockchain sector. The financial allocation is expected to promote innovation in blockchain and related fields.⁸⁹ In addition, Latvian law enforcement is already well-equipped to handle cryptocurrency cases. In 2020, the Latvian National Police confiscated EUR 110,000 worth of bitcoin (BTC), Ethereum (ETH), XRP, and USD-denominated Tether (USDT) from the group.⁹⁰

Cryptocurrency

The cryptocurrency market in Latvia is projected to grow by 13.48% from 2023 to 2027, resulting in a market volume of USD 30.78 million by 2027. This growth indicates increasing interest and investment in cryptocurrencies within the country. Factors such as evolving regulatory frameworks, technological advancements, and rising public awareness will contribute to this positive trend. Despite a relatively small market size compared to other European nations, the upward momentum of Latvia's cryptocurrency market suggests a growing acceptance and understanding of digital assets within the nation.⁹¹

VASPs

Latvia does not have a specific national framework for obtaining authorisation for trading in crypto assets. The regulatory approach to virtual asset service providers (VASPs) and crypto-asset issuers largely depends on the business model and categorisation of crypto-assets. For instance, if during an initial coin offering (ICO), investment-type virtual assets are issued, they might be categorised as financial instruments under Latvia's Financial Instrument Market Law. In such cases, the initial offering of these assets is required to be conducted through a licensed investment firm or a credit institution.⁹²

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The blockchain sector in Latvia is experiencing modest growth, driven by regulatory measures and a community interested in the technology. Currently, there are several companies offering blockchain services

⁸⁷ Source: <https://cms.law/en/int/expert-guides/cms-expert-guide-to-crypto-regulation/latvia#:~:text=AML%20Regulation%20Financial%20Services%20Regulation%3B.and%20Terrorism%20and%20Proliferation%20Financing>

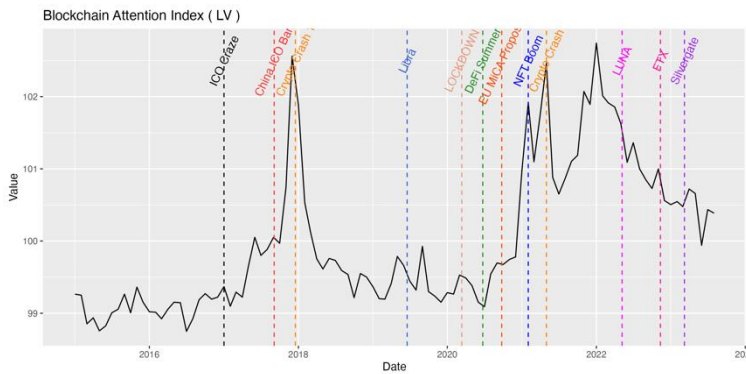
⁸⁸ Source: <https://cms.law/en/int/expert-guides/cms-expert-guide-to-crypto-regulation/latvia#:~:text=AML%20Regulation%20Financial%20Services%20Regulation%3B.and%20Terrorism%20and%20Proliferation%20Financing>

⁸⁹ Source: <https://FinTechLatvia.eu/news/latvian-FinTech-landscape-update-2023/>

⁹⁰ Source: <https://www.coindesk.com/policy/2020/07/22/latvian-police-seize-crypto-worth-126k-in-bust-of-suspected-cybercrime-ring/>

⁹¹ Source: <https://www.statista.com/outlook/dmo/FinTech/digital-assets/cryptocurrencies/latvia#:~:text=The%20Cryptocurrencies%20market%20in%20Latvia.experiencing%20a%20period%20of>

⁹² Source: <https://FinTechLatvia.eu/crypto-asset/requirements-for-crypto-asset-issuers-and-service-providers/>



in Latvia, indicating an increasing acceptance and specialisation of this technology within the country. Blockchain startups are innovating in areas including, but not limited to, smart contract development, FinTech, and digitalisation of industries.

Several companies in Latvia are engaged in cryptocurrency and Web3 technologies. For instance, Crypton Studio, a Riga-based company, is noted as the largest company in the custom blockchain development segment

in Europe, indicating a blend of blockchain technology with various sectors.⁹³ Additionally, AXIOMA, another company based in Riga, specialises in fintech projects, demonstrating the integration of blockchain technology with financial sectors.

In legislative terms, Latvia signed a memorandum of understanding with the other two Baltic states agreeing to support the blockchain Initiative. The Financial and Capital Market Commission (FKTK) is willing to advise the blockchain initiative on the various licences that may be required.⁹⁴ This marks a proactive strategy to manage consumer protection and security issues related to blockchain.

Furthermore, there are financial resources available for blockchain startups in Latvia. As an example, Latvian ICOs have raised over EUR 28 million, demonstrating Latvia’s supportive ecosystem for blockchain businesses.⁹⁵

These efforts and developments highlight Latvia’s ecosystem for supporting blockchain businesses and signify a positive direction for the Latvian blockchain industry. The combination of legislative and financial support combined with a community interested in blockchain technology sets the landscape for continuing to grow and innovate the blockchain industry in Latvia.

THE BLOCKCHAIN COMMUNITY

Latvia’s blockchain community is growing as is evident from the conferences and associations. The Baltic HoneyBadger 2023 conference will be held in Riga in September, providing a platform for blockchain enthusiasts, developers, and investors to converge and share insights.⁹⁶ In addition, the Baltic Business Technology Fair and Conference in October 2023 in Riga is another opportunity for technology enthusiasts to explore blockchain and other business technologies.⁹⁷ Moreover, the International Conference on Blockchain and Cryptocurrencies is scheduled for 17 June 2024, in Riga, signifying a continued interest in and commitment to advancing blockchain knowledge in the country and the wider region.⁹⁸

The Latvian Blockchain Association (LBAA) plays a key role in bringing together blockchain industry experts, entrepreneurs, and companies in Latvia. Founded in 2017, the LBAA actively promotes the integration of blockchain technology into the Latvian economy, focusing on areas like regulation. It aims to promote

⁹³ Source: https://techbehemoths.com/company/crypton-studio?service_name=Blockchain&service_url=blockchain

⁹⁴ Source: <https://eng.lsm.lv/article/economy/business/5-things-to-know-about-blockchain-in-latvia.a279080/>

⁹⁵ Source: <https://eng.lsm.lv/article/economy/business/5-things-to-know-about-blockchain-in-latvia.a279080/>

⁹⁶ Source: <https://cryptoevents.global/baltic-honeybadger-2023/>

⁹⁷ Source: <https://www.linkedin.com/company/rigacomm/>

⁹⁸ Source: <https://conferenceindex.org/event/international-conference-on-blockchain-and-cryptocurrencies-icbc-2024-june-riga-lv>

cooperation between all market participants and stakeholders in the blockchain ecosystem, with the aim of making Latvia a key Web3 centre in the EU.⁹⁹

⁹⁹ Source: <https://www.linkedin.com/company/the-latvian-blockchain-association-lbaa/?originalSubdomain=lv>

Key Figures

35+

**Dedicated Blockchain
solution providers**

313m

Total Funds raised.

The Liechtenstein blockchain ecosystem at a glance

Liechtenstein, despite being the fourth smallest country in Europe, has successfully cultivated a thriving blockchain community, largely attributed to the foundational legal framework provided by the “**Tokens and Trusted Technologies Service Provider Act**” (TVTG), commonly referred to as the “*Blockchain Act*”¹⁰⁰.

The Liechtenstein Innovation-Framework:

Liechtenstein's dynamic Innovation Framework is designed to foster a thriving blockchain ecosystem, providing both a high degree of legal certainty and continuous developmental support for individuals and enterprises within the digital and financial sectors. This comprehensive approach is detailed at <https://impuls-liechtenstein.li/en/innovations-framework/>.

Central to facilitating this environment is the “**Office for Financial Market Innovation and Digitalisation**” akin to an R&D department within a corporate setting. This office is pivotal in advancing legal and regulatory frameworks for emerging technologies, offering entrepreneurial services, and serving as the primary liaison for innovation-related queries in the financial market landscape.

Supporting the ecosystem further, the Financial Market Authority's “**Regulatory Lab**” a fintech competence center responsible for the registration and ad-hoc supervision of crypto-asset service providers (so called “TT service providers”). Parallely, the “**Entrepreneur Service**” within the Office of Economic Affairs provides crucial guidance for starting and operating businesses, enhancing the country's appeal as an innovation hub.

A key initiative bolstering Liechtenstein's commitment to digital advancement is the Liechtenstein **European Digital Innovation Hub (EDIH) “digihub.li”**, which started its operation in June 2023 and focuses on sustainable blockchain business models and innovation ecosystems. The European-wide EDIHs aim to support the private (SMEs) and the public sector in digital transformation. Funded by the EU's Digital Europe Program and a state grant from Liechtenstein, 'digihub.li' operates as a collaborative platform for digital technology advancement, although it's not a direct government entity.

¹⁰⁰ Source: <https://www.legal500.com/guides/chapter/liechtenstein-blockchain/>

Furthermore, the Liechtenstein government offers a lean innovation process for enhancing the country's framework conditions through the "**Innovation Club**". This format allows individual companies or consortia to submit suggestions for the improvement of laws, regulations, processes, or official practices, offering a direct, efficient pathway for fostering a more innovative business environment.

Through these integrated efforts, Liechtenstein is establishing a robust foundation for the blockchain sector, supported by innovative policies, specialized competence centers, and initiatives that collectively aim to enhance the nation's framework conditions and foster a vibrant ecosystem for digital and financial innovations.

TOWARDS MAINSTREAM ADOPTION

Regulation and Policymaking: Since its enactment in January 2020, the Blockchain Act has established a broad and technology-agnostic framework for the token economy, enhancing user protection and trust in digital transactions. The Act specifies the rights and obligations of service providers operating on Trusted Technology (TT) systems, requiring their registration and oversight by the Financial Market Authority (FMA). It introduces a pioneering civil law regime for tokens, delineating ownership, custody, and transfer rights over tokens within TT systems. This legislation covers digital assets like Bitcoin and facilitates the tokenization of physical assets, setting a legal precedent for the digital representation of tangible assets (<https://impuls-liechtenstein.li/en/blockchain/#tvtg>).

Liechtenstein's forward-thinking approach is evident in the registration of over 28 companies for nearly 60 service provider roles by October 2023, including four major exchanges. The upcoming Markets in Crypto-assets Regulation (MiCAR) in the EU provides transitional arrangements for service providers already registered under national laws, offering a competitive edge to those registered in Liechtenstein under the Blockchain Act by the end of 2024. The Blockchain Act's introduction has significantly increased the number of TT Service Providers registered with the FMA, attracting businesses to Liechtenstein for its legal clarity.

Blockchain technology is recognized as a catalyst for innovation across business and public sectors. The Blockchain Act complements Liechtenstein's broader "innovation framework," aimed at bolstering private and public sector innovation capabilities. Its application extends beyond the financial industry, fostering "Blockchain Banking" among various sectors, and offering a diverse array of products and services.

Moreover, the Act enables the tokenization of physical assets such as art, classic cars, and collectibles, broadening investment opportunities. This aspect of the Act is garnering significant interest and popularity.

The ongoing revision of the Blockchain Act (TVTg) prepares for alignment with the EU's MiCAR, proceeding in two stages. The first significant revision, effective from February 1, 2024, introduces new roles such as "crypto lending service provider" for staking and lending activities, alongside roles anticipated under MiCAR. These adjustments aim for a smooth transition to MiCAR, ensuring market continuity. The second phase will ultimately align the TVTG with MiCAR upon its implementation in Liechtenstein, maintaining the Act's innovative civil law provisions for tokens and roles beyond MiCAR's scope, thus enhancing the regulatory landscape for crypto-assets beyond MiCAR.

Blockchain in academia: The University of Liechtenstein acts as a major player in the country's blockchain-ecosystem. It acts as an innovation center and is actively involved in several projects and programs, providing support for business, policy as well as society. Currently, there exist two certificate programs related to blockchain:

- [Blockchain and FinTech certificate course](#)
- [Certificate course Digital Legal Officer](#)

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The economy of Liechtenstein is quite diverse, with several small and medium-sized enterprises. The key sectors that move the economy are industry and financial services ⁽¹⁰¹⁾. Liechtenstein over the years has created a favourable and competitive environment for establishing and operating a business offering, as well as an attractive taxation system and a well-regulated environment. This has attracted and fostered an international FinTech, blockchain, and crypto community in the country. In January 2020, the Principality was the first country in the world to enact a law specifically addressing blockchain technology governance and the token economy.

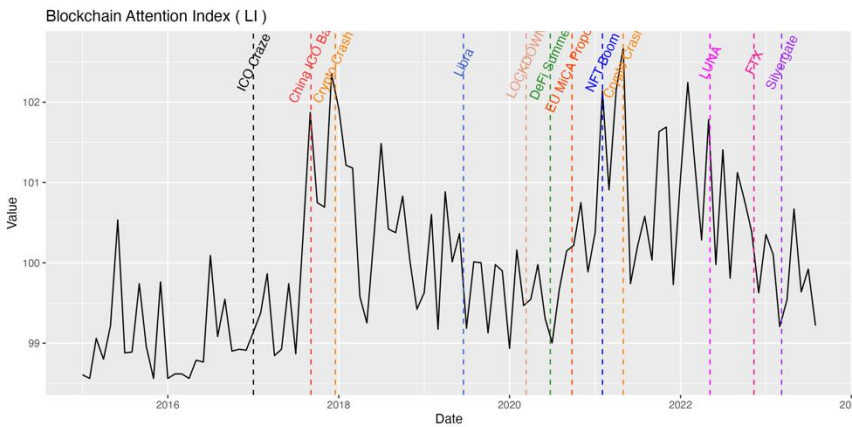
FinTech is one of the most supported sectors, and a specialised department was created to support financial technologies, including blockchain. Given the stability offered both at the financial and regulatory level, Liechtenstein has become a pole of attraction for FinTech, blockchain, and crypto companies. Even though there are no financial incentives for crypto investors, the framework conditions and the support provided by regulatory and taxation frameworks, suffice for setting up an environment that makes them feel welcome.

According to Tracxn.com⁽¹⁰²⁾, as of its latest updated data on Liechtenstein’s Blockchain and FinTech companies, there were 55 blockchain technology startups (February 2024). The most prominent of them are Celestia, Unizen, Blocktrade, Aeternity, and Nash.

According to Startupblink⁽¹⁰³⁾, Liechtenstein’s startup scene saw an increase in 2023 and jumped 5 spots from the previous year, outranking Nigeria, and a global rank of 63rd.

THE BLOCKCHAIN COMMUNITY

One of the most prominent blockchain communities in Liechtenstein is the [Blockchain Meet-up Liechtenstein](#) with more than 1,000 members, who have held 29 events so far. The community is well recognised and is being sponsored by seven blockchain enterprises and organisations, i.e. Blockchainbuero, Business Angels Club Liechtenstein, BWB Attorneys at Law Ltd., Ganten Group, NÄGELE Attorneys at Law LLC, SiriusTrusted Technologies, and VP Bank.



Since 2020, the SFID has been organizing a monthly event series known as the Blockchain & Innovation Circle. These events, facilitated by the Office for Financial Market Innovation, offer a platform for discussing concrete applications and current issues in the field, encouraging dialogue among experts, market participants, and authorities.

These sessions, available in English and German, are conducted online and in person, with recordings accessible on the impulse-Liechtenstein website.

THE FINTECH/BLOCKCHAIN ECOSYSTEM IN LIECHTENSTEIN

The FinTech and Blockchain ecosystem in Liechtenstein is a diverse and dynamically developing field. The market participants are blockchain service providers, technical infrastructure providers, adjunct service

¹⁰¹ Source: <https://www.worldatlas.com/articles/what-are-the-biggest-industries-in-liechtenstein.html>

¹⁰² Source: https://tracxn.com/d/explore/blockchain-technology-startups-in-liechtenstein/_FY8Rwpeu3op-8Ss2fl-GDCA-fugh8UISZYPwrfXxLyk/companies

¹⁰³ Source: <https://www.startupblink.com/startup-ecosystem/liechtenstein>

providers such as specialised lawyers and tax consultants, financial service providers such as banks, investor structures specialised in crypto and tokenization as well as a wide range of innovation-related events, education, research and training offerings in the field of emerging technologies, innovation, and digitalisation. (<https://impuls-liechtenstein.li/en/>)

A list of market participants can be found on the website of the Office for Financial Market Innovation and Digitalisation: <https://impuls-liechtenstein.li/en/>, the website of Liechtenstein Marketing: <https://www.liechtenstein-business.li/en/economic-area/blockchain-liechtenstein/blockchain-oekosystem> and the Liechtenstein Blockchain-Blog ico.li: <https://register.ico.li/firmenverzeichnis/>.

All FinTech/Blockchain service providers must register with the Liechtenstein Financial Market Authority before becoming operationally active. The FMA maintains databases and lists of the domestic financial intermediaries and of the financial intermediaries operating in Liechtenstein from abroad that fall within its scope of competence: <https://fmaregister.fma-li.li/search>

NOTABLE COMPANIES

Overall, there are more than 80 large blockchain companies registered in Liechtenstein. Some notable examples include:

- [Amazing Blocks AG](#) – a company that offers solution for tokenization projects (e.g. real estate, cars, machines).
- [BWare Labs](#) – a company empowering Web3 Development, through the creation of an infrastructure and development ecosystem to support Web3 builders throughout their entire blockchain journey.
- [Vlinder Climate](#) – a company that uses blockchain assets to finance carbon removals from mangrove and seaweed restoration.
- [Slant.li](#) – blockchain-based private data computing provider.
- [Unizen](#) – the company utilizes social sentiment indicators driven by AI learning and multi-chain deep liquidity from centralized and decentralized sources, eliminating the need for trading platform alternatives and allowing global traders and retail investors access to blockchain projects through the combined functionality.

INSIGHTS FROM EXPERTS

Dr Clara Guerra, Director of the Office for Financial Market Innovation and Digitisation of Liechtenstein.

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Liechtenstein? Has the recent growth of the cryptocurrency markets facilitated familiarity?

In Liechtenstein, public awareness and adoption of blockchain and cryptocurrency have been steadily maturing, though not necessarily expanding in size. This evolution reflects a growing market sophistication rather than just market growth. The impending implementation of the EU's Markets in Crypto Assets (MiCA) regulation is expected to be a game-changer for the blockchain ecosystem in Liechtenstein and across Europe. MiCA's introduction marks a pivotal shift, offering unparalleled market access and scaling opportunities across the EU/EEA's vast consumer base. It acts as a catalyst for innovation, fostering growth and stability in the blockchain sector by harmonizing regulatory frameworks. This regulation not only reduces business risks but also boosts consumer confidence, potentially accelerating the widespread adoption of digital assets. Building on this, Liechtenstein, with its substantial expertise and experience in regulating Crypto Asset Service Providers (CASPs), is ideally positioned as a strategic base for third-party businesses aiming to address the

EU market. Emphasizing quality over quantity, Liechtenstein offers a curated, controlled, and compliant gateway for enterprises seeking access to this expansive market.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Liechtenstein?

Evaluating the overall size and maturity of Liechtenstein's blockchain and cryptocurrency business ecosystem, we see a vibrant and forward-looking landscape. While the sector is relatively young, with 21 registered entities under the FATF/MiCAR definition of Virtual/Crypto Asset Service Providers (VASPs), including four banks, and an additional 7 entities as token generators or issuers, Liechtenstein's ecosystem demonstrates a significant commitment to growth and innovation in this space.

The heterogeneity of the sector, from large crypto exchanges to smaller VASPs, showcases a diverse and evolving market. Despite being moderate in size compared to global players, the ecosystem's strength lies in its sophisticated regulatory framework and proactive approach to compliance and innovation. Liechtenstein's integration of the Markets in Crypto-assets Regulation (MiCAR) and its unique position as a bridge between the Swiss and European markets further solidify its appeal to both small and large players in the fintech space.

The outlook is positive, with regulatory changes such as MiCAR expected to attract larger entities due to cross-border passporting opportunities, reinforcing Liechtenstein's role as a strategic hub for fintech and blockchain innovation. The country's commitment to stringent AML/CFT standards, along with its approach to managing ICT risks and consumer protection, aligns with its reputation for high-quality, compliant, and innovative financial services.

In summary, Liechtenstein's blockchain and cryptocurrency ecosystem, while still developing, is poised for significant growth and maturation, driven by a robust regulatory framework, a diverse range of players, and a strategic position in the European financial landscape.

What measures has Liechtenstein taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Over the past year, Liechtenstein has taken significant strides in the public sector initiatives and legislation to promote blockchain and cryptocurrency adoption. A key development is the establishment of digihub.li, operational since June 2023. As a European Digital Innovation Hub, digihub.li serves as a beacon for positive digital transformation, focusing on creating digital ecosystems for co-creation and collaboration in the token economy. It actively supports SMEs and public sector entities in Liechtenstein through various offerings such as digital ecosystems development, skill-building for digital innovation, practical coaching for positive transition, and hosting innovation spaces for start-ups, SMEs, and investors.

In terms of practical measures, Liechtenstein has enabled companies to be founded with cryptocurrency and recently accepted Bitcoin as a means of payment for public services. These steps demonstrate the country's commitment to integrating digital currencies into everyday life and business operations.

Legislatively, Liechtenstein is proactively adapting to the dynamic changes in the blockchain sector. Currently, the country is revising its Blockchain Act (TVTG) in preparation for the EU's MiCA regulation, focusing on strengthening consumer protection. This includes introducing a new Trusted Technology (TT) service provider role for crypto lending service providers, covering activities like staking and lending, thereby ensuring a robust and consumer-friendly regulatory environment for blockchain and cryptocurrency operations.

These initiatives collectively underscore Liechtenstein's dedication to fostering an innovative, sustainable, and digitally advanced environment, aligning with its overarching goal to maintain and expand wealth, prosperity, and quality employment through digital and green transformation.

What measures has Liechtenstein taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

To promote blockchain and cryptocurrency adoption at national and European levels, essential measures include harmonizing regulatory frameworks, such as through the implementation of MiCA, and engaging in discussions with multilateral organizations, institutions, and third countries to establish basic standards and rules, enhancing public and entrepreneurial education, fostering innovation ecosystems, supporting pilot projects, and facilitating access to funding. Liechtenstein exemplifies this approach through initiatives like the revision of its Blockchain Act in line with EU standards and upcoming framework, educational efforts through platforms like digihub.li, and encouraging collaborative innovation in the digital finance sector.

The future of Liechtenstein's blockchain and cryptocurrency ecosystem is poised to be both dynamic and influential. As we move forward, Liechtenstein is set to become a strategic bridge for countries and businesses aiming to engage with the European market. This pivotal role is underpinned by our commitment to continuously pilot and pioneer in legal and regulatory aspects of blockchain and cryptocurrency.

Our focus will be on showcasing successful implementations and widespread adoption within our jurisdiction. By presenting real-world, practical use cases, Liechtenstein aims to demonstrate the tangible benefits and potentials of blockchain technology in various sectors. This approach not only reinforces our position as a leader in this space but also serves as a model for others to follow.

Moreover, transparency and compliance will be at the forefront of our ecosystem's development. We believe that fostering an environment where these principles are paramount will not only cultivate trust within the industry but also encourage more entities to adopt block-chain and cryptocurrency solutions in a responsible and effective manner.

In summary, the future for Liechtenstein in this domain is about being more than just a participant; it's about being a facilitator, an innovator, and a trustworthy guide for others looking to navigate the complexities and opportunities of the blockchain and cryptocurrency landscape, especially in relation to the European market.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

The integration of AI and chatbots in the blockchain and cryptocurrency industry represents a significant trend, reflecting the ongoing evolution of these technologies. To sum up the impact: The integration of AI and chatbots into the blockchain and cryptocurrency industry is revolutionizing user experience and market analysis, enhancing security and personalized services. This synergy is fostering more informed decision-making, improved regulatory compliance, and paving the way for innovative applications and efficiencies in trading and smart contract management. Ultimately, it's significantly contributing to the industry's growth and sophistication.

Key Figures

96+

Dedicated blockchain solution providers

264m

Total funds raised.

1.20%

Population that owns crypto

The Lithuanian blockchain ecosystem at a glance

Lithuania has a strong technology and FinTech industry with several startups and businesses working on blockchain technology. Despite its small size, it is amongst the top EU countries for blockchain adoption. The country is home to blockchain startups working in sectors like online education, R&D, regulatory technology (or RegTech), digital banking and market intelligence.

Lithuania is known as a crypto-friendly destination with a comprehensive set of regulations in place.¹⁰⁴ There are over 1,000 virtual asset service providers (VASPs) registered in the country, with roughly equal numbers of exchange and wallet operators. Around 11% of Lithuanians have invested in cryptocurrencies, which is quite high when we consider that only 14% of its population has invested in traditional assets like stocks.

Apart from EU programmes there are also several government initiatives and policies to promote blockchain innovation, like Blockchain Lithuania, a government-supported competence centre, and GovTech Lab, an initiative to promote the public sector adoption of innovative tech solutions. The Bank of Lithuania (the central bank) has also created a regulatory sandbox called LBChain.

Over the years, the blockchain space in Lithuania has expanded with several home-grown startups, domestic and foreign VASPs applying for licensing, and even several foreign businesses moving their headquarters or establishing a strategic presence in the country. Furthermore, a combination of government policies, a favourable regulatory environment, and a vibrant tech sector will support the blockchain ecosystem's continued growth over the coming years.

TOWARDS MAINSTREAM ADOPTION

¹⁰⁴ Source: <https://www.linkedin.com/pulse/micas-effect-most-popular-european-crypto-licences-saxe-global/>

Regulations

Lithuania has a favourable regulatory regime for blockchain and crypto businesses. It is mandatory for VASPs to register with the Register of Legal Entities, which publishes lists of exchange and wallet operators. Furthermore, they are required to submit yearly reports and data to the Financial Crime Investigation Service (FCIS).¹⁰⁵ However, despite the strict regulations, there is no licensing provision and the FCIS website states that, 'The activity of virtual currency exchange operators and (or) depository virtual currency wallet operators is not licensed in Lithuania'.¹⁰⁶

Government initiatives

Lithuania has created the GovTech Lab which consists of a public sector team that identifies innovative solutions using emerging technologies like blockchain for challenges faced by the government and the public sector. GovTech's Innovation Bank is a pool of domestically developed replicable digital innovations, including on blockchain, that can be implemented by public sector organisations.¹⁰⁷

Cryptocurrencies

In Lithuania, cryptocurrencies are mostly regarded as an investment opportunity, and around 11% of Lithuanians have invested in cryptocurrencies, compared to 14% for traditional investments like bonds and stocks.¹⁰⁸ This shows a relatively high percentage of crypto investment. Some sources estimate cryptocurrency user penetration to be as high as 18% in 2023, and it is expected to be at 22.4% by 2027. There are many online businesses that accept crypto payments, and Lithuanian startups like Colibri Payments provide a means for businesses to accept crypto payments. From a revenue standpoint, decentralised finance, or DeFi, is expected to register high growth in 2023-27 period.¹⁰⁹

VASPs

Lithuania is known as a crypto-friendly EU destination. The country saw a rapid growth in crypto business registrations after Estonia tightened its virtual asset regulations in early 2022. As a result, nearly 800 VASPs were registered in the country between January and October 2022.¹¹⁰ Lithuania also tightened its crypto regulations at the beginning of 2023, but it did not significantly affect the number of VASPs registered; as of October 2023, there are over 1,000 VASPs registered.

Businesses

Lithuania is home to several companies working on blockchain technology. Owing to the country's regulatory regime, a substantial majority of these companies operate in the FinTech sector as VASPs. Binance also opened its Lithuanian subsidiary, which in just one year became one of the top 5 taxpayers in the country and the second largest corporate taxpayer.¹¹¹ Major fields apart from VASPs include RegTech, blockchain research and development, market intelligence, digital banking, and online education.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Lithuania is known for its crypto-friendly business environment despite having a strict regulatory framework for businesses operating in the crypto field. There are several programmes and incentives in place to support

¹⁰⁵ Source: <https://www.sorainen.com/publications/the-cryptocurrency-sector-in-lithuania-is-moving-towards-transparency/>

¹⁰⁶ Source: <https://www.fntt.lt/en/money-laundering-prevention/information-for-legal-entities-carrying-out-the-activities-of-virtual-currency-exchange-operators-and-or-depository-virtual-currency-wallet-operators-in-the-republic-of-lithuania/4115>

¹⁰⁷ Source: <https://govtechlab.lt/govtech-innovation-bank/>

¹⁰⁸ Source: <https://www.visualcapitalist.com/cp/crypto-popularity-in-europeans-union-nations/>

¹⁰⁹ Source: <https://www.statista.com/outlook/fmo/digital-assets/cryptocurrencies/lithuania>

¹¹⁰ Source: <https://www.ecovis.com/lithuania/blog/2022/11/25/crypto-companies-in-lithuania-what-to-expect-in-the-future/>

¹¹¹ Source: <https://coinpaper.com/2273/binance-emerges-as-the-largest-corporate-taxpayer-in-lithuania>

companies working on blockchain technology like Blockchain Lithuania, GovTech Lab, and LBChain. Moreover, physical presence and office space is not mandatory (except for an AML officer who needs to be a Lithuanian resident) and companies can work with a virtual address. As a result, many blockchain businesses have moved their headquarters to or established a subsidiary in Lithuania.

There are several initiatives by the Lithuanian government to promote blockchain projects. Blockchain Lithuania is a government-supported competence centre that brings together industry experts, corporates and academia to work towards developing the blockchain ecosystem in the country.¹¹² The Bank of Lithuania also developed a regulatory sandbox named LBChain in 2018 which ‘combines regulatory and technological infrastructures as well as allowing market participants to test their business solutions in a controlled environment’.¹¹³ Furthermore, one of the key objectives of the 2023-28 Strategic Fintech Action Plan is to provide financial incentives to startups working on blockchain technology, supervised by the Ministry of Economy and Innovation.¹¹⁴

As of the end of 2022 there were 263 FinTech companies operating in the country, 8% of which were working on blockchain technology.¹¹⁵ A survey of FinTech companies found that an astonishing 32% of the firms plan to incorporate distributed ledger technology between 2022 and 2025.¹¹⁶ Furthermore, startups working on advanced technologies including distributed ledger technology can benefit from Lithuania’s Innovation Promotion Fund and receive other financial incentives.

Some innovative blockchain business based in Lithuania are Axiology, a tokenised securities trading and settlement system; SUPER HOW?, a blockchain R&D firm; MicaPass, a RegTech startup; DappRadar, a decentralised application marketplace; and BitDegree, the world’s first blockchain-powered, smart-incentive-based online education platform which revolutionises global education and tech recruiting.

Some notable foreign companies that have moved to or established a presence in Lithuania include Binance, Blockchain.com, XREX, and Revolut (cryptocurrency platforms); FIDES Loyalty, a blockchain-based travel rewards startup; Alchemetrics, a customer data platform; HCL, an IT giant, and Lendwill, a blockchain-based peer-to-peer microlending platform.

THE BLOCKCHAIN COMMUNITY

Lithuania has a strong blockchain community, with most companies located in Vilnius together with some in the smaller cities of Kaunas and Klaipėda. Apart from companies, there are several blockchain centres and associations promoting blockchain-powered solutions across the country.

Blockchain Lithuania is an ‘independent, government-supported competence centre of industry experts, corporates, and academics working together to grow the blockchain ecosystem nationally and regionally’ with offices in Vilnius and Kaunas. The centre is broadly divided into three spheres: business, community, and learning. It boasts of several partners, ranging from VASPs, blockchain startups, consulting and legal firms, universities, media and public sector initiatives to government ministries and the central bank.

Blockchain Centre Vilnius is a network-based organisation founded in 2017 that assists ‘companies and

¹¹² Source: <https://bchain.lt/about-us/> <https://bchain.lt/about-us/>

¹¹³ Source: <https://www.lb.lt/en/lbchain>

¹¹⁴ Source: <https://finmin.lrv.lt/uploads/finmin/documents/files/2023-2028%20FINTECH%20strategy%20of%20Lithuania.pdf>

¹¹⁵ Source: <https://finmin.lrv.lt/uploads/finmin/documents/files/2023-2028%20FINTECH%20strategy%20of%20Lithuania.pdf>

¹¹⁶ Source: <https://finmin.lrv.lt/uploads/finmin/documents/files/2023-2028%20FINTECH%20strategy%20of%20Lithuania.pdf>

Key Figures

48+

Dedicated blockchain solution providers

71m

Total funds raised.

0.97%

Population that owns crypto

by major post-trade services providers, including Clearstream, a leading international central securities depository (ICDC). The country is a major European FinTech and startup hub, with eBay, PayPal, Amazon Pay, Rakuten, Alipay, MangoPay, AirBnb amongst the leading startups incorporated in the country.

Luxembourg's advanced financial and startup ecosystem is the result of a responsive regulator and EU-wide licensing, along with a politically stable country. According to the Eurobarometer, Luxembourg is the most multilingual country in Europe, with an average of 3.6 spoken languages, partially because 48% of the population are foreigners, which ranks first when it comes to highly skilled workers in the world, according to the World Economic Forum (WEF).

According to Luxembourg for Finance, the agency for the Development of the Financial Centre, Luxembourg has emerged as a key European payment and e-money hub, underpinned by the relocations of major brands in the context of Brexit. With the advent of PSD2, Luxembourg aims to strengthen its role as home to one of the largest open banking platforms in Europe with specialised providers of API gateways catering to the needs of banks.

Luxembourg is committed to adapting its legislative framework to encourage innovation in the financial industry and push for the development of the European legal framework in new finance sectors such as tokenisation.

In 2014, the Luxembourg financial regulator, the [Financial Sector Supervisory Commission](#) (CSSF), was the first authority in the financial sector that was in favour of the regulation of platforms for the exchange of virtual currencies when exercising an activity of the financial sector. The CSSF considered that activities such as the issuing of means of payments in the form of virtual or other currencies, the provision of payment services using virtual or other currencies, and the creation of a market (platform) to trade virtual or other currencies, are to be defined as being financial activities and that any person wishing to establish in Luxembourg to carry out such an activity has to receive ministerial authorisation.

The country is home to numerous high-growth blockchain startups. We have located at least three operating non-governmental organisations, which consist of hybrid organisational formats (engaging the public sector with the private market) committed to the widespread adoption of blockchain technology and educating professionals about its prospects and applications across numerous domains.

The blockchain ecosystem in Luxembourg at a glance

Luxembourg is one of the Eurozone's financial centres and the second-largest investment fund capital in the world. Luxembourg remains constantly Europe's centre of excellence in wealth management, corporate, commercial, and depositary banking, featuring +125 international banks from 27 countries, with more than EUR 500 billion private banking assets under management (AuM).

According to the Commission de Surveillance du Secteur Financier (CSSF), the financial regulation authority of Luxembourg, (June 2018), Luxembourg is a global hub for international fund distribution, and more precisely the No 1 in Europe, and only the second in the world, with EUR 5.6 trillion AUM in investment funds (according to [Luxembourg for Finance](#)).

Luxembourg is the European leader in international securities listings with over 36,000 listed and tradable securities on the Luxembourgish Stock Exchange in over 64 currencies, counting 2,100 issuers from 100 countries, and EUR 7 billion held in custody

In the [whitepaper](#) ‘Smart Contracts, a Luxembourg Perspective. Assessing Key Legal Opportunities & Challenges’, published in July 2021, the non-profit organisation LëtZBlock outlined the potential areas of legal uncertainty and associated challenges related to smart contracts.

In January 2022, the Luxembourg financial sector supervisory authority, the Commission de surveillance du secteur financier, published a [white paper](#) on DLT and blockchain sharing its advice on assessing the risks when designing or implementing a project using DLT. The publication of this whitepaper was a reaction to a considerable number of solicitations received by the CSSF from different market participants, ranging from well-established institutions to startups, all wishing to use DLT and blockchain for various purposes.

On 6 October 2022, the Ministry of State, Department of Media, Connectivity and Digital Policy (SMC) together with Infrachain, presented a [report](#) on the Luxembourg blockchain ecosystem, ‘Putting Luxembourg on the Blockchain Map: Where does the ecosystem stand?’ The report was drafted by the sector organisation Infrachain on behalf of the SMC. It includes a mapping of the Luxembourg blockchain ecosystem and how different players perceive blockchain and its use, paths for improvement, and the role of government in blockchain. The report also includes some recommendations for the way ahead.

In April 2023, the Luxembourg Blockchain Lab presented its [Blockchain Policy Recommendations](#). The document provided recommendations from the Luxembourg Blockchain Innovation Cluster, the Luxembourg Blockchain Lab, to the Luxembourg political parties with regard to the inclusion of Blockchain and DLTs in their political programmes in view of the legislative elections in October 2023. The government formed as a result of these elections prominently included Blockchain in their [coalition agreement](#), saying that they want to continue developing the country into a prime location for Blockchain.

TOWARDS MAINSTREAM ADOPTION

Public Sector, Regional Governance & Policy-Making

As a global financial centre, Luxembourg has positioned itself as a financial technology startup hub, embracing early blockchain technology. It has been widely considered amongst the most innovative EU countries, with a liberal and progressive mindset, embracing new technologies by the ‘innovation through law’ mindset. Luxembourg was the first EU country that licensed virtual currency exchange platforms as financial institutions. In April 2016, Bitstamp Europe SA was authorised to exchange Bitcoins, euro and US dollars. This authorisation was the outcome of the opinion issued by the CSSF, which was the first regulator that advised that virtual currencies could be regulated by financial activities.

In December 2019, five leading actors active in the blockchain space (INFRACHAIN, LëtZBlock, LHoFT, LIST and SnT) joined forces to support Luxembourg’s economy. This initiative, called the [Luxembourg blockchain lab](#), aims to create the Luxembourgish blockchain ecosystem.

The task force has the objective of connecting the major actors of the blockchain/ digital assets industry to fix issues, tackle challenges, and foster collaboration between the stakeholders. The lab mainly focuses on sustainable development goals (SDGs).

The Lab includes the following stakeholders:

- [Infrachain](#): a pan-European organisation supported by the Luxembourg government to enable governance for operational blockchain use.
- The Luxembourg Blockchain and DLT Association [LëtZBlock](#): a non-profit supporting the blockchain industry in Luxembourg.
- [The Luxembourg House of Financial Technology](#) (LHoFT): a dedicated startup centre to foster innovation in financial technology.
- [The Luxembourg Institute of Science and Technology](#) (LIST)
- [The University of Luxembourg](#) (SnT).

This cross-sectoral consortium intends to develop a European blockchain lab for research, education, and industrial blockchain projects where the industry could test commercial proof-of-concepts by the end of 2020.

Former Prime Minister Xavier Bettel stated during Luxembourg Blockchain Week 2021 that the country is planning to 'keep looking forward' and 'keep taking risks' when it comes to innovative technology like blockchain. 'My government's goal is to make out of Luxembourg the digital frontrunner it already is,' said the Prime Minister. 'It is in the frontrunner's nature to keep progressing, rather than preserving the lead of the moment.'

Legislation for virtual currencies that might affect blockchain

Luxembourg has enacted three laws related to blockchain technologies.

1. **Loi du 14 février 2019 relative à l'utilisation des technologies de registres distribués (DLT) pour la circulation de titres** (Law of 14 February 2019 on the use of distributed ledger technologies (DLT) for the circulation of securities)

This law established a legal framework for the use of distributed ledger technology (DLT) in the issuance, circulation, and custody of securities. It enabled the recording of securities on DLT platforms, the creation of DLT-based securities, and the use of DLT for securities transaction management.

2. **Loi du 18 mars 2021 relative à l'utilisation des technologies de registres distribués (DLT) pour l'émission de titres** (Law of 18 March 2021 on the use of distributed ledger technologies (DLT) for the issuance of securities)

This law further strengthened the legal framework for the use of DLT in the securities sector. It permitted the direct issuance of securities on DLT platforms and opened up the role of the central securities depository (CSD) to credit institutions and investment firms from the European Union.

3. **Loi du 22 juin 2023 relative à l'utilisation des technologies de registres distribués (DLT) dans le domaine des garanties financières** (Law of 22 June 2023 on the use of distributed registry technologies (DLT) in the field of financial guarantees)

This law complemented the existing DLT framework by addressing the use of DLT for financial collateral arrangements. It allowed the representation of financial collateral on DLT, the management of financial collateral transactions, and the creation of financial collateral on DLT platforms.

These three laws have positioned Luxembourg as a global leader in blockchain finance. They have provided a robust and stable legal infrastructure that fosters innovation and the adoption of blockchain technologies in the financial sector.

Academic Courses and Professional Qualifications

While there is no available academic coursework dedicated to blockchain technologies, the University of Luxembourg has acted proactively, showcasing partnerships with the private sector. A plethora of organisations are actively organising events and trainings to educate mainly professionals and students about blockchain technology.

Additionally, the American technology company Ripple has announced it will partner with the academic community to help lead the development of blockchain research. The University of Luxembourg is building a new blockchain research programme inside their Departments of Computer Science and Engineering with the help of the University Blockchain Research Initiative (UBRI).

Previously, the Luxembourg-based VNX Exchange and the University of Luxembourg aimed to improve the security of digital assets, business news outlet the *Luxembourg Times* reported on 23 November 2018. The researchers at the university's Interdisciplinary Centre for Security, Reliability, and Trust (SnT) will reportedly design new IT frameworks to improve exchange security, as well as custody of crypto assets.

The Luxembourg Blockchain Lab has developed several [Blockchain courses for the Digital Learning Hub](#).

Cryptocurrency Exchanges:

- EU passporting licence, two cryptocurrency exchanges already licensed.
- Partnership with key FinTech hubs around the world.

Tokenised Securities:

- Law on blockchain and the circulation of tokens as dematerialised securities.
- Flexible company law. In Luxembourg, as an issuer, one can manage their own securities register.

Other notable use cases gathered by media releases/mentions:

Tokenisation

Tokeny provides an enterprise-grade infrastructure to allow companies and financial actors to compliantly issue, transfer, and manage assets on blockchain, enabling them to improve asset liquidity. Tokeny is a Blockchain 50 company recognised by CB Insights. <https://tokeny.com/>

Music Royalties

A>Note Music is a European marketplace for buying and selling songs that aims to connect investors with owners of music rights. The startup is restructuring how music is funded and creating a liquid, transparent, and integrated market for music rights.

Real Estate Tokenisation

[BlocHome](#)

Property Token SA, co-founded by Creahaus SA and Espace Invest SA, two key real estate players in the Grand Duchy, have successfully launched the first issuance of a Luxembourg real estate token. The first example has been the tokenisation of an office complex located in the Grand Duchy.

Financial resilience

[IBISA](#) builds, distributes and operates Climate Insurance Solutions for the agriculture value chain.

Compliance

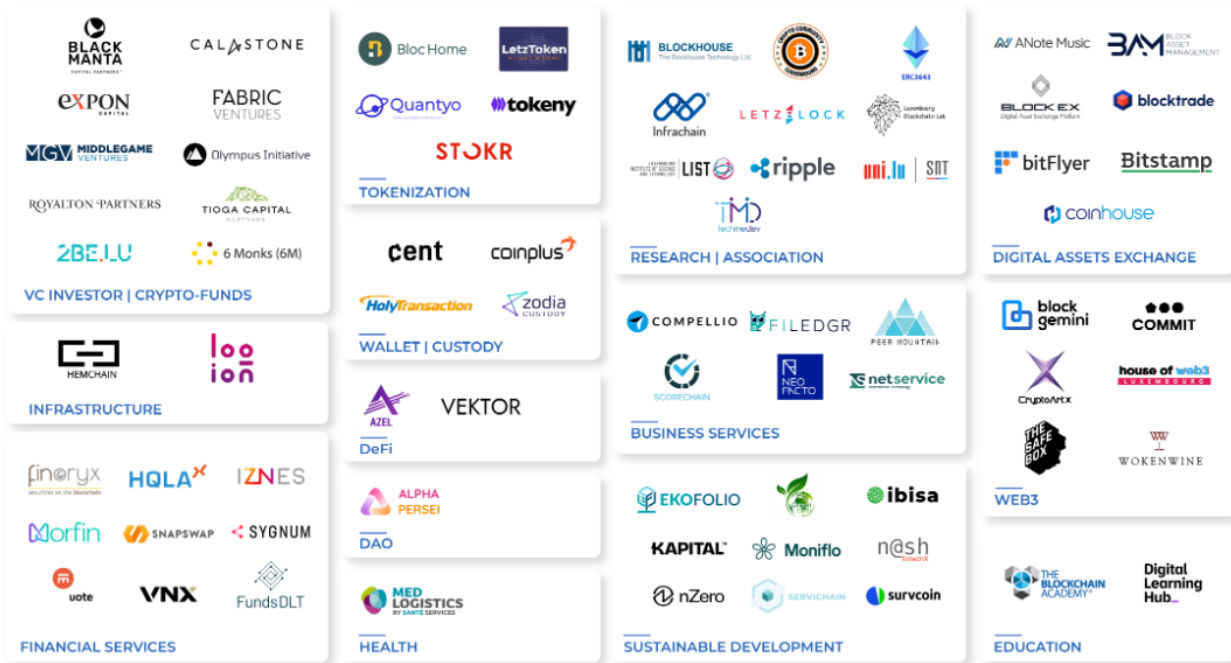
[Scorechain](#)- The Compliance Solution for Crypto Asset Regulation: Analytics for AML Compliance, Audit & Forensics.

Technology

Blockhouse Technology provides solutions that form the core of banking, e-government, and identity systems, with integrated regulation.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Luxembourg BLOCKCHAIN ECOSYSTEM



2023 Update Luxembourg Blockchain Map - Credit to Luxembourg Blockchain Lab  www.blockchainlab.lu

According to [The Luxembourg Blockchain Lab](#) (previously mentioned), all the actors in the blockchain industry in Luxembourg are showcased in the following graphic.

THE BLOCKCHAIN COMMUNITY

The Luxembourgish blockchain ecosystem is prominent, featuring high-growth opportunities due to the active engagement opportunities in the scene, and the large number of organisations advocating to support blockchain technology. The community consists of 30,300 to 35,600 observers, or a general audience loosely interested in blockchain and virtual currencies.

NOTABLE BLOCKCHAIN COMPANIES

INFRACHAIN: a Luxembourgish non-profit organisation supported by the Luxembourg government and created by the emerging blockchain industry. INFRACHAIN is a blockchain community, a non-profit organisation committed to creating an on-top governance framework allowing blockchain applications to become operational in the current regulatory environment.

Blocktrade: a digital asset platform to buy and sell Bitcoin, Ethereum, eCredits, and other cryptocurrencies.

RDX: an alternative investments tokenisation service provider.

Gainbit: operates as an investment firm that pools money from investors to invest in the Bitcoin mining industry.

LHOFT: a public-private partnership. The organisation is supported by the Government of Luxembourg and by Luxembourg for Finance, who assist in promoting FinTech around the world, and the Chamber of Commerce of Luxembourg. LHOft has a task force dedicated to blockchain, with seven members and one of the key challenges is also to issue a recommendation to the board of LHOft.

[A-Note Music](#): a European primary and secondary market for music royalties. Through our investment platform, anybody can now invest in music and purchase rights from content creators.

[Stokr](#) provides a turn-key solution to founders for their investment processes. Using Stokr, founders can manage the issuance, subscription, maintenance and administration of security tokens (programmable digital shares), as per the EU capital market laws. Stokr provides support for multi-blockchain issuance of security tokens.

[3C Payment](#): their technology makes it convenient and secure for consumers to pay in person and online with point-to-point-encryption (P2PE) solutions and specialised EMV tokenised transaction flows, which simplify the payment experience. Their secure 3C Integra hosted platform unifies multiple payment channels, allowing merchants to confidently trade across border in over 30 countries worldwide with multiple acquirers through a standardised infrastructure integrated to onsite and ERP systems.

[Tokeny](#): the European market leader in delivering an institutional-grade, secure end-to-end platform, allowing for the issuance and servicing management of digital securities.

[Scorechain](#): easy-to-use and customisable risk-AML software for cryptocurrencies.

Key Figures

82+

Dedicated blockchain solution providers

271m

Total funds raised.

1%

Population that owns crypto

The Maltese blockchain ecosystem at a glance

Malta is located in the southern European archipelago in the Mediterranean Sea. Counting a population of approximately 500,000 and covering an area of 316 km², the island state is one of the smallest countries in Europe and the 10th smallest in the world. Despite this, Malta's innovation-driven economy has led the country to adopt a proactive and receptive approach towards blockchain and digital currencies. Malta's positive outlook on those technologies further confirms the trend of smaller European nation-states, Austria, Cyprus, and Estonia included, adopting blockchain as a facilitator of economic growth and entrepreneurship.

In 2018, the Maltese parliament [enacted three laws](#) establishing a comprehensive regulatory framework for blockchain and digital currencies, as part of the country's national strategy to pave the way for blockchain adoption. Malta became one of the first countries in the world to offer relative regulatory clarity in those areas. As a result, many prominent businesses from the blockchain and digital currency space, including Binance, OKEx, and BitPay, along with hundreds of smaller startups flocked to Malta to benefit from this positive regulatory climate, while other notable initiatives, such as TRON, [expressed their interest](#) in contributing to the country's blockchain vision. This 'migration' was [welcomed by the prime minister](#) and other high-profile state officials. Within a short timeframe, Malta became a hotspot for blockchain conferences and business–state dialogue, and even adopted blockchain technology to issue and store its educational degrees and register of local businesses. The largest university in the country, the University of Malta, started offering a master's programme in blockchain and DLT in 2019.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

Malta's blockchain strategy is characterised by a regulation-first approach. While addressing the UN in 2018, former Prime Minister of Malta Joseph Muscat [presented the country as 'Blockchain Island'](#). In the same year, following a highly collaborative procedure involving regulators and businesspeople, the country launched the highly anticipated Digital Innovation Framework, a comprehensive regulatory scheme concerning the areas of blockchain and DLT, ICOs and digital currencies. The goal of the framework was to foster innovation in the aforementioned areas while preserving the country's financial integrity and stability and protecting potential investors.

Malta was the [first country to install a blockchain-based IP register](#) and transfer 60,000 records using the blockchain network. Thereafter, the Government of Malta announced three new blockchain projects to be implemented, covering: a project for the [certification of food products produced on the island of Gozo](#); a blockchain-based property [planning system](#) for ensuring transparency of processes; and a blockchain-based copyright and IP system.

Regulation was deemed necessary to realise the country's ambition for blockchain to account for [10% of its total GDP by 2027](#). The key authorities responsible for the trio of laws collectively referred to as the Innovation Framework include: the Malta Digital Innovation Authority (MDIA), and the Malta Financial Services Authority (MFSA). Furthermore, the Malta Gaming Authority (MGA) announced a digital asset focused sandbox thereafter. The laws approved by the Maltese parliament were the Virtual Financial Assets Act (VFAA), with the objective of regulating the field of ICOs, digital assets, digital currencies and related services, the Innovative Technological Arrangements and Services Act, which empowers the MDIA to oversee the registration of technology service providers in the blockchain space and the certification of DLT and related software, and the Malta Digital Innovation Authority Act, which establishes the MDIA and outlines its roles.

The Malta Digital Innovation Authority launched a [Technology Assurance Sandbox](#). A flexible environment within which new types of technologies and operations (e.g. NFTs and DAOs) can raise levels of trustworthiness through the supervision of a national authority through a staggered and gradual approach with the aim of reaching full certification.

As in most European countries, digital currencies are not considered legal tender in Malta. However, unlike most other nation-states, the country's financial regulatory framework (including the VFAA) recognises four distinct categories of digital assets, subject to different sets of rules. These mutually exclusive categories are: electronic money, financial instruments, virtual (utility) tokens, and virtual financial assets (VFAs). The MFSA has introduced the Financial Instrument Test to classify blockchain and DLT-based assets in one of the aforementioned categories and thus determine whether they would be subject to regulation under the VFAA. Digital assets falling under the virtual token category are exempt from regulations. Digital currency and digital assets taxation adhere to the aforementioned guidelines, with such assets taxed according to their classification. Licensing requirements for activities involving blockchain and digital currencies are also determined according to provisions of the VFAA. Four different types of licences exist, and companies interested in acquiring one need to apply to the MFSA. Activities in the digital currency and blockchain space are subject to AML and counter-terrorism financing (CTF) rules.

In 2019, Malta became the first country in Europe [to issue its educational certificates in blockchain](#). Junior Minister of Financial Services, Digital Economy and Innovation Silvio Schembri [announced](#) that the country will use blockchain to register new businesses. In the same year, [Vision 2021](#) was launched as an initiative to strengthen the MFSA and prepare for the next generation of financial services, including blockchain-backed ones.

Blockchain in academia

The **Centre for Distributed Ledger Technologies of the University of Malta** offers a [Master of Science in Blockchain and Distributed Ledger Technologies](#) allowing students to specialise in either ICT, law and regulation, or business and finance. Students of the programme have [reportedly](#) developed and launched a blockchain voting platform. In 2022, the university announced the [Malta Blockchain Summer School \(MBS\)](#), which offers an introduction to blockchain, DLT, cryptocurrencies, NFTs and beyond.

In addition, the Leadership and Management Institute offers blockchain courses and programmes, including a [Master of Science in Blockchain and Cryptocurrency](#).

Blockchain across key industries

Maltese regulation and guidelines were some of the first in the world to provide a framework for ICOs at a time where excitement around alternative forms of financing was high. Various local startups took advantage of this newly found market for ICO services by beginning operations in the field, in an example of a state-identified business opportunity/sector that was exploited by private initiatives. Similarly, the country's intent to provide a welcoming regulatory slate for financial service providers active in the blockchain and digital currency space attracted global players in this field. While the ICO frenzy has come to an end, Malta remains home to initiatives across the financial, payments and banking services industries.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

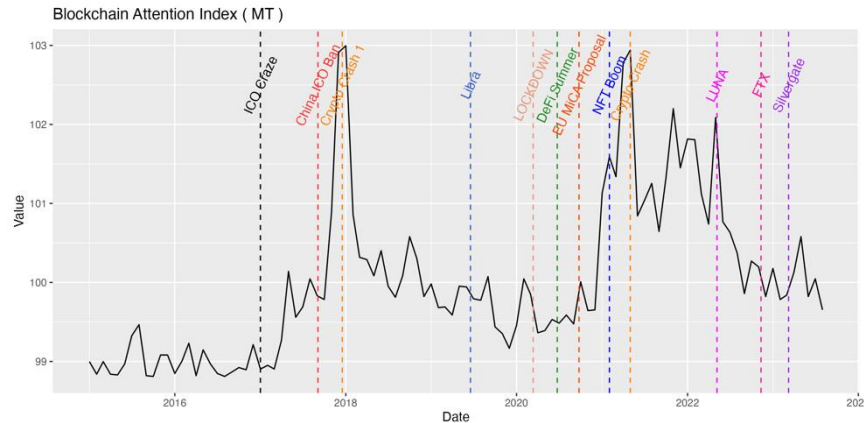
The state's actions and its adoption of what was seemingly a blockchain-friendly regulatory framework constituted a catalytic development for the local blockchain and digital currency startup and business scene. From late 2017 to mid-2019, Malta became the recipient of a migration wave from large companies active in the blockchain space, due to them facing [increasing regulatory scrutiny in Japan](#) and other areas of the world. This wave included well-known names such as Binance, OKEx, ZBX, BitPay and other companies with which government officials maintained strong ties. Smaller startups followed suit in what would become – in many regards – a case of success for the country.

In April 2020, the [MFSA announced a 'Warning to the Public'](#), stating that a large number of companies 'failed to submit either a letter of intent to initiate the application process for a virtual financial assets services licence or a cessation of activities notification', before warning the public of the risks of conducting business with unregulated firms. With only 26 of the initial 83 companies applying for a licence and none granted to date, all signs point to the fact that many entities found the VFSA's requirements too demanding. Many companies ceased operations, while others have maintained a presence in the country.

Malta's top 10 companies collectively raised more than EUR 141 million through a variety of mediums. Most businesses participated in seed funding rounds, with others conducting ICOs and seeking later-stage venture funds. A high concentration and business activity is observed in the financial services industry, which slowed down overall after the – stricter than expected – regulation.

THE BLOCKCHAIN COMMUNITY

Despite its small size and low population, Malta is home to a vibrant blockchain and digital currency community. Beginning in 2018, the country became a hotspot for some of Europe's biggest blockchain conferences, which featured prominent figures from the space. The two flagship conferences that focus on blockchain technology are the [AI and Blockchain Summit](#) and the DELTA Summit. [The former attracted 12,000 attendees from over 80 countries in 2021](#). Post-COVID, [Crypto-Hub](#), a crypto meet-up has been taking place weekly, bringing together professionals, enthusiasts, students, academics and those interested in learning more about cryptocurrencies and blockchain.



INSIGHTS FROM EXPERTS

Dr Joshua Ellul, professor, University of Malta

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Malta? Has the recent growth of the cryptocurrency markets facilitated familiarity?

I would say that, in general, the Maltese population is more aware of blockchain and cryptocurrency than many other countries. Indeed, these include those that both have just heard about the technologies and sector and those that are more deeply involved. This is due to Malta's early regulatory approach and local media hype. Thereafter, from Google Trends figures it can be seen that, despite less media blockchain-related attention, local interest in blockchain and cryptocurrencies saw similar trends to those seen abroad, likely due to international markets.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Malta?

Malta's local business ecosystem is maintaining its size whilst also seeing new industry players (both from local grassroots as well as from renewed interest in the ecosystem). With respect to maturity, again, given Malta's early regulatory approach and often cited regulatory similarities with MiCA, the local ecosystem is likely to be more mature with respect to regulation. At the same time, the ecosystem has a good balance of large, small, more mature, and newer industry players.

What measures has Malta taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Given Malta's early regulatory approach, there is little more it can do with respect to regulation, beyond being MiCA-ready earlier on, for which it is in a good place to be, given similarities that exist with the regulatory approach taken. Yet still, in an effort to provide clarity, the Malta Financial Services Authority issued [guidelines with respect to NFTs](#).

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

The following initiatives should be focused on: (i) At both national and European levels, policy makers should continue to promote blockchain as a tool to guarantee transparency and auditability with respect to public services. Such tamperproof public digital processes could not only provide a means of exposing the public to

the technology and its benefits, but also allow for policy makers and public servants to demonstrate their willingness to put in place digital processes that can mitigate corrupt practices. The costs of using a blockchain for such processes can not only be negligible, but also be cheaper than traditional digital processes. Therefore, this raises the question of why policymakers have not already flocked towards using blockchain as a means of not only demonstrating good governance but guaranteeing it with respect to such digital processes.

(ii) Education initiatives are required across the board. The EU has a chance to be a global leader in the blockchain and crypto sectors, and to do so it needs to invest in the workforce to support such a sector.

What does the future hold for the Maltese blockchain and cryptocurrency ecosystem?

Undoubtedly crypto bull and bear markets play a significant role in the (both international and local) perception of the blockchain and cryptocurrency ecosystem. Over the past years, despite the various infamous bad crypto actors and market crashes that have been witnessed internationally, the local ecosystem did not really see a decline of interest in the sector. Many believe that a bull market is around the corner in a year-to-two. On the basis of this, I believe we will see not only renewed international interest, but also will see local interest, given that Malta's regulatory similarities with MiCA may provide a suitable home for those companies looking to be MiCA-ready earlier-on.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

The crypto and blockchain sector saw many wanting to jump on the bandwagon to make a quick buck. The recent AI hype has most definitely helped to filter out many such actors from the blockchain and crypto sectors, which is positive for sustainable growth, yet the flipside is indeed that investment has also more recently focused on the AI hype as well. Yet again, it is not the short-term hype and benefits (such as investment) that will eventually result in long-term success, but effort spanning across cutting edge research, dedication, and real-world solutions that will.

Key Figures

195+

Dedicated blockchain solution providers

415m

Total funds raised.

2.70%

Population that owns crypto

The Dutch blockchain ecosystem at a glance

The Netherlands is actively balancing regulation with innovation in the blockchain and cryptocurrency space. While the government takes steps to manage risks, a growing community of developers and companies are exploring new ways to use these technologies. Despite facing some challenges in 2022, like a lack of clear regulatory frameworks, the Dutch blockchain scene continues to evolve, showing promise for the future.

In terms of regulation, the Dutch government has adopted a proactive yet cautious stance towards cryptocurrencies. The Finance Minister of the Netherlands has repeatedly called for a European or global regulatory framework to address the associated risks of cryptocurrencies. In recent years, measures have been initiated to set up licensing frameworks to tackle money laundering and terrorist financing in the crypto sphere. Moreover, the De Nederlandsche Bank (DNB, the central bank) and the Dutch Authority for the Financial Markets have been vigilantly supervising the crypto domain, issuing cautions about inherent risks, while also exploring the potential of CBDCs.¹¹⁷

The Netherlands has also seen the emergence of several blockchain development companies, offering a spectrum of services and solutions for various sectors.¹¹⁸ However, the blockchain industry faced certain challenges in 2022, marked by a downturn in crypto asset values and governance issues within major entities.¹¹⁹ In general, the Netherlands balances innovation with regulation in its evolving blockchain and cryptocurrency landscape.

TOWARDS MAINSTREAM ADOPTION

Regulation

The regulatory framework for cryptocurrencies in the Netherlands is principally governed by the amendments to the Money Laundering and Terrorist Financing Prevention Act in 2020, in response to the EU's 5th Anti-Money Laundering Directive (AMLD5).¹²⁰ These amendments have provided a clear regulatory stance compared to some EU nations where crypto regulations might still be ambiguous. Unlike in some other EU countries, cryptocurrencies are not recognised as digital money in the Netherlands, which aligns with the stance of the DNB.

¹¹⁷ Source: <https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/netherlands>

¹¹⁸ Source: <https://www.goodfirms.co/directory/country/list-blockchain-technology-companies/netherlands>

¹¹⁹ Source: <https://www.invesco.com/nl/en/insights/beyond-the-freeze-blockchains-revival-after-crypto-winter.html>

¹²⁰ Source: <https://sumsub.com/blog/amld5-in-the-netherlands/>

The Netherlands mandates registration for entities providing professional or commercial services for the exchange between virtual and fiat currencies, or offering custodian wallets, with the DNB.¹²¹ This registration is mandatory even for entities from other EU or EEA member states if they cater to Dutch clients. The regulatory framework also includes provisions for initial coin offerings (ICOs), which are only subjected to financial supervision if qualified as a security.¹²² This clear regulatory environment fosters a conducive atmosphere for blockchain and cryptocurrency innovations.

Government initiatives

In the Netherlands, the Dutch Blockchain Coalition (DBC) is a significant government-backed initiative, fostering a public-private partnership to leverage blockchain technology. The DBC embodies a collaborative model engaging governmental bodies, commercial entities, and knowledge centres to decentralise digital infrastructure, develop blockchain use cases, and nurture blockchain talent. The coalition seeks to establish a reliable and socially acceptable blockchain application.¹²³

Cryptocurrencies: The cryptocurrency market in the Netherlands has been showing a positive trend over the past few years, reflecting a growing acceptance and use of digital currencies. The revenue in the cryptocurrency market in the Netherlands is projected to reach USD 509.60 million in 2023, with an expected annual growth rate of 11.56% from 2023 to 2027.¹²⁴ The use and trade of cryptocurrencies have been on the rise, with nearly a million users in the Netherlands as of 2021, and this number is increasing.¹²⁵ In 2021, it was estimated that 3.04% of the Dutch population owned cryptocurrency, which translates into over 520,000 individuals.¹²⁶ Bitcoin is still the most popular cryptocurrency in the Netherlands, with 8% of the population owning some. Next in the rankings are Ethereum with 6%, Cardano with 4%, Ripple with 3%, and Dogecoin with 2%.¹²⁷

VASPs: As of 2023, the Netherlands has 31 virtual asset service providers (VASPs) registered with the DNB, demonstrating a structured approach towards cryptocurrency service regulation.¹²⁸ While cryptocurrencies are legal in the country, they are not recognised as digital money, but VASPs are required to adhere to anti-money laundering (AML) regulations.¹²⁹

Collaboration: Dutch banks have adopted a collaborative approach to exploring blockchain technology's potential. For example, ING partnered with Société Générale and Mercuria on a blockchain-based live oil trade, while ABN AMRO collaborated with Dutch university TU Delft and the Port of Rotterdam on blockchain logistics opportunities. Furthermore, ABN AMRO and Rabobank joined global initiatives like SWIFT's blockchain proof-of-concept for the Global Payments Innovation service. These collaborations demonstrate Dutch banks'

¹²¹ Source: <https://sumsub.com/blog/amld5-in-the-netherlands/>

¹²² Source: <https://sumsub.com/blog/amld5-in-the-netherlands/>

¹²³ Source: <https://dutchblockchaincoalition.org/en#:~:text=The%20Dutch%20Blockchain%20Coalition%20is,for%20society%20and%20for%20businesses>

¹²⁴ Source: <https://www.statista.com/outlook/dmo/FinTech/digital-assets/cryptocurrencies/netherlands#:~:text=Revenue%20in%20the%20Cryptocurrencies%20market,in%20a%20projected%20total%20amount>

¹²⁵ Source: https://www.ey.com/en_nl/banking-capital-markets/unleashing-cryptocurrency-potential-4-ways-to-increase-institutional-adoption

¹²⁶ Source: <https://triple-a.io/cryptocurrency-ownership-data/>

¹²⁷ Source: <https://bitvavo.com/en/blog/research-multiscope#:~:text=The%20number%20of%20cryptocurrency%20owners,their%20disposable%20assets%20in%20cryptocurrencies>

¹²⁸ Source: <https://thebanks.eu/list-of-vasps/Netherlands#:~:text=31%20virtual%20assets%20service%20providers,apply%20for%20registration%20with%20DNB>

¹²⁹ Source: [Blockchain & Cryptocurrency Laws & Regulations | Netherlands \(globallegalinsights.com\)](Blockchain & Cryptocurrency Laws & Regulations | Netherlands (globallegalinsights.com))

commitment to pooling resources and expertise to harness blockchain technology for innovating financial services and addressing industry challenges.¹³⁰

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

In 2023, the ecosystem of blockchain companies in the Netherlands continued to evolve. The supportive stance of the Dutch government, the culture of collaboration, and well-structured infrastructure are instrumental in fostering a favourable landscape for blockchain development and adoption. Furthermore, the Dutch Blockchain Coalition epitomises the collaborative spirit within the sector by uniting various stakeholders to expedite blockchain adoption across diverse industries.¹³¹

The 14 blockchain companies identified in the Netherlands in 2023 exhibit a wide range of focus areas, covering different applications from financial services to healthcare.¹³² These companies, though varying in size, are key in demonstrating the growing ecosystem that has become increasingly favourable for blockchain development and innovation. Events such as Dutch Blockchain Week 2023 and Dutch Blockchain Days 2023 highlight the progress, trends, and developments in the blockchain sector within the country, providing platforms to display the Netherlands' blockchain capabilities.¹³³

In August 2021, the DNB issued a warning concerning Binance's provision of cryptocurrency services in the Netherlands without the necessary legal registration with DNB.¹³⁴ Following this, Binance, recognised as one of the world's preeminent cryptocurrency exchange platforms, embarked on a quest to secure the requisite licensing to continue its operations in the Netherlands. However, by June 2023, it became apparent that Binance's attempts were in vain, as it failed to persuade the Dutch regulator to issue a VASP licence.¹³⁵ Binance has therefore chosen to discontinue all trading activities in the Netherlands, a decision that was announced in June 2023.¹³⁶

THE BLOCKCHAIN COMMUNITY

The Netherlands has a growing and active blockchain and Web3 community, mainly found in the tech cities of Amsterdam and Rotterdam. The Blockchain Netherlands Foundation is a big part of this community. It helps organise events and bring blockchain enthusiasts together.¹³⁷ Every year, the Dutch blockchain community holds events like the Dutch Blockchain Week and Dutch Blockchain Days. These events help people network, learn, and explore the latest in blockchain, crypto and Web3 technologies.

The cryptocurrency community in the Netherlands is spread across the country with regular meetups and discussions, and several platforms like Crypto.com have been approved by the DNB to offer cryptocurrency services. Furthermore, these gatherings and regulatory advances signal that the blockchain and cryptocurrency environment in the Netherlands is maturing. The market's gradual acceptance of

¹³⁰ Source: <https://www.coindesk.com/markets/2017/09/04/ideation-to-realization-how-dutch-banks-are-harnessing-blockchain/>

¹³¹ Source:

<https://dutchblockchaincoalition.org/en#:~:text=The%20Dutch%20Blockchain%20Coalition%20is,for%20society%20and%20for%20businesses>

¹³² Source: <https://www.goodfirms.co/directory/country/list-blockchain-technology-companies/netherlands>

¹³³ Source: <https://dutchblockchaindays.nl/>

¹³⁴ Source: [Dutch central bank fines Binance 3.3 million euros \(yahoo.com\)](https://www.yahoo.com/news/dutch-central-bank-fines-binance-3.3-million-euros-1200000000.html)

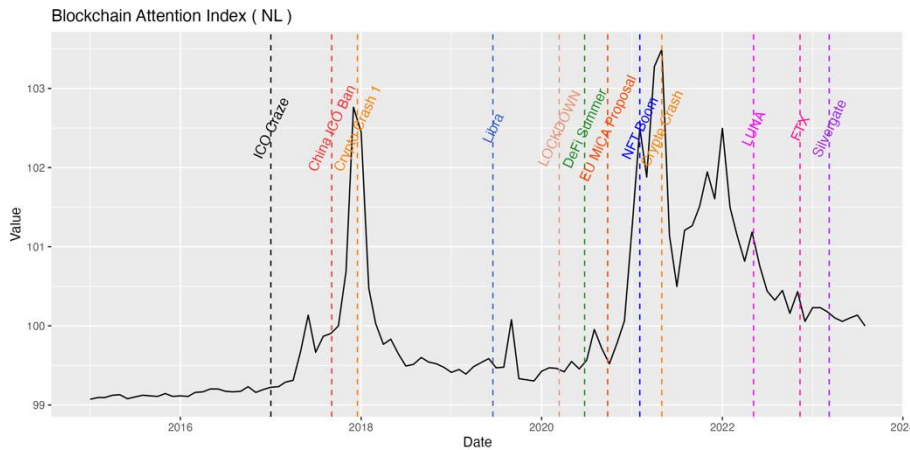
¹³⁵ Source: [Crypto Exchange Binance to Quit Netherlands After Failing to Acquire Anti-Money Laundering License \(coindesk.com\)](https://www.coindesk.com/news/binance-exchange-to-quit-netherlands-after-failing-to-acquire-aml-license/)

¹³⁶ Source: [Binance to quit Netherlands after failing to register | Reuters](https://www.reuters.com/technology/binance-to-quit-netherlands-after-failing-to-register-2023-06-01/)

¹³⁷ Source: <https://www.meetup.com/nl-NL/bcnlfoundation/>

cryptocurrency transactions, supported by the regulation of these platforms, demonstrates a growing trust and understanding of the potential of cryptocurrencies.

The positive stance of regulators such as the DNB in working with cryptocurrency platforms also shows a map of a maturing blockchain and cryptocurrency environment. This balanced approach to regulation and innovation makes the Netherlands an attractive centre for blockchain enthusiasts, startups, and investors alike. Ongoing dialogue between regulators, the blockchain community, and market participants is helping to create a thriving, well-regulated blockchain ecosystem in the Netherlands.



Key Figures

41+

Dedicated blockchain solution providers

365m

Total funds raised.

1.13%

Population that owns crypto

The Norwegian blockchain ecosystem at a glance

The Norwegian Ministry of Finance's 2023 Financial Market Report highlights the rapid growth of the virtual asset and currency market in Norway in recent years. This surge is attributed to Norwegian consumers seeking new investment opportunities as they adapt to the post-pandemic landscape. While cryptocurrencies have gained considerable attention, their volatility has raised concerns about their long-term reliability.

The Norwegian market has been influenced by the turbulent global crypto-asset market in the past year, witnessing value fluctuations, system failures, and even bankruptcies. Notably, the collapse of FTX and the challenges faced by stablecoins like USD Terra and USDC have significantly impacted investors, particularly non-professionals. Additionally, some banks serving the crypto industry have encountered difficulties.

According to a survey conducted in April 2023 by K33 and EY, approximately 8% of Norwegian adults, equivalent to 345,000 individuals, are cryptocurrency owners. This represents a 2% decline compared to 2022.

The cryptocurrency service landscape has evolved with the emergence of marketplaces and fund platforms, facilitating buying, selling, and payment in cryptocurrencies or other digital assets through suitable fiat gateways. There is also substantial interest in blockchain-based virtual assets, particularly non-fungible tokens (NFTs). The 2023 survey by K33 and EY indicates that 23% of Norwegian cryptocurrency owners are active in NFTs as of April 2023, marking a 13% increase from 2022.

Government discussions in Norway have oscillated between embracing and limiting cryptocurrency. Regulatory concerns have arisen due to the lack of regulation and the potential risks associated with virtual currency, especially from a consumer perspective. Challenges related to cryptocurrency handling, both legally and fiscally, have been identified for both individuals and companies. Ambiguities surrounding bookkeeping, reporting, and proper legal and tax classification further amplify these risks, necessitating careful and strategic approaches to mitigate them effectively. The Financial Supervisory Authority of Norway (FSAN) has repeatedly cautioned against the risks of investing in cryptocurrency and emphasised the need for a legal framework and regulation in the crypto-asset market to ensure investor protection.

However, the government has shown a positive attitude towards exploring and harnessing blockchain technology to drive future technological advancements and stimulate new business models and markets, both in the private and public sectors. Furthermore, the government is focused on the potential of financial products and services based on decentralised finance (DeFi), which can reduce reliance on central intermediaries, lower brokerage costs, and enhance financial services accessibility. In certain contexts, DeFi solutions can also offer improved security by mitigating counterparty and settlement risks. The government has also addressed legal challenges at the intersection of the General Data Protection Regulation (GDPR) and blockchain technology.

TOWARDS MAINSTREAM ADOPTION

Regulation and policy making

Currently, Norway lacks specific legislation or regulatory guidelines pertaining to cryptocurrencies and blockchain technologies. However, there are laws that are applicable to activities and services using blockchain technology and virtual currencies.

It's important to note that Norway is not a member of the European Union (EU), but it is part of the European Economic Area (EEA) through the EEA Agreement. This agreement connects Norway to the EU's internal market and serves as the foundation for Norway's European policy. EU legislation does not automatically become Norwegian law; it must be integrated into the EEA Agreement and subsequently transposed into Norwegian law.

In Norway, several laws partially regulate investments, customer due diligence, financial services, and utility tokens, including the Securities Trading Act (Act no 75 of 29 June 2007), the AML Act (Act no 23 of 1 June 2018) to combat money laundering and terrorist financing, and the Financial Institutions Act (Act no 17 of 10 April 2015).

Providers of exchange service platforms and custodian wallet providers dealing with virtual currencies must adhere to the requirements of the AML Act, governed by the Anti-Money Laundering Regulations (AML Regulations). These services can only operate after registering with the Financial Supervisory Authority of Norway (FSAN).

As of 29 June 2023, Regulation (EU) 2023/1114 on Markets in Crypto Assets (MiCAR) has come into force in the EU. However, the implementation of this regulation involves the formulation of numerous level 2 and level 3 measures, which will take effect within a 12 to 18-month timeframe, depending on the mandate. The first set of regulations will apply in the EU from 30 June 2024, and the second set from 30 December 2024.

MiCAR is part of the 'Digital Finance Package', aiming to promote innovation and competition in digital finance while enhancing consumer and investor protection. It covers instruments not currently addressed by other EU regulations and introduces regulations related to transparency, disclosure, authorisation, and supervision of transactions involving crypto assets. MiCAR also defines rules for the issuance and public offering of stablecoins, such as ARTs and EMTs, and requires the creation, notification, and publication of a crypto-asset white paper (CA-WP) for other crypto-assets. The definition of a crypto-asset service provider (CAS-Provider) is expanded, and licensing requirements apply to CAS-providers offering services throughout the EEA. Detailed rules are also provided regarding supervision and administrative sanctions.

In the 2023 Financial Market Report, the Norwegian Ministry of Finance (MoF) recognises MiCAR as relevant to the EEA. The Ministry is expected to assess Norwegian implementation once the regulations are adopted in the EU. Market participants affected by the proposed regulations are currently only partially subject to specific rules. At present, there is no information available from the EEA committee or the Norwegian legislator regarding the implementation timeline for MiCAR and its level 2 and 3 regulations in Norway.

Regarding personal data, Act no 38 of 15 June 2018 on Personal Data, incorporating the General Data Protection Regulation (GDPR), applies to blockchains containing personal data. Key issues include determining whether storing personal data on a blockchain constitutes data processing, clarifying stakeholder responsibilities for GDPR compliance, safeguarding individuals' rights, and conducting data protection impact assessments before using blockchain technology.

Exchange service platforms and custodian wallet providers dealing with virtual currency must register with FSAN if they are registered in Norway, operating from Norway, or targeting the Norwegian market. This registration obligation covers services such as trading virtual currency for official currency, switching between different virtual currencies, facilitating trades, and storing private cryptographic keys for virtual currency transactions. This includes all exchanges between different virtual currencies and official currencies, regardless of the payment method used (e.g. credit cards, cash, e-money). Storage solutions that do not store private cryptographic keys (often called 'non-custodial wallets') are exempt from these regulations. Service

providers are subject to these regulations based on the services they offer, regardless of their organisational structure; it is the nature of the activity itself that determines the registration obligation.

Sales regulation

Unlike regulated savings and investment products, there is currently no legal consumer protection in place for individuals who buy cryptocurrencies in Norway. However, once Norway implements the new framework covering crypto assets outlined in MiCAR, these digital assets will be subject to regulation.

The Financial Supervisory Authority of Norway (FSAN) has emphasised the importance of consumer awareness, especially considering the potential risks involved in buying and selling cryptocurrencies, given their volatile nature. FSAN has made it clear that it awaits the adoption and subsequent implementation of EU and EEA regulations on investor protection in Norway before additional safeguards can be established for consumers.

In March 2022, the European Financial Supervisory Authorities (ESMA, EBA, and EIOPA) issued a joint statement cautioning consumers about the high risks associated with investing in Bitcoin, other virtual currencies, or financial instruments linked to these currencies. FSAN endorsed this joint statement and issued a national warning in March 2022 to reinforce the message.

Moreover, FSAN released a press statement in August 2021, highlighting that some cryptocurrency platforms in Norway had falsely advertised themselves as being regulated or approved by FSAN. FSAN clarified that while these platforms must adhere to anti-money laundering regulations and report to FSAN for money laundering oversight, FSAN does not have broader supervisory authority over these entities.

In June 2022, FSAN published a report on consumer protection and financial services, offering further insight into the risks associated with cryptocurrency.

Blockchain in Academia

There is limited but notable activity regarding blockchain in academia in Norway. There are 5 universities offering courses on blockchain and cryptography: [The Norwegian University of Science and Technology](#) (Trondheim), the [University of Oslo](#), the [University of Bergen](#), the [University of Stavanger](#) and the UiT, the [Arctic University of Norway](#) (Tromsø).

Blockchain Across Key Industries

Prominent applications of blockchain and other distributed ledger technologies (DLTs) in Norway, include activities like cryptocurrency trading, secure data storage, supply chain tracking, public records management, and trading in the oil, gas, and energy sectors. Some of the most prominent applications include:

- Regulated centralised cryptocurrency trading and brokerage platforms such as Norwegian Block Exchange AS, Kaupang Krypto AS, and Firi AS (formerly known as MiraiEx) fall under the oversight of the Financial Supervisory Authority (FSA).
- Decentralised exchanges (DEXs) like Uniswap, Sushiswap, dYdX, and Raydium operate as smart contract protocols, allowing users to engage in peer-to-peer cryptocurrency trading. These DEXs are accessible to Norwegian citizens but remain beyond the active regulatory view of Norwegian authorities due to their decentralised nature.
- A partnership between international the accredited registrar and classification society DNV and Deloitte has resulted in a live blockchain solution for storing certificates.

- A Norwegian startup Diwala has developed a platform facilitating educational institutions and organisations in issuing and verifying credentials securely and digitally, leveraging blockchain technology.
- The Norwegian Seafood Trust, launched in 2020 by the Norwegian Seafood Association and Nordic IT infrastructure company Atea, employs IBM blockchain technology to share supply chain data across Norway's seafood industry. Nova Sea and BioMar joined this network in 2021.
- The Norwegian industrial company Hydro is piloting the DNV blockchain-powered 'Tag. Trace. Trust' service to substantiate its sustainability claims concerning the aluminum it produces.
- The Norwegian Registry of Business Enterprises, in collaboration with Symfoni (formerly known as Blockchangers), is developing a blockchain-based solution for shareholder registers. Symfoni is set to unveil 'Symfoni' by the end of 2021, a unified software collection for building interconnected services on blockchain.
- Symfoni has also partnered with the Norwegian Intellectual Property Office to create a licence register and has crafted a prototype for a property registry for OBOS BBL, Norway's largest housing developer. This registry records real estate and ownership transactions using blockchain technology.

There is substantial interest of the public sector in Norway's oil and gas production, with the Norwegian state being the primary shareholder in publicly traded Equinor ASA. Equinor has conducted trials with GumboNet, Data Gumbo's proprietary blockchain platform, to create an immutable record of operations at Equinor's oilfields, facilitating transaction confirmation and supplier payments.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The startup ecosystem in Norway is characterised by strong collaboration between various stakeholders in the public and private sectors. Norway places great emphasis on technology, innovation, and providing robust support for startups and entrepreneurs through its well-developed public sector support system. The country has a history of successful public-private partnerships in business ventures. This active government involvement has made Norway a highly business-friendly destination and established a regulatory framework that welcomes startups and investors. The government not only invests in large corporations but also actively supports small businesses and startups across the nation through various funds and organisations.

Notable examples include Innovasjon Norge, an organisation that fosters innovation and entrepreneurship, as well as Investinor and Startup Norway, two prominent and proactive startup investment entities. Recently, both foreign and domestic entrepreneurs and investors have recognised the opportunities and vibrancy of the Norwegian startup scene, boosting the ecosystem's visibility. However, Norway still lags behind other Scandinavian countries like Sweden, which began developing their startup ecosystems as strategic assets several decades ago. Additionally, the stability and security of the Norwegian economy may discourage risk-taking. The country's relatively small population of around five million limits the talent pool, leading to the acquisition of talent from other nations. Norway also faces one of the highest costs of living globally and falls behind its Nordic counterparts in terms of private investment in the tech sector.

Nevertheless, Norway has seen notable startup successes. In 2021, the country celebrated its first three unicorns: Gelato, Cognite, and Oda. The list of success stories continues to grow with companies like Dune Analytics, and there are several promising contenders poised to join the unicorn club. This indicates rapid growth in Norway's tech sector in recent years.

In summary, Norway is a prosperous nation with a stable economy, a skilled workforce, and a comprehensive social safety net. Notably, there is a high participation of women in startup teams, and Norway shows a strong commitment to a greener economy. These factors contribute to the entrepreneurial incentives, even considering the associated costs.

Notable Blockchain Companies

Mintix is a blockchain-based ticket company that integrates with web3 seamlessly. They are a cutting-edge ticketing platform and api that harnesses the power of blockchain technology, specifically through the use of non-fungible tokens (nfts).

Joystream provides the architecture to build video-based applications on the Polkadot blockchain. Joystream also has its own video platform where you can upload videos, sell them as NFTs, and also issue a token from your own channel.

Alpha Venturi is a co-innovation and venture studio specialised in emerging technologies (IoT, DLT, AI) and digital cleantech.

JSGenesis is the company building and launching the Joystream platform until it's ready to govern itself.

IAGON is a platform for harnessing the storage capacities and processing power of multiple smart devices over a decentralised blockchain/tangle grid. IAGON enables the storage of big data files and repositories, as well as smaller scales of files, and the carrying out of complex computational processes, such as those needed for artificial intelligence and machine learning operations, within a fully secure and encrypted platform that integrates blockchain, cryptographic, and AI technologies in a user.

EnlightAID is fighting corruption in aid through transparency technology. 30% of the money allocated towards aid globally is diverted because of acts of corruption, which translates into more than USD 160 billion lost annually. We have created a system that sheds light on the path funds take from fundraising to expenditure, showing their impact with the goal of reducing the economic incentive for malfeasance, restoring trust, encouraging more investments, and helping aid efforts reach their maximum potential.

Empower.eco is building a global plastic waste ecosystem based on the same philosophy as the Norwegian bottle deposit system. By giving plastic waste a value, Empower aims to stop the leakage of plastic into the environment and cost-efficiently incentivise the collection of leaked waste. The solution functions digitally via a mobile app. By tracking plastic waste and making digital inventories, they ensure that most of it is reused and recycled. This is done by setting up collection points around the world.

Packoorang sells reusable packaging products to ecommerce and logistics companies, as well as operate a return system to enable consumers to return the empty packaging (they take care of the logistics including cleaning and delivery back to the owner of the products).

SPENN is a financial services platform offering deposits, savings, loans and payment services to consumers and businesses alike. SPENN's unique retail digital currency platform and regulatory experience enables customers to transact fee-free directly with embedded payments facilitating a future where everyone in emerging markets has access to financial products.

THE BLOCKCHAIN COMMUNITY

Approximately 7,290 individuals interested in blockchain, and cryptocurrencies could be identified. This signifies a decrease of 540 people since 2022. This number amounts to less than 0.15% of the total population. Community members are geographically split in the capital city of Oslo, along with Bergen, the second-largest city by population. There are 9 groups/communities of practice (6 communities fewer than those identified in 2022) and these are the key organisers of most major community meetups.

Furthermore, according to a survey conducted in April 2023 by K33 in collaboration with EY, approximately 8% of Norwegian adults, equivalent to 345,000 individuals, own cryptocurrency. This figure indicates a decline of 2% compared to the number of cryptocurrency investors in 2022.¹³⁸

Useful resources:

[Blockchain & Cryptocurrency Laws and Regulations | Norway | GLI \(globallegalinsights.com\)](#)

[Cryptocurrency Demographics in Norway \(bitgate.io\)](#)

[The legal 500 country comparative guides: Norway BLOCKCHAIN](#)

[Startup Norway](#)

[Startup Blink](#)

[Crunchbase](#)

[NordicHQ](#)

[Startup Universal](#)

[Innovation Norway](#)

[Chambers& Partners](#)

[Cointelegraph](#)

[Ledger Insights](#)

¹³⁸ Source: [Blockchain & Cryptocurrency Laws and Regulations | Norway | GLI \(globallegalinsights.com\)](#)

Key Figures

111+

Dedicated blockchain solution providers

211m

Total funds raised.

2.80%

Population that owns crypto

The Polish blockchain ecosystem at a glance

Poland is in central Europe and is the fifth Member State in population size in the EU. The European Commission has published a [forecast](#) for the nation's economy. The Polish ecosystem has more than 3,000 startups, as indicated in the [Polish Development Fund](#). The Polish economy is well integrated within the EU and the world, as stated in the [EC's report](#).

Some initiatives are indicating the intention for solid adoption of blockchain in Poland, but updates on the development are scarce and hard to judge. Although the [Polish Digital Transformation Agenda](#) clearly highlights the benefits of blockchain adoption in sectors like Healthcare and Education, there hasn't been much progress. The cases of blockchain adoption are in the private and public sectors alike. The most notable cases are the [virtual sandbox](#) and [Innovation Hub](#) by the Polish Financial Supervision Authority (UKNF).

The legislative frameworks in Poland around blockchain and cryptocurrencies focus on taxation and AML. The existence of simple joint stock mainly aims to promote innovation and can impact the blockchain sector. The current legislation frameworks follow the European frameworks.

The blockchain community can educate through courses and training available from academia. Moreover, associations are supporting the community with events and workshops.

The interest in blockchain is clear, and the blockchain ecosystem expands each year. This observation is a result of the increase in the number of startups and large-scale events.

TOWARDS MAINSTREAM ADOPTION

Blockchain adoption

The adoption of blockchain in the public sector is a subject of research, as blockchain can decentralise public administration and its processes. The adoption of technology by the public sector can accelerate its adoption by the rest of the sectors. In Poland, Olsztyn has adopted blockchain to improve services in tourism and emergency services. The system possesses a native token, CoperniCoin, which can be used in the different services in the municipal area, as stated in an [article](#).

Another public authority experimenting with blockchain applications is the Warsaw Stock Exchange (GPW), which aims to pioneer the deployment of a platform for settlements based on the technology. The [memorandum](#) between the Ministry of Digital Affairs and GPW in 2018 and the GPW tech [project](#) in 2019 were initiatives for adopting blockchain in the public sector. However, there are no updates on the development of the project. From a published [interview](#), it became apparent that experiments are ongoing with a platform targeting small exchanges to be referenced during the interview.

The UKNF (Urząd Komisji Nadzoru Finansowego) launched a virtual sandbox in 2021. The virtual sandbox was intended to simulate several banking operations and test solutions with the interaction of Open API for innovative payment services.

The Polish project [Student Coin](#), which is a one-stop shop for blockchain information and education, was initiated in 2021. In an [announcement](#), the project announced that it had reached its hard cap of USD 21 million in 58 days. Users have at their disposal a tokenisation option for an educational token. Users of the system can be people and organisations that opt to launch a digital token.

Blockchain has the potential to disrupt the business models in different sectors. Sport teams experiment with the technology to change and organise their structure to facilitate the supporters' involvement. There are established companies around Europe, and one can be found in Poland. The startup, [Zetly](#), suggests a platform for issuing utility tokens. As reported in an [article](#), the smart contract will be deployed on the Polygon network.

An interesting case for blockchain adoption is the idea of an established business accelerator, [ReaktorX](#). A [blog post](#) referred to the idea of shifting to a DAO format for the accelerator. The concept will be based on three groups of stakeholders and establish an internal digital currency to facilitate the purposes of the accelerator.

NFTs exploded in popularity after 2021, and the public is still learning about their implementation and applications. Similarly to sports, there is activity around NFTs at national level. A [startup](#) using NFTs featured on a national website is [SmartVerum](#), whose application is based on art tokenisation.

Legislation of blockchain

In Poland, authorities permit the use of digital currency, recognising the potential benefits for the country. Currently, they are actively formulating cryptocurrency regulations to align with Polish legislation. Bitcoin mining is permitted in Poland, and discussions are ongoing to determine whether Bitcoin will be officially recognised as a form of payment or remain classified as a digital asset. Indeed, the Polish Financial Supervision Authority (KNF) will start supervising digital assets by the end of this year (2024). This means creating clear legislative frameworks and being able to impose financial penalties on companies in the cryptocurrency sector (see [article](#)).

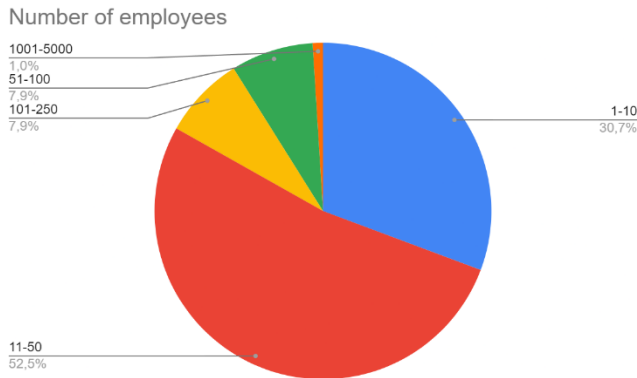
The Polish Financial Supervision Authority published [a warning](#) in July 2021 about the Binance platform, which was gaining popularity. The warning was similar in fashion to those made by other national supervisory authorities about the operation of Binance. The warning was more of a reminder to the public that the cryptocurrency market is neither regulated nor under any supervision, and there are risks involved in investing in it.

Cryptocurrency regulations have introduced a new AML regulation for entities operating in the cryptocurrency space. The [blog post](#) by Schonherr details the regulation and notes that companies need to register with the Register of Virtual Currencies curated by the Polish Ministry of Finance. There is a fine for those that do not abide by the regulation.

It should be noted that the regulatory framework introduced the [simple joint stock](#) corporate entity in 2020. This new type of entity is aimed at promoting ideas to startups and to aid innovation in Poland. Nominal company capital, along with an online registration process, makes it easy to establish an entity. There are more characteristics that can impact the business scene in the long run.

Blockchain in academia

This section expands on the previous report’s educational initiatives. There are dedicated programmes for educating the public on blockchain along with research initiatives. Only an indicative number of academic programmes and research initiatives are presented.



Initially, the SGH Warsaw School of Economics runs a [postgraduate blockchain programme](#) addressing the business, law, and technological aspects of technology. The participants attend lectures and workshops to acquire up-to-date knowledge on different blockchain subjects, including smart contracts.

Another training programme is [IT technologies and business processes](#) organised by Informatyka Akademica Gorniczo-Hutnicza. As blockchain is a

general technology, the Poznan University of Economics and Business provides professional certificates to participants in [Blockchain Fundamentals for Accounting and Finance](#). Individual courses are available in programmes for undergraduate and postgraduate students, such as the [one from the University of Warsaw](#).

The research on blockchain in Poland is rich with numerous published works. As search on the Wroclaw University of Economics and Business returns 1,005 [publications](#) on the term ‘blockchain’. Moreover, the University of Warsaw runs the [Cryptography and Blockchain Lab](#) with emphasis given to cryptography. Finally, the Nicolaus Copernicus University researches the subject and has consequently published an empirical study on the uses of cryptocurrencies in the payment services.

Blockchain across key industries

Blockchain is mainly adopted to provide IT and financial services. Blockchain is a component in the architecture of a solution that provides specific functionalities. Finally, the financial sector is one of the most active sectors in incorporating new technologies.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The blockchain startup in Poland is growing, with more entities entering the scene. Generally, this is due to the organised environment around funding companies, as indicated by [poland’s venture capital landscape](#). An [interview](#) with Szymon Janiak published in *Cyfrowa* provided a brief statement on the blockchain scene in Poland. A notable point from the interview is the availability of funding for the early and later stages, but there are issues with mid-range funding to scale entities.

There are a couple of options in venture capital for entities to seek funding. One choice is [Black Pearl VC](#), which focuses on early-stage venture capital firms in the technology sector. The VC has a blockchain solution in their portfolio, Autenti, an e-signature application. There is also a chance for software founders to approach [Alfabeat](#) for funding, as an entity involved in the analytics of cryptocurrencies, Coinfirm, is part of the portfolio. There are more choices from VCs focused on specific sectors, like [AgriTechHub](#), which is active in the agricultural sector.

Blockchain is a technology that is of interest to well-established entities, as they expand their business and include blockchain solutions. The majority of the entities are considered SMEs due to their number of

employees. Despite this, there are a couple of entities exceeding 250 employees. Finally, the startup scene is involved in a wide range of business sectors, but the major sectors are IT and financial services.

THE BLOCKCHAIN COMMUNITY

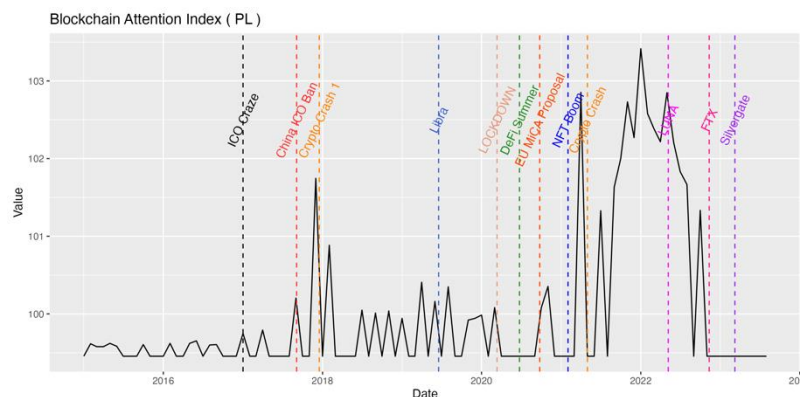
The blockchain community in Poland is lively, as indicated by the associations and events in the country. The associations active in the country organise activities for educating the public and promoting the technology. There are large-scale events for the community to participate in to further expand their connections within the community.

There are private initiatives that promote blockchain. One of them is the [Polish Blockchain and New Technologies Chamber of Commerce](#), which is a community driven initiative with the objective of opening a dialogue with public authorities.

A detailed description of the initiative established in 2017 by 150 founding member is available online, together with its objectives and areas of activity. An action by the Chamber is the Arbitration Court of Blockchain, the first court in Europe to settle disputes in this novel area.

Associations have formed throughout Europe to support the blockchain community with actions organised to educate and inform the public. The Polish Blockchain Association ([Blockchain Polska](#)) was established in 2018 by a group of active blockchain participants. Apart from traditional initiatives, the association has established a community for women in technology named [Blockchain Girls](#). The initiative has organised meetups to educate its audience on blockchain and cryptocurrencies. As reported in the last version of the report, the [Swiss-Polish Blockchain Association](#) continues its activity with a range of activities like events, workshops, and blockchain talks. Moreover, this association aims to aid Polish initiatives to operate in a legal form based in Switzerland. Another initiative is the non-profit organisation the [Blockchain Development Foundation](#), located in Łódź. Finally, another association is the [Polish Bitcoin Association](#) which has a long history, as it was established in 2013, and has the goal of demystifying Bitcoin and blockchain as the underlying technology of the token.

The community can participate in conferences and events for learning and networking. In Warsaw, there is a



festival called the [Next Block Expo](#), to be held in May 2024, with numerous speakers, such as Jonas Jünger (Binance), Jan Sell (Coinbase), etc.

Workshops are also held by the different groups and associations. For example, Blockchain Devs held a [webinar on NFTs](#) in March 2022.

AN INDICATIVE BUT NON-EXHAUSTIVE LIST OF BLOCKCHAIN COMPANIES IN POLAND

[Redstone](#): cross-chain data Oracles for Web3 & DeFi protocols; and Warp, data-driven smart contracts layers on Arweave.

[Golem Factory GmbH](#): a solution to rent your unused CPU/GPU cycles and get paid in cryptocurrency.

[DoxyChain](#): a Blockchain document management system (DMS).

[Cryptony](#): is an application deployed in 2021 that aids users to overview their cryptocurrency taxes. Profits from crypto trading are regarded as monetary capital and are taxable, so it is important for users to keep a track record of their transactions. The application uses exchanges' API keys, which are provided by users, and the application generates a tax report once the application collects the data.

[Formation.Fi has rebranded to Every Finance](#): is a protocol for cross-chain risk parity smart farming established in 2021. The protocol allows users to diversify their portfolios depending on their risk preferences. In a Medium post, the protocol set out seven principles; chain agnostic, low transaction costs, radical simplification, investment, communal effort, long-term focus, and constant innovation. The protocol has attracted over EUR 3 million for investing.

[DAC.Digital](#): is a developers studio that delivers information technology services, founded in 2009. One of the technologies that the studio is involved with is blockchain. The studio participated in the Block.IS programme.

[REXS.IO](#): is a startup established in 2020 that offers a technology stack based on blockchain for the notarisation of existing data. The software aims to decrease the technical complexity of the DLT ecosystem and mitigate risks. Moreover, the functionality is delivered to be technology-agnostic to be used in different cases. The startup participated in the BlockchStart programme.

Key Figures

95+

Dedicated blockchain solution providers

163m

Total funds raised.

2.62%

Population that owns crypto

The Portuguese blockchain ecosystem at a glance

Portugal is increasingly impacting the world of cryptocurrencies and blockchain technology. The country is home to innovative startups and organisations exploring the potential applications of blockchain beyond cryptocurrencies. Various blockchain-related events, conferences, and research initiatives contribute to a vibrant and collaborative ecosystem.

Recently, the presence of crypto companies in Portugal has increased significantly, changing the way the Portuguese perceive and engage with the cryptocurrency industry. [Criptoloja](#) has made history by being the first crypto exchange to receive a licence from the Portuguese Central Bank, allowing it to operate in the country – a milestone reached in October 2021. With [Criptoloja](#), you can now conveniently buy over 90 different cryptocurrencies with euros, making it much easier to access the world of digital assets.

Thanks to its favourable tax regulations and innovative products, such as the [crypto visa card](#), Portugal is one of the top locations supporting crypto and blockchain-related activities.

The startup ecosystem and community have grown significantly. The blockchain community is supported by associations organising events and other actions. Detailed descriptions are included in the following sections. All in all, the blockchain ecosystem is active and growing each year. The main sectors for blockchain are application development and appliance in the financial sector.

TOWARDS MAINSTREAM ADOPTION

Blockchain adoption

There has been an increase of interest in real estate negotiations involving cryptocurrencies, with such transactions expected to increase following the specific guidance on the matter by the Notaries Association; there is also increased interest in the tokenisation of assets and DAOs. The ZLTs framework will significantly contribute to the development of, experimentation with, and adoption of the technology in the Portuguese market.

Exchanges are an easy way for the public to purchase cryptocurrencies with fiat. Portugal's Central Bank granted the [first operating licences for crypto exchanges](#) to Criptoloja and Mind the Coin with an official statement explaining how the existing law allows any authorised or licensed crypto company to

carry Exchange services between Cryptocurrencies and fiat currencies, transfer services of virtual assets, “safekeeping and/or administration of virtual assets or instruments that enable the control, ownership, storage or transfer of such assets, including private encrypted keys”.

The financial sector is a prime sector that researches and applies blockchain in different scenarios. In Portugal, Deloitte has developed a [platform for distributing funds](#). The initiative is related to the [Portuguese Association of Investment Funds, Pension Funds, and Asset Management](#). This platform aims to facilitate the payment procedure and alleviate issues encountered in it.

Since 2021, the Portuguese public administration has taken action to adopt blockchain technology in the public sector. A use case is the [participa.gov](#) platform, aiming to aid citizens’ participation safely and reliably. Apart from public administration, the agricultural sector applies blockchain for tracking food products while enhancing safety. The Portuguese [Veracruz](#) entity has collaborated with Arabyka to apply blockchain in the supply chain. Blockchain has applications in sports, and Portuguese teams are part of the initiative. Some examples are the news about the [national football team’s collaboration with Socios](#) for launching a crypto token and teams like [Porto](#).

Legislation of blockchain

The Portuguese legislative framework for technological free zones (Zonas Livres Tecnológicas – ZLTs) is aimed at setting up real-life geographical areas as regulatory sandboxes to promote and facilitate research, demonstration, and testing activities for innovative technologies, products, and services, including blockchain applications, across all industries, making Portugal an attractive option for investment and exploration of the technology.

Generally, Portugal applies European legislation and suggestions on blockchain. Generally, cryptocurrencies are not treated as legal tender, but there is a division between utility tokens and security tokens based on the tokens’ function.

Taking into account that blockchain/DLT is not subject to uniform regulation in Portugal or the EU, any EU-wide regulatory or policy initiative would have an impact on the national blockchain market. The following regulations in the EU Digital Finance Package, which sets out the general guidelines for the digital transformation of the financial sector, have a direct impact on the market:

- the Regulation on Markets in Crypto-assets (MiCA);
- the Regulation on Digital Operational Resilience for the Financial Sector (DORA); and
- the Regulation on a Pilot Regime for Market Infrastructures based on Distributed Ledger Technology (DLT Regulation).¹³⁹

Entities active in virtual assets provision have to adhere to requirements to operate within the Portuguese territory. The Central Bank of Portugal presents the [requirements](#), including Article 112-A of Law No 83/2017 and [Notice No 3/2021](#). The Notice regulates the provisions of the previous article and involves entities exercising a professional capacity with virtual assets.

Blockchain in academia

Currently, the most prominent blockchain-focused training programme is the graduate programme offered by the ISAG-European Business School in Porto, focused on [Web3.0, Blockchain & Cryptoeconomics](#).

¹³⁹ Source: <https://practiceguides.chambers.com/practice-guides/blockchain-2023/portugal>

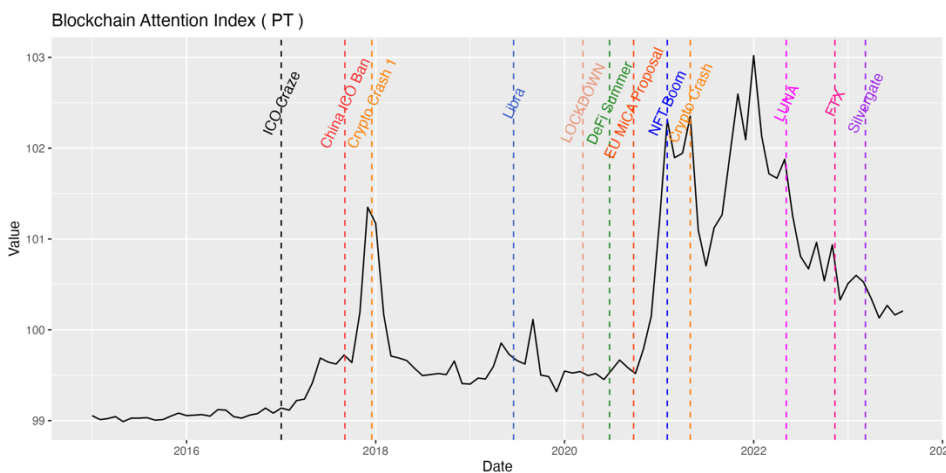
Blockchain across key industries

Investors both at national and international level continue to invest in the Portuguese blockchain market. The need for secure digital transactions and operations has stimulated an increased interest in the technology – especially among large national and international entities that are exploring the business and legal feasibility in sectors such as healthcare and real estate – as well as exploring alternative business structures, such as DAOs. Moreover, companies across sectors are increasingly exploring the possible convergence of blockchain, AI, and AR/VR for various metaverse projects.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The blockchain startup ecosystem consists of small and medium companies in Portugal. This is to be expected, as technology startups have small and swift teams while achieving great impact with their developed applications. A great number of startups were established in 2018, but more startups are established each year, expanding the startup ecosystem. The main sectors that startups are active in are the service and financial sectors. In essence, blockchain is adopted in applications to deliver functionality for users.

THE BLOCKCHAIN COMMUNITY



The past four years have brought about a 50% decline in the total amount of global venture funding for blockchain technology. However, Europe’s piece of this pie has grown to 17%, a significant jump from 10% in 2018. Within the same time cycle, Portugal has raised USD 295 million in venture deals. This accounts for 0.46% of the total blockchain venture investment in Europe and 0.3% of the global.

Between Q3 ‘22 and Q3 ‘23, Portugal secured USD 106.3 million in blockchain venture funding. This represents a 221% funding increase over the last four quarters. Despite a global slump in crypto venture funding, the average deal size in Portugal witnessed a whopping 543% year-on-year increase.

From blockchain networks to decentralised finance, and from gaming and metaverse applications to crypto exchanges, there is no shortage of Web3 innovation taking root across Portugal. These statistics tell the tale of an economy primed to embrace, leverage, and dominate the industrial sector of decentralised technologies.¹⁴⁰

¹⁴⁰ Source: <https://finance.yahoo.com/news/portugal-blockchain-report-icp-takes-140000671.html>

It is against this backdrop that the internet computer protocol emerges as a key player, poised to be a driving force behind the growth of Portugal's blockchain economy.

The Portuguese community is rapidly growing and aims to extend their operations on a global scale. The community can opt in to participating in associations, events, and hackathons focused on blockchain.

AN INDICATIVE LIST OF BLOCKCHAIN COMPANIES IN PORTUGAL

Anchorage Digital: a company founded in 2017 with offices established in Portugal. The company offers a financial platform and is an infrastructure provider for digital assets. It aims to help institutions invest in digital assets in a secure manner and with regulatory compliance.

Catapult Console: introduced as an app distribution console established in 2019. It is subscription-based to allow developers to distribute their applications across numerous stores. Essentially, developers sign their APK to be managed by the protocol.

Digital MZN: founded in 2021 in Lisbon. Their platform integrates advanced AI-driven models with the financial world, offering users an automated asset management system tailored for the CeFi environment.

Knowtary: is a company founded in 2020 with participation in BlockStart. The main goal of the company is to support any entity that deals with contractual agreements and signatures, and essentially provides the public with document certification. The documents are notarised with the use of blockchain. The transition to digital documents along with the efficiency of the processes can alleviate bureaucracy and lessen the environmental burden. The company's solution has been adopted in SMEs as indicated by BlockStart.

NAU21: a developers studio established in 2015. The studio consults projects on cutting-edge technologies and one of them is blockchain.

Polkastarter: introduced as a decentralised protocol to launch new ideas, established in 2020. The protocol is an IDO (Initial DEX Offering) extending the previous well-known ICO structure. The project's documentation clarifies that projects can set fixed swap pools to raise funds. The protocol implements cross-chain swaps and runs on Polkadot due to speed, scalability, interoperability, and governance. An IDO's advantage is the community establishment to invest in inspiring projects.

Sense Finity: a company established in 2013 that works in the supply chain. During BlockStart, the company introduced a blockchain-based solution for food provenance certification. The solution is in place to track food's distribution with sensors and trackers. The blockchain offers data immutability and is based on Hyperledger. The solution allows consumers to be accurately informed about their food.

Associations are formed in Portugal to foster the growth and support the needs of the community around blockchain. The last version of the report included the [Portuguese Blockchain Alliance](#), which is still active with news, events like the [seminar on smart contracts](#), and partnerships for blockchain adoption .

The Portuguese Blockchain Alliance is an ecosystem with enterprises, academic and governmental institutions in order to give Portuguese economical system plenty of knowledge tools on Blockchain.

Another association active in Portugal is the [Associação Portuguesa de Blockchain e Criptomoedas](#) with great interest in blockchain and cryptocurrencies. An association founded in 2021 and focused on the digital economy is the [Instituto New Economy](#). Technologies are to disrupt and revolutionise the way of business operations and the institution will support the national ecosystem and its global standing.

INSIGHTS FROM EXPERTS

Ricardo Simoes, Executive Director, INATBA

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Portugal? Has the recent growth of the cryptocurrency markets facilitated familiarity?

Public awareness and adoption of blockchain and cryptocurrency in Portugal have been on the rise, especially with the recent growth of the cryptocurrency markets. This surge can be attributed to the country's relatively friendly regulatory stance towards cryptocurrencies. Portugal has been known for its tax-friendly policies regarding cryptocurrency gains, which have encouraged both individual and institutional interest. According to a 2021 Statista Global Consumer Survey, awareness and ownership of cryptocurrencies in Portugal are growing, with a significant percentage of the population owning or using cryptocurrencies.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Portugal?

The blockchain and cryptocurrency business ecosystem in Portugal is growing but is still in its developmental stages compared to larger markets. Portugal has seen a rise in blockchain start-ups and companies focused on a variety of applications, from financial services to supply chain solutions. However, whilst there is a vibrant community and increasing interest, the overall size and maturity of the ecosystem are evolving. Events like the Web Summit in Lisbon also play a crucial role in bringing together entrepreneurs, investors, and developers from the blockchain space, fostering growth and innovation.

What measures has Portugal taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Portugal has made significant strides over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption. Notably, Portugal has been an active participant in the European Blockchain Partnership and has also committed to be part of the new EDIC (European Blockchain Services Infrastructure), led by the Belgian presidency of the Council. This commitment underscores Portugal's proactive stance in adopting blockchain technology to enhance European public services. Furthermore, with its oversight role, the Banco de Portugal has registered 12 entities providing services with crypto assets, demonstrating a regulatory environment conducive to responsible growth in this sector.

What measures can be taken at a national and European level to promote blockchain and cryptocurrency adoption by the public whilst also making it a more appealing option for entrepreneurs?

At both the national and European level, several measures can be undertaken to promote blockchain and cryptocurrency adoption:

- Education and Awareness: comprehensive educational programmes to enhance the understanding of blockchain and cryptocurrency among the general public and businesses.

- Regulatory Clarity and Support: Implementing clear, consistent, and supportive regulatory frameworks, namely MiCA (Markets in Crypto Assets regulation), to protect consumers and investors while encouraging innovation. This includes leveraging Portugal's participation in the European Blockchain Partnership and its commitment to the EBSI/EDIC to foster cross-border blockchain initiatives.

- Incentives for Startups and Entrepreneurs: Providing tax incentives, grants, and funding opportunities targeted explicitly at blockchain startups and projects.

- Public-Private Partnerships: Facilitating collaborations between public sectors and private blockchain companies to explore and implement innovative blockchain applications in public services.

- Fostering European Collaboration: Enhancing cooperation across EU member states to create harmonised regulations and standards for blockchain, facilitating a more integrated and efficient European blockchain ecosystem.

- at an institutional level, increase the connection and engagement with relevant financial pilots and sandboxes, like the EU DLT Pilot regime, testing enhanced market infrastructures and tokenisation of financial assets.

What does the future hold for the Portugal blockchain and cryptocurrency ecosystem?

The future of the blockchain and cryptocurrency ecosystem in Portugal is bright, with the country poised to play a pivotal role in the European blockchain landscape. Portugal's active participation in the European Blockchain Partnership and its commitment to the EBSI project highlights its dedication to leveraging blockchain technology for public service improvement and digital transformation across Europe. With ongoing investments in education, regulatory clarity, and infrastructure, along with a supportive environment for startups, entrepreneurs and institutions, Portugal is well-positioned to become a significant hub for blockchain innovation and adoption.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

The integration of AI and chatbots is significantly impacting the growth and development of the blockchain and cryptocurrency industry by enhancing efficiency, user experience, and security. AI's ability to analyse market trends and predict fluctuations with high accuracy is proving invaluable for traders and investors. Meanwhile, chatbots are revolutionising customer service and user engagement within crypto exchanges and wallets. The combined capabilities of AI, chatbots, and blockchain technology are driving further innovation, streamlining operations, and enhancing security across the industry, paving the way for accelerated growth and development.

Key Figures

64+

Dedicated blockchain solution providers

16m

Total funds raised.

1.63%

Population that owns crypto

The Romanian blockchain ecosystem at a glance

In Romania, the blockchain market is evolving towards greater maturity, leveraging the preceding period of market stagnation to develop its Web 3.0 offerings. Over the past 3 to 4 years, there has been a notable increase in public awareness and acceptance of blockchain and cryptocurrency.

In the public sector arena, blockchain technology has emerged as a reliable tool widely used by government authorities across various sectors. One of the most important areas benefiting from blockchain adoption is healthcare, where the technology improves data management, and governmental institutions, but also enhances transparency. An indicative example of the use by the government, includes the Romanian government embracing blockchain technology during the December 2020 parliamentary elections to safeguard the integrity of the electoral process, enhance transparency, and ensure tamper-proof real-time voter attendance data.

Furthermore, more sectors, such as education, transportation, legal, and finance are experiencing the integration of blockchain-based services, particularly for reasons related to transparency, notarisaton, and traceability (e.g. issuance of diplomas and certificates on-chain). It is important to highlight that Romanian legislation also needs to adjust to comply with the implementation of the European Directive on Markets in Crypto Assets (MiCA).¹⁴¹

TOWARDS MAINSTREAM ADOPTION

Blockchain adoption

Countries can be hesitant over blockchain adoption, despite the activity around the technology. On the other hand, countries are experimenting and adopting blockchain as a driver towards the future. Romania implemented blockchain to safeguard the integrity of [parliamentary elections](#) in November 2020. Blockchain was used as a trust layer to guarantee that [no interference occurred](#) in the election process. Moreover, two systems benefiting from data immutability are deployed on top of the blockchain for [monitoring election](#) turnout and [producing reports](#) that are publicly available on the [site](#).

Romania's public sector fosters interest in implementing and experimenting with blockchain technology. There are initiatives that will deliver material on blockchain, like the [Romanian Digitalisation Authority](#) for public administration.

Aligned with the worldwide movement, there is a significant interest in Romania towards crypto-assets and technologies based on distributed ledger technology (DLT). Enthusiasts in the country have the option to engage with numerous international crypto exchanges and trading platforms, alongside domestically created trading venues like Tokero (previously known as LDV). When it comes to fundraising, initial coin offerings (ICOs) or initial exchange offerings have been used by companies founded in Romania (such as Restart

¹⁴¹ Source: <https://chambers.com/articles/legal-500-romania-blockchain>

Energy) or based there (like Elrond), with the latter developing a public blockchain ecosystem for a variety of financial applications, including the Mayar wallet for its eGold native cryptocurrency.

Additionally, blockchain technology has been adopted for use in various sectors, exemplified by Sablier, which facilitates real-time crypto payments. Local regulatory bodies, including the Financial Supervisory Authority (FSA), are investigating the potential of blockchain as a regulatory technology (regtech) tool in their supervisory activities, as outlined in the FSA's Strategy for 2021–2023.¹⁴²

Legislation of blockchain

The Romanian legal landscape does not specifically cater to FinTech companies with a distinct regulatory framework, with the notable exception of crowdfunding services. These services are governed by the EU Crowdfunding Regulation, which has been in effect in Romania since 10 November 2021, alongside Law no 244/2022. This law establishes national standards for the direct application of Regulation (EU) 2020/1503 on European crowdfunding service providers for business, known as the 'Crowdfunding Law', and it was implemented on 6 August 2022.

For other operations conducted by entities in the sector, they may be subject to the licensing requirements for banking and financial services. These requirements are largely derived from EU directives like PSD2, the E-money Directive, MiFID II, and the Solvency II Directive, in addition to local laws and regulations. This includes rules concerning non-banking financial institutions, such as those detailed in Law 93/2009, which has been updated over time.

From July 2022, FinTech firms offering remote video identification services for electronic identification as defined under the eIDAS Regulation face new registration mandates. These are based on local regulations introduced in December 2021 by the Authority for the Digitalisation of Romania, through Decision 564/2021 published in the Official Gazette of Romania on 24 November 2021, known as 'ADR Norms'. Furthermore, on 22 November 2022, the European Banking Authority released its final guidelines on remote customer onboarding solutions. While the ADR Norms aim to fulfil objectives like these guidelines, they should be considered in tandem with the European Banking Authority's guidelines on remote customer onboarding. Credit and financial institutions must evaluate how their solutions, aligned with the ADR Norms, adhere to these new guidelines.¹⁴³

Blockchain in academia

Several universities now incorporate modules on blockchain and digital currencies' technological and financial aspects into their undergraduate and master's level courses. Blockchain is also a popular subject for bachelor's, master's, and PhD theses across many universities.

Dedicated research groups on blockchain include:

- The Centre for Open Education and Blockchain at Ioan Slavici University of Timisoara,
- A group at the Faculty of Mathematics and Informatics of the West University of Timisoara,
- The Distributed Systems Research Laboratory at the Technical University of Cluj-Napoca.

In November 2020, the first postgraduate programme in Romania focusing on 'Entrepreneurship in Blockchain' was launched online by the West University of Timisoara's Faculty of Mathematics and Informatics. The

¹⁴² Source: <https://practiceguides.chambers.com/practice-guides/comparison/768/10624/17027-17029-17043-17047-17052-17055-17058-17068-17073-17077-17080-17083-17093>

¹⁴³ Source: <https://practiceguides.chambers.com/practice-guides/comparison/768/10624/17027-17029-17043-17047-17052-17055-17058-17068-17073-17077-17080-17083-17093>

programme was coordinated by Professor Viorel Negru and Lecturer Ciprian Pungila, with tutors from the university and experts in finance and entrepreneurship.

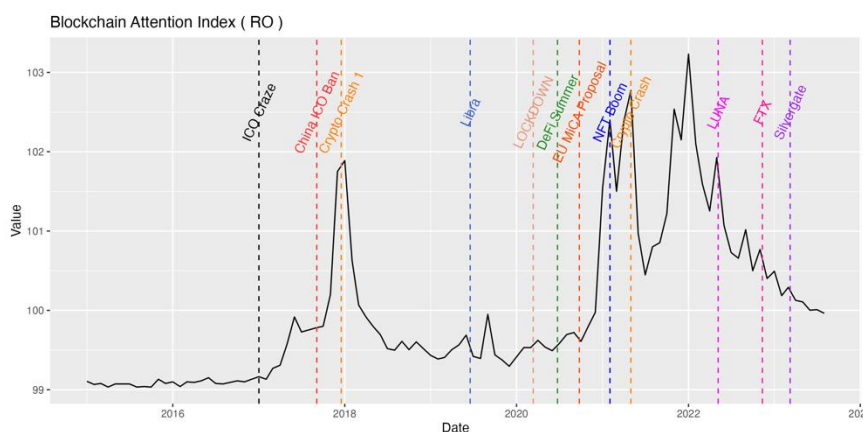
The National Institute for Research and Development in Informatics – ICI Bucharest introduced the European Centre for Excellence in Blockchain in 2018. Since the summer of 2020, ICI, through the Executive Blockchain Laboratory led by Dr Paul Niculescu-Mizil Gheorghe, has been offering an 8-week online course titled ‘Blockchain Technology: Application and Innovation of Transformational Business’, in collaboration with various international institutions and companies.

There are companies and organisations that offer courses about blockchain: [NobleProg](#), [Crystal Mind](#), [Life University](#), [Modex](#) as well as [Webdollar](#) which offers short video tutorials. [CryptoZZ](#), founded by [Anna Mera](#), is a project aiming to extend knowledge about blockchain and cryptocurrency, by organising meetings and publishing [educational videos](#). [StakeBorg](#) is a startup that aims to be an educational hub facilitating the adoption of blockchain technology in Romania.¹⁴⁴

Blockchain across key industries

Most of the companies using DLT technologies are active in the financial sector. The main reason for this is that the regulations in the financial sector are well established, and the reasoning and procedures are clear, making it easy to code in programming logic. Moreover, blockchain and its ledger are well suited to documenting transactions by alleviating issues like double-spending. Finally, blockchain is a component in complex architecture that delivers a specific functionality like data immutability, security, and others. The inclusion of IT services as the second sector makes sense, as users select services based on their functionalities and can be oblivious to the underlying technologies.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE



The blockchain startup and business scene in Romania is marked by a vibrant community, notable success stories, and significant growth potential. As the ecosystem continues to evolve, it is expected that more innovative solutions and companies will emerge from this space, further establishing Romania as an important player in the global blockchain industry.

The startup ecosystem in Romania is generally composed of SMEs, as indicated by the number of employees for each company. Most companies were established in 2017 and 2018, but the popularisation of blockchain

¹⁴⁴ Source: [Romanian Blockchain Ecosystem - EBSI4RO](#)

as a technology has attracted the attention of established companies. As with other countries, the financial sector is the predominant area to apply blockchain technology.

Romania boasts a robust technical education system, with universities like the Polytechnic University of Bucharest and Babeş-Bolyai University producing skilled graduates. There are also active blockchain communities and meetups across major cities, providing networking opportunities and fostering innovation.

The blockchain startup scene in Romania has attracted both local and international investors. There are a growing number of accelerators and venture capital firms interested in Romanian blockchain ventures.

THE BLOCKCHAIN COMMUNITY

The interest in blockchain is clear, as the community in Romania is growing each year. Most meetups and events take place in cities like Bucharest, Cluj, and Timisoara. The community in Romania can interact in associations, events, and hackathons.

In Romania, there are several organisations and associations to promote blockchain and educate the public on the technology. The most popular one is [Asociatia Blockchain Romania](#) while there is also the [Blockchain Romanian Community](#) supported by BlueDrive, but there is little to no update on their activity.

AN INDICATIVE BUT NON-EXHAUSTIVE LIST OF BLOCKCHAIN COMPANIES IN ROMANIA

Modex: offers fully integrated data protection solutions and aims to make digital technologies user-friendly for organisations and people. The Modex Blockchain Database (Modex BCDB) platform allows companies to implement their first blockchain project in just a few days instead of a few months, offering real data integrity, log immutability and data security.

Elrond: a blockchain platform for building high performance and secure applications (DApps) based on smart contracts. The platform creates a global digital economy by enabling blockchain interoperability. Elrond's network is capable of processing up to 15,000 transactions per second, making it one of the highest performing blockchains. Transactions at Elrond are confirmed almost instantly.

Zitec: a company specialised in the development of digital transformation solutions, customised services and technological products, mobile applications, blockchain, as well as digital marketing services. Its [Blockchain portfolio](#) consists of projects such as Persona, [Aurus](#), the [Gibraltar Blockchain Exchange \(GBX\)](#) [Crypto One-Stop Shop \(COSS\)](#). Zitec was awarded the company of the year at the [ANIS Gala](#), on 31 March 2022 ([ANIS](#), the Employers' Association of the Software and Services Industry).

Humans.ai: a deep-tech startup, with offices in Bucharest, London, and Amsterdam, offering synthetic media products – simulating human voice, image and gestures using AI. The company introduced the first framework for ethical AI with blockchain and is also creating NFTs and cryptocurrency tokens linked to AI – [Talkens](#). In April 2022 it [announced](#) a new listing for its \$HEART token on top tier Asian crypto exchange Liquid, a new step towards Humans.ai's continued growth in the East Asian market.

Aurachain developed a [low-code platform for Blockchain applications](#). The company is the technology partner for the Bucharest Stock Exchange (BVB) and the Central Securities Depository, for [two innovative solutions](#) to accelerate and optimise the shareholder voting process at exchange-listed companies using blockchain technology, and to facilitate access to the capital market by digitising investor enrolment.

Key Figures

30+

Dedicated blockchain solution providers

17m

Total funds raised.

1.44%

Population that owns crypto

The Slovakian blockchain ecosystem at a glance

Despite the relatively limited blockchain scene in Slovakia, the Slovakian blockchain hub is constantly offering opportunities for local tech professionals to engage further with the blockchain technology and community.

The country achieved an essential landmark in the history of virtual currencies. On 8 December 2013, Europe's first Bitcoin ATM was installed in Bratislava, Slovakia. Similarly, an independent store of the popular fast-food chain Subway has been accepting payments in digital currency in its Bratislava store since 2013.

On another note, the venture capital firm and crowdfunding platform [Crowdberry](#), an official partner of the Slovakian government sovereign fund Slovak Investment Holding, has invested in blockchain startups. The country is home to a Bitcoin mining facility that converts human and animal waste into Bitcoin hash rate, securing the network while mining Bitcoin. AmityAge mining facility uses human and animal waste to generate electricity for mining.

TOWARDS MAINSTREAM ADOPTION

There is no available data suggesting blockchain has had significant adoption in the Slovakian public sector or regional governance.

Legislation of blockchain

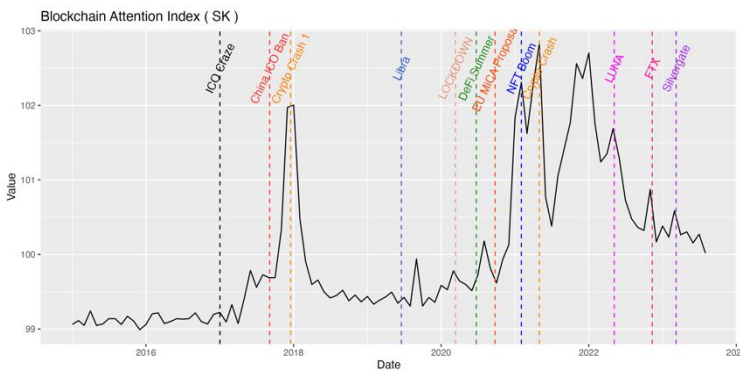
On 23 March 2018, the ministry of finance published guidance explaining that revenues stemming from cryptocurrencies need to be taxed. It said that any type of exchange, such as an exchange of a virtual currency for an asset or a service rendered or for another virtual currency, must be regarded as a taxable transfer. The guidance underlines that virtual currencies must be treated as 'short-term financial assets other than money' and priced at market value at the time of transaction. The guidance also notes that virtual currencies directly obtained from mining should be kept off the balance sheet until they are sold or traded. Earlier, the finance minister had pointed out that trade in cryptocurrencies, which is unregulated and anonymous, involves risks of terrorism and organised crime.

Also, it is interesting to note that Slovakian lawmakers voted in mid-2023 in favour of a law that approves lower crypto taxes, with other measures affecting cryptocurrency holders (see [article](#)).

Blockchain in academia

During the 2020-2021 academic year, a fully-fledged university-level course for computer science focused on an in-depth understanding of Bitcoin, Ethereum, cryptocurrencies and blockchain technology was run at the

Faculty of Informatics and Information Technologies at the Slovak University of Technology by blockchain advisors David Stancel and Kristian Kostal. The [course syllabus](#) is publicly available.



Additionally, [Blockchain Slovakia](#), an educational non-profit organisation, aims to create a platform that brings together all the stakeholders in the country’s crypto space, such as regulators, developers, businesses, and the general public. The organisation is focused on raising awareness about cryptocurrencies and blockchain technology via various educational activities. The organisation regularly hosts meetups, seminars, and workshops.

Blockchain across key industries

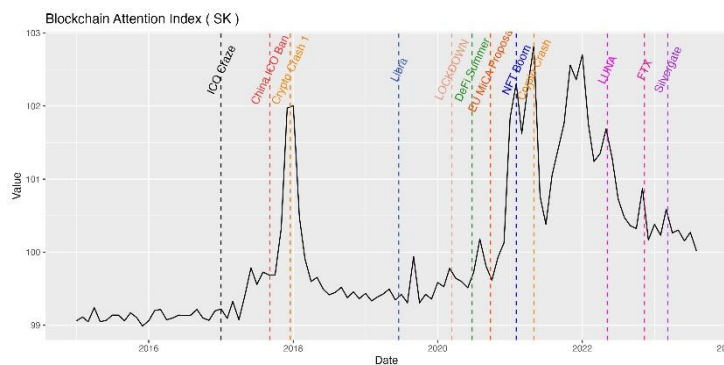
The Slovakian cybersecurity firm ESET has been active in identifying malware in numerous blockchain and virtual currency projects. ESET began as a pioneer of antivirus protection, creating award-winning threat detection software. Given the company's expertise and size in the Slovak tech ecosystem, cybersecurity could be identified as one of the industries relevant to blockchain opportunities.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The number of blockchain startups in Slovakia is rather low, with only two companies with more than 51 employees (SuperScale and CaizCoin).

Bratislava is home to the second centre for crypto-anarchy – the Paralelni Polis, which was initially established in Czechia. Paralelni Polis is self-described as a ‘freedom think-tank’ that aims to serve as a breeding ground for such ideas. A phrase that translates to ‘parallel city’, on the surface, Paralelni Polis is like many virtual currency centres worldwide. The Paralelni Polis focuses on education, meetups, a co-working space, and walking newcomers through the process of converting their fiat into virtual currency to buy a coffee, for example. As Coindesk [reports](#), Paralelni Polis stands for its open refusal to cooperate with governments and its role in nurturing projects that actively antagonise the state. It is also on a mission to provide individuals with the tools to disassociate themselves from it.

THE BLOCKCHAIN COMMUNITY



Sizeable communities of technology enthusiasts can be found around educational NGOs such as Paralelni Polis and Blockchain Slovakia. They are committed to educating the public.

NOTABLE BLOCKCHAIN COMPANIES

SuperScale: an all-in-one growth platform that profitably scales games & blockchain apps to their maximum potential.

Blockmate: an open-crypto API platform which integrates and connects users' crypto data to a single unified API.

Mangata Finance enables easy and secure decentralised trading for Polkadot and Ethereum. The project claims to be the first decentralised blockchain exchange without insider trading and MEV.

3IPK: a B2B blockchain software as a service (SaaS) platform providing digital solutions, automating certification, supply chain, maintenance, and programme management processes for aerospace, automotive, defence and other sectors.

Fumbi Network: smart and safe investing in a dynamic portfolio of top cryptocurrencies for the general public.

Key Figures

31+

Dedicated blockchain solution providers

104m

Total funds raised.

1.13%

Population that owns crypto

The Slovenian blockchain ecosystem at a glance

The Republic of Slovenia, while small in size, is renowned worldwide for its blockchain companies. The country promotes its economy as 'Green, Creative, Smart', and one that leans towards higher adoption of blockchain technology.

To highlight the importance of blockchain-related technologies in the Slovenian economy, in October 2017, Slovenia's prime minister at the time, Miro Cerar, declared that the government 'want[s] to position Slovenia as the most recognised blockchain destination in the European Union.'

In December 2019, an important milestone was reached in the country. [Slovenia launched the national test blockchain infrastructure SI-Chain](#), enabling the testing of existing and new blockchain applications for the public and private sectors. This also provided the country with the opportunity to actively participate in the development of use cases implemented on the European Blockchain Services Infrastructure. Slovenia became the first EU Member State to establish a blockchain test infrastructure.

Slovenia was further recognised by the United Nations Group of Friends on Digital Technologies as a role model. This stems from the cooperation between public and private sectors in the country to develop blockchain solutions. Finally, the European Commission recognised Slovenia as a reliable partner to be hosting the first pilot project – the regional investment fund for AI and Blockchain startups in Europe.

The University of Ljubljana, a major research and education organisation in Slovenia, participates in next generation internet projects, such as the scientific and technical coordination of the ONTOCHAIN project and the Europe-South Korean project DECENTER. Slovenia was the first country in the world issuing NFT tokens, IfeelNFT.si, which served to promote Slovenian businesses and tourist destinations during Expo Dubai 2021. Slightly before that, Viberate, a blockchain company, launched their first NFT in the field of music.

Regulatory framework

Slovenia actively participated in the preparation process for MiCA and the DLT Pilot regime. In 2023, the Interservice Working Group was established, led by the Ministry of Finance, to prepare the national framework for piloting the DLT as an option for SMEs to increase the possibility of access to finance.

Institutional framework

Slovenia was also one of the founding members of EUROPEUM-EDIC, a multi-country project, together with Belgium, Italy, Portugal, Poland, Croatia, Luxembourg, and Romania in mid-2023. EDIC will be the first

European entity on blockchain, established and operational in the first quarter of 2024, focusing as priority on the development, deployment, and exploitation in the production of the EBSI infrastructure and its use cases.

Slovenian stakeholders are also partnering with other European partners on the digital Europe programme use cases, such as EBSI-VECTOR, TRACE4EU, and EBSI-NE.

In 2022, the Government of Slovenia adopted the strategy of digital transformation of the economy, focusing primarily on the integration of advanced digital technologies into businesses. Blockchain has been put in place as one of the most important advanced digital technologies, and consequently, a substantial amount of RRF funding was allocated to consortiums of companies (large, SMEs, and startups) to integrate advanced digital technologies to transform their business models. Large traditional companies have been motivated to implement blockchain technology for data recording, management and verification, which will have an impact on the transparency, accountability, efficiency, productivity and competitiveness of the companies.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

In November 2019, the launch of the SI-Chain was established by the technology provider company [Hashnet](#), in cooperation with [Telemach](#), the telecommunication solutions provider, which helped Slovenia's public sector make significant progress towards blockchain adoption. Moreover, [Blockchain Think Tank Slovenia](#), established in 2017, serves as an open forum that enables individuals, organisations, and commercial and state bodies to work together, share, and exchange information. The think tank is one of the key enablers promoting the blockchain environment in Slovenia by fostering the dissemination of information among relevant stakeholders, from government, research and innovation bodies, companies, and non-governmental organisations. Blockchain stream also became a member of the Digital Coalition in Slovenia, established by the Chamber of Commerce.

Legislation of blockchain

The Financial Administration of the Republic of Slovenia clarifies that the profit received by individuals from trading virtual currencies (due to fluctuations in the virtual currency market) is not subject to any income taxation. This clarification is based on the fact that, according to the Slovenian Income Tax Act, capital gains are generally not taxable if derived from movable property or disposal of derivative financial instruments. Taking into account that virtual currencies are not defined as financial instruments or shares, they do not fall within the scope of capital gains tax applicable to natural persons.

Blockchain in academia

Following the wide adoption of blockchain technologies in the country, academia is also starting to adapt to this new trend. The [University of Ljubljana](#) is the scientific and technical coordinator of the [Next Generation Internet](#) project [ONTOCHAIN](#) and participates in the European Union-South Korean project [DECENTER](#). The [Digital Innovation Hub Blockchain for Trusted Data Ecosystems](#) was also formed in 2021 as an initiative of the University of Ljubljana, the Technology Park Ljubljana, and the company Hashnet. These stakeholders organised the first [European Blockchain Week](#) in the second half of September 2021, during the Slovenian presidency of the Council of EU. The second EU Blockchain Week was organised in Bled, Slovenia, in September 2022, it discussed raising the importance of emerging Web3.0 and its elements and focusing on Metaverse solutions. The World Metaverse Council was established to create a stable framework based on the trust and collaboration of the international community. In 2023, there was third edition of EU Blockchain

Week, organised by the EU Blockchain Observatory and Forum, in Ljubljana, Slovenia, focusing on the DEP use cases and implications of blockchain to achieve more sustainable development, which also took into account the COP28 later that year in Dubai, where a 3-day event was organised by the Ministry of Economy, Tourism and Sport, dedicated to the green and digital transition, presenting different use cases for the implementation of blockchain in different fields: the circular economy and circular construction, sustainable transport, smart cities and communities, and renewable energy solutions.

Slovenian companies (Naka, Origin Trail, Palmatrix) were also presented at the largest global technology fair and conference, the Gitex Global/Future Blockchain Summit in October 2023 in Dubai.

The [Blockchain Lab of the University of Maribor](#) is also a notable academic initiative in Slovenia related to blockchain technology. The blockchain lab consists of a multidisciplinary team of researchers, developers, and consultants who develop and evaluate solutions and services, based on blockchain technology. The lab's focus is on promoting and accelerating the use of blockchain technology in developing innovative IT solutions and services that support new business models. In addition to this initiative, other universities have already added or are in the process of adding courses related to blockchain technology to their curricula. Moreover, several associations, such as the [Slovenian Blockchain Association](#), the [Bitcoin Association Slovenia](#), the [Blockchain Alliance Europe](#), and the [Noordung Blockchain Hub](#) offer professional training related to blockchain and virtual currencies. In 2023 the EU Crypto Initiative was established with founding members from Slovenia, members of Blockchain Think Tank Slovenia.

Blockchain across key industries

While blockchain startups operating in Slovenia cover a wide spectrum of sectors and businesses, those focusing on financial and virtual currency make up the majority. Of these, Bitstamp is the most notable virtual currency startup. It was originally incorporated in Slovenia, but later moved its registration to the United Kingdom and then to Luxembourg, due to the lack of adequate financial and legal services in Slovenia. Supply chain-related startups are also starting to emerge in the country, making this a promising sector for the years to come.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Relative to its size and population, Slovenia hosts a large and vibrant blockchain ecosystem. This is no surprise, as some of the most significant EU blockchain companies emerged from the country's capital. The fast-paced growth of the blockchain startup and business scene is attributed to the fact that since 2017, Slovenian projects have received over 5% of global investments in the country. Half of the startup companies, not eligible for institutional funding due to their growth levels, were mainly funded by ICOs, which gave rise to the blockchain-related entrepreneurial ecosystem and expanded the existing business environment in Slovenia in new directions. As a result of this boom in blockchain startups, Slovenia currently has many IT professionals who offer their services not only to companies within the country but also to companies worldwide that outsource parts of their software development process.

To promote the development of an innovative and diverse startup ecosystem, as well as to foster the productivity and competitiveness of the Slovenian economy, in 2018, the Ministry of Economic Development and Technology issued a call for demonstration and pilot projects funded by EU funds amounting to EUR 73 million. It was allocated to projects planning the use of blockchain technology (65% funding) and artificial intelligence (74% funding) and other converging technologies (internet of things, big data, machine learning, predictive analytics, augmented reality, virtual reality, mixed reality, 3D, etc.). It is expected that the results and the lessons learned from these projects will allow the Slovenian government to create the necessary regulatory

the fully decentralised option to give everyone access to financial services. NAKA allows people to switch from using cash to a convenient digital money, safeguarding their earnings against high inflation. It enables people to receive funds 24/7 via blockchain from anywhere in the world directly on your NAKA card, and start spending it instantly, all with nearly zero remittance costs.

Blocksquare: developer of a blockchain-based tokenisation system for commercial real estate properties. Blocksquare's vision is to provide real estate businesses with the world's best real estate tokenisation system with all required tools and modules for the creation, issuance, sale, distribution, management, tracking, and trade of tokenised properties.

OriginTrail: enables data sharing along any supply chain. The decentralised, blockchain-supported platform helps companies exchange relevant data seamlessly and in a secure way to build accountability, protect their brands, and increase efficiencies. OriginTrail is organising billions of assets for Web3, enabling the discovery and verification of everything from physical to digital assets, NFTs, DeFi and beyond. Using its open-source decentralised knowledge graph, OriginTrail creates a unified environment that connects the physical to digital world, emphasising transparency and trust. Its decentralised knowledge graph serves as a fundamental tool to link, verify, and value data across both physical and digital assets.

SunContract: an energy-trading platform that uses blockchain technology to create a new business model for buying and selling electricity.

Tolar HashNET: a scalable, fast, secure, and fair decentralised-beyond blockchain project, leveraging distributed ledger technology and a consensus algorithm that keeps all the positive characteristics of blockchain technology, while increasing throughput to more than 200,000 transactions per second.

Viberate: a database and analytics company for electronic music artists and professionals. The platform is meant for artists, labels, and venues to browse the profiles of other professionals. The company tracks the performance of artists and venues through online channels and generates analytics based on the same.

Palmatrix: a global platform in a financial business where experts unite their knowledge and experience: banking IT, hightech software, financial expertise, and digital UX. All our products are based on this universal real-time multi-exchange trading and data processing platform.

INSIGHTS FROM EXPERTS

Nena Dokuzov, Head of Project Group for New Economy and Blockchain Technologies at Ministry of Economic Development and Technology, UNECE Expert and Head of Delegation for Slovenia

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Slovenia? Has the recent growth of the cryptocurrency markets facilitated familiarity?

Public awareness has improved substantially in the last 5 or 6 years. In the case of Slovenia, there are two 'streams', mainly based on the original motivations: a stream more technologically focused on the integration and implementation of blockchain technology in business processes, which is becoming important also for the traditional companies to embrace this new technology and optimise business models in combination or convergence with other advanced digital technologies (mostly with AI, IoT, automation, big data). The other stream is focused on awareness of cryptocurrency adoption, the prevailing focus of the crypto ecosystem, which is still strong and vibrant. Having in mind that MiCA provoked a large part of the legal community, we also

established the BLF Adria Region Hub. Not only the growth of cryptomarkets, but also the technological innovation that facilitates cryptocurrency markets contributed to higher awareness, as well.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Slovenia?

As regards the maturity of the blockchain ecosystem, we can assume it is in the moderate maturity stage. Technology still has to be scaled by all types of companies – large, SMEs and startups. For companies that are already using blockchain technology, it seems to be at high maturity level. However, there is still untapped potential and room for improvement. We have the strategic objective by 2030 to become one of the top 3 EU countries regarding the integration of advanced digital technologies. It is also expected that blockchain will be deployed and used on larger scale.

What measures has Slovenia taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Over the past year we: (1) started with the implementation of the strategy for the digital transformation of the economy, where blockchain is listed as one of the most important advanced digital technologies. (2) Engaged in the finalisation of MiCA and discussions on it at national, European, and international levels. (3) Established the Interservice Working Group on the DLT Pilot Regime. Engaged into multi-country projects (DEP projects) on blockchain. (4) Adopted (by the government) innovative procurement guidelines. (5) Contributed to the creation of the ecosystem with different (not only crypto) stakeholders.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

On both levels, EU and national, there is a need for mass adoption of blockchain, therefore, the steps which need to be taken are: (1) Build a strong ecosystem for blockchain. (2) EBSI should come into the production – for the more successful integration of EBSI into national and EU systems, it needs to be shown a) that it works – as it is in preparation and b) that it is more efficient than conventional IT systems. (3) Align it with other MCPs (not necessarily in the narrow DEP blockchain area) through complementarity and the convergence of different technologies to demonstrate how business and public sector models can be improved and more efficient. (4) The level of knowledge should be increased. Skills and competences need to be raised to enable the wider population to understand and deploy the technology. (5) Funding needs to be ensured from the EU to enable continuation of the work started already in 2018 (with EBSI and use cases), and we need more use cases to demonstrate the benefits of the technology (like EBSI ELSA).

What does the future hold for the Slovenia blockchain and cryptocurrency ecosystem?

- a) It is very important to strengthen all parts of the ecosystem: entrepreneurship, research and financial. Our strategic objective is (among other things) to increase the number of startups by 10% in the whole population of companies by 2030, or to increase the number of smart financial instruments (which will be possible through the DLT pilot regime).
- b) It is also very important to increase the digital intensity of SMEs by increasing the integration of advanced technologies into business models
- c) Corporate and equity financing should be used at larger scale
- d) It is important to strengthen the R&D&I and improve skills (tailormade programmes for specific target groups according to their needs)

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

The blockchain and cryptocurrency industry can benefit from AI and chatbots. It is a fact that AI and chatbots are quite centralised. On the other hand, blockchain is a decentralised/distributed concept. Recent developments in decentralised AI will make blockchain more useful and lead to the even better complementarities of the technologies. For cryptocurrency trading and markets, AI can provide additional functionality, e.g. through predictive analytics, better forecasting analytical tools, and reliable data. On the other hand, combined with blockchain, AI can add value to blockchain technology with the structuring of data leading to higher usability. The convergence of all these technologies can make a substantial contribution to better efficiency of the industry and therefore higher added value.

Key Figures

327+

Dedicated blockchain solution providers

614m

Total funds raised.

3%

Population that owns crypto

The Spanish blockchain ecosystem at a glance

Spain is the second largest country in the EU and the fourth largest within the continent. Blockchain technology is generally viewed as an opportunity by the country's officials and local entrepreneurs alike.

2018 was catalytic for blockchain development in Spain, as the technology gained traction amongst regulators and prominent entities in business. Draft bills and proposed legislation regarding blockchain enjoyed wide acceptance across the country's political parties too. At the same time, Spanish authorities issued warnings against ICOs and digital currencies on several occasions. Nonetheless, blockchain initiatives from the private sector started gaining significant traction, with companies in the banking, energy and shipping sectors exploring blockchain applications.

Today, blockchain and digital currencies remain largely unregulated, while, over the last two years, the government has taken steps in regulatory terms, especially to adapt to European regulations. Spain is home to more than 200 companies and startups in the blockchain and cryptocurrency space. These companies are active in a variety of verticals, with only financial services presenting a high amount of concentration. Approximately 16% of the country's population is interested in blockchain and digital currencies. Despite this, no less than sixteen universities are offering tertiary-level blockchain education.

In March 2023, the Government of Spain granted a facility connected with the Next Gen EU Funds to build the ISBE (Spanish Blockchain Services Infrastructure), a nationwide technology infrastructure network based on blockchain, aligned with the EBSI, with a total budget of EUR 18 million, that can potentially be increased as more autonomous regions join the project over time.

In December 2020, the Spanish Association for Standardisation (UNE) published the UNE 71307-1 standard, the first global standard for decentralised identity management based on blockchain technology and distributed ledgers (DLT).

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

2018 was characterised by the increased interest of Spanish policymakers in areas relating to blockchain and digital currencies. In May 2018, [a draft bill](#) to regulate blockchain and digital currencies received wide cross-party support in the Spanish Congress. The initiative promoted blockchain as a cost-efficient system to facilitate payments and monetary transfers and argued for the introduction of blockchain technologies into the Spanish market in a controlled manner. A month later, deputies from the leading party [proposed](#) the use of blockchain in public administration, while tax breaks for blockchain companies were also [being considered](#). At the same time, a

Spanish bank [reportedly](#) became the first in the world to use blockchain technology in their financial products. On 17 September 2020, the Spanish Congress unanimously approved new legislation to facilitate the digital transformation of the financial system (published in the Official State Gazette - BOE - on 14 November 2020). The new bill introduces a regulatory sandbox for novel FinTech projects, including blockchain and digital currencies. Eighteen total projects have been selected to participate in the sandbox, half of which use blockchain technologies in their operation. Of the 67 applicants, 10 are connected to the Bank of Spain, 4 are from the Directorate-General for Insurance and Pension Funds, and another 4 from the National Securities Market Commission.

The sandbox has carried out five calls, on which projects related to crypto assets, blockchain, and DLT have had a very relevant impact:

- 1st call: 8/18
- 2nd call: 2/4
- 3rd call: 2/3
- 4th call: 4/5
- 5th call: 2/7

<https://www.tesoro.es/sandbox/cohortes>

In March 2023, the new [Securities Markets and Investment Services Law](#) was published, which incorporates new features regarding blockchain technology and crypto assets. The determination of the financial instruments can be issued through distributed registry technology (in application of Directive 2014/65/EU), the incorporation of a legal regime that allows the representation of securities in this technology (for the adequacy to the pilot regime of market infrastructures based on DLT), and includes the rules for the implementation of MiCA when it comes into force.

Spanish public administrations at regional level are also advancing the regulation and promoting blockchain. In February 2021, the Autonomous Community of Aragon approved the regulation for the use of decentralised digital identity and blockchain in public administration (Administrative Simplification Law, approved by the Cortes de Aragon, published in the Official Gazette of the Cortes de Aragon, 16 February 2021).

In April 2022, the Autonomous Community of Madrid created the Blockchain Cluster, made up of 22 companies and institutions to promote the development of this technology in the region, and whose presidency is held by Alastria.

That said, Catalonia is the only autonomous community in Spain that has already issued a blockchain strategy (approved in 2019), with the aim of harnessing the benefits of a 'technology that has the potential to globally modify the way in which traditional digital services are provided to public sectors, industries and citizens'.

Digital currencies are not considered legal tender and their exchange is VAT exempt. They are largely governed under legislation that relates to commodities, namely the general rules of the Civil Code and the Code of Commerce. On several occasions, Spanish financial authorities have criticised and distanced themselves from digital currencies and ICOs. This is especially true in areas that fall under the country's securities legislation. In February 2018, in a joint statement, the Spanish National Securities Market Commission and the Bank of Spain noted that digital currencies are not issued, registered, authorised or verified by Spanish regulators, in an attempt to alert investors to the inherent risks of loss or fraud associated with them. In a similar announcement, on 27 March 2019, the National Securities Market Commission stated that the agency has never approved or authorised projects active in the ICO sector to that date. In February 2021, the Bank of Spain issued another warning to the public, which besides reiterating points made in 2018's announcement, also warned against malicious advertisements and cryptocurrency derivatives. Most recently, the National Securities Market Commission issued guidelines on the content and format of promotional campaigns for cryptocurrencies in an attempt to ensure that 'the advertising of the products offers true, understandable and non-misleading content, and includes a prominent warning of the associated risks.'

Although Spain does not have its own local regulation on crypto assets, the Bank of Spain has set up a registry of service providers for exchanges, wallets, and custodians of digital currencies, having neither regulatory nor supervisory competencies over these instruments.

Capital gains from the exchange of digital currencies are subject to a variable tax rate ranging from 19% to 26%. ICOs and other alternative forms of financing that use blockchain may be subject to securities regulation. Digital currency mining remains unregulated.

From a tax point of view, cryptocurrency trading operations generate capital gains or losses that are subject to taxation (as a novelty, the Spanish Tax Agency included a specific box for virtual currencies in the 2022 income tax return). Staking gains must also be declared. In the case of gains, the tax rate ranges between 19% and 26%. PoW mining is considered an economic activity covered by specific taxes.

In the standardisation field, in December 2020, the Spanish Association for Standardisation (UNE) published the UNE 71307-1 standard, the first global standard for decentralised identity management based on blockchain technology and distributed ledgers (DLT) (27 December 2020). According to this standard, a generic reference framework is defined for the issuance, administration and decentralised use of those attributes that facilitate the characterisation (identification) of individuals or organisations, allowing the latter to create and control their own digital identity in a self-managed manner without the need to rely on centralised authorities.¹⁴⁵ This UNE standard has taken up the identity model developed by Alastria (Alastria ID).

The Government of Spain approved 13 strategic projects with a high territorial and economic impact within the RETECH initiative for the digital transformation of the country, within the recovery, transformation, and resilience plan Next Generation EU. One of them corresponds to the financing of the Spanish blockchain infrastructure; the construction of a nationwide technological network based on blockchain technology, aligned with the European blockchain services infrastructure. This project is coordinated by the Community of Madrid with the participation of Asturias and the Canary Islands, with a total budget of EUR 18 million.

Blockchain in academia

Spanish universities, vocational institutions and training centres are committed to providing tertiary-level blockchain education, with [numerous standalone courses](#) offered across a wide range of interest areas. In total, eight universities that offer master's programmes focusing on blockchain could be identified. Through their academic programmes, these institutions cover a wide range of areas – even niches – in the blockchain space, including, but not limited to: smart contracts, decentralised autonomous organisations, game theoretical elements, regulation and tax, cryptography, development, and monetary policy. Most programmes are offered in-person, while others adopt a hybrid model or are conducted exclusively online. Courses are taught in Spanish and English. More specifically, some of the courses offered are:

[University of Alcalá: 'Master's in Blockchain, Smart Contracts and CryptoEconomy'](#). Established in 2019, the 'Master's in Blockchain, Smart Contracts and CryptoEconomy' is offered in Spanish and provides options for in-person and distance learning. It focuses on the areas of game theory and blockchain application development, with a primary focus on Ethereum.

[Innovation and Entrepreneurship Business School – 'Master's in Blockchain and Fintech'](#). Since 2018, the Innovation and Entrepreneurship Business School has been providing an online master's degree in blockchain and FinTech. The curriculum covers the areas of blockchain, regulation, digital currencies, and smart contracts.

[University of Barcelona – 'Global Master's in Blockchain Technologies'](#). Since March 2019, the University of Barcelona has been offering the online Master's in Blockchain Technologies, in collaboration with the Zigurat

¹⁴⁵ <https://www.une.org/la-asociacion/sala-de-informacion-une/noticias/estandar-une-pionero-sobre-blockchain>

Innovation & Technology Business School. The curriculum covers the areas of blockchain architecture, cryptography, digital currencies and regulation.

[Miguel de Cervantes European University – 'Master's in Applied Blockchain, Programming Taxation and Cryptoeconomics'](#). Since March 2019, the Miguel de Cervantes European University has been offering a master's degree in applied blockchain, focusing on the areas of programming, taxation, and digital currency economics.

[EU Business School / Universidad Católica de Murcia / University of Roehampton – 'MBA in Blockchain Management / MSc in International Management'](#). The programme on blockchain management by the EU Business School offers a dual qualification, depending on the students' professional experience: an MBA by the University of Roehampton and a master's degree in international management accredited by the Universidad Católica de Murcia.

[University of the Basque Country – 'Master's in Blockchain Technology and Cryptoeconomy'](#). Since October 2020, the University of the Basque Country has been offering an in-person master's degree in applied blockchain, focusing on the areas of cryptography, game theory, regulation and tax, quantum computing, and blockchain programming.

[Universidad Europea de Madrid – 'Master's in Fintech in Blockchain'](#). With a duration of 6 months, the postgraduate programme offered by the Universidad Europea de Madrid teaches the fundamentals of blockchain design, development and implementations. The same university also offers an [in-person 3-month bootcamp on blockchain technologies](#).

[Universidad de Salamanca – 'Master's in Blockchain Technologies and Smart Contracts'](#). With a duration of one academic year, it mainly focuses on cryptography, blockchain, Bitcoin, smart contracts and the regulations surrounding them.

Universidad Internacional de Andalucía (UNIA) – 'Master's in Permanent Training in DLT & Blockchain'. A postgraduate programme recently approved to start this year, jointly organised by the University of Jaen, the Alastria Association and UNIA. It is expected to start in October 2022 and run until June 2023, recurring every academic year. Mostly, the master's programme will focus on DLT and blockchain standards, network architecture, protocols and associated technologies, tokens and DeFi, self-sovereign identity and data protection in PDLs, and cybercrime. It aims to touch upon the technological, economic, and legal aspect of blockchain and it is addressed to pre-doctoral or master's alumni, or any blockchain professionals who specialise in one or more of the three aspects above.

[Universidad Cardenal Herrera \(CEU\) – 'Certificate in Fintech and Cryptoactive'](#). An online programme that lasts for 8 weeks and runs every 4 months. The certificate focuses on the areas of FinTech and crypto assets and it is mainly for audiences with banking background. In the first edition of the certificate, in October 2021, the programme awarded 19 students, while in the February 2022 edition, the programme was expected to surpass the number of 25 participants.

[Polytechnic of Catalonia University](#). Master's in blockchain technologies. The programme covers distributed network technologies, blockchain and cryptocurrency projects, the development of decentralised applications (DApps), security, cryptography, and legal and business aspects.

[Complutense of Madrid University, School of Legal Practice](#). High specialisation in blockchain diploma. The programme analyses blockchain solutions, business applications, the value they bring to and generate in companies, and the current and projected regulatory framework.

[Catholic of Murcia University \(UCAM\)](#). 'Master's in Continuing Education in Executive Blockchain'. Complete vision of all blockchain use cases, from the decentralisation of cryptocurrencies to the business application in the different economic sectors.

[Polytechnic of Valencia University](#). Master's degree in blockchain and digital innovation. The programme covers the different variants and components of blockchain, the use of cryptocurrencies, and the applications of non-fungible tokens and the metaverse. The master's provides for a comprehensive training, both technical and business, with a special focus on the application of data analytics to blockchain networks and Web3.

[University of the Basque Country](#). Master's in Bitcoin and blockchain technology, provides a multidisciplinary training in the field of Blockchain Technology, with special emphasis on the fundamentals of this technology.

In July 2023, CEU San Pablo University launched the Blockchain and Cryptoassets Observatory (OBC), with the aim of promoting the development of the digital economy in Spain, through research and dissemination of knowledge. CEU San Pablo University also created the Metaverse I+D Community Lab Observatory for the research and development of innovative projects based on immersive environments, as well as the investigation of their contributions in the various fields of healthcare, meta-economics, meta-society, training experiences and other applications in the context of the 'metaverses'.

Blockchain across key industries

Spanish banks were some of the first entities in the country to explore blockchain-powered applications. [BBVA](#) issued a EUR 750 million loan entirely on-chain, which reportedly '[cut the negotiation time for the loan from days to hours](#)'. [Banco Santander announced plans](#) to use xCurrent, a blockchain-based technology provided by [Ripple](#), for cross-border payments and remittances. The focus of Banco Santander in the last months is the collaboration on issuance of EIB bonds. [CaixaBank](#) continues to explore blockchain technology, [even partnering](#) with leading companies from the space. Firms from one of Spain's largest sectors, the energy sector, are also exploring blockchain technology. Indicative examples are initiatives from [ACCIONA](#) and [Iberdrola](#). [Endesa](#) is also using blockchain in collaboration with Malaga City Council to protect financially vulnerable customers. The food giant Campofrío also [uses blockchain technology](#) to guarantee transparency in some of its food products.

Banco Santander, jointly with Goldman Sachs and Société Générale, has collaborated with the European Investment Bank (EIB) to issue digital bonds for EUR 100 million on private blockchain.

The Dalion consortium, formed by nine large companies from different private sector industries (Banca March, Banco Santander, CaixaBank, Generali, Inetum, Línea Directa Aseguradora, MAPFRE, Repsol and Unicaja Banco) and the Polytechnic University of Madrid, has developed a digital identity management model, which was the first project to successfully complete the financial sandbox tests.

Metrovacesa, one of the leading real estate companies, has implemented blockchain into the phases of the construction process (with the integration of technology into building information modeling) and marketing of real estate development, with the use of NFT for pre-booking and a new sales channel in the Metaverse.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

The Spanish blockchain startup and business ecosystem is active with initiatives from prominent players in traditional fields such as banking, energy, shipping, telecommunications and even sports. In 2017, 70 of the largest Spanish companies from the areas of banking, energy and telecommunications came together to form Alastria, a non-profit consortium aiming to accelerate digital transformation through blockchain technology. Today, Alastria counts more than 500 members from the private and public sectors, has developed a digital identity model, Alastria ID, and has promoted the construction of two blockchain networks (Quorum and Hyperledger Besu) collaboratively among its members, for the deployment of PoC and non-critical use cases. Alastria has more than 60 non-financial use cases developed by its partners in different sectors, many of them related to traceability, certification, identity and tokenisation.

In 2018, [BBVA became the first global bank to issue loans using blockchain](#). In 2019, Banco Santander announced that it has issued the first end-to-end blockchain bond.

CaixaBank, through its digital services bank Imagin, dives into the NFT universe through the first collection of 'tokenised' digital illustrations, which reward those users who contribute to the sustainable challenge set by the platform: to clean 100 tons of plastics from the sea.

Spain is home to more than 212 small and medium-sized companies and startups in the blockchain and digital currency space, which employ on average 10-15 individuals. Companies in the country have collectively raised more than EUR 80 million in funds, primarily through venture funds. Blockchain companies are active in a wide range of areas, from financial services and IT to gaming and energy. Apart from financial services, no significant concentration in any other vertical could be identified.

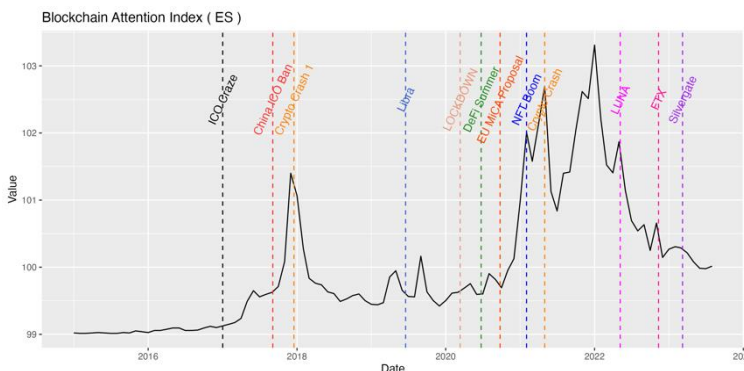
Alastria launched the [first Blockchain Map in Spain](#) in December 2022, a dynamic mapping that aims to identify the size of a fast-growing sector, in collaboration with INVYO. In the first version, 154 small and medium-sized companies, considered 'builders & shapers', were identified, representing more than 6,000 jobs. The main activity of these companies is oriented towards FinTech services, followed by digital assets/crypto and thirdly blockchain as services (BaaS).

THE BLOCKCHAIN COMMUNITY

Compared to the country's population and total area, the Spanish blockchain and digital currency community is relatively small. Approximately 110,000 individuals interested in blockchain and cryptocurrencies could be identified, a number that amounts to 2.3% of the total population.

According to the [Statista Global Consumer Survey](#), in Spain, 16% of people surveyed said they would use or own cryptocurrencies in 2021/2022, up from 10% in 2018/2019.

INSIGHTS FROM EXPERTS



Jiménez Zaballos, CEO at Alastria

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Spain? Has the recent growth of the cryptocurrency markets facilitated familiarity?

This market has been growing fast and steadily, and it has already around EUR 20

Tn locked into different products and services (including trading, DeFi, NFTs, gaming, real world tokenised assets and other types of tokens), hence, it is too large to ignore. At the same time, there has been a large adoption of cryptocurrencies in our core markets, Spain being one of the countries across Europe with the largest retail adoption (12% of the adult population. Spain is 6th in Europe and 34th worldwide in general crypto adoption – according to Chainalysis, Finder and Funcas Research). Blockchain is somehow nascent, and the country still needs a use case that mobilises GDP at scale while creating employment. We foresee a growth here, as now we will enjoy both MiCA and pilot regime, the regulatory clarity is just around the corner!

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Spain?

Again, and already touched on in the first question, we see an adoption that still needs awareness, simplification and public backing. We already have a good 200 companies devoted to blockchain development and 7,000 jobs already created.

What measures has Spain taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

We should maybe split blockchain and crypto apart to reply to the question:

- When it comes to blockchain, the public sector has touted blockchain through several grants from Next Generation EU to build networks, implement protocols, and register intellectual property.
- At the same time, and through European representation, Spain has contributed to the definition of MiCA while implementing beforehand some pieces of local regulation to embrace the activity before MiCA comes into force, as it is currently waiting for enactment. The most relevant ones are regulation of advertising and crypto operators registering with the Bank of Spain and in CNMV books.
- Last but not least, the Bank of Spain has launched a sandbox organised in cohorts where blockchain ideas have been frequent and prominent.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

Organisations like Alastria are now publicly backed, albeit privately led since inception. However, we enjoy participating in regional clusters to develop projects mainly for SMEs and entrepreneurs. At the same time, there is an active push from the European Union to nurture the Blockchain ecosystem, leading open calls and spearheading the necessary conditions for the ecosystem to flourish. It is worth noting that Alastria has around 250 SMEs under membership already.

What does the future hold for the Spanish blockchain and cryptocurrency ecosystem?

There is lot of opportunity that we will hopefully witness through the coming years due to factors already covered. The tech promise of Blockchain became a reality as scalability and privacy are challenges already solved using new pieces of software and infrastructure. But not all companies or projects can use a public network or versions of it. Also, when using private networks, there is a gap between expectations and real value. We firmly believe that public-private-permissioned environments are the perfect choice to be able to deploy regulated and at-scale use cases that 'move the needle'.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

Blending exponential technologies is at the front and centre of Alastria's strategy. We have a commission that covers AI, cyber and IoT combined with blockchain use cases that comprises algorithms, tokenisation, smart contracts, and code reviewing using AI powered tools and the like to extract the maximum value of cross technologies.

Key Figures

93+

Dedicated blockchain solution providers

282m

Total funds raised.

1.56%

Population that owns crypto

The Swedish blockchain ecosystem at a glance

Sweden has a strong and vibrant IT sector which contributed 3.5% of GDP in 2022. The country's financial sector has seen high adoption of digital services over the years,¹⁴⁶ with Stockholm, the capital, being a major global FinTech hub also dubbed as the 'Silicon Valley of Europe'. This supported Sweden's swift development of a thriving blockchain ecosystem focusing on areas like finance, supply chain management, digital identification and record keeping.

The country is also in the forefront of cryptocurrency adoption, with several domestically developed virtual asset service providers (VASPs). The Riksbank, Sweden's central bank, is currently exploring the possibility of issuing e-krona, the Central Bank Digital Currency (CBDC). The e-krona project began in 2017, and three pilots have been conducted in 2020-23. However, Riksbank is evaluating the need for a CBDC and has made it clear that its introduction will be a 'political decision'.¹⁴⁷

Nevertheless, recognising its potential benefits, the Riksbank has asked the parliament to invest SEK 30 million (USD 3.1 million) yearly for five years to make the country an innovation hub for digital currencies.¹⁴⁸ On the regulatory side, Finansinspektionen (FI), the country's financial supervisory authority, is tasked with monitoring cryptocurrency activities and has issued warnings regarding the risks of investing in digital assets. In general, crypto-related activities are currently not regulated in Sweden, but VASPs with a physical presence in the country must register with FI.¹⁴⁹

TOWARDS MAINSTREAM ADOPTION

Regulations

Most aspects of cryptocurrencies are currently not regulated explicitly in Sweden but are subjected to anti-money laundering and counter-terrorism financing regulations. Mining activities are unregulated and there are no licensing or registration requirements.¹⁵⁰ Digital assets are recognised as property and accorded the same protection under Swedish laws. However, with MiCA coming into effect, Swedish VASPs will be subjected to a robust regulatory framework and will be required to get authorisation from FI to continue operating in the country. The country has also developed a regulatory sandbox called Innovation Centre, allowing FinTech

¹⁴⁶ Source: Sweden: Financial Sector Assessment Program—Technical Note on Central Bank Digital Currency and Fintech, IMF, 5 April 2023. <https://www.elibrary.imf.org/view/journals/002/2023/134/article-A001-en.xml>

¹⁴⁷ Source: <https://www.riksbank.se/en-gb/payments--cash/e-krona/>

¹⁴⁸ Source: <https://freemanlaw.com/cryptocurrency/sweden/>

¹⁴⁹ Source: <https://cms.law/en/int/expert-guides/cms-expert-guide-to-crypto-regulation/sweden>

¹⁵⁰ Source: <https://thelawreviews.co.uk/title/the-virtual-currency-regulation-review/sweden>

companies to maintain a dialogue with FI and test their innovations under the regulator's supervision.¹⁵¹

Government initiatives

The Riksbank has conducted three phases of pilot projects for e-krona, its CBDC, in partnership with Accenture, a tech giant, between 2020 and 2023, and is awaiting a 'political decision' on its implementation. It also participated in Project Icebreaker for testing cross-border payments using CBDC in collaboration with the central banks of Israel and Norway and the Bank of International Settlements.¹⁵² The Swedish Tax Agency and Public Employment Service have also conducted tests to digitise receipts for special income tax and verify employment status using blockchain technology, respectively.¹⁵³ Lantmäteriet, Sweden's land registration authority, initiated a pilot project on improving real estate transfer processes using blockchain in 2016, which was finalised in 2019. However, whether a permanent solution is developed based on this pilot remains to be seen.¹⁵⁴

Cryptocurrencies

It is estimated that 11% of Swedish residents have invested in cryptocurrencies, and approximately EUR 40 million have been raised in initial coin offerings (ICOs).¹⁵⁵ Sweden abolished tax incentives for data centres in July 2023, making cryptocurrency mining very expensive. However, in August, it welcomed a hydro-powered Bitcoin mining centre in the far north.¹⁵⁶ The country has been a pioneer in the early adoption of crypto exchange traded products (ETPs) and the first European crypto ETP was launched by XBT Provider, a Sweden-domiciled company, in 2015.¹⁵⁷ However, cryptocurrency investments are subject to a rather high tax rate of 30% for capital gains tax and interest income tax. There are companies that accept Bitcoin and other cryptocurrencies as a payment method for things like travel and hotel bookings, electronics, hair care, gelato and bakery goods.¹⁵⁸

VASPs

Sweden has taken a proactive stance on digital assets and the underlying blockchain technology. There are no restrictions on cryptocurrency trading and related activities, and the country is described as a 'crypto-friendly nation'.¹⁵⁹ The country is home to many VASPs, including exchanges like Safello and BTCX which offer SEK fiat-to-crypto options. Also, in the beginning of , Binance received confirmation from FI to offer virtual currency trading services in the country.¹⁶⁰

Financial sector

Sweden's banking sector has stepped up in realising the advantages blockchain technology offers. Recent initiatives include projects on setting up a new payment platform using blockchain, issuing bonds in a more climate-friendly way, and partnering with the central bank on the CBDC project. However, the banks maintain

¹⁵¹ Source: <https://www.eversheds-sutherland.com/lists/static/uploads/navigating-the-regulatory-landscape-of-FinTech-business---sweden.pdf>

¹⁵² Source: <https://www.delphi.se/uploads/2023/06/blockchain-2023-trends-and-developments-1.pdf>

¹⁵³ Source: https://northsearegion.eu/media/9469/david-suomalainen_blockchain-in-the-public-sector-in-sweden_juni-gothenburg.pdf

¹⁵⁴ Source: <https://www.delphi.se/uploads/2023/06/blockchain-2023-trends-and-developments-1.pdf>

¹⁵⁵ Source: <https://cointelegraph.com/news/the-state-of-crypto-in-northern-europe-hostile-scandinavia-and-vibrant-baltics>

¹⁵⁶ Source: <https://cointelegraph.com/news/renewable-energy-bitcoin-mining-sweden>

¹⁵⁷ Source: <https://etp.coinshares.com/de/knowledge/investment-resources/sweden-a-hub-for-crypto-adoption-and-innovation>

¹⁵⁸ Source: https://www.bitcoinforeningen.se/?page_id=36

¹⁵⁹ Source: <https://www.lexology.com/commentary/banking-financial-services/sweden/wigge-partners/current-trends-in-swedish-crypto-market>

¹⁶⁰ Source: <https://www.binance.com/en/feed/post/208295>

a cautionary stance and do not provide crypto-related investment services.¹⁶¹ There are many FinTech startups in Sweden working on a range of blockchain-powered solutions,¹⁶² including digital identification, VASPs, NFT minting and FinTech-related enterprise applications.

Blockchain in other industries

Sweden also has several non-FinTech startups exploiting blockchain technology. Some examples of different sectors are music rights, social networking, enterprise integration software, gaming, and a peer-to-peer rewards platform.¹⁶³ The country is also part of the European Blockchain, which focuses on establishing the European Blockchain Service Infrastructure (EBSI), a blockchain-based mutual, shared and open infrastructure for provision public sector services.¹⁶⁴

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Sweden is one of the world's most digitally advanced countries and is rapidly moving towards a cashless society; only about 1% of the total value of payments is done using currency bills and coins. Along the same lines, the Swedish government has taken a positive approach towards blockchain technology and has been testing its usage across different societal aspects.¹⁶⁵

The country has a healthy FinTech startup ecosystem, and most Swedish startups working on decentralised finance can be said to be in their early stages, though there are a few exceptions.¹⁶⁶ A major Stockholm-based blockchain startup established in 2014 is Chromaway. The company is well known for working with Lantmäteriet to develop smart contracts for property sale and registration, and for developing Chromia, a relational blockchain platform allowing people to build decentralised apps.

In 2021, the Swedish government asked the Swedish Companies Registrations Office to develop an experimental register for blockchain-related companies and startups. The project focused on analysing trends in the blockchain sector and developing 'Proof of Business', allowing businesses and entrepreneurs to verify details and exchange information in a secure format. Despite its limited scope, the agency has a positive outlook and presented the case study to the government in March 2023. The agency will also be involved in developing this framework at an EU level for a wider bloc-level cooperation.¹⁶⁷

Given a lack of crypto-specific regulations in the country, the FI launched the Innovation Centre in 2018 as a point of contact for businesses that are uncertain about the regulations and requirements in place. However, the centre works on the principle that regulations and supervision are not to be obstacles in FinTech sector development and, as such, is not directed towards promoting blockchain and Web3 technologies.¹⁶⁸

¹⁶¹ Source: <https://www.lexology.com/commentary/banking-financial-services/sweden/wigge-partners/current-trends-in-swedish-crypto-market>

¹⁶² Source: https://tracxn.com/d/explore/blockchain-in-financial-services-startups-in-sweden/_twsGzy5bLHdGxZVTsklqtZzuLZvaMfOX-bUWNBqaoHY/companies

¹⁶³ Source: <https://www.f6s.com/companies/blockchain/sweden/stockholm/co>

¹⁶⁴ Source: <https://www.delphi.se/uploads/2023/06/blockchain-2023-trends-and-developments-1.pdf>

¹⁶⁵ Source: https://www.investstockholm.com/documents/200/Stockholm_FinTech_guide_2023.pdf

¹⁶⁶ Source: https://www.investstockholm.com/documents/200/Stockholm_FinTech_guide_2023.pdf

¹⁶⁷ Source: <https://www.delphi.se/uploads/2023/06/blockchain-2023-trends-and-developments-1.pdf>

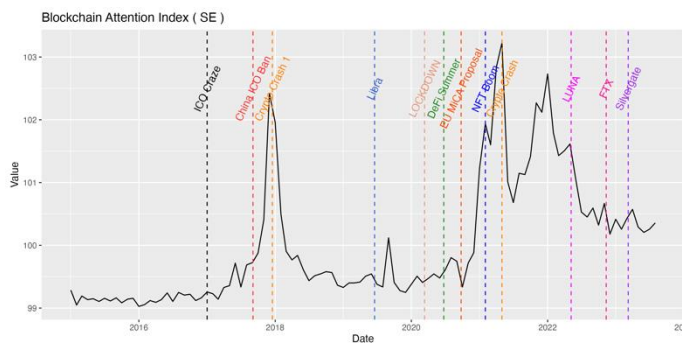
¹⁶⁸ Source: https://www.investstockholm.com/documents/200/Stockholm_FinTech_guide_2023.pdf

THE BLOCKCHAIN COMMUNITY

Sweden has a relatively small but vibrant blockchain and Web3 community, mainly located around Stockholm and Gothenburg. Apart from some Swedish blockchain associations, like Blockchain of Sweden and the Swedish Blockchain Association, a major regional player is the Nordic Blockchain Association, a non-profit volunteer-run entity that also organises several events round the calendar in different Nordic cities.

The crypto community is more widely spread across the country, with frequent and regular meetups organised in relatively smaller cities like Uppsala and Kalmar.¹⁶⁹ There are also smaller businesses like shops, restaurants and bakeries that accept cryptocurrency as a form of payment.

There are also startups that focus on developing the blockchain community in Sweden. The Dibit Network is a Stockholm-based startup founded in 2021, which aims to develop a ‘Blockchain Social Community’ by operating akin to a social media platform with timelines, discussion forums, information, alerts, and wallet features.¹⁷⁰ Moralis Academy is a 2017 startup that provides Web3 learning courses and boasts of its community of over 60,000 students.¹⁷¹ Immvr.se, the startup behind the now defunct token ImmVRse, now operates as an information and discussion hub for blockchain technology and cryptocurrencies.¹⁷²



¹⁶⁹ Source: <https://www.meetup.com/swedish-bitcoin-meetups/>

¹⁷⁰ Source: <https://www.f6s.com/company/dibit-network>

¹⁷¹ Source: <https://www.f6s.com/company/moralis-academy>

¹⁷² Source: <https://immvr.se/about/>

Key Figures

625+

Dedicated blockchain solution providers

3.5b

Total funds raised.

1.96%

Population that owns crypto

The Swiss blockchain ecosystem at a glance

Switzerland, [called the 'Crypto Nation'](#), can – in many regards – be considered Europe's most mature blockchain ecosystem and a global blockchain hotspot. The Swiss economy is amongst the most [advanced](#) in the world, with wealth management and banking constituting primary pillars of economic prosperity in the country. Progressive blockchain and digital currency legislation coupled with early successful private initiatives in the space, an established infrastructure of educational and research institutions, expertise in areas relating to financial services and well-capitalised international investors have positioned the country to emerge as a blockchain epicentre.

The crypto winter did accelerate some consolidation and concentration in the Swiss blockchain ecosystem, which has proven to be rather robust and stable. As of 2022, Switzerland is [reportedly](#) home to 1,038 companies active in the blockchain and cryptocurrency space (1,135 when counting in Liechtenstein). Top locations are Zug, Zurich, Liechtenstein, Geneva, and Ticino. The top 50 companies are valued at USD 175.6 billion in total. Amongst those companies, the country counted 7 'unicorn' projects and 2 unicorn commercial companies valued at above USD 1 billion. These included the Ethereum Foundation, Cardano, Web3, Solana, Cosmos, Near, DFINITY, and 21.co and Safe. Apart from initiatives in the blockchain protocol and infrastructure sectors, companies in the financial services cluster are driving innovation too. Switzerland is home to the first two blockchain banks SEBA and Sygnum, with a banking licence from the Swiss Financial Market Supervisory Authority (FINMA).

The large blockchain ecosystem can mainly be attributed to an overall positive regulatory outlook towards blockchain and digital currencies, a strong epicentre of blockchain activity, in the form of the Crypto Valley, the emergence of large-scale, global-reaching initiatives from the country, such as Ethereum, and low corporate taxation. On various occasions, blockchain has been used by regional authorities for digital ID deployment, voting, and even payments through digital currencies.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

Swiss regulators and policymakers are generally receptive towards blockchain and digital currencies. The transformative potential of those technologies is generally recognised in the country, with both the Swiss Financial Market Supervisory Authority (FINMA) and the federal government highlighting their importance on various occasions. The government's positive outlook was further reaffirmed by a [recent set of law reforms](#), in favour of blockchain technology. Those changes to existing laws came fully [into force](#).

Legislation of blockchain

In December 2018, the Swiss federal government [issued an extensive report](#) analysing the applicability of the current general legal framework on blockchain. The report deemed existing legislation sufficient. In March 2019, the Federal Council published [draft legislation](#) in an attempt to improve the existing framework conditions relating to blockchain and DLTs. In September 2020, the Switzerland was in many regards well positioned to reap the benefits of blockchain, in part due to its favourable legislation and the efforts by the various state authorities or cantons. On a regional level, blockchain has been used in the fields of digital self-sovereign identity and identity management, as well as voting, with digital currencies accepted for paying taxes and various public services. The city of Zug, arguably the epicentre of 'Crypto Valley', spearheaded the above efforts. Following a successful pilot, the city [launched its blockchain-powered digital identity programme](#) in November 2017. In early summer 2018, the Ethereum-based Zug ID was successfully used for a [non-binding referendum](#). Although the new Swiss E-ID is planned to integrate aspects of self-sovereign identity (SSI) and use a wallet, it will not be based on distributed ledger technology. Additionally, in what is the first case of government agencies accepting digital currencies as a form of payment, the municipalities of [Zug](#) and [Zermatt](#) accept some tax payments in digital currencies. Bitcoin, the most popular digital currency, can be bought 24/7 from all ticket machines of the Swiss Federal Railways.

Digital currency legislation that applies to blockchain

Despite the above, digital currencies are not deemed legal tender in Switzerland, as is the case in most other countries. In 2014, the Swiss federal government [published a report](#) addressing their economic significance, clarifying their legal treatment, and highlighting risks associated with their use and exchange. In the same report, digital currencies were characterised in the following way: 'A digital currency is a digital representation of a value which can be traded on the internet. ... Digital currencies exist only as a digital code and therefore do not have a physical counterpart, for example in the form of coins or notes. Given their tradability, digital currencies should be classified as an asset.' This same definition has been used by the FINMA and in the country's AML ordinance. In 2018, the FINMA [published guidelines](#) on how market legislation would apply to the various types of digital currencies and alternative forms of financing such as ICOs. The FINMA categorised digital currencies based on their function and purpose as: 1) payment tokens, which have no further function other than as a payment/investment medium; 2) utility tokens, which provide utility on an underlying platform; and 3) asset tokens, which closely resemble financial instruments that represent equity in an underlying company, earnings, entitlement to dividends, and interest payments. This last category is analogous to equity bonds or derivatives.

The DLT-Law which came into effect in 2021 constitutes an 'umbrella legislation' that introduced comprehensive adaption of existing laws to crypto assets. It created a new concept of 'DLT-Securities' under the Swiss Code of Obligations, allowing for the tokenisation of rights, claims and financial instruments. In addition, the DLT-Law provides for the introduction of a new licensing category of 'DLT trading facility' under the Financial Market Infrastructure Act (FinMIA) and certain clarifications relating to the treatment of cryptocurrencies in Swiss insolvency proceedings. The DLT-Law also revised the Ordinance on Banks and Savings Institutions (BO) and amended the Federal Act on Private International Law (PILA) regarding the determination of the applicable law. The DLT-Act also amended the Financial Services Act (FinSA) to apply security regulations, including the duty to publish a prospectus also for DLT-securities. The National Bank Act (NBA) was amended to establish oversight of DLT-trading facilities by the Swiss National Bank (SNB). The Law on Banks was amended to regulate how crypto asset deposits should be treated in case of bank insolvency. The Anti-Money Laundering Act (AMLA) was modified to include trading facilities for DLT securities (DLT trading facilities) as financial intermediaries. The Intermediated Securities Act (Bucheffectengesetz) was amended to include DLT-trading facilities as registers.

Tax rates and rules vary between the individual cantons. Digital currencies are generally treated like foreign currencies for the purposes of wealth taxation. Their exchange value is determined by the Federal Tax administration at the end of the year, with assets that do not receive an official evaluation taxable at the cost of acquisition. Capital gains on digital currencies are exempt from income tax for individuals. Purchases of digital currencies are VAT exempt.

The new MiCA regulation by the EU might also affect Switzerland in two ways. Firstly, it also applies to some Swiss blockchain ventures offering tokens or services to clients in the EU. Secondly, Switzerland might adopt a similar rule-book in the future, reacting to regulatory pressure from the US and the EU. In 2022 no further major crypto regulation has been passed.

Blockchain in academia

Currently, blockchain education in Switzerland consists of singular courses as well as comprehensive education programs often concerning blockchain in addition to other transformative technologies, provided both by companies and universities. While many such initiatives exist, some indicative programmes offered by prominent organisations are listed below.

University of Applied Sciences and Arts of Southern Switzerland (SUPSI) – MAS in blockchain, cryptocurrency and decentralised technologies. The course builds upon four modules, namely: Introduction to Blockchain; Smart Contracts Development and Use Cases; Crowdfunding and Regulation; and Decentralised Technologies to give a complete overview of blockchain technologies. The programme was jointly developed by SUPSI and the Swiss blockchain company Eidoo and supported by the European Chamber of Digital Commerce.

University of Zurich Blockchain Centre – A competence centre established to fathom the complexity of distributed trust through an interdisciplinary lens. It is a centre of research, offers regular invited lectures, hosts conferences, and offers the UZH CAS in blockchain with 3 modules: Blockchain technology, blockchain business and economics, and blockchain regulation and law.

University of Geneva - CAS in decentralised application development with blockchain and distributed ledger technologies (DLT) (CAS Développement d' applications décentralisées avec blockchain et DLT) with the modules Fondamentaux techniques, juridiques et business des blockchains, crypto-monnaies et de la finance décentralisée; Introduction au design et développement d' un projet blockchain; Développement avancé avec Ethereum; and Management de projet blockchain et développement avec d' autres DLT. The University of Geneva also hosts the Bloxberg Hub (Bloxberg is an academic proof-of-authority blockchain).

In Geneva, the Haute école de gestion (HEG) offers a CAS in blockchain and finance consisting of blockchain fundamentals, tokenomics, decentralised finance, on-chain analysis, regulation, and strategy.

The Lucerne University of Applied Sciences and Arts (HSLU) offers a CAS in blockchain disruption through distributed databases, including modules about blockchain technology, platforms and best practices, business models, crypto finance and crypto currencies, legal and compliance.

The University of Liechtenstein offers a certificate in blockchain and FinTech

The Private University of Liechtenstein held a symposium on crypto assets as a challenge for legal compliance and enforcement.

Many other universities also offer blockchain education either as a specialised education programme or as part of other studies e.g. in economics or law.

Blockchain across key industries

Public and private actors in Switzerland have identified a plethora of industries to be disrupted by blockchain technologies. In terms of regional governance, blockchain has been used by regional authorities for identity management, voting, and payments in digital currencies. Companies in the country are active in the areas of financial and banking services, blockchain protocol and infrastructure, and even art, education, energy and utilities, insurtech, media and entertainment, transport, and supply chain. However, we see some consolidation. Some applications have matured while others have been discontinued. Blockchain is increasingly finding its niche.

Blockchain at the UN

Switzerland is home to many UN organisations and the WTO. Many have experimented with blockchain to support the UN sustainable development goals. Discussions have focused on the use of blockchain for trade, for identity, for providing aid, and for tracking supply chains or climate certificates, with numerous reports being published by UN organisations like UNECE, other international organisations like the WTO and NGOs like Geneva Macro Labs. While these discussions were sometimes overly enthusiastic in the beginning, they gave way to a more careful but also more concrete approach towards the use of blockchain technology. Standards organisations located in Geneva, like UN-ITU and ISO, passed further blockchain-related standards in 2022.

Geneva is also the seat of the Global Blockchain Business Council.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

[Data primarily derived from CV VC's TOP 50 REPORT 2022](#)

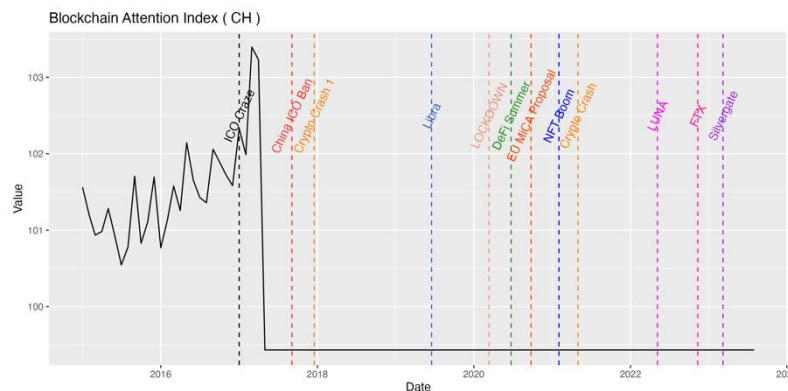
The Swiss blockchain and digital currency startup and business scene is, in many regards, the most mature and one of the largest in Europe and the world. While employment in the top 50 firms increased by 24% (from 1,010 to 1,248) the total number of employees slightly decreased by 4% to 5,766. The top 50 organisations' funding increased by USD 85.2 million to USD 3.2 billion. [Regarding the latter](#), since 2016, Switzerland has hosted 6 of the 15 largest overall ICOs. In 2017, ICOs active in the country raised EUR 1,237 million, a number second only to the US.

The Crypto Valley, an area spanning the canton of Zug to Liechtenstein, is showing the highest concentration of blockchain businesses. [CV VC's biannual report](#) highlights seven crypto hotspots in Crypto Valley: Zug, Zurich, Liechtenstein, Geneva, Ticino, Vaud, and Neuchatel. As of February 2022, the area counts at least nine unicorns including two commercial company unicorns: Ethereum (USD 148.9 bn), Cardano (USD 8.8 bn), Web3 (USD 5.2 bn), Solana (USD 4.4 bn), Cosmos (USD 2.6 bn), Near (USD 1.1 bn), and Dfinity (USD 1.0 bn). The two commercial unicorns are 21.co (USD 2 bn) and Safe (Gnosis, USD 1.2 bn). With the crypto winter, the valuation of the Crypto Valley top 50 platforms has decreased by 31% to USD 175.6 billion from USD 254.9 billion. However, commercial platforms have increased by 56% from USD 6.2 bn to USD 9.7 bn). Companies are active in a wide range of verticals. In total, CV VC's report identifies six verticals of digitalisation where blockchain technology is used: 1) future of work, 2) lifestyle & health, 3) education & science, 4) security & identity, 5) e-commerce & logistics, and 6) finance & investing. While secure DeFi transactions became a reality, the area of DeFi initiatives also showed some significant consolidation in crypto winter. The total value locked (TVL) shrank by 40% from USD 250 to USD 150 million. However, the TVL is highly dependent on the value of Ethereum and these numbers might therefore paint a too pessimistic picture. The growth of DeFi has also influenced demand for enterprise crypto custody and brokerage solutions, contributing to the growth of crypto banks, such as SEBA and Syngum.

THE BLOCKCHAIN COMMUNITY

The Swiss blockchain and digital currency business scene and community converge in many regards, with the area known as Crypto Valley constituting the epicentre of most activity. Co-working spaces such as [Trust Square](#) and initiatives such as the [Crypto Valley Association](#) or the [Swiss Blockchain Federation](#) have emerged as blockchain hubs for blockchain enthusiasts and businesspersons alike. Subject matter communities like [DIDAS \(self-sovereign identity\)](#), [Multichain Asset Managers Association](#) or Global Blockchain Business Council enrich the ecosystem and drive topics forward. Conferences on blockchain technology and related topics are hosted regularly too.

The crypto winter led to a slight consolidation regarding the number of employees to 5,766 (-4%) while the number of employees in the top 50 firms increased by 24% to 1,248. There is a total of 136 blockchain groups and communities of practice.



INSIGHTS FROM EXPERTS

Dr Jörn Erbguth, legal tech, blockchain, smart contract, and data protection consultant

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Switzerland? Has the recent growth of the cryptocurrency markets facilitated familiarity?

The current crypto winter has dampened some of the enthusiasm and led to a concentration and consolidation in the Swiss blockchain eco-system. At the same time, 21% of the population own crypto (highest percentage in Europe).¹⁷³ NFTs are commonplace, for example the Swiss Football Association (SFA) and Credit Suisse are selling a NFT art collection for the women's soccer team.¹⁷⁴ Tax laws for private citizens are quite simple. Crypto currency belonging to private citizens is usually only taxed under wealth tax, but not VAT or income tax. Although some cantons and businesses started to accept crypto currency payments, this has not continued to spread – possibly due to high transaction fees. Since the national railway company introduced the possibility to buy crypto currencies at their ticket machines, Switzerland is probably the country with the most places to buy crypto. Transactions up to CHF 500 only require a Swiss mobile phone number for identification. Other crypto ATMs still allow the buying or selling of crypto, without any identification, for up to CHF 1,000 CHF per transaction.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Switzerland?

The consolidation and rising regulatory requirements led to an increase in the maturity of the blockchain and crypto currency ecosystem.

What measures has Switzerland taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Cantons continue to support blockchain startups and crypto events. No significant new legislation has been passed since 2022. Future legislation is possible, particularly in reaction to the EU's MiCA regulation.

¹⁷³ Source: <https://www.financialmirror.com/2023/05/17/switzerland-leads-crypto-adoption-rate-in-europe/>

¹⁷⁴ Source: <https://csx.credit-suisse.com/en/account-card/csxnft.html>

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

Starting with a rather positive attitude, blockchain and cryptocurrencies are increasingly regarded as a regulatory challenge. CBDCs are expected to replace cryptocurrencies rather than to complement them and promote their adoption. As with many central banks, the Swiss National Bank (SNB) is also experimenting with CBDCs. Compared to other countries, the SNB seems to be intending to attribute a more active role to commercial banks.¹⁷⁵ Current regulation applies to managed DeFI, but regulation is not applied to DeFI without identifiable operators.¹⁷⁶

What does the future hold for the Swiss blockchain and cryptocurrency ecosystem?

The Swiss blockchain ecosystem is embedded in the international blockchain ecosystem. Switzerland also has to adhere to international developments regarding financial regulation. While some did talk about the end of crypto, this has been done in every crypto winter. With the recovery of crypto prices, this mostly stopped. Regulatory pressure from outside will have its effects on Switzerland, too. In my opinion, in the battle between technology and regulation, technology will always win in the short run, but regulation will succeed in the end. However, it is still unclear, what amount of regulation will satisfy regulators. Switzerland has offered relatively good legal certainty and transparent regulation from the start, which provided a positive environment and enabled the Swiss blockchain ecosystem to grow. However, with some delay, Switzerland has to play within the international framework of financial regulations dominated by the US and the EU.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

AI and blockchain are very distinct technologies. While AI can provide very sophisticated services, it is neither transparent nor reliable. Blockchain, on the other hand, has very limited functionality, full transparency and very reliable execution of transactions. Therefore, blockchain and AI are not competing but complementary technologies. AI could improve usability. It could draft smart contracts and other blockchain code. It could validate the code for vulnerabilities. It could be used for negotiation of smart contract transactions. Blockchain, on the other hand, could answer some challenges created by AI: since AI will be able to forge any document, text, image or video, blockchain could secure and trace content creation. Every video could include a trail of certifications to prove its authenticity even when it has been edited.

¹⁷⁵ Source: https://www.snb.ch/en/mmr/speeches/id/ref_20230330_amrtmo/source/ref_20230330_amrtmo.en.pdf

¹⁷⁶ Source: <https://www.finma.ch/en/documentation/dossier/dossier-FinTech/decentralized-finance-defi/>

Key Figures

1,763+

Dedicated blockchain solution providers

9+b

Total funds raised.

5.52%

Population that owns crypto

The UK blockchain ecosystem at a glance

Located off the north-western coast of Europe, with a population of 67 million, the UK is the [second largest European economy](#) and the [fifth largest in the world](#) by nominal GDP, with its growth primarily driven by financial services. The UK constitutes one of the [most important financial centres of the world](#).

Country officials showed great interest in blockchain and DLTs early on. The UK established itself as one of the first movers in the space, as indicated by a 2016 [report by the UK Government Chief Scientific Adviser](#), which explored the potential of blockchain and DLT. Since then, local authorities have dedicated efforts to understanding business behaviour and consumer sentiment in the field. Overall, the UK's policymakers have introduced no specific cryptocurrency laws and have adopted a neutral approach towards blockchain and DLT.

While in recent years more agile European countries may have taken the blockchain lead in terms of using the technology in public infrastructure, the UK remains a strong epicentre of blockchain business activity. The country is home to more than 1,000 companies and startups active in the space, primarily active in the financial services space. These have collectively raised more than EUR 3.8 billion in funding through a combination of venture funds and alternative forms of blockchain crowdfunding. London in particular, has emerged as a definitive hub and is home to the vast majority of blockchain companies.

TOWARDS MAINSTREAM ADOPTION

Regulation and policymaking

The UK government has a positive stance towards the crypto industry. In February 2023, HM Treasury said that the country intends to set out 'plans to regulate crypto and protect consumers' aiming to 'grow the economy by robustly regulating crypto asset activities.' In July 2023, HM Treasury [dismissed a recommendation](#) that had been submitted by the House of Commons Treasury Committee in May 2023, which suggested classifying crypto trading as gambling.

The UK was one of the first countries to officially recognise the potential of blockchain and DLT [in a 2016 report](#) by the Government Office of Science. The significance of digital currencies was highlighted [in a 2015 report](#) by HM Treasury, which identified potential benefits, risks, and barriers towards their adoption and suggested regulatory actions in relation to this new form of digital asset. In 2017, the government [launched its digital strategy](#) with the ambition to facilitate the development of digital businesses, including companies active in the blockchain and DLT space. The [Financial Conduct Authority \(FCA\) digital sandbox](#) is also accepting initiatives from the blockchain space.

The UK’s financial regulators have, on several occasions, issued [warnings](#) in relation to digital assets, while the broader legal framework is still largely under development. The Bank of England has [officially](#) highlighted the potential of a digital currency issued by a central bank, also known as CBDC. [Andrew Bailey](#), Governor of the Bank of England, mentioned during a [recent speech](#): ‘Our main motivation for a retail CBDC would be to promote the singleness of money by ensuring that the public always has the option of going into fully functional central bank money that can be used in their everyday lives.’ During the speech, Mr Bailey, rejected crypto as according to his view ‘they are not money.’

Blockchain Industry in the UK: Government Agencies and Hubs



Legislation of blockchain

In June 2023, the Financial Services and Markets Bill (FSMB) was [approved](#) by the House of Commons, received Royal Assent, and is now law. The Bill aims to enable the regulation of crypto assets to support their safe adoption in the UK; it recognises crypto as a regulated activity, and stablecoins are now considered a means of payment under existing laws. In addition, the law established sandboxes that can facilitate the use of emerging technologies such as blockchain in financial markets.

In May 2018, the Chancellor of the Exchequer launched the Cryptoassets Taskforce, bringing together HM Treasury, the FCA, and the Bank of England, in an attempt to foster innovation in the blockchain and DLT space while protecting consumers and preserving the UK’s reputation as a safe and transparent place for financial services through regulation. The legal statement on the status of crypto assets and smart contracts by the UK Jurisdiction Taskforce of the LawTech Delivery Panel (the UKJT) has been instrumental in legal discussions on blockchain and DLT and, crucially, leading the way in defining crypto assets as property across several jurisdictions. Legislation is not, therefore, the only place to focus on developments in the law on crypto assets, or by extension blockchain and DLT.

The same is true for using the technology in the public sector or regional governance. This regulatory neutral approach is further reaffirmed in a [2018 report](#) by the Cryptoassets Taskforce, which highlights: ‘The Taskforce considers that the technology is still in its early days, and there are some significant challenges to wider adoption... The Taskforce does not consider there to be regulatory barriers to the adoption of DLT. The PRA

and FCA will continue to take a technologically neutral approach to regulation as well as providing a platform for innovation.’ The report goes on to highlight the potential of blockchain and DLT in areas such as efficiency, resilience, transparency, automation, and tokenisation.

Cryptocurrency legislation that applies to blockchain

HM Treasury has [published](#) a consultation on the first financial market infrastructure sandbox, which excludes derivatives and unbacked crypto assets from the regulatory sandbox. Until there is more certainty in these frameworks, existing regulatory initiatives will be used for them.

The Cryptoassets Taskforce [defines](#) digital currencies as ‘cryptographically secured digital representations of value or contractual rights that use some type of DLT and can be transferred, stored or traded electronically.’ The authority has created a framework for the characterisation of digital assets based on their use and intrinsic value or lack thereof, categorising them as: 1) exchange tokens, meaning digital currencies that are primarily used as a medium of exchange and usually hold no intrinsic value; 2) utility tokens, or digital currencies that can be redeemed for services or products in the underlying blockchain or DLT deployment; 3) security tokens, meaning digital currencies that represent ownership of an underlying asset, share in future profits and others; and, lastly, 4) e-money tokens, which refer to digital assets that meet the e-money definition of the [Electronic Money Regulations](#). From the above, the latter two, e-money and security tokens, are considered regulated tokens, or digital currencies for which a regulatory framework exists, while exchange tokens and utility tokens remain unregulated. Any digital currency or digital asset that doesn’t fit the description of security tokens or e-money is considered unregulated.

Digital currency taxation is largely determined [by a 2019 policy paper](#) issued by the UK tax authority, HM Revenue and Customs (HMRC). Dealings in digital currencies are likely subject to capital gain tax and income tax. Digital assets received for payment or income are subject to taxation too. Lastly, funds received through activities such as mining and airdrops are also subject to income tax.

Blockchain in academia

Educational institutions in the UK are embracing blockchain as part of their curriculum. Most notably, the Master of Science programmes in the field of FinTech from [the University of Strathclyde](#), [the University of Sussex](#), [Manchester Metropolitan University](#), [the University of Stirling](#), [SOAS University of London](#) and [Coventry University](#) all cover blockchain technologies to a certain degree. Stand-alone courses exist too, such as:

- The [Oxford Blockchain Strategy Programme](#) course by the University of Oxford
- [Blockchain and Digital assets](#) course by City, University of London
- [Blockchain Programming](#) by the University of London
- [Blockchains and Distributed Ledgers](#) curriculum course by the University of Edinburgh
- [UCL Blockchain Rules Online Programme](#) by University College London
- [Distributed Ledger Technologies: Foundations and Applications](#) curriculum course by the University of Cambridge
- [Blockchain Technology: Foundations, Applications and Implications Masterclass](#) by Imperial College London
- [Blockchain in Business and Society MSc](#), by Queen Mary, University of London
- [MSc Financial Technology \(FinTech\)](#) by the University of Exeter
- [Introduction to Blockchain and Distributed Ledger Technology \(DLT\)](#) by the UCL Centre for Blockchain Technologies
- [MSc Blockchain and Financial Technologies](#), by the University of East London

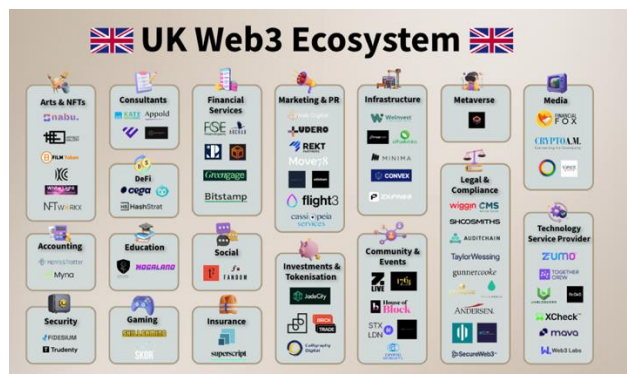
Blockchain across key industries

Taking advantage of the country’s large financial services sector, blockchain companies have leveraged existing expertise and infrastructure in their offerings. The majority of blockchain startups and initiatives fall, one way or another, under the financial services or FinTech sector. The energy and creative industries are two emerging sectors in terms of blockchain application.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Following initial enthusiasm for ICOs, the number of blockchain companies in the UK rose rapidly from 2015 to 2017, before declining sharply to pre-2015 levels. More than 300 companies have raised more than EUR 3.8 billion, with an average of 4 investors per company.

Reports from the All-Party Parliamentary Group on Blockchain (APPG Blockchain) and the digital technologies agency Digital Catapult further reaffirm the above. In Digital Catapult’s report, the lack of regulatory clarity and a deficit of legal experts in the field were highlighted as key sources of concern for blockchain companies. Additionally, 54% of companies active in the space faced significant difficulty in opening a traditional bank account for their business activities. The capital city of London has emerged as the UK’s most definitive blockchain hub and geographical cluster, with more than 90% of all blockchain companies in the country headquartered there.



Source: Web3Ecosystem <https://www.linkedin.com/company/web3ecosystems/>The blockchain community

In an [updated 2023 consumer research report](#), the FCA presents key figures of digital currency and digital asset usage in the country. Its data can prove useful in determining the overall size and characteristics of the domestic digital currency and blockchain community. The report estimated that 9% of the adult population own digital currencies at present (up from 4.4% in 2021).

The median holding has also risen from EUR 310 in 2020 to EUR 360 in 2021. Additionally, 91% of the adult population reported having heard of cryptocurrencies, an increase from 78% in 2021 and 42% in 2019. Digital currency owners are predominately male, under 45, located mainly in London and Northern Ireland. The majority of cryptocurrency owners reported that the crash in price did not influence or concern them when it came to selling their assets.

London boasts a vibrant blockchain community, characterised by regular meetups and events. **Crypto Mondays London**, part of a decentralised global community with over 4,500 members, meets monthly at various locations across the city. These gatherings aim to create a fun and educational space for the crypto community. Over the past five years, Crypto Mondays London has hosted over 70 events, featuring participants and speakers from some of the largest blockchain companies.

INSIGHTS FROM EXPERTS

Matt Hawkins, CEO & Founder of Cudo Ventures

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in the UK? Has the recent growth of the cryptocurrency markets facilitated familiarity?

Familiarity has been growing in cryptocurrency since the early 2010s, but really gained traction and media headlines in 2016/2017 in one of the early bull runs. It then gained the same in the next bull run of 2021. Many people still do not understand the difference between blockchain, cryptocurrency, Bitcoin etc. The majority of the general public still think of it as a trading asset, rather than understanding the technology or business uses. However, what is different now to 5 years ago is that everyone has heard of it and knows of it, even if they don't understand it. It's still like the earlier years of the internet.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in the UK?

It's estimated 6-7% of the UK have owned cryptocurrency with locations such as London estimated at 23%. UK Youtube Channels such as Coinbureau are educating the market with millions of watchers. From a blockchain perspective, 81 of the world's top 100 companies are working with blockchain technologies. It's hard to find that statistic purely for the UK. This shows the great potential of this technology and how the world's leading companies understand its potential over the coming years. There is a great deal of R&D in the blockchain industry, and in companies exploring their use cases with blockchain. This enables many of the similar technology revolutions that the internet did.

What measures has the UK taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Historically, the UK has been behind the leading countries in blockchain, but ahead of many others such as the US. Clear definition of regulation is key to the success of any industry. This does not mean that all it needs are regulations, but what should be clear is what does and what does not need regulating, to ensure companies building these technologies can do so in the knowledge they will meet the requirements. Certain areas should be regulated, and others should be left open for more flexibility in technology, as many industries are not regulated and this can enable faster technological innovation. The main changes in the last year include stablecoins falling under the scope of regulation of the Financial Services and Markets Bill. It was stated that the act, 'Gives us control of our financial services rulebook.' The UK wants to position itself as a 'global hub for crypto asset technology.' But over-regulation will very much prevent this happening, so there needs to be a balance. It's key that the government supports exchanges, custodial services, and banking integrations if the UK is going to be a hub. The UK is hugely ahead of countries such as the US, which is why we are seeing companies moving from the US to the UK, which is good for employment and GDP.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

I believe it is already appealing to entrepreneurs, which is why you are seeing such fast growth of the market and technological innovation. For the UK to truly be a hub, you need the skills. This means more education, courses, and government help in training in these technologies. Promotion of it though, really comes down to the media. It's easy for certain media to just class blockchain and cryptocurrency as hype. These are the same amusing headlines you saw from certain media publications when the internet was in its early years. Both of which have proven it to be wrong. So, it is often down to the media for people to trust a new innovation or technology.

What does the future hold for the British blockchain and cryptocurrency ecosystem?

British blockchain is still in its early years but growing quickly. The technology and adoption will continue to grow globally as it has done for the last 15 years, with the UK being no exception.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

AI is in a significant growth cycle at the moment. This is across all industries. Natural integrations with chatbots is increasing this factor substantially. The key to growth of any industry is the tools and platforms that enable access to the innovations. This is why ChatGPT grew so quickly, because they provided a platform for anyone to use, whether you are a user or developer, and had 1000s of companies integrating it into their services in months. The 2 leading companies in this space in the UK are Fetch.ai and Cudos.org. Fetch has created the technology to enable anyone to build AI applications on the blockchain quickly and easily. Cudos has enabled anyone to scale the computing needed for these types of applications or to run their own AI on the blockchain. As we see more UK companies building this tooling, we will see even faster adoption and innovation in these applications going forwards. The technology is now there in the UK for companies to build and innovate quickly.

Key Figures

96+

Dedicated blockchain solution providers

32m

Total funds raised.

10.3%

Population that owns crypto

The Ukrainian blockchain ecosystem at a glance

According to the blockchain analytic company [Chainalysis](#), Ukraine is one of the leading countries in the world in terms of crypto adoption. According to [Chainalysis](#), the crypto turnover in Ukraine in 2020 was about USD 16.2 billion. During this time, Ukraine sent approximately USD 8.2 billion worth of cryptocurrency and received around USD 8.0 billion worth of cryptocurrency. Over the past five years, [more than 80 Web3 startups](#) have been launched in Ukraine. More than [50 Ukrainian blockchain development companies](#) provide services to clients worldwide.

[The top 15 Web3 companies](#) by valuation have Ukrainian roots. Ukraine has made it to the [top10](#) countries in Europe by crypto interest. Ukraine is one of the world's most active crypto nations. Ukraine is the birthplace of teams that founded the crypto startups Bitfury, Hacken, Everstake, WhiteBit and Propy, not to mention numerous crypto developers.

TOWARDS MAINSTREAM ADOPTION

Over the last few years, crypto assets have become widely used in Ukraine. Ukraine has the highest [crypto adoption index in Europe](#) and the fourth globally. To promote and expand their legal use, Ukraine's Parliament has adopted the Law on Virtual Assets. In March 2022, during the second month of a full-scale war, President Volodymyr Zelenskyy [signed and approved a 'Law on Virtual Assets'](#).

Once the law comes into force, it will empower local financial authorities to regulate crypto companies, distributing power-making decisions between the National Bank of Ukraine and the National Commission for Securities and Stock Market. The new law will allow crypto exchanges to legally operate in Ukraine, Ukrainian banks will be able to open crypto accounts, and crypto consumers will be entitled to expand the use of such assets and enjoy legal protection for them. The crypto legislation has implemented FATF recommendations on the prevention of money laundering, crime, terrorist financing, and proliferation. The government is still drafting relevant amendments to the Ukrainian Tax and Civil Codes in order to establish the comprehensive regulatory framework for the crypto assets in Ukraine.

In June 2022, Ukraine was granted the status of a candidate for European Union membership, the first step to joining the organisation. To align with European standards, Ukraine needs to adapt its national legislation. For this reason, Ukraine's main crypto regulator, the National Commission for Securities and Stock Market intends to incorporate Europe's Market in Crypto Assets (MiCA) legislative package into Ukraine's national legislation in order to become a regional leader in crypto adoption.

Ukraine has been granted [observer status](#) in the European Blockchain Partnership (EBP). ([English](#))

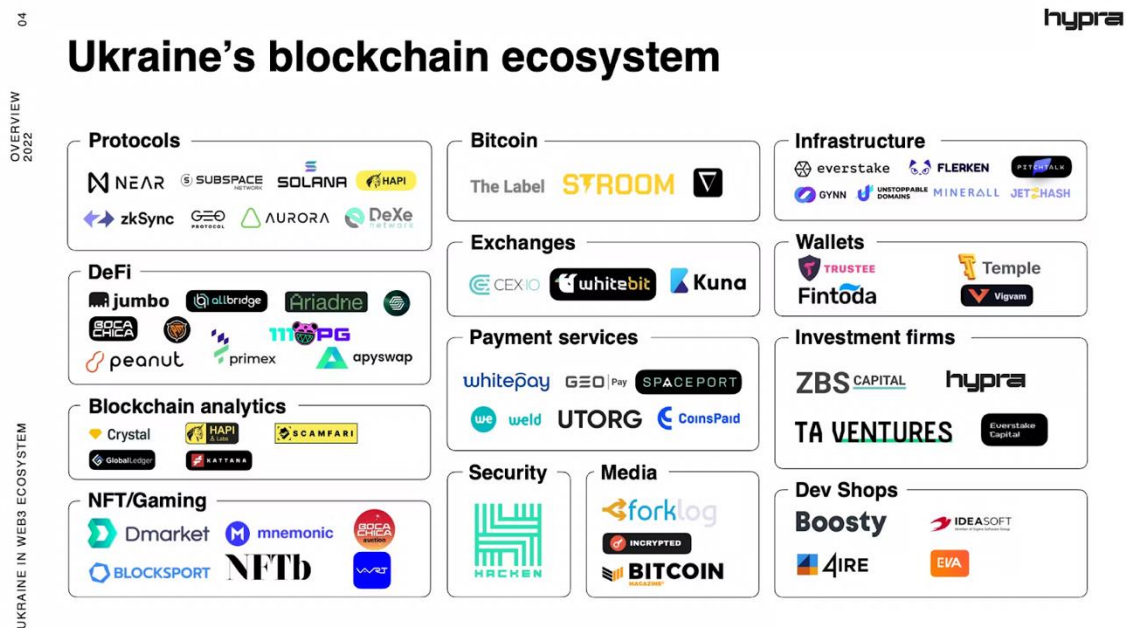
Ukraine has become the [30th country](#) in the world and the second country outside the European Union, after Norway, to participate in a project using blockchain technology for cross-border government services.

Blockchain4Ukraine and the public association 'Virtual Assets of Ukraine' have announced a [roadmap](#) for the implementation of blockchain and Web3 technologies in the country. The roadmap proposes a set of measures for promoting Web3, such as the launch of a regulatory sandbox for blockchain and Web3 projects, the creation of a national blockchain-backed land and realty register, preparation of a 'blockchain plan' to rebuild the country after the war, and integration of Ukraine into the European Blockchain Partnership.

THE BLOCKCHAIN STARTUP AND BUSINESS SCENE

Over the past five years, [more than 80 Web3 startups](#) have been launched in Ukraine. These projects have attracted over USD 1 billion in the past four years. [Over 50 Ukrainian blockchain development companies](#) provide services to clients worldwide. The top 10 companies include Boosty Labs, IdeaSoft, 4IRE, Eventyr, Evacodes, INC4, Blaize, Distributed Lab, mad.fish, and 482.solutions.

[The top 15 Web3 companies](#) by valuation have Ukrainian roots. These include Solana, NEAR Protocol, Matter Labs, Everstake, Global Ledgerand, WhiteBIT. [Over 10 funds](#) invested in blockchain and crypto startups in Ukraine. International funds that invested in Ukrainian Web3 companies include a16z, Coinbase Ventures, Pantera Capital, and Hypersphere.



THE BLOCKCHAIN COMMUNITY

The [Ukrainian Blockchain Association \(BAU\)](#) is a non-profit organisation that has fostered the integration of blockchain technology into Ukraine's economy since 2014.

[BlockchainUA](#) is one of the largest blockchain conferences in Eastern Europe, which has been held in Ukraine for 6 years, organised by the local CryptoAlcoholics community and supported by leading crypto enthusiasts from Eastern Europe. BlockchainUA brings together IT and FinTech experts, developers, top managers, entrepreneurs, investors, startup teams, bankers, lawyers, media, regulators and blockchain enthusiasts from around the world.

[Kyiv Tech Summit](#) is a unique first-of-its-kind event. Its aim is to bring together some of the best developers, technology providers, designers, innovators, and product evangelists who are looking to solve tangible, on-the-ground issues to aid the Ukrainian people in their fight for freedom.

[Virtual Assets 2030](#) (VA2030) is a public association that focuses on boosting the crypto industry in Ukraine.

INSIGHTS FROM EXPERTS

Ukraine is one of the most active crypto nations in the world, with a powerful community of blockchain developers and a flourishing crypto ecosystem. It possesses all the essential elements to become a top destination for crypto businesses. A regulated crypto industry could become an integral part of our digital economy, which is one of Ukraine's top priorities. The crypto-based economy has enormous potential to encourage economic growth and boost employment, which is what we need the most for Ukraine's post-war recovery efforts. Therefore, we are actively working on shaping the crypto policy to establish a favourable regulatory framework, allowing crypto companies to legally operate in Ukraine.

Oleksandr Bornyakov, the Deputy Minister of Digital Transformation of Ukraine on IT industry development

Yuliya Parkhomenko, Director of the Digital Economy Directorate of the Ministry of Digital Transformation of Ukraine

How would you evaluate the public awareness and adoption of blockchain and cryptocurrency in Ukraine? Has the recent growth of the cryptocurrency markets facilitated familiarity?

With every crypto bull run, public interest increases among regular people in Ukraine due to the additional opportunities for wealth creation. According to recent Coingecko [research](#), Ukraine is one of the top 10 European countries with a moderate interest in crypto. In order to educate Ukrainian citizens on how to use crypto assets competently, the Ministry of Digital Transformation launched a free educational course on blockchain technology and crypto literacy in February 2023. The practical part of the course was implemented by the Ministry of Digital Transformation in cooperation with the largest European crypto exchange WhiteBIT, which has Ukrainian roots, the Filecoin Foundation for the decentralised web, and the social meta-universe Atlantis.World. Other project partners include Aragon, a blockchain project that creates a technological infrastructure for managing decentralised organisations (DAOs), Zapper.xyz, Safe, zkSync, and the Optimism Foundation.

How would you evaluate the overall size and maturity of the blockchain and cryptocurrency business ecosystem in Ukraine?

Over the past five years, [more than 80 Web3 startups](#) have been launched in Ukraine, attracting over USD 1 billion in investment during the last four years. However, none of these crypto startups have been registered in Ukraine, even if they desire to be, because there is no regulatory framework in place yet. Therefore, in Ukraine, we don't have a regulated and mature crypto market. When Ukraine's main piece of crypto legislation, the 'Law on Virtual Assets', comes into force, we will be able to be more precise about how

many crypto companies decide to seek authorisation in Ukraine. Policymakers can support the legitimate aspects of the crypto asset market while reining in their abuses, as clear regulatory rules promote market trust.

What measures has Ukraine taken over the past year in terms of public sector initiatives and legislation to promote blockchain and cryptocurrency adoption?

Road Map for Boosting the Crypto Assets Industry in Ukraine

In July 2021, the Ministry of Digital Transformation of Ukraine presented a strategy, created with input from the local crypto community, for developing the country's crypto assets industry. The [report](#) entitled 'Virtual Assets in Ukraine – 2030', reflects the results of research conducted between March and June by the ministry together with crypto exchanges, miners, and other crypto-community participants.

Crypto legislation

Over the last few years crypto assets have become widely used in Ukraine. To promote and expand their legal use, Ukraine's Parliament has adopted the Law on Virtual Assets. In March 2022, during the second month of full-scale war, President Volodymyr Zelenskyy signed and approved the 'Law on Virtual Assets'. Once the law comes into force, it will empower local financial authorities to regulate crypto companies, distributing power-making decisions between the National Bank of Ukraine and the National Commission for Securities and Stock Market. The new law will allow crypto exchanges to legally operate in Ukraine, Ukrainian banks will be able to open crypto accounts, and crypto consumers will be entitled to expand the use of such assets and enjoy legal protection for them. The crypto legislation has implemented FATF recommendations on the prevention of money laundering, crime, terrorist financing, and proliferation. In June 2022, Ukraine was granted the status of a candidate for European Union membership, the first step to joining the organisation. To align with European standards, Ukraine needs to adapt its national legislation. For that reason, Ukraine's main crypto regulator, the National Commission for Securities and Stock Market intends to adopt the Europe's Market in Crypto Assets (MiCA) legislative package into Ukraine's national legislation in order to become a regional leader in crypto adoption. We are still crafting relevant amendments to the Ukrainian Tax and Civil Codes in order to establish the comprehensive regulatory framework for crypto assets in Ukraine.

European Blockchain Partnership

In June 2022, Ukraine joined the European Blockchain Partnership as observer. The country's accession to the EBP will allow for recognition of Ukraine's higher education diplomas and the driver's licences of millions of Ukrainian refugees in Europe.

Crypto literacy

In February 2023, the Ministry of Digital Transformation launched a free educational course on blockchain and crypto literacy. The course consists of 4 modules and is available for study on the Diia.Digital Education platform. The primary goal is to educate Ukrainians on how to use crypto assets competently. The course encompasses 100 training hours, covering both theoretical and practical aspects. Students will work on specific cases using a simulator format on real partner platforms. Currently, more than 16,000 Ukrainians have enrolled in the course. Additionally, over 100 higher educational institutions in Ukraine have expressed interest in incorporating the course into their curricula as an elective.

What measures can be taken at national and European levels to promote blockchain and cryptocurrency adoption by the public while also making it a more appealing option for entrepreneurs?

The global crypto market needs comprehensive legislation that will help the industry mature and move out of the 'gray area' into a legal framework, incentivising crypto businesses to pay taxes. Competitive crypto taxation would be the next crucial step for boosting mass adoption. Policymakers should collaborate with crypto professionals to understand the possible economic impacts of certain regulatory models for crypto. The real question is the extent to which global regulators grasp that crypto is a different type of tech product from anything they have regulated before. For sustainable growth, the crypto industry also requires a powerful and independent judiciary.

What does the future hold for the Ukrainian blockchain and cryptocurrency ecosystem?

We believe that the blockchain ecosystem in Ukraine has a bright future. Ukraine is one of the most active crypto nations in the world, and we are striving to be a top destination for crypto businesses. In Ukraine, we have a tech-savvy population and powerful community of blockchain developers. Over 80 web3 startups have been launched within Ukraine's blockchain ecosystem. Ukraine has emerged as a strong tech hub in Europe over the last few years. Ukraine's IT sector remains strong and an integral part of the country's economy. The Ukrainian IT industry continues to function and flourish with [around 85%](#) of the country's tech sector fully operational, despite the ongoing active contribution of IT specialists to Ukraine's victory. Ukraine has a modern banking system. Ukraine's [FinTech sector](#) is growing despite the Russian war. [Cashless payments](#) remain a strong habit among Ukrainians even in war times, while the popularity of contactless payments using smartphones or other NFC-enabled gadgets has grown significantly. Ukraine is a quite progressive country in terms of government tech. Diia is Ukraine's e-governance app from the Ministry of Digital Transformation that made Ukraine the first country in the world to launch digital passports that have the same legal status as paper equivalents and one of only four European countries with digital driving licences.

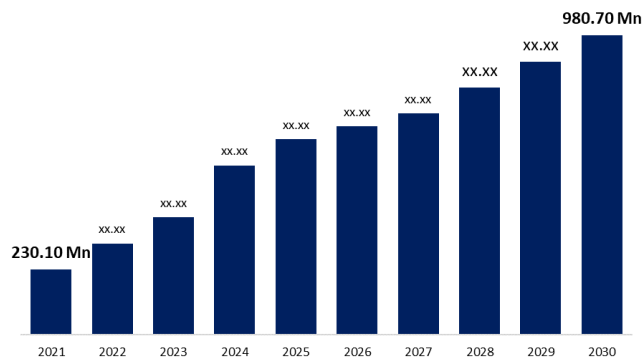
The main goal is to make 100% of public services available online. As of July 2023, more than 19 million Ukrainians have installed the Diia application. It allows Ukrainians to access 14 digital documents (ID card, foreign biometric passport, student card, driver's licence, vehicle registration certificate, vehicle insurance policy, tax number, birth certificate, IDP certificates) and 26 services in total. Diia has also proved to be enormously efficient in wartime. Ukrainians can use digital documents on their smartphones for identification in lieu of paper ones. These identity documents can be used both in online and offline transactions. Citizens can show their electronic documents to public and private service providers to prove their credentials (with the verifiable QR code) and even share the electronic documents via the Diia app, if a copy of the document is required to provide the service (e.g. to check into a hotel, or to submit documents to a university). The development of the Diia app has not been halted by the war. On the contrary, the Ministry of Digital Transformation in Ukraine has been launching new electronic services to fulfil the vision of the 'state on the smartphone'. For example, one of the new Diia app services is reporting on damaged or destroyed property.

Starting from May 2023, citizens can also apply for financial assistance to repair an apartment or house. Among other services launched during the war include: applying for social benefits for internally displaced persons, purchasing war bonds, informing of the movement of Russian troops via eEnemy chatbot, Diia TV and Diia.Radio, which became the only means for Ukrainians in certain areas to watch Ukrainian. Also, Ukrainian authorities are able to launch polls in the Diia app, to find out public opinion on different topics. For example, over 166,000 Ukrainians voted for Ukraine's entry in the Eurovision Song Contest. Diia has also become a platform for donating money to support the military. The digital economy is a priority for Ukraine's government.

How is the integration of AI and chatbots affecting the growth and development of the blockchain and cryptocurrency industry?

The synergy of artificial intelligence (AI) and blockchain will become a game-changer. As per [Spherical Insights](#), the fusion of blockchain and AI is projected to become a nearly \$1 billion industry in the next decade.

Integration of AI and financial ecosystems [aims](#) to strengthen resilience, mitigate risk, and build a sustainable and trusted foundation for the future of the industry. Today, blockchain and AI help in solving different financial issues and improving many business processes in the financial industry to make them smarter and perform more efficiently. Lightning Labs recently unveiled a [new toolkit](#) that enables AI-powered solutions to conduct Bitcoin transactions.



[WhiteBIT](#) – one of the biggest European crypto exchanges, founded in 2018 in Ukraine – features several AI crypto projects. Edain provides a functional system for analysing big data based on artificial intelligence, and Nooft uses AI to find NFT collections and centralise information about them from different resources much faster.

Some trading bots [leverage](#) machine learning and AI techniques to improve their strategies. They use advanced algorithms to buy and sell cryptocurrencies automatically. They learn from new data, can adjust trading strategies, and detect patterns that may not be obvious to humans. These bots make trading easier and more efficient for people by analysing large amounts of data and adapting to market changes.

According to Google Trends, the number of queries about cryptocurrencies among Ukrainians increased to record numbers in January-February 2023. The popularity of crypto was estimated [at 87 out of 100](#).

In 2020, the Cabinet of Ministers of Ukraine [approved](#) the concept of artificial intelligence development until 2030. It covers [nine areas](#) of AI application, from science to defence. As of July 2023, there are [194 AI companies](#) in Ukraine. 26 of them are engaged in blockchain development, and 94 have expertise in chatbots and conversational AI. AI and blockchain are technologically compatible and can complement each other in various ways. Blockchain's decentralised nature makes it an ideal platform for securely storing and managing large amounts of data, including data generated and used by AI algorithms. AI systems can leverage blockchain to access, verify, and use data from various sources while ensuring its integrity and immutability. AI-powered smart contracts could autonomously assess data and decide on specific actions, triggering automatic transactions when certain conditions are met. This is how AI-based trading bots work. In AI applications, it is essential to trace the origin of data used to train models and understand how decisions are made. Blockchain's transparent and immutable ledger ensures data provenance and auditability, enabling better accountability. Blockchain enables the creation of digital tokens, representing real-world assets or a utility within the AI ecosystem.

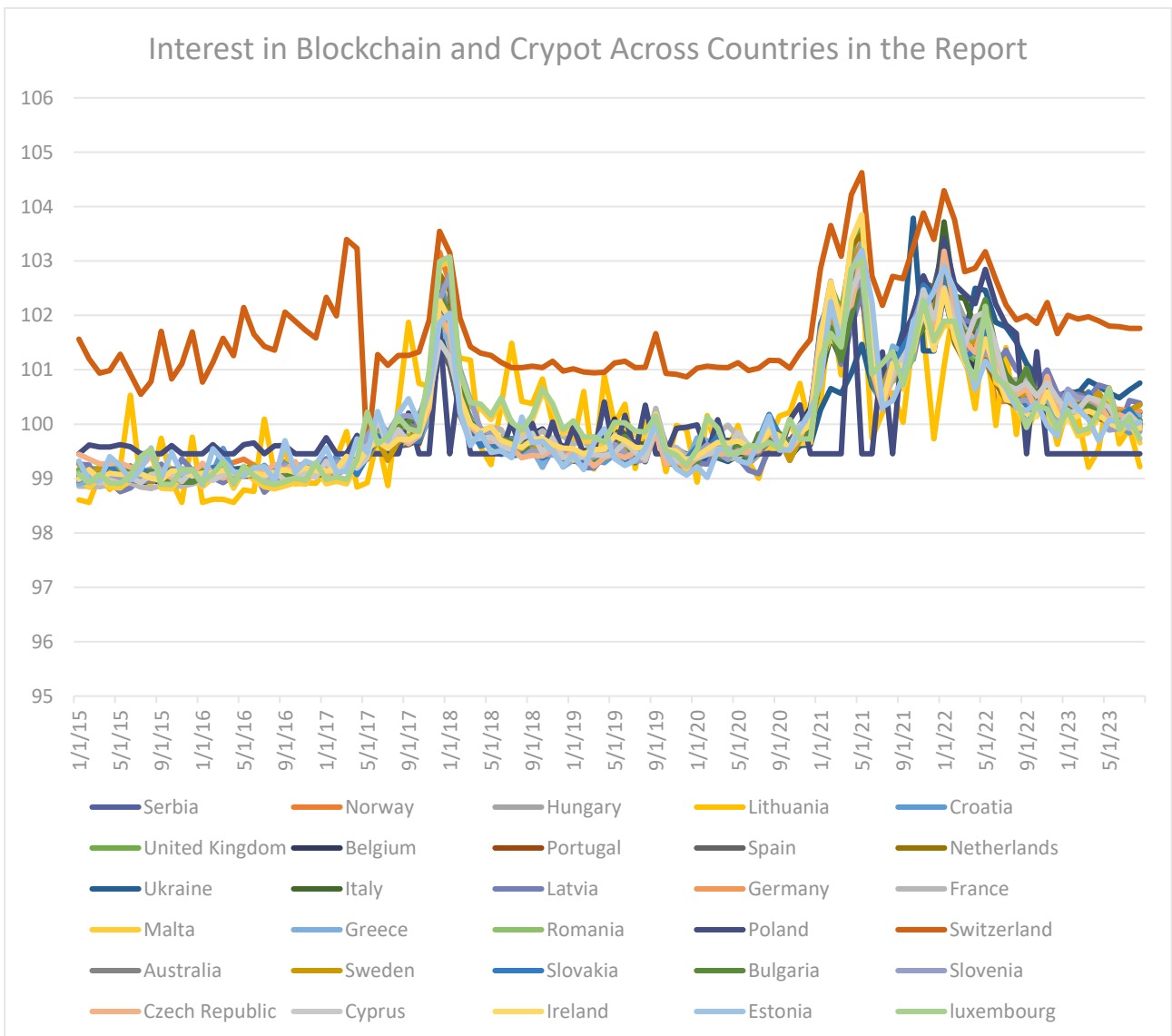
AI [can be used](#) to detect and respond to threats, while blockchain technology can ensure the security and integrity of data. By combining AI and blockchain, it is possible to create more secure and efficient cybersecurity systems for individuals, businesses, and governments. HAPI Labs [has launched](#) a platform for reporting scam- and crime-related addresses, in partnership with Ukraine's cyber police. [Scamfari OSINT](#), currently in beta mode, allows users to report cryptocurrency wallets related to scams, sanctions violations,

terrorism financing and other crimes. The project is supported by Ukraine's cyber police, which will work on freezing such wallets, the agency [announced](#). 'Telemedicine is undergoing active development in Ukraine: about 4,000 mobile telemedicine devices and diagnostic systems have been delivered to primary healthcare facilities', said [Minister of Health Viktor Liashko](#). Telemedicine is another sector where the combination of AI and blockchain has [enormous potential](#). By analysing medical data on the blockchain, AI algorithms can help identify patterns and anomalies in patient data, allowing doctors to make more accurate diagnoses and treatments. Blockchain technology as the mechanism for keeping patient data can help protect privacy and ensure security, essential in the healthcare industry. Additionally, electronic healthcare records [can be stored](#) on the blockchain. AI could help provide treatment insights based on this data. AI and blockchain projects can help raise money for charity. For example, a Ukrainian deep tech startup is [launching a charity NFT project](#) to sell AI-generated artworks with the twin goal of raising money to support people affected by Russia's war of aggression and also — it hopes — keep attention locked on the conflict as it approaches its fourth month, with many in the country concerned that the world's focus is flagging. AI [can help enhance](#) the efficiency and transparency of supply chains in the transportation sector and other industries. By analysing data on the blockchain, AI algorithms can help identify bottlenecks and inefficiencies in the supply chain, enabling companies to optimise their operations. Blockchain technology, on the other hand, can help ensure the transparency and traceability of products as they move through the supply chain.

Comparison with past reports

The regulatory and educational landscape within the blockchain sphere has shown signs of maturation and moderation. With pan-European developments paving the way for standardized regulations across the continent, countries with longstanding policies have largely preserved their regulatory stances. As such, the general state of affairs in both regulatory and educational realms remain consistent with prior assessments. The cohesive strategy of the EU starkly contrasts with the fragmented regulatory landscapes in other regions, where the absence of unified regulations has fostered uncertainties for businesses and investors, despite promising growth prospects initially.

Regarding public engagement with blockchain and cryptocurrencies, our data reveal notable fluctuations in interest, peaking notably during the major bull run in the cryptocurrency market in 2021—coinciding with significant developments in the DeFi and NFT arenas. This surge, particularly pronounced in countries with robust ecosystems, corresponds with increased institutional and retail investment in cryptocurrencies. Conversely, the lows in public interest, following major market disruptions like the collapses of Terra Luna and

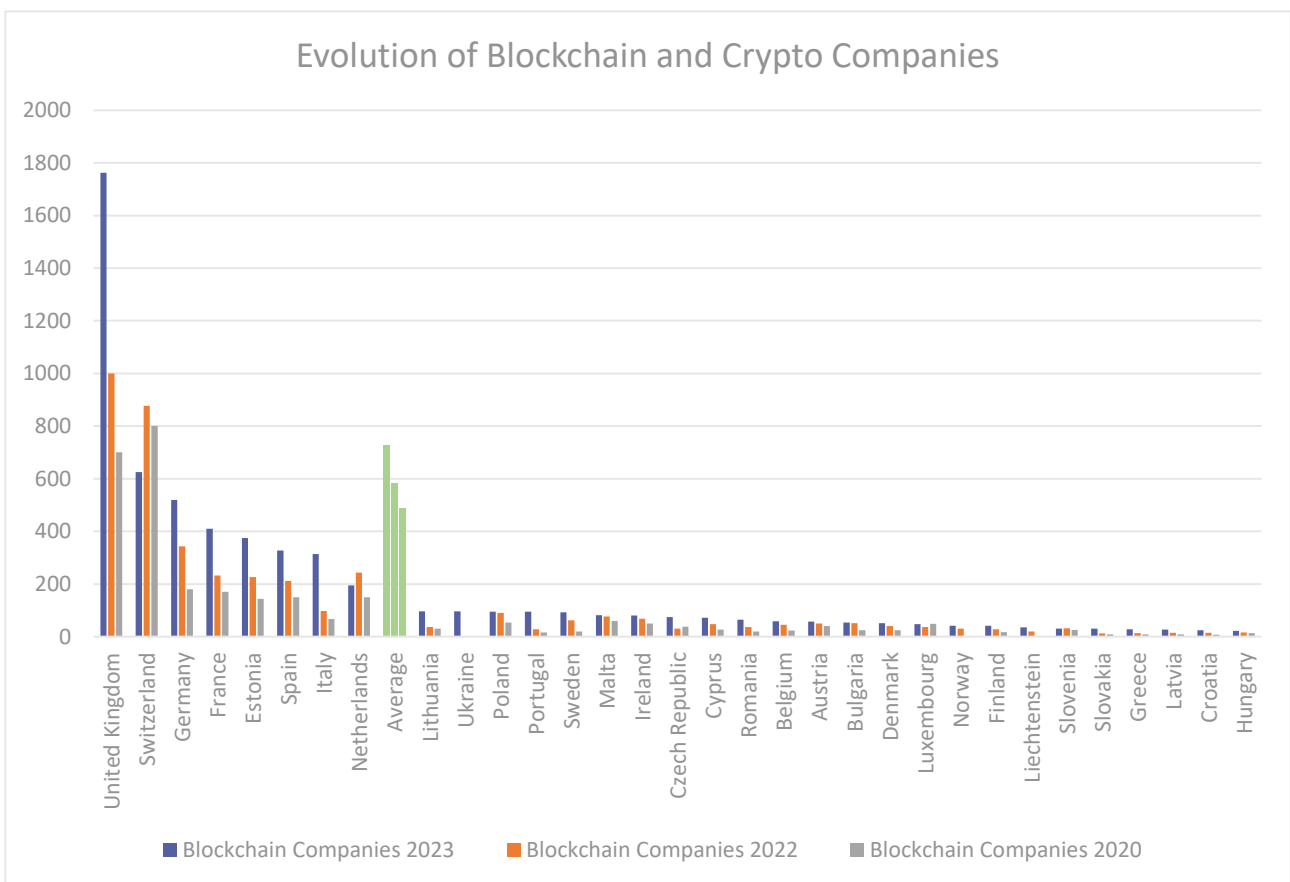


FTX, suggest that such events tend to negatively impact consumer confidence and attention. Overall, the data underscore the dynamic nature of the crypto market, with public interest closely mirroring the market’s volatility.

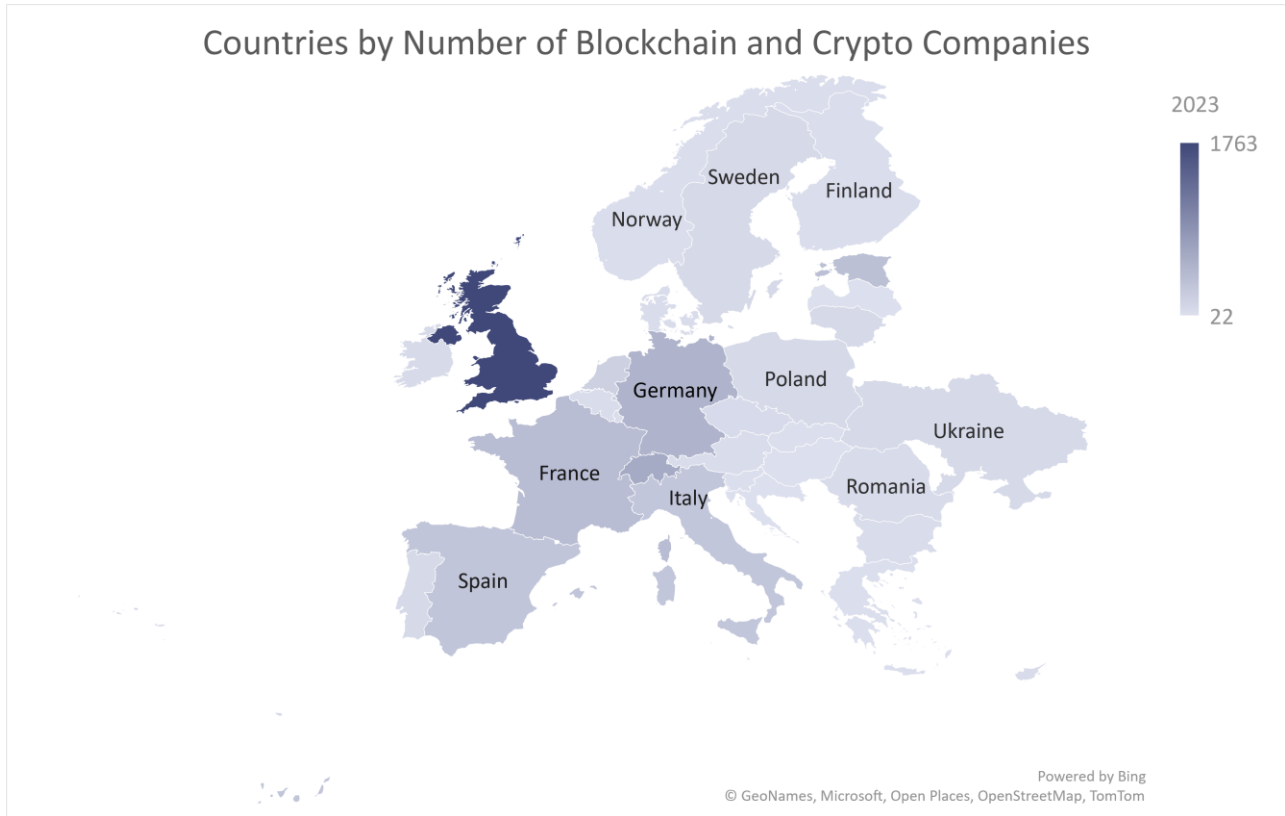
We also observe that the correlation between different countries is generally high, suggesting that global events significantly influence public interest across the board, indicating synchronized responses to global cryptocurrency market movements. The variability in public interest, as shown by the standard deviation of yearly average scores, is relatively low, with a slight increase in 2017 and 2021, and a decrease in subsequent years. The standard deviation peaked in 2017 and 2021, which could be attributed to significant events in the cryptocurrency market, including price rallies and increased mainstream attention. Additionally, the year-over-year rate of change in global interest highlights key periods of significant fluctuation. Notably, there was a substantial increase in 2021, aligning with a year of heightened cryptocurrency adoption and market enthusiasm. This surge is contrasted by a decrease in 2023, suggesting a cooling-off or stabilization of public interest following the previous years' spikes.

The European blockchain industry has witnessed a steady increase in company establishments and funding, reflecting a broad endorsement of blockchain technology across the EU. This upward trend signifies not only growth in the volume of activities but also diversification within the sector, as smaller countries increasingly contribute to its expansion. The consistent rise in investment figures across the board suggests sustained confidence among investors and strategic alignment with the EU's digital agenda, indicating a blockchain ecosystem evolving into an integral component of Europe’s economic fabric.

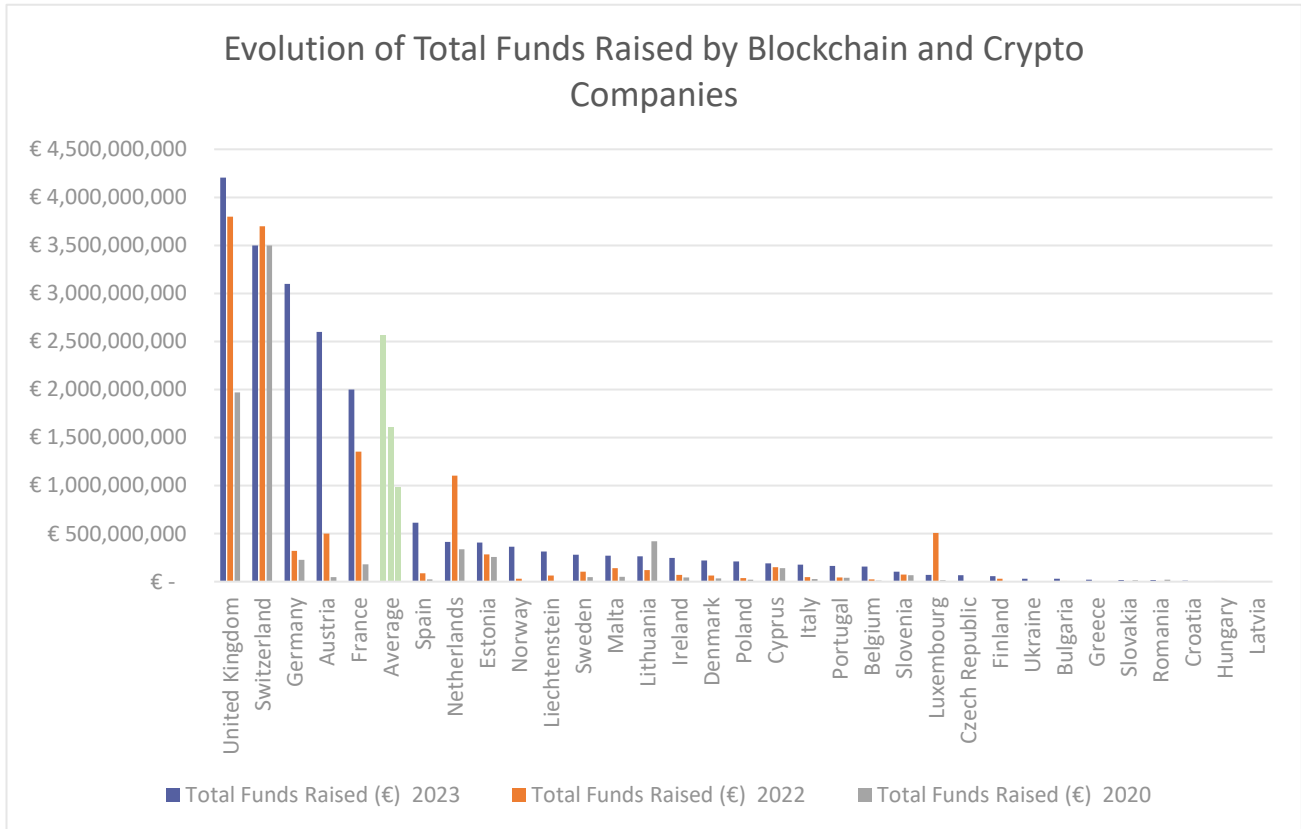
Data from 2023 show that the United Kingdom, Switzerland, and Germany lead in the number of blockchain companies, with the average number across surveyed countries showing a significant increase, consistent with the gradual maturation of the technology and its broader adoption. This sustainable growth within the



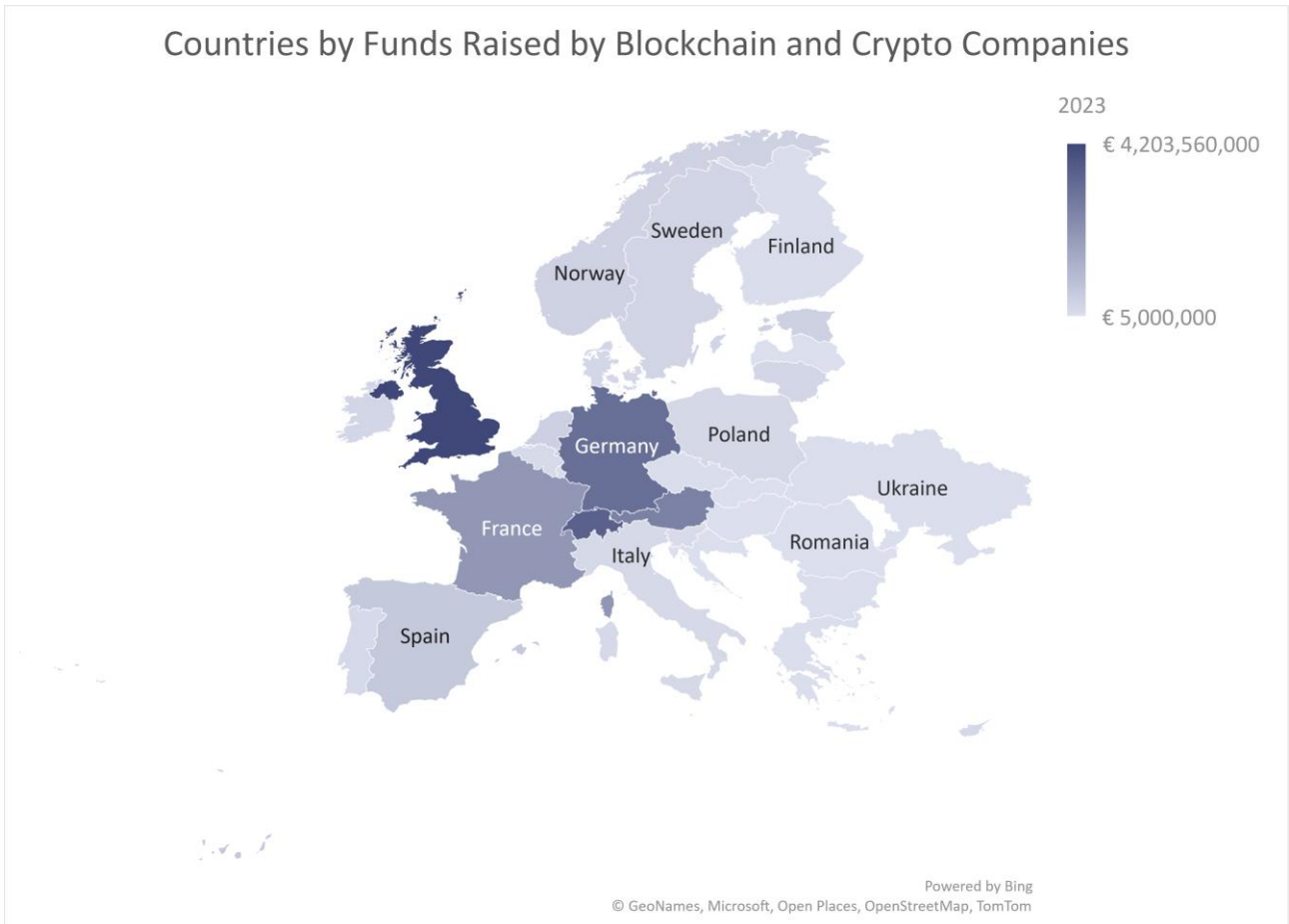
industry aligns with measured enhancements in regulatory frameworks that aim to nurture innovation while ensuring market stability.



The analysis of funds raised by blockchain companies indicates a robust increase in investment activity, with the United Kingdom¹⁷⁷ maintaining its lead by raising over 4 billion euros in 2023. This trend is echoed by strong growth in Germany and a notable influx of capital into Austria and France, reflecting varying stages of blockchain adoption and market maturity across these nations. The overall upward trajectory supports a broader shift towards a more integrated and innovative financial technology ecosystem in Europe.

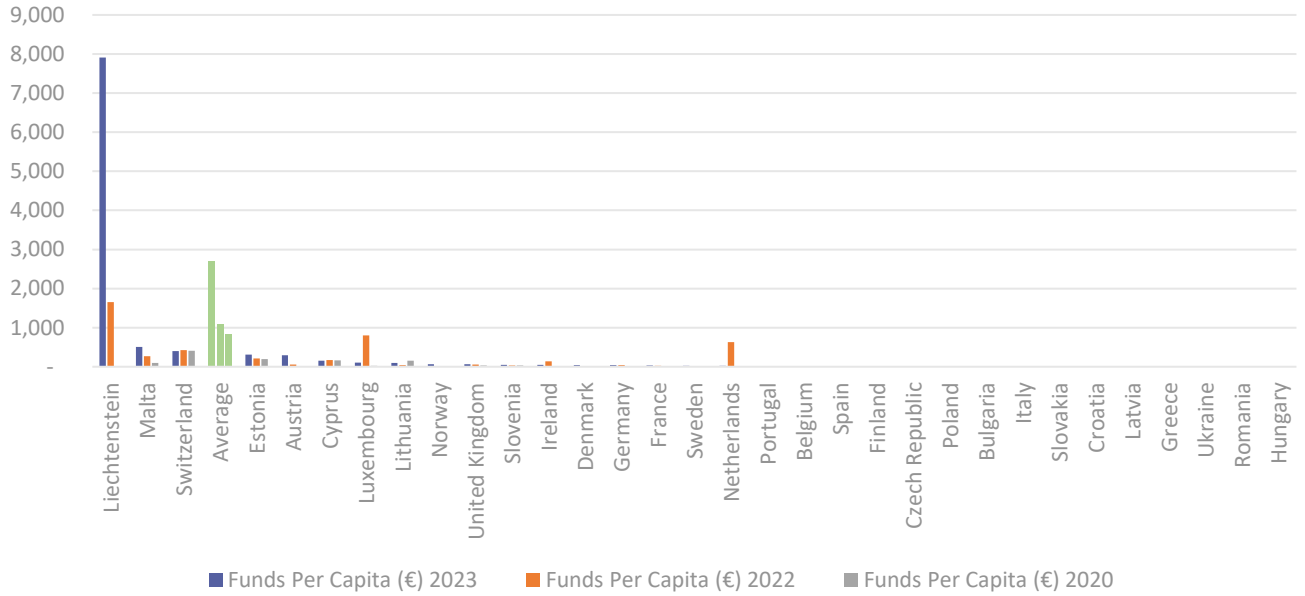


¹⁷⁷ Owing to limitations in data acquisition from our provider, Crunchbase, we estimate the funding secured by UK-based companies through an approximation method. This involves calculating the marginal percentage increase in funds raised relative to the percentage increase in the number of companies across all countries in our dataset. Utilising this factor, we then estimate the capital raised by UK enterprises, based on the percentage growth in their numbers.

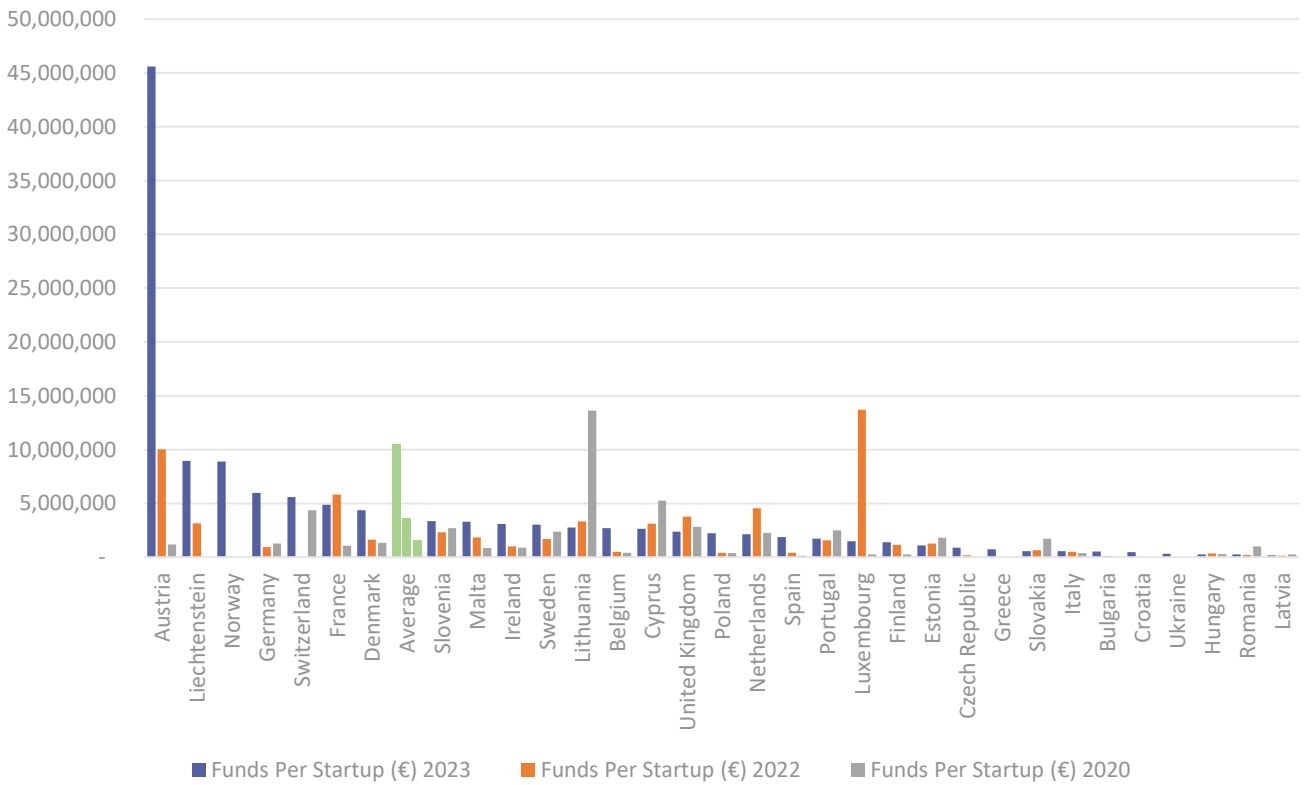


When examining the funds raised on a per capita basis, standout figures for Liechtenstein and Estonia are likely influenced by their relatively small populations, which can amplify per capita metrics. Similarly, the per startup metrics seek to normalise differences between absolute numbers but faces similar limitations.

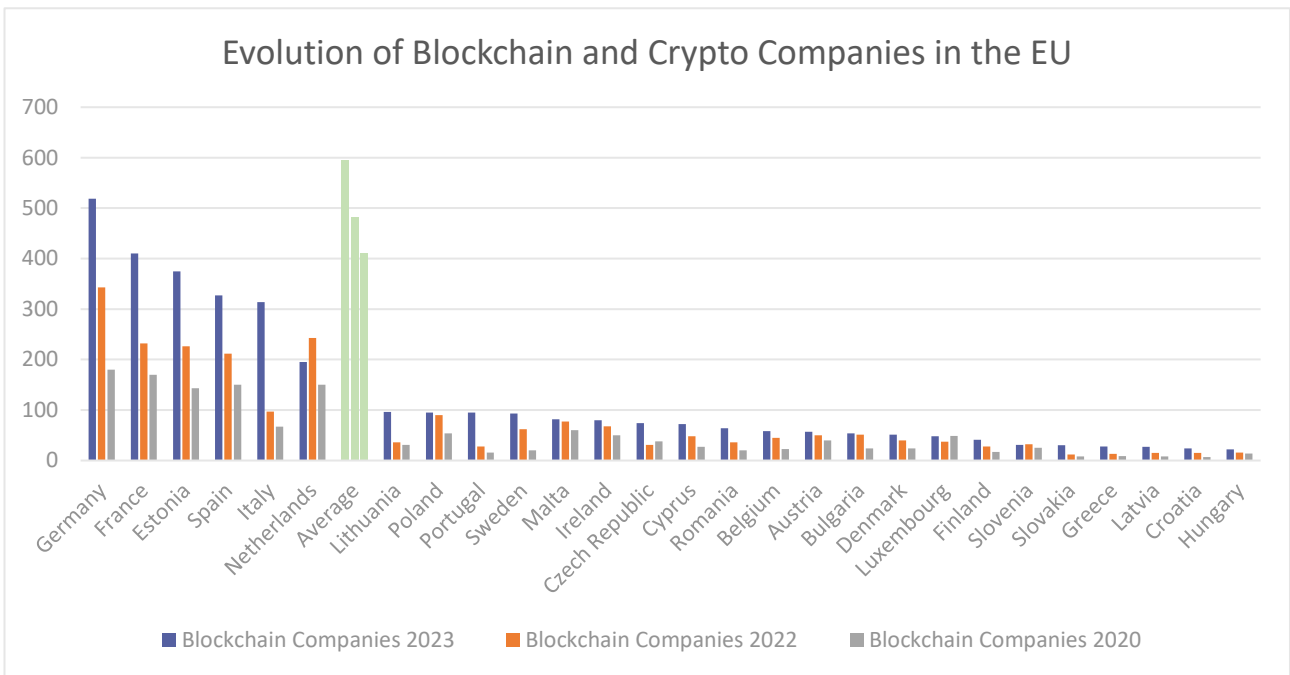
Countries by Funds Raised per Capita by Blockchain and Crypto Companies

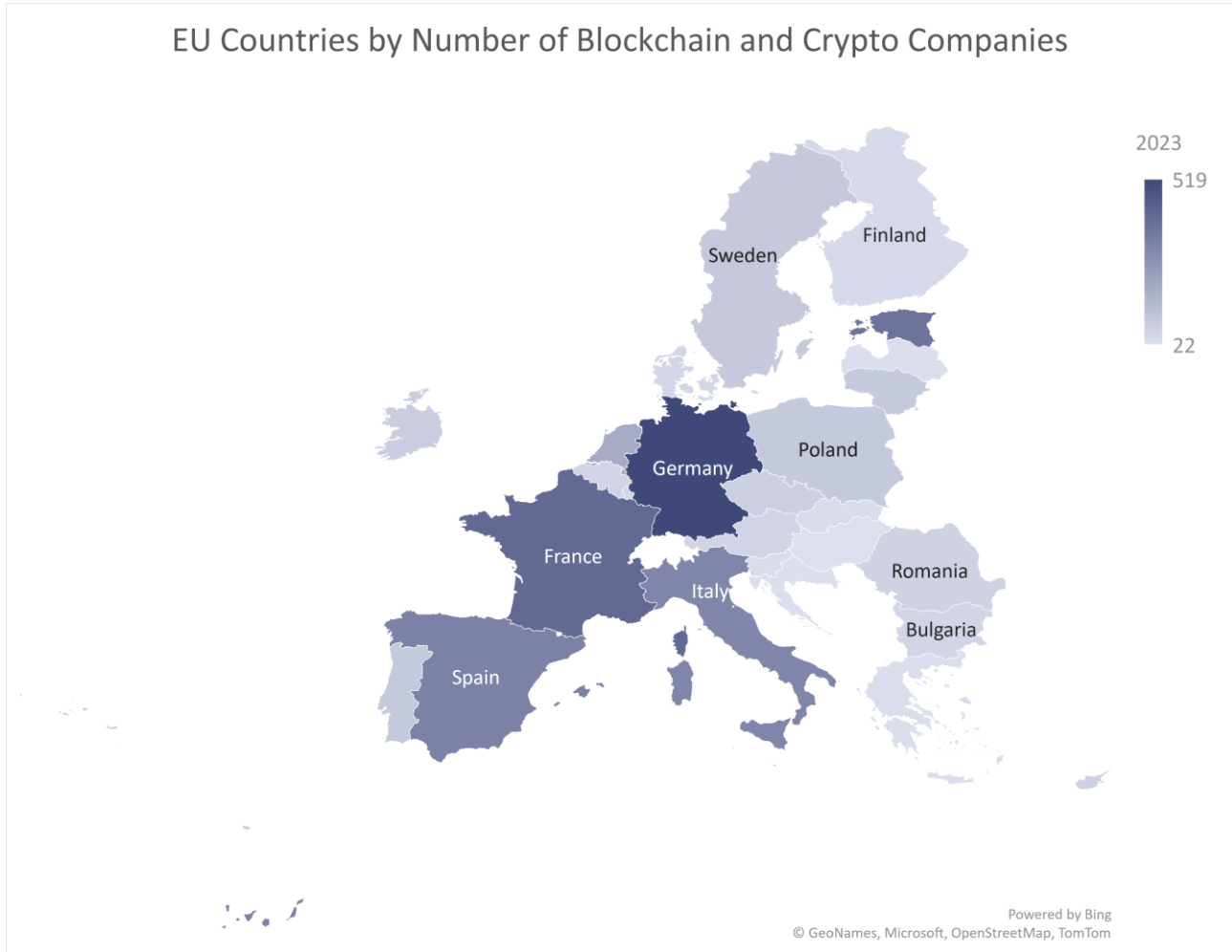


Countries by Funds Raised per Company by Blockchain and Crypto Companies



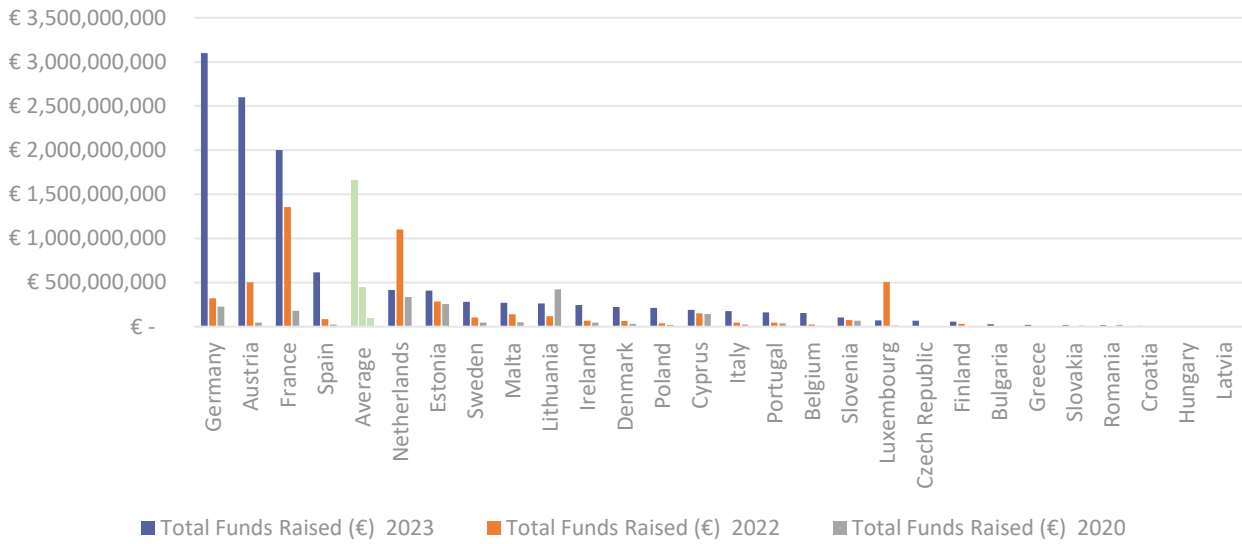
When considering EU countries in isolation, data suggests a steady increase in the number of blockchain companies. Germany, France, and Estonia have shown notable rises in company numbers, reflecting wider acceptance and integration of blockchain technology within their economies. The average number of companies in the listed countries has grown, indicating a general upward trend within the EU. This growth may correlate with a supportive regulatory environment and increasing openness to digital innovation in these regions. Countries like Italy and Portugal show significant proportional increases, albeit from smaller bases, suggesting emerging hubs of blockchain activity. The consistent increase across the board hints at a healthy and expanding blockchain industry within the European Union.



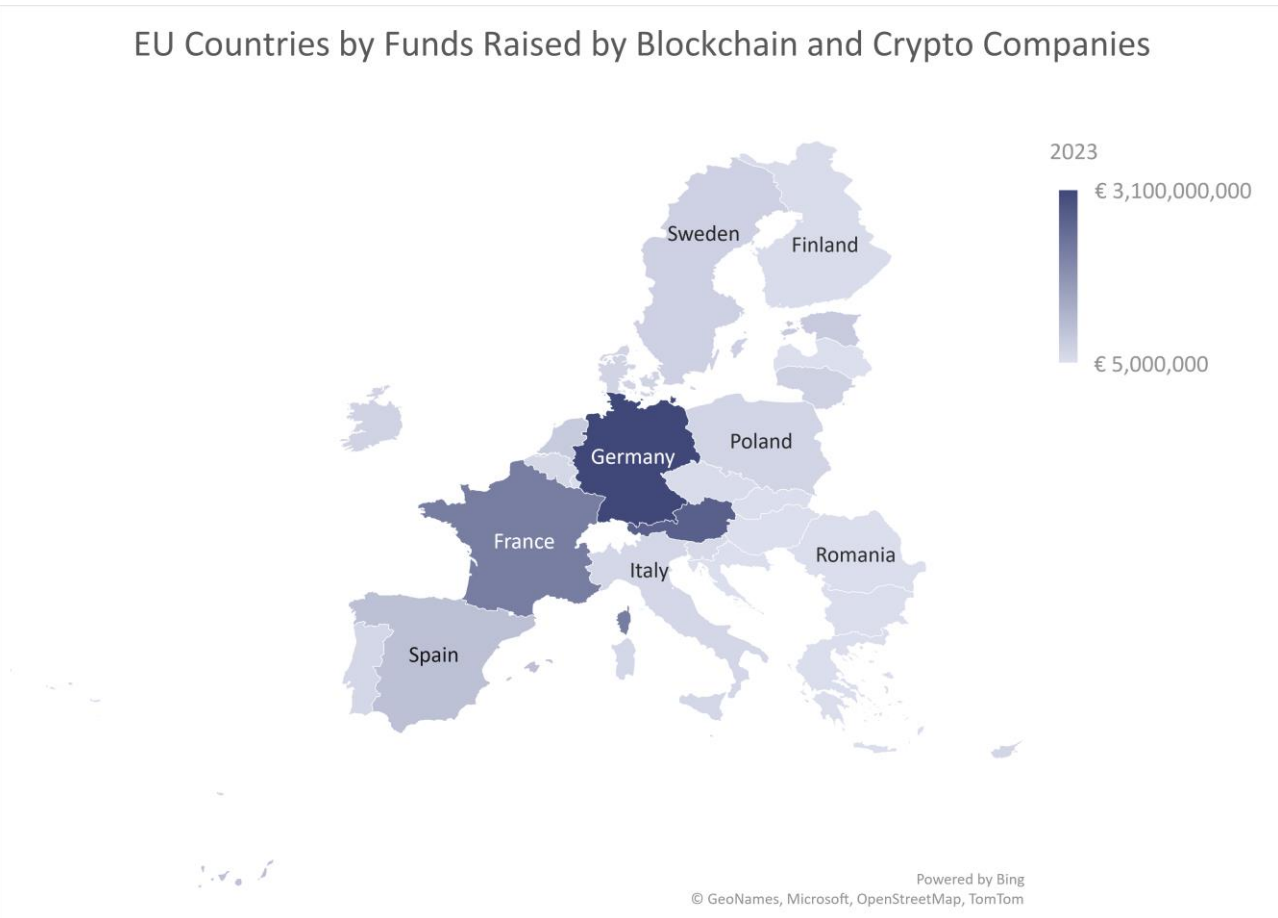


Data for total funds raised by blockchain companies in EU countries from 2020 to 2023 presents a landscape of growing financial investment within the sector. Germany, Austria, and France have experienced substantial increases in capital raised, suggesting an expanding appetite for blockchain ventures and perhaps a maturing market in these regions. The average funds raised across the countries have shown significant growth, pointing to a broader trend of increased funding for the blockchain industry within the EU. This trend is also evidenced by Spain's marked increase in funds raised from 2020. While these figures are indicative of the industry's overall health and investor confidence, they may also reflect an increase in the scale and scope of blockchain projects requiring considerable capital. It's notable that countries with smaller economies, such as Malta and Lithuania, have seen considerable absolute investment amounts, indicating that size does not preclude the ability to attract substantial funding in the blockchain domain - and in certain cases the opposite is true.

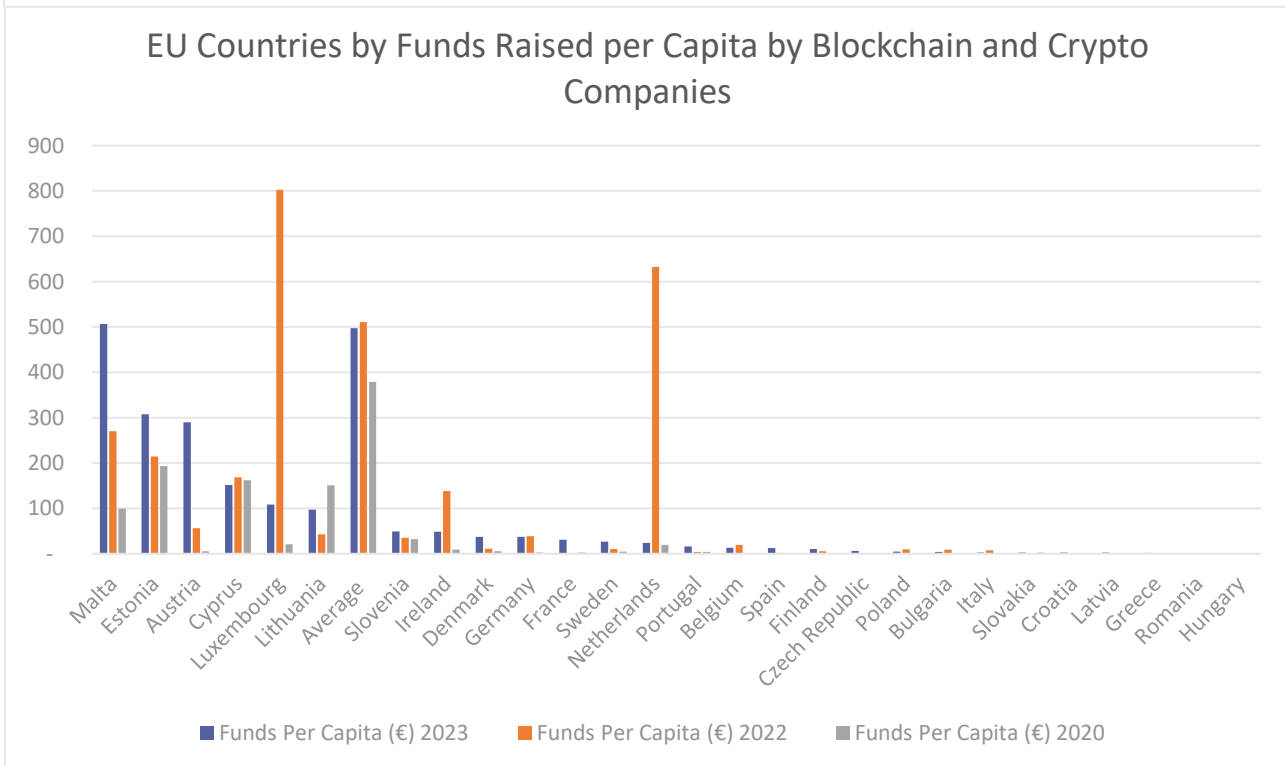
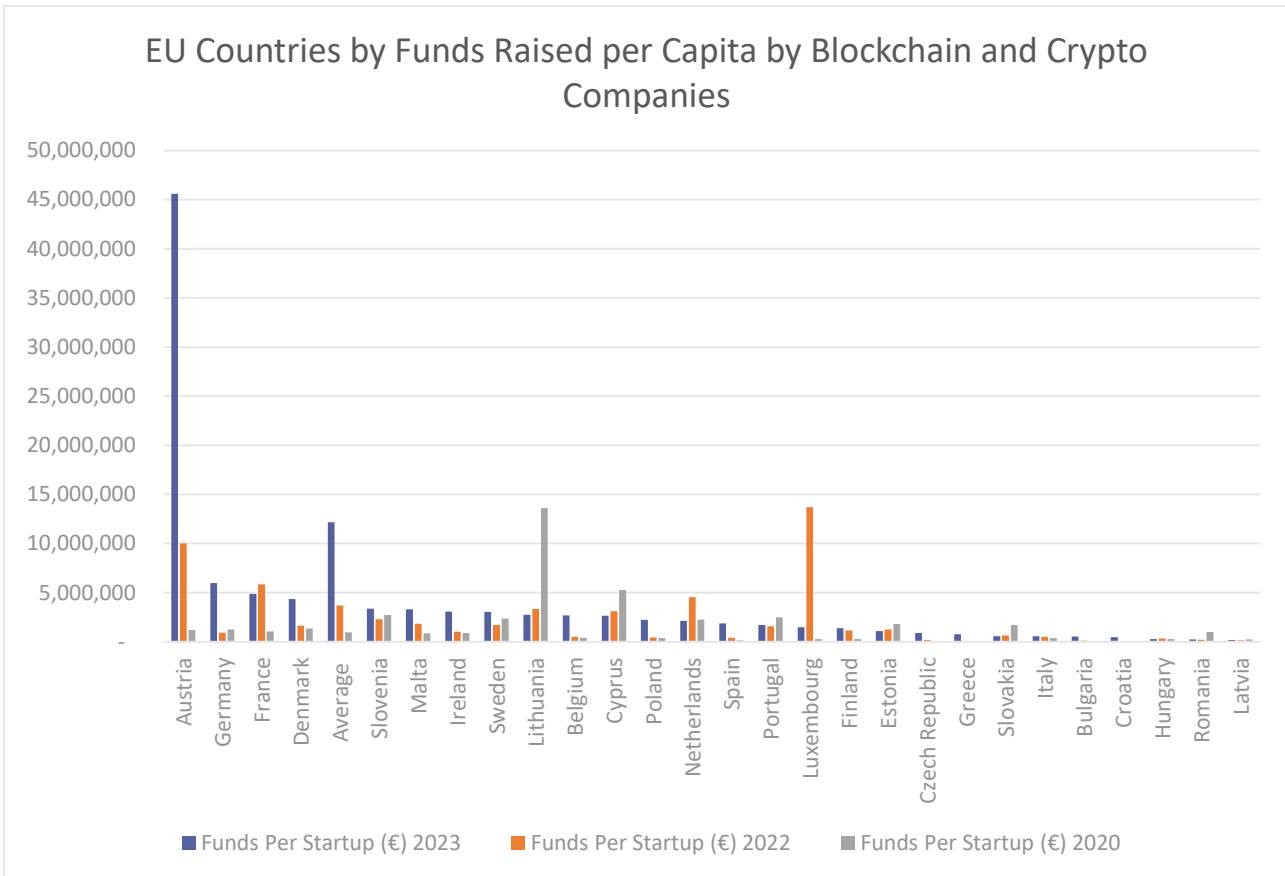
Evolution of Total Funds Raised by Blockchain and Crypto Companies in the EU



EU Countries by Funds Raised by Blockchain and Crypto Companies



Data on a per capita/company basis, as well as the full data for EU countries are presented below.



Blockchain Companies				Total Funds Raised (€)			Funds Per Capita (€)			Funds Per Startup (€)					
Countries	2023	2022	2020		2023	2022	2020	Countries	2023	2022	2020	Countries	2023	2022	2020
Germany	519	343	180	Germany	€ 3,100,000,000	€ 320,576,878	€ 227,500,000	Malta	506	270	99	Austria	45,614,035	10,026,641	1,175,000
France	410	232	170	Austria	€ 2,600,000,000	€ 501,332,070	€ 47,000,000	Estonia	308	214	193	Germany	5,973,025	934,626	1,263,889
Estonia	375	226	143	France	€ 2,000,000,000	€ 1,353,542,531	€ 181,500,000	Austria	290	56	5	France	4,878,049	5,834,235	1,067,647
Spain	327	212	150	Spain	€ 614,000,000	€ 87,126,423	€ 23,000,000	Cyprus	152	169	162	Denmark	4,352,941	1,628,901	1,345,833
Italy	314	97	67	Netherlands	€ 415,000,000	€ 1,102,503,952	€ 337,000,000	Luxembourg	108	802	21	Slovenia	3,354,839	2,305,690	2,708,000
Netherlands	195	243	150	Estonia	€ 407,000,000	€ 285,012,344	€ 257,000,000	Lithuania	97	43	151	Malta	3,304,878	1,841,314	850,000
Lithuania	96	36	31	Sweden	€ 282,000,000	€ 105,450,373	€ 47,330,000	Slovenia	49	35	33	Ireland	3,075,000	1,016,140	900,000
Poland	95	90	54	Malta	€ 271,000,000	€ 141,781,174	€ 51,000,000	Ireland	49	138	9	Sweden	3,032,258	1,700,812	2,366,500
Portugal	95	28	16	Lithuania	€ 264,000,000	€ 119,557,315	€ 422,000,000	Denmark	38	11	6	Lithuania	2,750,000	3,321,037	13,612,903
Sweden	93	62	20	Ireland	€ 246,000,000	€ 69,097,546	€ 45,000,000	Germany	37	39	3	Belgium	2,689,655	502,597	413,043
Malta	82	77	60	Denmark	€ 222,000,000	€ 65,156,045	€ 32,300,000	France	31	20	3	Cyprus	2,652,778	3,119,581	5,259,259
Ireland	80	68	50	Poland	€ 211,000,000	€ 38,161,148	€ 20,000,000	Sweden	27	10	5	Poland	2,221,053	424,013	370,370
Czech Repub	74	31	38	Cyprus	€ 191,000,000	€ 149,739,880	€ 142,000,000	Netherlands	24	632	20	Netherlands	2,128,205	4,537,053	2,246,667
Cyprus	72	48	27	Italy	€ 176,000,000	€ 47,391,179	€ 25,600,000	Portugal	16	4	4	Spain	1,877,676	410,974	153,333
Romania	64	36	20	Portugal	€ 163,000,000	€ 44,006,295	€ 40,000,000	Belgium	13	20	1	Portugal	1,715,789	1,571,653	2,500,000
Belgium	58	45	23	Belgium	€ 156,000,000	€ 22,616,845	€ 9,500,000	Spain	13	2	0	Luxembourg	1,479,167	13,708,009	265,306
Austria	57	50	40	Slovenia	€ 104,000,000	€ 73,782,086	€ 67,700,000	Finland	10	6	1	Finland	1,390,244	1,139,506	270,588
Bulgaria	54	51	24	Luxembourg	€ 71,000,000	€ 507,196,332	€ 13,000,000	Czech Republic	6	1	0	Estonia	1,085,333	1,261,117	1,797,203
Denmark	51	40	24	Czech Repub	€ 66,000,000	€ 5,516,757	€ 1,450,000	Poland	5	10	1	Czech Repub	891,892	177,960	38,158
Luxembourg	48	37	49	Finland	€ 57,000,000	€ 31,906,171	€ 4,600,000	Bulgaria	4	9	0	Greece	750,000	11,643	16,333
Finland	41	28	17	Bulgaria	€ 29,000,000	€ 6,389,975	€ 620,000	Italy	3	8	0	Slovakia	566,667	634,359	1,712,500
Slovenia	31	32	25	Greece	€ 21,000,000	€ 151,360	€ 147,000	Slovakia	3	1	3	Italy	560,510	488,569	382,090
Slovakia	30	12	8	Slovakia	€ 17,000,000	€ 7,612,306	€ 13,700,000	Croatia	3	0	0	Bulgaria	537,037	125,294	25,833
Greece	28	13	9	Romania	€ 16,000,000	€ 7,443,370	€ 20,000,000	Latvia	3	1	1	Croatia	458,333	6,995	7,143
Latvia	27	15	8	Croatia	€ 11,000,000	€ 104,922	€ 50,000	Greece	2	0	0	Hungary	272,727	349,627	285,714
Croatia	24	15	7	Hungary	€ 6,000,000	€ 5,594,030	€ 4,000,000	Romania	1	0	1	Romania	250,000	206,760	1,000,000
Hungary	22	16	14	Latvia	€ 5,000,000	€ 2,135,012	€ 2,000,000	Hungary	1	1	0	Latvia	185,185	142,334	250,000
Average	595	482	411	Average	€ 1,662,800,405	€ 452,515,985	€ 95,800,404	Average	498	511	379	Average	12164015	3685285	970878

Blockchain Ecosystem Growth

The European Union has been proactive in developing a cohesive regulatory framework for blockchain and crypto-assets, reflecting its commitment to fostering innovation while ensuring consumer protection and financial stability. It had established itself as a leading centre for crypto innovation with anti-money laundering (AML) regulation in 2019/2020, which was implemented in an inconsistent manner.

In an effort to unify the approach across member states and prevent regulatory fragmentation, the European Commission introduced a comprehensive legislative package titled [Markets in Crypto-Assets \(MiCA\)](#), designed to bring clarity to the crypto-assets market. MiCA's proposals included regulations on crypto-asset issuance and service providers, stablecoins, and measures to prevent market abuse. It is intended to help streamline distributed ledger technology (DLT) and virtual asset regulation in the EU whilst protecting users and investors. MiCA was approved on 20 April 2023 by the EU Parliament. With MiCA, the EU has become the first leading jurisdiction globally to roll out a detailed regulation framework for the sector. **As shown in the report, many EU member states are actively preparing to implement MiCA by amending their national regulations.**

Simultaneously, the EU has explored the potential of a [digital Euro](#), with the European Central Bank (ECB) and European Commission analyzing a wide array of policy, legal, and technical questions related to its implementation. This investigation aligns with their mandates and the independence established by the EU Treaties.

Further emphasizing its commitment to technological advancement, the EU has set up a [pan-European blockchain regulatory sandbox](#) under the aegis of the [European Blockchain Partnership](#). This innovative platform unites regulators, companies, and technology experts to pilot and refine blockchain applications across various sectors, including health, environment, mobility, and energy. The sandbox is designed to identify and overcome practical and regulatory challenges, thereby facilitating the broader adoption of blockchain technology and enhancing Europe's digital infrastructure. This strategic move not only supports technological growth but also positions the EU as a leader in blockchain innovation and governance.

In summary, the European Union has continued to take proactive steps in developing a cohesive regulatory framework for blockchain and crypto-assets. With the implementation of MiCA, the EU has established a clear regulatory environment aimed at streamlining distributed ledger technology and virtual asset regulation, enhancing user and investor protections. Additionally, the exploration of a digital Euro by the ECB and the European Commission highlights the EU's commitment to integrating blockchain technology into its monetary systems, further reinforcing its position as a leader in blockchain innovation and governance.

Conclusions

State of the union: a country-level analysis of 31 countries

As with previous reports, we have analysed the status in each EU Member State (as well as Norway, Liechtenstein, the UK, Ukraine, and Switzerland) across two dimensions:

Regulatory Maturity Curve: This dimension measures the degree of top-down support provided by national or regional governments. On this axis, we have grouped countries into three broad categories, namely:

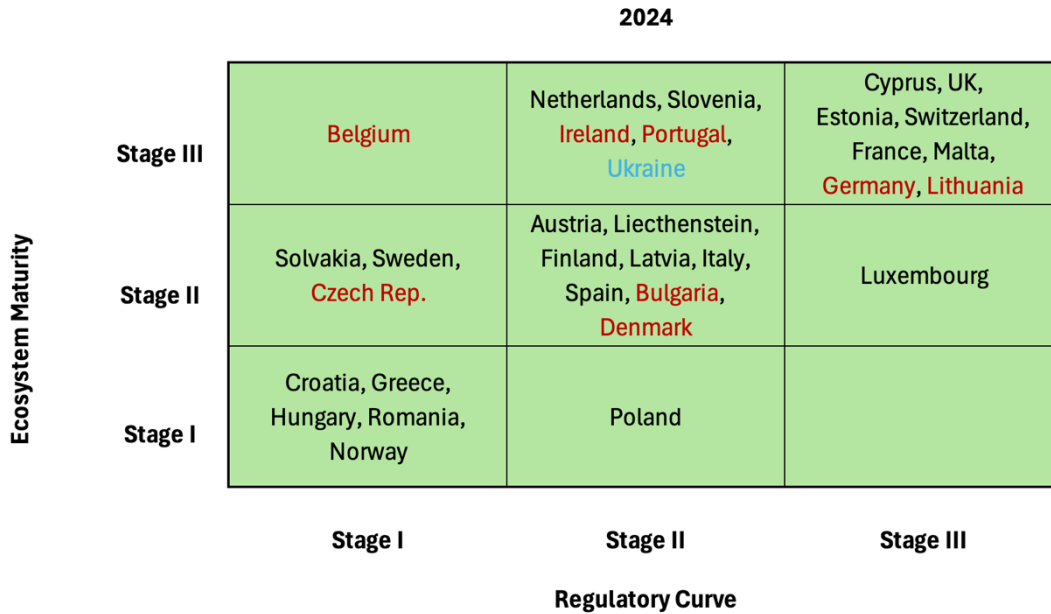
- **Stage I Regulatory Maturity**, where no significant specific blockchain or virtual assets-related legislation exists, save perhaps for warnings issued by local authorities in the context of investor protection or other minor state initiatives.

- **Stage II Regulatory Maturity**, where the state has shown signs of significant involvement with the field, either through the adoption of wider regulatory schemes (for example, related to KYC/AML, but also explicitly touching upon virtual assets, such as the regulation of alternative forms of financing, ICOs, STOs) or through other specific measures, which might include government-sponsored studies (for example, taxonomies of virtual assets as far as applicable existing regulation is concerned) or government-sponsored pilot applications of blockchain in the public sector. An established framework for the taxation of virtual currencies and digital assets is another characteristic of countries that fall under Stage II.
- **Stage III Regulatory Maturity**, where either specific legislation for blockchain or virtual assets has been voted on or published, and/or the government has announced a sovereign national strategy/vision, specific to blockchain (or for new technologies, explicitly addressing blockchain). Regulatory sandboxes, innovation hubs, and other initiatives that allow blockchain, FinTech, and other firms to pilot novel implementations, as well as the involvement of the banking sector, are also characteristics of countries in Stage III.

Ecosystem Maturity Curve: This dimension measures the degree of bottom-up development of the local ecosystem in each country, as evidenced through three main indicators – presence of a local business/startup ecosystem; number of blockchain-related formal education and academic research initiatives; number of user-driven communities around blockchain or virtual assets. Again, we have grouped countries into three broad categories:

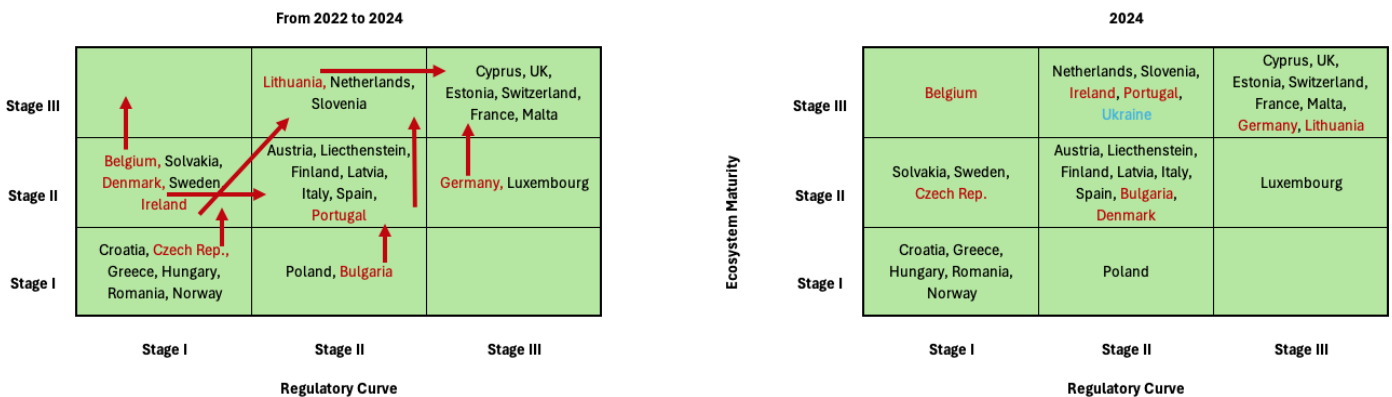
- **Stage I Ecosystem Maturity**, where there is evidence of sizeable and dynamic initiatives in none or one of the three indicators (business, academia, communities).
- **Stage II Ecosystem Maturity**, where there is evidence of sizeable and dynamic initiatives in at least two of the three indicators.
- **Stage III Ecosystem Maturity**, where there is evidence of sizeable and dynamic initiatives in all three indicators.

According to the above classification, we can position the 32 countries we have studied into a 3x3 matrix, as shown in the following figure. It must be noted that, naturally, the borders between categories are by definition porous, and countries may not always objectively belong strictly to one of the matrix categories. Moreover, our process for categorisation does not rely on strict quantitative metrics, but rather the authors' and experts' opinion and experience. It must also be stressed that this is a fast-evolving space, so that all countries are expected to gradually move from the bottom-left to the top-right part of the matrix, especially as regulation becomes more standardised. As a matter of fact, this trend has been observed in the reports we have produced, where most countries have moved diagonally right (up in the regulatory and ecosystem curve) as time passes. Notwithstanding this, the matrix is a helpful instrument in assessing the current status of the European blockchain ecosystem as of 2024.



When we compare the current report with the previous one, we notice subtle but noteworthy transitions along the regulatory curve and more pronounced evolutions within the ecosystem maturity landscape. This trend supports the argument we made, i.e., that a maturing ecosystem typically precedes regulatory developments, suggesting that regulations tend to follow in response to the expansion of the private sector's activities. Notably, with a few exceptions, most countries have maintained their previously established positions on the matrix. In the domain of regulatory maturity, most countries have introduced no major new legislation, with the exception of Denmark and Lithuania, which have shown progress. Denmark has moved up in the regulatory curve, and Lithuania has also advanced its regulatory framework, as outlined in our factsheets.

Shifts in the ecosystem were mostly attributed to the growth in the number of companies and the influx of related funding. Belgium, Bulgaria, Ireland, and Germany have moved up in the ecosystem maturity, indicating an increase in the number of companies and the influx of related funding. The Czech Republic has similarly advanced in ecosystem maturity reaching level II. Germany and Ireland have progressed to level III on both axes.



When comparing this with the findings of our previous reports, we note a trend whereby regulatory clarity marginally lags behind ecosystem development. This suggests that legislation is, at least for the countries with the most developed ecosystems, reactionary. It will be interesting to observe how subsequent pan-European legislation influences ecosystem development where this lag effect was not observed. In other words, whether regulation preceding ecosystem development can have a positive effect on the advancement of said ecosystem. This will provide important insights for regulators and policymakers in that area, as well as in other adjacent areas.

Simultaneously, we also observe countries moving diagonally right—up in both regulatory and ecosystem maturity curves—in each subsequent report. With most of the activity concentrated in the lowest quadrants, this potentially suggests an effect whereby, as the wider ecosystem develops, this development has positive spillover effects on individual countries' ecosystems. The most intuitive justification for this are the positive externalities and synergies created within the single European market.

Finally, in our previous reports, we observed that smaller countries with agile regulatory frameworks and developed tech ecosystems were the first to move to the higher quantiles. Subsequently, larger countries with developed regulations, relying on positive ecosystem synergies, moved to the upper quantiles. In the final report, we observe no discernible pattern, suggesting that after the initial stages of development, all countries are moving upwards as the ecosystem matures. With regard to countries that remain in the first quantile on both regulatory and ecosystem maturity, there is again no discernible pattern observed.

