

Crypto Regulation and the Case for Europe



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Abstract The blockchain phenomenon has seen an extraordinary rise to prominence. The technology has grown at a revolutionary speed across many sectors and within little over a decade. It is no longer a niche technology for geeks, but a formidable innovation capable of triggering a paradigm shift, not only in finance, but within the society as a whole. While the blockchain industry has experienced an unprecedented growth, regulators struggled to keep pace with this innovation, both in terms of understanding this phenomenon and adapting or providing adequate legal and regulatory frameworks. As a result, legal and regulatory uncertainties are some of the main obstacles for blockchain innovation. This paper seeks to analyze regulators' and policymakers' efforts to understand and develop an adequate regulatory approach to crypto assets, tokens, and the distributed ledger technology (DLT) in Europe and illustrates the evolution of regulatory perception and recognition of this innovation. As the EU regulator remained passive for some time toward blockchain innovation except for a few inconsequential statements or reports, the EU countries tried to address this innovation individually and mostly attempted to apply existing legal framework to blockchain, with limited success. This paper gives an example of Liechtenstein as a jurisdiction that developed a comprehensive, bespoke and unique law that creates an entirely new legal architecture and principles to enable the token economy. It also outlines the EU latest initiative to create unique and bespoke regulation to govern markets in crypto assets and highlights the challenge of regulating the dynamically developing blockchain technology for the entire European region.

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1 Introduction

With Bitcoin, a new type of technology was born in 2008 when Satoshi Nakamoto released the white paper for a new cash payment system (Nakamoto 2008), which effectively invented blockchain technology. By 2015 the technology already gained a lot of interest among startups, financial institutions, and industrial enterprises. Besides Bitcoin, many other crypto assets emerged with various design approaches such as stablecoins, utility tokens, security tokens, decentralized finance (DeFi), and non-fungible tokens (NFTs). Many of these tokens have an identifiable issuer to whom existing regulatory frameworks could potentially apply. However, other types of assets that are based on fully decentralized protocols are governed entirely by technology and either do not have an issuer (like in the case of Bitcoin) or the initiators designed the technology in an “issuerless” way—and have no relation to any “real-world asset”. It is the latter class of assets that are truly new and that have recently attracted increasing attention from regulatory authorities, international organizations, standard-setting bodies, and the like.

On the part of regulators and policymakers, interest in and the activity surrounding cryptocurrencies, crypto assets, and stablecoins peaked in 2019 so far. Of the several key regulators and policymakers at the supra-national level, nearly all issued a report, warning, study, or recommendations on some aspect of blockchain technology in financial markets.¹ This spike in interest is related to the increasing business activity in this area and growing interest of investors and consumers. The exponential rise in the price of Bitcoin also attracted the interest of a wider audience [1]. The increasing business activity always preceded the actions of regulators and policymakers, thus rendering the activities of the latter a “reaction” to the market developments.

According to the Financial Stability Board (FSB), crypto assets reached an estimated total market capitalization of \$830 billion on January 8, 2018, before falling sharply in subsequent months [2]. While the global value of the crypto assets market is still relatively small compared to the entire financial system, its absolute value and daily transaction volume are substantial, and its rapid development continues, gaining increasing market acceptance [3].

This paper seeks to analyze regulators’ and policymakers’ efforts to understand and develop an adequate regulatory approach to crypto assets, tokens, and the distributed ledger technology (DLT) in general. After several years of innovation in the space of decentralized technologies, several principles became clear on how to treat both issuer-based tokens and issuerless tokens. However, when regulators and policymakers tried at first to understand these new decentralized technologies and the assets they enable, it was not clear to them from the beginning how to treat assets based on this new technology. Only recently has it been possible to identify best regulatory practices and to disentangle good approaches to regulation from the “noise”

¹ These include: European Central Bank, European Banking Authority, European Securities and Markets Authority, Bank for International Settlements, Financial Stability Board, Organisation for Economic Co-operation and Development, International Monetary Fund, Financial Action Task Force, International Organisation of Securities Commission and G7.

of warnings, recommendations, or studies. Liechtenstein has adopted a remarkable perspective on and vision for crypto assets and tokens by creating a set of abstract definitions and models and applying them in their bespoke regulatory approach. The Liechtenstein Token Act has therefore inspired other policymakers and subsequent regulatory actions.

The remainder of this paper is structured as follows. First, we seek to present the history of “opinions” on behalf of regulatory bodies and policymakers over the last years. These opinions often lacked clear definitions, understanding, and models but also included valuable contributions. In the next section, we present key definitions and models of the Liechtenstein Token Act and describe how these have been included in Liechtenstein’s national framework to build a solid basis for the emerging token economy. Thereafter, we describe how the European Union’s approach to regulate crypto assets—the Markets in Crypto Assets Regulation (**MiCA**)—tackles crypto assets and tokens, and how it relates to the Liechtenstein Token Act. In the subsequent section, we review a variety of regulatory approaches and strategies. Finally, we offer concluding remarks.

2 Evolution of Regulatory Views on Blockchain

2.1 First Institutional Statements Before 2016—Cryptocurrencies in Focus

The first official statements and analysis focused on virtual currencies. The European Banking Authority (**EBA**) first issued a public warning against risky and unregulated virtual currencies in 2013. The role of the EBA is to monitor new and existing financial activities and adopt guidelines and recommendations to promote the safety and soundness of markets and convergence of regulatory practice. The EBA followed with an opinion on virtual currencies in 2014. It identified more than 70 risks arising from virtual currencies across several categories including risks to users, non-user market participants, financial integrity, existing payment systems, regulatory authorities, and the risk of money laundering and other financial crime [4]. In 2014, the EBA did not recommend a comprehensive regulatory approach addressing all identified risks, but did suggest immediate fragmented measures including governance requirements, capital requirements, and the segregation of client accounts. It also discouraged credit institutions, payment institutions, and e-money institutions from buying, holding, or selling virtual currency to shield regulated financial services from virtual currency schemes. The first assessment of cryptocurrencies has been one of mistrust.

2.2 Year 2016—Cryptocurrencies and First Analysis of DLT

In 2016, the European Central Bank (ECB) issued an analysis of virtual currency schemes. It reiterated and confirmed its earlier considerations and reaffirmed that risks from virtual currency schemes are actually low and not material in terms of monetary policy, price stability, financial stability, and the operation of payment systems [5]. The ECB also acknowledged potential advantages of virtual currencies for users, including challenging existing payment solutions regarding costs, global reach, payer anonymity, and speed of settlement. Furthermore, the ECB noted that virtual currency schemes could potentially become more successful than those incumbent, specifically in virtual communities, closed-loop environments, and cross-border payments. This was a more positive and encouraging stance on cryptocurrencies than the earlier EBA opinion.

After the first wave of official statements and reports on virtual currencies, the ECB issued a paper in 2016 analyzing DLT in securities post-trading [6]. In the paper, the ECB speculated that DLTs might enter securities markets. At the time (in 2016), the technology was still in the early development stage, and it was uncertain whether it would be “widely adopted in the securities market, and whether its adoption will address current market inefficiencies” ([6], p. 3). In parallel with the ECB, in early 2017, the European Securities and Markets Authority (ESMA) issued a report on the DLT applied to securities markets [7]. ESMA is an independent EU authority that contributes to safeguarding the stability of the EU’s financial system by enhancing the protection of investors and promoting stable and orderly financial markets. It has full accountability toward the European Parliament, the Council of the European Union, and the European Commission. In its 2017 report, the ESMA identified several challenges of DLT to be addressed before its benefits can materialize. It noted interoperability issues, lack of common standards, and potential privacy and scalability problems. While the ESMA emphasized that the existing regulatory framework could apply to blockchain, it also acknowledged that some regulatory requirements could become less relevant and additional regulations might be needed to mitigate emerging risks. In 2017, the ESMA only considered potential regulatory impediments for the emergence of blockchain technology, as it was premature to fully appreciate the impact of the technology and resulting regulatory needs. The ESMA has not found any impediments in the EU regulatory framework to prevent blockchain technology from developing and fully emerging. Although the ESMA focused on securities markets, it also highlighted the need to clarify broader legal issues beyond financial regulations, including legal certainty and issues pertaining to corporate, contract, competition law, and DLT. Although the technology has now developed beyond speculations about whether it would be adopted in financial markets, most issues persisted, and many problems remained unresolved, including interoperability and the lack of common standards.

2.3 Year 2017—ICOs Controversies and First Acknowledgements of Crypto Assets

Not long ago, DLT was just starting to be noticed and scrutinized by regulators and supervisory bodies. Blockchain was still considered an immature technology and any dedicated regulation precipitate. The potential impact on financial markets and uptake of the technology in financial services was also unclear. However, the blockchain industry has rapidly grown, and 2017 was marked by a meteoric rise in Initial Coin Offerings (ICOs) and a massive increase in the value of various cryptocurrencies [8].

Also in 2017, first, the US Securities and Exchange Commission (SEC) warned investors about ICOs [9], and second, China and South Korea banned ICOs [10, 11], calling them “illegal fundraising”. Third, in Europe, the ESMA issued two statements on ICOs, one on risks for investors and another on the rules applicable to firms involved in these offerings [12]. Regulators began realizing both the potential of this technology for financial markets and the magnitude of the associated risks. In its Fintech Action Plan of 2018, the **European Commission** acknowledged that crypto assets had become a worldwide phenomenon and a promising new type of financial asset; however, their high volatility, fraud, operational weaknesses, and vulnerabilities posed many risks. It also admitted for the first time that it was necessary to assess the suitability of the EU regulatory framework regarding crypto assets. The European Commission decided to continue monitoring the development of crypto assets and work together with supervisors, regulators, industry, civil society, and international partners to determine any further course of action [24]. It has also mandated the EBA and ESMA to assess the applicability and suitability of the existing EU financial services regulatory framework to crypto assets.

2.4 Year 2018—Cryptocurrencies and Crypto Assets—Focus on Risks and Concerns

In 2018, two reports commissioned by the **European Parliament** were produced. The first report on virtual currencies and central banks’ monetary policy acknowledged that financial regulators may dislike virtual currencies because of their anonymity or cross-border circulation, money laundering risks, financing of illegal activities, tax avoidance, circumvention of capital controls, and fraudulent financial practices [13]. However, the report recommended that regulators treat virtual currencies as any other financial transaction or instrument proportionally to their market importance, complexity, and associated risks. The report also suggested the cross-border harmonization of regulations. The borderless and disintermediated character of the technology was becoming an issue confronting regulators, and only international cooperation could provide comprehensive regulatory solutions to this new phenomenon. The second commissioned report, on cryptocurrencies and blockchain, focused on the use of cryptocurrencies in financial crime, money laundering, and tax

evasion [14]. It recommended that the fight against these activities should focus on cases of the illicit use of cryptocurrencies, while leaving blockchain untouched from the perspective of money laundering, terrorist financing, and tax evasion. The EU also amended its Fourth Anti-Money Laundering Directive to include virtual currency trading platforms and hosting wallets as entities subject to AML and combating the financing of terrorism (CFT) requirements.²

Finally, 2018 concluded with a Financial Stability Board (**FSB**) report on the crypto assets market and potential channels for future financial stability implications [2]. The FSB is an international body established to coordinate the work of national financial authorities and international standard-setting bodies to develop and promote the implementation of effective regulatory, supervisory, and other financial sector policies. In its report, the FSB concluded that although crypto assets did not pose a material risk to global financial stability, they raised several broader policy issues. It recommended vigilant monitoring. The primary identified risks that could have future implications for financial stability are related to market liquidity, volatility, leverage, technology, and operations. By 2018, several national regulatory bodies in the EU were already actively monitoring the regulatory implications of crypto assets, increasing their oversight and supervision; and issuing guidance, warnings, and clarifications on the applicability of the legal framework.

2.5 Year 2019—Peak of Interest in ICOs and Crypto Assets and the Impact of Libra

Pre-Libra Institutional Activity

After a busy 2018, during which the interest and activity of regulatory bodies in crypto assets, blockchain, and virtual currencies increased, 2019 witnessed an explosion of reports, statements, and recommendations issued by several EU and international regulatory and supervisory bodies. As such, crypto assets firmly entered the regulatory agenda. In the meantime, however, the market for token sales and new ICOs collapsed in 2018 and stalled in 2019 [15].

In January 2019, the **ESMA** issued advice on ICOs and crypto assets [16], and the **EBA** issued a report on crypto assets [31]. The ESMA recognized that the main challenge from the increasing presence of crypto assets in the market is the lack of clarity on the applicability of the existing regulatory framework to these new types of assets. It noted that while the current regulatory framework might apply to some crypto assets, it might need to be clarified and reconsidered for new types

² Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU, PE/72/2017/REV/1, OJ L 156, 19.6.2018, p. 43–74.

of assets. However, the ESMA also emphasized considering whether the regulations should be expanded to cover crypto assets and related activities that remain outside the regulatory governance framework. In these considerations, the ESMA advocated a technology-neutral approach to ensure that similar activities are subject to the same standards regardless of their form. It identified and made recommendations regarding regulatory gaps, for when crypto assets qualify as transferable securities or other types of financial instruments and are subject to the relevant financial regulations,³ and when they do not fall within an existing regulatory framework (when they do not qualify as financial instruments or other regulations relating to non-financial instruments like the E-Money Directive,⁴ for example). Notably, as some EU member states initiated regulatory efforts to establish national rules, the ESMA highlighted a concern over the divergent national approaches to crypto assets in the EU and the emerging bespoke regulations at the national level, which given the cross-border nature of crypto assets, could hamper regulatory harmonization across the EU. Similarly, the EBA expressed concern about the proliferation of uncoordinated legislative and supervisory actions at the national level, which can give rise to many risks to consumer protection, operational resilience, a level playing field, and market integrity. The EBA also concluded that activities related to crypto assets in the EU are thus far limited and pose no risks to financial stability overall. In addition, it recommended that the European Commission undertake a cost-benefit analysis to decide whether EU-level action is appropriate and feasible ([4], p. 4).

The Bank of International Settlements (**BIS**), which serves central banks in their pursuit of monetary and financial stability and fosters international cooperation, acknowledged in a statement in March 2019 that while the crypto assets market is still relatively small, the continued growth of these products and trading platforms can increase concerns related to financial stability and the risks faced by banks [17]. BIS considers crypto assets an immature asset class in constant evolution and lacking agreed standards. It highlighted many risks for banks, such as those related to liquidity, markets, operations, money laundering and terrorist financing, and legal and reputational aspects. It also noted wider implications and risks from the future growth of crypto assets, including implications for monetary policy, payment systems, consumer protection, market integrity, deposit insurance and guarantee schemes, and data privacy, and taxation. As such, BIS issued a discussion paper seeking stakeholders' views on designing a prudential treatment of crypto assets [18].

³ Including: Markets and Financial Instruments Directive (MFID II) 2014/65/EU and Regulation (EU) 600/2014; The Prospectus Regulation (EU) 2017/1129 of the European Parliament and of the Council of 14 June 2017; The Prospectus Directive 2010/73/EU; Market Abuse Regulation (EU) 596/2014; Transparency Directive 2013/50/EU of the European Parliament and of the Council of 22 October 2013; Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories; Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems.

⁴ Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions.

The **OECD** has also issued a report on ICOs in which it highlights the regulatory vacuum in the crypto assets market [19]. It considers legal and regulatory uncertainties to be the main impediments for the development of ICOs as a form of financing small and medium-sized enterprises. The OECD cites the lack of a clear regulatory framework applicable to an ICO offering, unclear legal rights and obligations of token issuers and holders, and a poor understanding by the investment community of potential legal and regulatory requirements of token issuances as the main limitations of ICO offerings. The lack of regulatory clarity also applies to the underlying DLT and related legal issues of enforceability, liability, and recourse in the use of smart contracts. The OECD emphasized the risk of regulatory arbitrage and risks to investors stemming from the lack of transparency in the absence of disclosure requirements. Furthermore, it considers the clarification of regulatory and supervisory frameworks applicable to ICOs, as well as international cooperation, as stepping stones to overcome current limitations and risks, prevent regulatory arbitrage, and realize the potential of ICOs for the financing of blockchain-based enterprises while protecting investors ([19], p. 43).

In addition, the **FSB** prepared a report to update G20 Finance Ministers and Central Bank Governors on the global outlook and work underway on regulatory and supervisory approaches to crypto assets and potential gaps [20]. The report recommended that G20 keeps the topic of regulatory approaches and potential gaps under review and adopts a forward-looking risk assessment in the rapidly evolving crypto asset ecosystem. The FSB recognized that a regulatory response needs to balance the need for a coherent multilateral approach with inherent jurisdictional differences, resulting in regulatory asymmetries. Furthermore, the FSB determined that crypto assets are at the nascent stage, do not present material risks to global financial stability, and that most issues can be addressed within existing regulatory frameworks.

The International Organization of Securities Commissions (**IOSCO**), an international body and global standard setter for the securities sector, also contributed and published a report in 2019 on issues and risks associated with the trading of crypto assets on crypto asset trading platforms. The purpose of the report is to assist regulatory authorities and provide a toolkit of measures regulatory authorities can use in policymaking to govern crypto asset trading platforms. Recommended considerations for regulators include rules on access and on-boarding, safekeeping of participant assets, transparency of operations, market integrity and trading rules, price discovery mechanisms, and the resiliency and security of the technology [21].

In May 2019, the **ECB** noted that while crypto assets do not pose an immediate threat to financial stability in Europe because of their small relative value and limited links to the financial sector, diverse and unconnected national regulatory initiatives could be ineffective, facilitating regulatory arbitrage and ultimately inhibiting the resilience of the financial system as a whole. The ECB recommended a broader and balanced approach to the regulation of crypto assets, particularly with regard to risks arising from unregulated entities, including “gatekeeping” services (like custody, trading, and exchange services). In addition, the ECB noted that regulatory intervention could be complicated because of the distributed architecture of crypto assets

[22]. Thus, it distinguished two possible regulatory approaches. First, if centralized service providers carry out crypto asset activities, the existing regulatory framework may be applicable. For decentralized activities, the ECB suggested a principle-based approach to regulations coupled with an additional formal validation mechanism. Shortly after the ECB report, the **FSB** produced another report, on financial stability and the regulatory and governance implications of decentralized financial technologies [23]. The FSB noted the challenges stemming from decentralized financial technologies such as blockchain for financial regulatory and supervisory frameworks, which were designed for a centralized financial system. Such decentralized technologies could be used to avoid regulations, compromise regulatory enforcement, and increase jurisdictional uncertainty. To combat these risks, the FSB suggests considering the appropriateness, applicability, and effectiveness of current financial regulations and potential regulatory gaps. New methods of regulatory enforcement and potential gaps in supervisory systems should also be considered. The FSB recommends that any regulatory action should involve multi-stakeholders, be proportional to the risks, and technology neutral.

Based on the myriad of reports, statements, and opinions, a set of firm regulatory recommendations started to emerge, highlighting the risks, acknowledging regulatory gaps, and recommending specific regulatory approaches. In parallel with European and other international organizations and bodies, the Financial Action Task Force (**FATF**) is actively considering the implications of virtual assets for international financial systems. FATF is an inter-governmental standard-setting body that promotes the effective implementation of legal, regulatory, and operational measures for combating money laundering, terrorist financing, and other threats to the international financial system. In October 2018, FATF adopted changes to its Recommendation 15 to clarify that it applies to virtual assets and virtual asset service providers [24]. The amended FATF Recommendation 15 requires that virtual asset service providers are regulated for AML/CFT purposes, licensed or registered, and subject to monitoring and supervision. In June 2019, FATF adopted an Interpretative Note to Recommendation 15 [25] that requires a risk-based approach to virtual asset financial activities and virtual asset service providers. It introduces licensing and registration obligations, and the monitoring and supervision of virtual asset service providers by competent authorities rather than self-regulatory bodies. It also extends the application of a range of sanctions for non-compliance. In addition, FATF recommends the application of all relevant preventive measures including customer due diligence, recordkeeping, and suspicious transaction monitoring.

The Impact of Libra Announcement

The second half of 2019 was dominated by the controversies and consternation surrounding stablecoins, a new type of crypto asset that seeks to stabilize its price by linking its value to an asset or a pool of assets. The debate on crypto assets underlying DLT, stablecoins, and their potential impact on the financial ecosystem accelerated after Facebook announced its project to issue Libra, a global stablecoin.

The Libra project announcement had an extraordinary impact and provoked immediate and firm official reactions worldwide. Promptly, several authorities, including the FSB, Bundesbank, the Bank of England, and the US Federal Reserve issued statements addressing Libra [26–29]. The Governor of the Bank of England and The U.S. House of Representatives' Committee on Financial Services have also issued a statement each, highlighting that Libra has not been received with “an open door” and requesting that Libra meets the “highest standards of prudential regulation and consumer protection” [30, 31]. The U.S. House of Representatives' Committee on Financial Services went as far as to request that Facebook and its partners immediately cease implementation plans “until regulators and Congress have an opportunity to examine these issues and take action” and requested a moratorium on any movement forward on Libra. The overall sentiment expressed through those first statements was akin to panic and the statements were dominated by concerns over serious potential risks and challenges of such global stablecoins arrangements. Uncertainties related to the lack of a clear regulatory framework, scrutiny, and recognition of global stablecoins were potentially hampering the actual issuance of Libra.

The **G7** meeting that took place in July 2019 was dominated by concerns over the Libra project. The Chair of the Committee on Payments and Market Infrastructures (CPMI) and member of the ECB Executive Board highlighted several serious risks posed by global stablecoin projects in his speech to the G7 in July 2019, including anti-money laundering/combating the financing of terrorism (AML/CFT), consumer and data protection, cyber resilience, fair competition, tax compliance, issues related to monetary policy transmission, financial stability, and the smooth functioning of and public trust in the global payment systems [32]. At the same time, the need to improve access to payment services to ensure faster and cheaper payments and cross-border remittances has also been acknowledged as well as other benefits of stablecoins including greater competition in payment services and greater financial inclusion. Nevertheless, proposed recommendations illustrated a firm and skeptical approach to global stablecoins projects. The need to ensure public trust by meeting the highest regulatory standards, prudent supervision and oversight, and globally consistent regulatory approaches has been emphasized. Legal compliance of stablecoins projects across jurisdictions was also considered essential, including adequate governance and a risk management framework to ensure operational and cyber resilience and safe, prudent, transparent, and consistent management of the underlying assets. The G7 meeting official closing statement acknowledged that “projects such as Libra may affect monetary sovereignty and the functioning of the international monetary system” and “raise serious regulatory and systemic concerns, as well as wider policy issues” [33]. G7 strongly concluded that any stablecoin projects would need to meet the highest standards of financial regulation, especially with regard to AML/CFT, to guarantee they do not affect the financial system's stability or undermine consumer protection.

Several other bodies and organizations have issued statements and assessments of stablecoins, including the ECB, G7 Working Group, and FSB. The **ECB** published a report analyzing the taxonomy of stablecoins and assessing their macroeconomic impact on financial stability and monetary policy, noting a strong correlation between

the type of stablecoin and its price volatility [21]. The report acknowledged significant uncertainties regarding the governance and regulatory treatment of stablecoins, which might hamper their uptake. Less innovative stablecoins were considered to be less volatile than more innovative ones. The ECB also acknowledged the possibility that stablecoins can be made redundant if financial institutions use the same underlying technology for traditional assets.

A **G7** working group investigated the impact of global stablecoins, identifying a long list of risks stemming from stablecoins of any size [34]. The risks are related to legal certainty and governance issues, investment rules of the stability mechanism, illicit finance, safety, the efficiency and integrity of payment systems, cybersecurity, operational resilience, and market integrity. Stablecoins are thought to pose challenges to data privacy and data protection, consumer and investor protection, and tax compliance. The biggest risks of global stablecoins can be attributed to their scale, which could affect monetary policy, monetary sovereignty, financial stability, fair competition, and the international monetary system overall. G7 strongly contends that no global stablecoin project should go ahead without adequately addressing all these risks. Regulations should be appropriately adjusted to address the specifics of global stablecoins. The recommended regulatory approach should be technology neutral, functional, mindful of the risks of regulatory arbitrage, and ensure a level playing field that encourages competition. The report also acknowledged the weaknesses of existing cross-border payments systems and the need to improve access to financial services and cross-border retail payments. However, instead of acknowledging stablecoins' potential in addressing these issues, the report was skeptical given the uncertainty created by the significant legal, regulatory, supervisory, and operational challenges posed by stablecoins. Instead, the G7 Working Group recommended focusing on improving the efficiency and inclusiveness of existing, established financial systems and financial services.

FINMA, the Swiss financial authority with which the Libra project has been submitted for an assessment of its project under Swiss law, published a supplement to its ICO guidelines outlining the treatment of stablecoins [35]. FINMA adopted a technology-neutral approach and "same risks, same rules" principle focusing on "substance over form" and looking at tokens' economic function and purpose. The supplement concluded that stablecoins vary, and therefore the laws that apply to them may include money laundering, securities laws, banking, and fund management regulations. FINMA emphasized legal uncertainties regarding transferability and enforceability under civil law of claims linked to tokens.

At the same time, elsewhere in Europe, fear and rejection of the Libra project dominated. Just two days after the FINMA guidance was published, Germany and France issued a joint statement addressing Libra and declaring that the project had failed to convince that risks would be properly addressed and reiterating that "no private entity can claim monetary power, which is inherent to the sovereignty of nations". The statement emphasized the risks including financial security, investor protection, AML/CFT, data protection, and financial and monetary sovereignty [36].

Furthermore, the **FSB** emphasized in its report delivered to a G20 meeting in October 2019 the need to assess any regulatory gaps in existing regulatory and

supervisory frameworks in the context of stablecoins at the national level and in the cross-border and cross-authority context to minimize the risk of regulatory arbitrage. At the international level, stablecoins could affect existing international regulatory and supervisory standards. The FSB noted that global stablecoin projects could, in fact, alter the then assessment that crypto assets do not pose a material risk to financial stability and acknowledged that stablecoins can indeed pose systemic risks due to their large user base and potential to become of systemic importance, particularly in individual jurisdictions where they could replace domestic currencies. The FSB recognized that global stablecoin could disrupt banks' funding and have implications for financial stability, market integrity, competition, and data protection. Thus, the FSB recommends strengthening international cooperation and coordination to address potential concerns of global financial stability and systemic risk. However, in spite of a long list of risks and challenges and some high-level recommendations, no specific regulatory steps have been suggested leaving stablecoins' issues with much uncertainty [37].

The **ECB** also issued a more comprehensive study on stablecoins, acknowledging benefits that global stablecoin projects could make international payments cheaper and faster, and facilitate financial inclusion while also highlighting previously recognized risks, including potential impacts on operational robustness, safety and soundness of payment systems, customer protection, risks to financial stability and monetary sovereignty, and AML/CFT compliance [38].

The **EU Council** and the **Commission** officially joined the trend with their joint statement on stablecoins, which was rather repetitive and similar to other statements and reports issued in the aftermath of the Libra announcement [39]. It acknowledged the benefits of financial innovation in promoting competition and financial inclusion, broadening consumer choice, increasing efficiency, and delivering cost savings and the benefits of cheap and fast payments. However, the statement mainly highlighted challenges to consumer protection, privacy, taxation, cybersecurity and operational resilience, AML/CFT, market integrity, governance, and legal certainty. It emphasized risks to monetary sovereignty, monetary policy, the safety and efficiency of payment systems, financial stability, and fair competition. The Council and the European Commission committed to providing a framework for stablecoins and ensuring appropriate consumer protection standards and orderly monetary and financial conditions. In a follow-up step, the EU public consultation on an EU framework for markets in crypto assets, issued in December 2019, included questions seeking stakeholders' views concerning stablecoins.

To wrap up the year, the International Monetary Fund (**IMF**) issued a note in December 2019 in which it identifies selected elements of regulation and supervision to assist policymakers in framing the discussion on the regulation of crypto assets [40]. Note that the IMF considers crypto assets at the core of the Fintech revolution, and any regulation should not stifle innovation but build trust ([40], p. 17). The IMF provides several high-level recommendations for regulators, including a sequential, risk-based, and proportional approach to developing regulatory frameworks based on priorities and resources. Furthermore, it recommends a continuous comprehensive assessment of the risks and strategies. It emphasizes cross-sector and international

cooperation and coordination as key elements in enhancing investor protection and minimizing the potential for regulatory arbitrage while maintaining regulatory flexibility to adapt to technological progress. In its advice, the IMF focused on the main aspects of crypto assets: offering, trading, custody, and exposure. In addition, it acknowledged relatively low societal financial and technology literacy and the need to ensure that participants, investors, and customers are adequately informed about the particularities and risks of crypto assets. Therefore, appropriate disclosure requirements at the time of the initial offer and thereafter are essential in protecting investors. Regarding the trading of crypto assets, the IMF follows IOSCO's report [27], recommending robust governance requirements for platform operators, onboarding compliance requirements for access to the platform, and resilient and safe operating systems and controls. Regulators should also consider the applicability of market abuse and transparency rules. The IMF suggests that a regulatory determination be made regarding the types of assets to be permitted for trading and safe custodial services. Clarifying the legal position of crypto asset ownership is also important in ensuring the effective clearing and settlement of crypto asset trading. The IMF highlighted its concern over the lack of a global standard for the prudential treatment of exposure to crypto assets for banks or other regulated entities ([40], p.16). The ongoing BIS consultation in this regard should address this concern [18]. It recommends a conservative approach such as capital deductions or the imposition of high-risk weights and robust assets segregation and separation. This relates to both direct and indirect exposure to crypto assets from derivatives, financial instruments linked to crypto assets, cyber insurance to wallet providers, or loans to crypto investors. Finally, the IMF acknowledges that formulating an adequate regulatory framework for crypto assets involves intense monitoring, a flexible approach, and international cooperation [18].

At the EU level, 2019 finished with the final report of the Expert Group on Regulatory Obstacles to Financial Innovation (**ROFIEG**) to the European Commission on recommendations for regulation, innovation, and finance [41]. Essentially, in relation to crypto assets, ROFIEG recommends accelerating the work to assess the existing regulatory framework and develop solutions to fill potential regulatory gaps. This should include addressing the lack of a common taxonomy and the resulting fragmented national approaches to crypto assets. The main risks to be addressed include money laundering, terrorist financing, tax evasion, governance and operational resilience, client asset protection, disclosure requirements, consumer protection, and the prudential treatment of exposure to crypto assets ([41], p. 16). The commercial law aspects of crypto assets, including the conflict of laws rule might also need to be addressed at the EU level.

2.6 Year 2020—*Stablecoins and MiCA*

Interest in crypto assets further intensified in 2020. At the request of the **European Parliament**'s Committee on Economic and Monetary Affairs a study on key developments, regulatory concerns, and responses on crypto assets was published in May 2020, a week before the announcement of the second version of the Libra project [42]. Interestingly, the study reiterated that stablecoins remain a marginal phenomenon among crypto assets and their impact remains local. It recognized that stablecoins pose challenges and risks to financial stability and monetary policy and that AMLD5 lags behind and should be enhanced and the current EU financial regulatory framework is not sufficiently tailored to crypto assets resulting in legal uncertainty. The risks stem also from financial institutions gaining exposure to highly volatile crypto assets.

The **ECB** issued more comprehensive official report on stablecoins and their implications for monetary policy, financial stability, market infrastructure and payments, and banking supervision in the euro area, in which it characterizes stablecoin arrangements, emphasizes the role of technology-neutral regulation in preventing arbitrage, and the importance of comprehensive Eurosystem oversight, irrespective of stablecoins' regulatory status [43]. The report goes further in its analysis of stablecoins than previous official documents and analyzes various scenarios for the uptake of stablecoins and the associated public policy, regulation, and supervision implications. The ECB estimates that the uptake of stablecoins collateralized with euro-denominated assets is a more likely scenario in the eurozone. It emphasizes potential implications of such a scenario for Eurosystem's monetary policy transmission and concludes that stablecoins could become a new payment method and could reach a scale, giving rise to financial stability risks due to fragilities of stablecoin arrangements and their links with the financial system. Again, the need for adequate, internationally coordinated regulation, and cooperative oversight has been recognized, as well as the importance of "same business, same risks, same rules" principle to ensure a level playing field and prevent regulatory arbitrage. The same principle for stablecoins' regulation has been recognized by the **FSB** in its report on regulation, supervision, and oversight of global stablecoins, in which the FSB calls for completion of international standard-setting work, establishment of cooperation arrangements among authorities and adjustment of regulatory, supervisory and oversight frameworks [44]. The FSB also acknowledged the need for a holistic regulatory approach that addresses any potential regulatory gaps and clarifies regulatory powers, including internationally coordinated regulatory efforts to help achieve common regulatory outcomes across jurisdictions and reduce opportunities for cross-sectoral and cross-border regulatory arbitrage. In terms of cross jurisdictional analysis, the FSB identified regulatory gaps that include incomplete or non-existent implementation of the revised FATF standards, lack of capacity to provide regulatory supervision of global stablecoin arrangements, lack of adequate competition policies, and inadequate consumer protection measures. The FSB formulated a number of recommendations that include application of international standards to

global stablecoins on a functional basis and proportionate to their risks and comprehensive governance frameworks with clearly allocated accountability, effective risk management frameworks, operational resilience, and AML/CFT measures.

Finally, the latest step in the recognition of crypto assets is the proposal of the **European Commission** of a regulation on Markets in Crypto-Assets (MiCA) [45]. The European Commission differentiates between crypto assets that are already governed by EU legislation and which will remain subject to existing legislation including MiFID II [46], and other crypto assets. For crypto assets that will remain subject to existing legislation, the European Commission proposes a pilot regime [47] for market infrastructures that wish to try to trade and settle transactions in financial instruments in crypto asset form to enable market participants and regulators to gain experience with the use of DLT exchanges that would trade or record shares or bonds on the digital ledger. MiCA forms a part of a digital finance package adopted by the European Commission on September 24, 2020 [48], which also includes a digital finance strategy. MiCA sets out a bespoke regime for previously unregulated crypto assets, including “stablecoins” and it has four main objectives: legal certainty, innovation support, consumer and investor protection and financial stability. MiCA introduces compliance requirements for issuers and crypto asset service providers wishing to apply for an authorization to provide their services in the single market. The requirements include capital requirements, custody of assets, a mandatory complaint holder procedure available to investors, and rights of the investor against the issuer. In addition, issuers of significant asset-backed crypto assets will be subject to more stringent capital requirements, liquidity management, and interoperability requirements (see Sect. 4 for more details).

2.7 *Regulatory Uncertainties*

The blockchain ecosystem has been evolving rapidly in the last decade and it outpaced regulators, authorities, and policymakers. As illustrated by our earlier analysis, multiple authorities and institutions analyzed cryptocurrencies, DLT and eventually crypto assets and either issued a statement, a report (or multiple reports), or participated in the debate by undertaking another form of analysis of these new phenomena.

However, for quite some time, this activity has not led to clear regulatory guidelines, set of principles, or proactive regulatory steps. Therefore, in the early phases of blockchain development, market participants faced high regulatory uncertainty. At first, some regulators tried to apply or formulate regulations to govern blockchain application within existing legal frameworks and normative principles. Only a few countries viewed crypto assets—in particular decentralized protocols—as a novel technology that commanded new principles for a regulatory framework and a bespoke regulatory approach.

One of these countries is Liechtenstein which sought to create an all-encompassing framework on how to treat tokens from a regulatory perspective. In Liechtenstein, a

vision for the future token-based economy emerged. This vision guided the regulator to formulate the Liechtenstein Token Act which rests on multiple normative models and principles on how crypto assets and tokens should be viewed and regulated.

3 The Liechtenstein Token Act

3.1 Background

On January 1, 2020, the first comprehensive regulation of the so-called “token economy” came into force in the Principality of Liechtenstein with the Law on Tokens and TT Service Providers (Token Law or TVTG). The Government of Liechtenstein had explicitly developed a very broad regulation approach to create legal certainty for all applications of blockchain in the economy. This approach therefore is fundamentally different from other regulations that focus on the virtual assets, stable coins, digital securities, and related financial services.

3.2 The Vision of the Token Economy

The vision of the token economy (see also Duenser [13]) is based on the token’s property to create digital information which cannot be manipulated or copied. This property is not only relevant for digital money or digital securities, but for many other assets and rights of the existing legal system. The token economy refers to the possibility to tokenize any kind of assets, such as a physical item like a car or a house, by representing a right corresponding to a physical item in a token. Such a right can be the property rights or usage rights of an item and they usually derive from official registers (like in the case of real estate), civil law (like in the case of physical items), or from contracts in all possible forms. To tokenize such rights means to create a unique object representing this right, which can then be owned and transferred like a physical item. This innovation is similar to the concept of creating physical security by representing an investor’s rights relating to a company on a piece of paper. The invention of physical security was one of the drivers of the modern economy. The token is expected to trigger a similar development, but in a much broader sense. As the creation and transfer of a token is very efficient, there are almost no limitations for potential applications. As such, every purchase contract could be concluded and settled with tokens, for example, The purchase of a bicycle is equivalent to the transfer of the property right token versus digital money tokens. By using a token, the buyer would instantly receive a proof of ownership of the bicycle. By storing such a token in a personal wallet, the owner can show this digital proof of ownership to everyone in the world. On the other hand, the seller would instantly receive the digital money.

Therefore, the concept of the objectivization of rights via a token therefore has a similar effect on the legal system as the invention of physical security on the modern economy. By using digital, programmable contracts (e.g., smart contracts), tokens can now be used to transfer the rights described in a contract. Moreover, the same right can then be transferred to another person. Consequently, an additional layer of unique and objectivized rights will evolve, which will help to prove true legal ownerships [13]. This innovation is therefore expected to bring an unprecedented level of legal certainty to the digital economy.

The concept of tokenization can be applied to all processes and transactions: In supply chain management or in international trade, tokens can be used to prove the transfer of a good. In e-commerce, tokens can prove the successful purchase of a good or a right. Tokens can be used to secure the intellectual property of music, books, or movies. On a festival, tokens can help to simplify the order process of drinks and snacks.

Even if the vision of the token economy includes the application of digital money and securities, it covers a much broader field of applications. This has a significant impact on regulation. The regulatory approach of Liechtenstein is based on this broad vision of a token economy.

3.3 Classification of Tokens in Liechtenstein Token Act

As the legal classification of tokens triggers legal consequences, many countries have tried to fit the current applications of blockchain within existing legal classifications, such as currencies, security tokens, and the new forms as utility coins. Liechtenstein deliberately did not rely on existing classifications but introduced the (general) token as a new legal element (Liechtenstein Token Model). In the Token Act, the token is defined as “a piece of information on a TT System [i.e., a DLT Transaction System] which can represent claims or rights of memberships against a person, rights to property or other absolute or relative rights; and is assigned to one or more TT Identifiers [i.e., a Wallet-Address]”. This step has wide-reaching consequences.

First, it provides the legal fundament for all possible applications of blockchain technology, including the current and future forms. Virtual currencies, like Bitcoin, are tokens which do not represent any rights and have no reference to real-world values. Utility coins are—for example—tokens representing usage rights of a DLT system. Security tokens, like share tokens, represent voting and/or dividend rights regarding companies, while bond tokens might represent the right of interest payments and redemptions. In this token model, stablecoins are tokens that represent, for example, the right to receive fiat money or gold. But more important is the fact that with the general token definition, all rights regarding physical items can be tokenized, such as the property right of a painting, the usage right of a car, or the right to receive a drink. It is also possible to tokenize license rights of intellectual property, such as the right to listen to music, and rights to use a patent. With the approach Liechtenstein has chosen, many more forms of tokens are covered with a

legal fundament, which enables the secure use of tokens for almost every application in the economy. Hence, the “Liechtenstein approach” is intended to be a legal fundament of the token economy. As such, this token model itself is a revolution, since it enables the bridge between the existing legal framework and a digital transaction infrastructure. It supports the objectivization of any rights of the Liechtenstein legal system (which means to create objects which represent a right), so that they can be digitally possessed and transferred like a physical item. With this step, Liechtenstein has seen the potential to increase the legal certainty of any economic (and by that: legal) transaction of the digital and analogue economy.

Second, it solves the central problem of unsuited legal consequences appearing when using existing classifications for tokens. For example, if a country generally classifies tokens as securities, all laws on securities and financial instruments, especially financial market laws, and related tax rules would apply, making it impossible in practice to use a token for applications other than investment, such as a means of payment. The classification of tokens as a currency would trigger the application of other laws, so that the use of such tokens in or by a decentralized network would not be possible in certain jurisdictions. Therefore, focusing on existing classifications bears the risk of hindering innovation in the context of a fundamental technology like DLT, which can be used for almost every application. With the Liechtenstein Token Model, the legal consequences depend on the right which is represented by the token: If a security is represented, security laws shall apply, whereas in the case a token represents intellectual property rights, intellectual property laws should be applied, etc. With this approach, Liechtenstein is relying on the principle “substance over form”. The sole act of creating a token has no legal implications in Liechtenstein. In particular, only the fact that a token is transferable does not trigger the application of security laws. This treatment of a token is crucial for the broad application of blockchain technology in the economy outside of financial markets.

Third, by introducing the token as a new element into the existing legal system, it is possible and also necessary to clarify all civil law questions relating to tokens: Can a token be owned, can it be stolen? How can a token be legally transferred? (see next section).

Fourth, Liechtenstein’s approach offers a solution to potential conflicts between tokens and real-world assets. From the perspective of the token economy, it becomes clear that most tokens will have a reference to the real-world rights or assets. Pure virtual currencies or virtual assets without reference to the real world, such as Bitcoin, will rather be an exemption. Tokens with reference to the real-world face the challenge that the real-world asset or right is not synchronized with the token representing this right. For example, if a token represents the property right of a car, a conflict can arise if the owner of the property right token is not the same person as the holder of the car. This can happen, if the car is stolen, or sold to another person not knowing that the property right is tokenized and sold to another person. For the functioning of the Token Economy, the synchronization of online and offline rights is essential. The Liechtenstein Token Model is offering the legal fundament for the clarification of such conflicts within the legal system.

3.4 *Civil Law of the Token in Liechtenstein Token Act*

By introducing the token as a new legal element, Liechtenstein had to consider several fundamental legal questions: As the properties of a token are similar to those of a physical item, in theory the property law could be used to clarify the open questions about possession and ownership of a token. But as many legal rules and the jurisprudence of property law is based on corporeality, this option has proven to raise other significant legal issues and—by that—increased the legal uncertainty. One aspect of these considerations is the potential confusion between a physical object and its digital twin, if property law applies for both. Since a true digital object like a token is new, it became apparent that it would be better to introduce a new legal fundament for tokens in order to avoid confusion and the interference of corporeality.

To put the concept of a digital item into effect, Liechtenstein has developed new concepts of possession and ownership of tokens. The DLT has special properties which have to be respected. Tokens themselves cannot be owned or possessed because they are always assigned to some kind of address. Both, the token and the address are part of the transaction ledger (i.e., the blockchain) and cannot be owned in a traditional sense. In terms of ownership, the key with which a person can sign new transactions is particularly relevant. For DLT with asymmetric encryption, the key is often referred to as a “private key”, but the Liechtenstein law is intended to be technology neutral, so that the law defines the “TT-key” in an abstract manner as “a key that allows for disposal over Tokens” (Article 2 TVTG).

Therefore, the Liechtenstein Token Act defines the holder of the key who is able to initiate transactions as the person who is possessing a token. To avoid confusion with the terms of property law, Liechtenstein introduced the term “a person with the power of disposal over the token” as corresponding with “a person possessing a token”.

Another fundamentally relevant decision is the differentiation between possession and legal ownership of tokens. This is particularly interesting because of the discussions about the “code is law” principle among blockchain pioneers, which implies that the legal ownership is identical with the possession of a token. Liechtenstein acknowledged that the legal ownership and the possession can diverge in practice, such as when a token is stolen, or if the token or the key is transferred to a delegate, like a custodian. Legal owners of tokens might face difficulties when seeking to rely on a legal system where neither the token is legally clearly defined, nor is there a legal construction for clarifying token theft, i.e., by hacking a wallet. Liechtenstein decided that introducing the concept of legal ownership is crucial to clarify the integration of DLT in the legal system, so that both the service providers in their terms and conditions as well as the authorities and the courts are able to manage all circumstances properly. Therefore, the term “person with the right to dispose of a token” is introduced as an equivalent of legal ownership. This two-layered approach is especially important in the common use of custodial service providers, as they often either have access to the key or are assigning the token to their own respective

wallet's address. The Token Act, therefore, also provides the legal fundament for clarifying problems that can arise between service providers and their clients.

Even though this differentiation is crucial for legal certainty for token holders, it brings up additional questions that have to be clarified in the legal system. How can a person seeking to buy a token be sure that the seller is the legal owner? It would hinder the efficiency of the token economy, if the buyer had to verify the legal ownership of a token before each transaction. In order to protect users and to increase the efficiency of the token economy, Liechtenstein introduced the legal assumption that the person possessing the power of disposal over a token also has the right to dispose over the token. In addition, it is regulated that "those who receive tokens in good faith, ... for the purpose of acquiring the right of disposal ... are protected in [their] acquisition, even if the transferring party was not entitled to the disposal over the Token unless the recipient party had been aware of the lack of right of disposal or should have been aware of such upon the exercise of due diligence" (Article 9 TVTG). By these rules, Liechtenstein has introduced a civil law concept to protect both the buyer and the legal owner of a stolen token.

Similar to the fact that tokens cannot be owned directly, it is also not possible to transfer tokens directly. Technically spoken, a token is transferred by changing its assignment to another address. Therefore, a transfer transaction changes the power of disposal to the person which is holding the key of the new address. Thus, Liechtenstein legally defined that the disposal over tokens is equivalent to the transfer of the right of disposal over the token (Article 6 TVTG). With that legal definition, buyers of tokens can now be sure that after a successful technical transfer the legal transfer is also ensured. These elements build the fundament of legal certainty for tokens, i.e., in the digital layer.

As another pillar of legal certainty of token transfer, Liechtenstein had to clarify the requirements for the disposal over tokens. It is important to clearly define at what point of time a transfer is legally fulfilled. Article 6 of the Token Act therefore states three conditions: First, the (technical) conclusion of the transfer according to the rules of the DLT system, second, the declaration of both parties about the will to transfer the token, and third, the legal ownership of the transferring party. Only if all three conditions are met, the token is legally transferred.

The Token Act is consequently oriented to the token economy, acknowledging that most tokens have a reference to the analogue world. In addition to the legal clarification of the token transfer, Liechtenstein also had to regulate the consequences of a token transfer regarding the rights or assets in the analogue world. The synchronization of "online" and "offline" dimensions is crucial for the legal certainty of token owners. Therefore, the TVTG defines in Article 7: "(1) Disposal over the token results in the disposal over the right represented by the token". Because it is possible for tokens to represent any kind of rights on a DLT system, this rule clarifies that with the transfer of the token, the receiving party also gets the represented right. By that, it is possible to create a transferable object of every right in the existing legal system. This is the key for enabling the token economy. These rules have to be accompanied with collision rules: "If the legal effect under (1) does not come into force by law, the person obliged as a result of the disposal over the Token must ensure, through

suitable measures, that [...] the disposal over a Token directly or indirectly results in the disposal over the represented right, and [...] a competing disposal over the represented right is excluded” (Article 7/2). The TVTG even contemplates the possibility of enforcement proceedings: “The disposal over a token is also legally binding in the event of enforcement proceedings against the transferor and effective vis-à-vis third parties, if the transfer: (a) was activated in the TT system prior to the commencement of the legal proceedings, or (b) was activated in the TT the system after the initiation of the legal proceedings and was executed on the day of the proceeding’s openings, provided that the accepting party proves that he was without knowledge of the proceedings openings or would have remained without knowledge upon the exercise of due diligence”.

By considering that more applications of tokens represent rights within the legal system and the economy and are, in particular, not purely virtual, like Bitcoin, it becomes important that a token can be cancelled. This is not an option for virtual currencies or many forms of utility coins as the original applications, but for every other tokenized asset, this is crucial for the legal certainty: If, for instance, the property right of a house is tokenized, and the token is lost or stolen, or becomes non-functional, it is necessary that there exists a legal procedure to cancel the token and create a new one. This is also a relevant feature if a multi-DLT-environment is considered: If a token owner decides to move a token to another DLT system, the cancellation procedure is also necessary to create legal certainty for all participants.

Tokens can also represent securities, as the shareholder rights to an equity in a company or debt rights. For both parties, the obligor and the obligee, it is necessary that tokens can be used to fulfill the legal part of such arrangements. Therefore, the TVTG defines in Article 8 the legitimacy and exemption: “(1) The person possessing the right of disposal reported by the TT System is considered the lawful holder of the right represented in the token in respect of the Obligor. (2) By payment, the Obligor is withdrawn from his obligation against the person who has the power of disposal as reported by the TT system, unless he knew, or should have known with due care, that he is not the lawful owner of the right”. By this rule, an obligor of a security represented in a token can be sure that his or her obligations are fulfilled if the payments (interests or dividends) are transferred to the token holder. This rule also enhances the legal certainty of token holders.

Because of the special features of securities, the Liechtenstein law defined specific rules for security tokens. It is possible to create so-called uncertificated rights or book-entry securities, where it is explicitly stated that the book-entry register can be implemented by using DLT systems. This means that companies can directly create such book-entry securities by generating a security token without extra efforts. This way to create digital securities is very efficient and is intended to support innovation in this sector while having a high level of legal certainty.

3.5 *Regulation of Service Providers in Liechtenstein Token Act*

With the Token Act, Liechtenstein has also introduced a regulation of specific service providers. As the law was intended to be open for innovation, the service provider regulation is formulated in a role- and principles-based manner. This means that no existing business models are regulated as a whole, such as crypto exchanges, but only functions or roles. For example, if a company offers custodian services, it must comply with the relating obligations, no matter if this is the only service or if this is part of a comprehensive business, such as the provision of a trading facility. For all single roles, specific duties are introduced to address the relating specific risks. These duties are formulated in an abstract and principles-based manner, so a company is free to choose how to implement its service as long as the principles are achieved.

The Token Act covers 10 roles in total:

- (1) “Token Issuer”: a person who publicly offers the tokens in their own name or in the name of a client;
- (2) “Token Generator”: a person who generates one or more tokens;
- (3) “TT Key Depositary”: a person who safeguards TT Keys for clients;
- (4) “TT Token Depositary”: a person who safeguards token in the name and on account of others;
- (5) “TT Protector”: a person who holds tokens on TT Systems in their own name on account for a third party;
- (6) “Physical Validator”: a person who ensures the enforcement of rights in accordance with the agreement, in terms of property law, represented in Tokens on TT systems;
- (7) “TT Exchange Service Provider”: a person, who exchanges legal tender against Tokens and vice versa and Tokens for Tokens;
- (8) “TT Verifying Authority”: a person who verifies the legal capacity and the requirements for disposal over a Token;
- (9) “TT Price Service Provider”: a person who provides TT System users with aggregated price information on the basis of purchase and sale offers or completed transactions;
- (10) “TT Identity Service Provider”: a person who identifies the person in possession of the right of disposal related to a token and records it in a directory.

As Liechtenstein is a member of the European Economic Area (EEA), the financial market regulations are derived from EU laws. Therefore, the Token Act does not cover financial market functions, such as operating a trading facility or providing investment advice, because this would collide with the harmonized European single market. The Token Act is therefore applicable to all non-financial market applications, but—as long as the European regulation is not adopted—should also cover those financial market applications which currently are not in the scope. In this sense, Liechtenstein regulated such services for all tokens regardless how they are classified.

3.6 User Protection Regulation in Liechtenstein Token Act

From the perspective of users of blockchain systems, it is of utmost relevance that neither the tokens themselves nor the possession of tokens can be manipulated. Therefore, the technical quality of the “blockchain technology” is relevant for the level of user’s security. On a technical level, the integrity of a DLT-transaction-database depends on several features: Number of nodes, distribution of nodes, consensus mechanism, level of cryptographic security, and many more. This means that the technical quality of a specific DLT system is derived from static design features, but also from dynamic aspects, like the distribution of nodes and miners. If, for example, one group of persons comes in the position of dominating the mining process by providing an extraordinary amount of computing power, it might also have the power to change the transaction ledger in certain DLT systems. Both aspects make it difficult for average token holders to assess the risks. To protect token holders, some governments might consider regulating the quality of the technology itself to define the minimum standard of DLT systems accessible in a jurisdiction.

To ensure user protection, Liechtenstein has decided to choose a fundamentally different approach. The Token Act does not regulate the quality of a DLT system, but obliges service providers to ensure that the chosen DLT system is appropriate for specific use. Consequently, the ten service providers regulated in the Token Act (TT service providers) have to fulfil the legal obligations (see last section).

The Government of Liechtenstein deliberately has refrained from regulating the quality of the technology in order to not hinder innovation. Even after a decade, DLT is still a relatively new technology with a high pace of development. The Government of Liechtenstein argued that a technology-based regulation would only be able to cover the currently known forms of DLT, so that not only new forms would be restricted in their implementation, but also the legal certainty for users of new forms would be undermined, since the legal protection would only cover the old forms. Especially with regard to civil law applicable to tokens, a restricted legal scope would cause severe risks to holders of tokenized assets. Liechtenstein therefore established the legal definitions very carefully and in a technology-neutral manner so that all current and future forms of DLT are provided for. Instead of the common term “DLT” which might focus only on the current forms, the Token Act defines the term “TT Systems” as “transaction system which allows for the secure transfer and storage of Tokens and the rendering of services based on this by means of trustworthy technology” And “trustworthy technology” is defined as “Technologies through which the integrity of tokens, the clear assignment of tokens to TT Identifiers and the disposal over tokens is ensured”. TT identifiers are defined as “an identifier that allows for the clear assignment of tokens”. Even though Liechtenstein refrained from using common terms such as blockchain and DLT, this set of definitions is intended to cover all similar kinds of such transaction systems. In particular, it highlights that neither the distribution nor the encryption is relevant for being considered as TT systems, but the fact that a digital information (the Token) can be owned and possessed as a physical item without any reference to a (central) intermediary or other counterparties. This

means that every technology allowing such features falls under the scope of the law, regardless of its technological implementation. As a consequence, the use of DLT by one or several central intermediaries to provide a transaction system does not fall under the scope of the Token Act. For example, a private, permissioned blockchain used for the supply chain in industry is not covered by the Token Act. Also a bank using a private DLT system for its core banking database is not covered by this definition. If such applications want to benefit from the civil law fundament, it is possible to declare that civil law provisions expressly apply (Article 3 TVTG).

Therefore, the quality of the DLT system is not relevant for the application of the Token Act. The definition of a TT system is based on principal characteristics, and not on quality criteria. The scope of the definition of TT system is not only relevant for the civil law implications of tokens, but also for the obligation to register as a TT service provider according to the Token Act.

Natural and legal persons exercising one or more services based on a TT system need a registration prior to market entry and are obliged to fulfill the legal requirements. Consequently, both aspects have to be considered: The use of a TT system and the provision of a service. For example, a person providing custody services for tokens in a private DLT system which is not open to the public is not obliged to register as a TT service provider, since in such a situation, the need for client protection additional to standard consumer protection does not seem to be necessary only because DLT is used. On the opposite, if such a service is brought on an open TT system, it does not matter which instrument is tokenized for licensing obligation to apply. Consequently, a person holding a token representing a book (for example, the right to access and read a book) as a service for a third-party user, falls also under the scope of regulation like a custodian for cryptocurrencies or security tokens. Users of DLT systems which do not rely on the service of a registered service provider must check the quality of the blockchain systems by themselves and be informed of the current developments.

4 MiCA in Comparison to the TVTG

In September 2020, the European Commission has published the digital finance package [48], which also contains MiCA and a proposal for a pilot regime for multilateral trading facilities using DLT [47].

MiCA comprises a regulation of issuers of e-money tokens (title IV), of so-called asset-referenced tokens (title III), of crypto asset service providers (title V), and issuers of other crypto assets which are not regulated under title III and IV (title II). The regulation of issuers of e-money tokens and asset-referenced tokens is distinguished between significant and non-significant tokens.

The scope of MiCA applies “to persons that are engaged in the issuance of crypto assets or provide services related to crypto assets in the Union” ([45], Article 2.1). It is not applicable to crypto assets that qualify as financial instruments, electronic money, deposits, structured deposits, or securitization.

The term crypto asset is defined as “a digital representation of value or rights which may be transferred and stored electronically, using distributed ledger technology or similar technology”. Comparing this definition to the Liechtenstein Token Act, the terms “crypto” and “distributed” refer to the current state of development. In case a new technology is introduced without using distribution or cryptography, this might lead to legal uncertainty whether the law should be applied or not.

With the definition of crypto asset, the EU Commission decided to use a very broad definition of a crypto asset, but made it clear that crypto assets can appear in different forms, including as financial instruments. Instead of declaring every crypto asset a financial instrument, the European Commission has chosen an approach similar to the Liechtenstein Token Model. This step is important, since it clarifies that financial market laws are basically applicable to tokenized financial instruments, but, in parallel, it also opens the possibility to draft new regulation for other forms of crypto assets. Consequently, the European Commission had to solve problems in the existing financial market framework caused by the fundamentally new technology used. In particular, the secondary markets for financial instruments require to use a central securities depository (CSD), which hindered many projects of security token trading, because almost no existing CSD had been able to register tokens. In addition, DLT has the potential to dispense with the CSD function to avoid unnecessary costs.

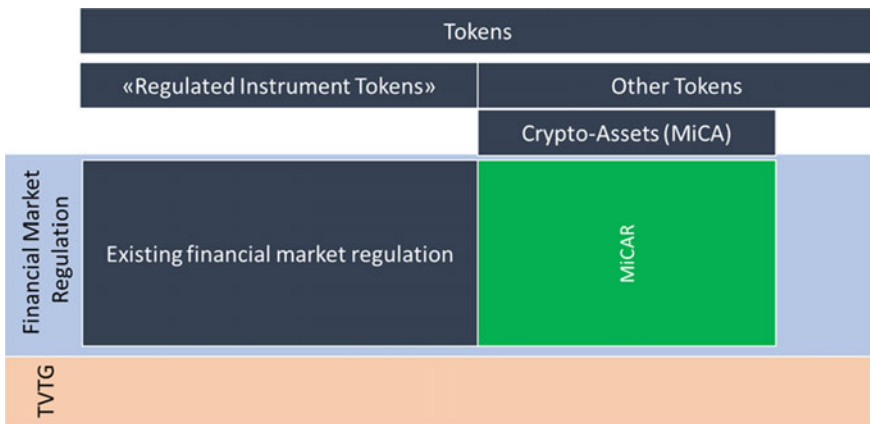
With the regulation of crypto asset service providers (title V), the European Commission developed a new regulatory framework for financial services with crypto assets that do not qualify as financial instruments. Therefore, the crypto asset services regulated in title V are very close to the definitions of investment services and activities regulated in MiFID II [46]:

- custody and administration of crypto assets on behalf of third parties,
- the operation of trading platform for crypto assets,
- the exchange of crypto assets for fiat currency that is legal tender,
- the exchange of crypto assets for other crypto assets,
- the execution of orders for crypto assets on behalf of third parties,
- placing of crypto assets,
- the reception and transmission of orders for crypto assets on behalf of third parties,
- providing advice on crypto assets.

Similar to Liechtenstein’s TVTG, the European Commission decided to introduce a more role-based and principles-based regulation, so that companies with certain focused activities are regulated adequately, whereas the regulation still is open for innovation.

By comparing the TT service providers regulated in the TVTG, it becomes clear that both laws are addressing different actors: MiCA intends to regulate financial services with crypto assets, and the Token Act regulates the fundamental services which are relevant for the whole token economy. As Liechtenstein is a member of the European Economic Area (EEA), the European financial market regulation is also

applicable in Liechtenstein. Therefore, the TVTG is designed as a complementary regulation to financial market laws: If a service using tokens is considered to fall under financial market regulation, the service provider must comply with both, the TVTG and the particular financial market law. This is introduced to ensure that financial service providers who want to use DLT have sufficient knowledge and well-defined processes for creating a sufficient level of client protection. In cases where no special regulation is applicable to token service providers, providers only have to comply with the TVTG. Therefore, the TVTG is a “catch all regulation” for token services. By enhancing the financial market laws to other crypto assets, another special regulation for token service providers is introduced. In particular, crypto asset service providers which operate a trading platform, execute orders, place crypto assets, receive and transmit orders or provide advice are not regulated in the TVTG, while the other services, such as custody and exchange services, are also regulated in Liechtenstein. This means that—in the case the government of Liechtenstein will not adopt the law—some CASP might have to comply with both laws, and some only with one of the laws. But as the level of regulation is quite similar, this is not expected to raise any additional burden to service providers.



Considering that MiCA intends to introduce financial market regulation for crypto assets and the fact that tokens can be used for almost every activity in the economy, also for non-financial-market services, MiCA potentially can expand the application of financial market regulation to many real-economy activities, which have not been covered with such regulation up to now. So, a precise legal definition of “crypto asset” is of utmost importance to clearly separate the tokenized financial market from the rest of the token economy.

As the civil law fundament, if crypto assets lies not within the competence of the EU-commission, MiCA is lacking a similar legal fundament for tokens as the Token Act. In order to get legal certainty for the European market, each country will have to face the challenge to adopt the civil law. Even if many countries have a civil law for physical or digital securities, the special features of security tokens often

make an adjustment necessary. Considering the further applications of tokens for the objectivization of any kind of rights, most countries are lacking clear and profound civil law fundament. This might hinder the further development of the token economy on cross-border activities.

5 Review of Regulatory Approaches and Strategies

Exponential speed of technological developments, growing awareness and knowledge gap, and the novelty and complexity of new technological advancements such as DLT make it difficult to find an appropriate and balanced regulatory response. Regulators struggle to keep up and often focus more on risks and challenges and less on the opportunities DLT offers. With the controversies of the developments like Libra project, regulators and lawmakers can also become unduly biased in their regulatory approach to DLT technology, aiming at capturing and controlling such developments with stringent compliance and regulatory burdens rather than providing innovation conducive environment supporting innovation and promoting entrepreneurship in blockchain industry. Vigilance for risks and their mitigation is justified and within the mandate of most regulators within the world. However, a balanced regulatory approach requires weighting out levels or risks with short- and long-term opportunities and needs.

It is not possible to define a unified regulatory solution or approach to DLT given the diversity of legal systems, regulatory parameters and mandates, levels of economic development, and political environment across the globe. However, well-recognized regulatory principles, such as “same risks, same activity, same rules, and same supervision”, can assist the regulators in their efforts to respond to blockchain innovation and ultimately could help global harmonization of laws and regulations applicable to blockchain. The latter is particularly important given the inherently borderless nature of blockchain innovation. Adopting a risk-based approach allows assessing the levels of risk presented by various blockchain innovation and enables providing regulatory measures that are proportionate to such risks. DLT innovation should not be considered as raising the same risks every time it is being used. Sometimes, there is no real risk elevation from the use of blockchain technology, like its use for loyalty cards which already exist today without controversies. Other blockchain-based innovations present entirely new sets of risks, like global stablecoins that trigger concerns over financial stability, market integrity, and monetary policy. Risk-based approach to regulation helps differentiate between those higher-risk applications of blockchain that perhaps warrant a more stringent regulatory approach, and lower-risk or even risk-neutral blockchain innovation that may not need regulatory intervention at all.

Too much or too stringent regulation out of fear for the “worst-case scenario” could be very damaging for the industry, stifle innovation, and also deprive consumers of the benefits of this technological innovation. Ultimately, such disproportionate and out-of-sync regulation would be damaging to the regulators themselves as a positive

impact of regulation would be effectively diminished, the market would get distorted and negative externalities of technology amplified, necessitating even more invasive regulatory action and creating self-perpetuating regulatory spiral widening the gap between law and technology. Given the “novelty” of blockchain innovation, an activity-based regulatory approach could also allow regulators to identify and focus on activities that require regulatory intervention. This approach, coupled with some entity-based requirements for big players, like big tech companies, for example, could help address the risks arising out of new blockchain innovation and new significant market players entering the financial sector [49]. Further, a principle-based approach with the focus on an outcome rather than detailed rules would also be suitable for blockchain innovation, particularly for the type for which there is no regulatory precedent. To that end, principles of consumer protection, prevention of ML/FT, or level playing field, would be the examples of desired outcomes, which could be assessed against particular blockchain innovation. Flexibility of such approach allows more fluid adjustments to regulatory framework to keep at pace with technological developments unlike prescriptive detailed rules, which may need frequent amendments to close any potential gaps and address new developments.

These regulatory principles should be helpful in formulating an appropriate regulatory strategy toward blockchain-based innovations, taking into account needs, goals, and priorities of a particular jurisdiction. It is not uncommon that certain blockchain developments trigger robust prohibitive regulatory response. For example, China and South Korea banned ICOs and several countries introduced some kind of ban on cryptocurrencies. Such prohibitive approaches contribute to creating regulatory arbitrage opportunities and have several other negative effects, like reducing financial inclusion or criminalizing certain innovation. It is also usually most damaging to the country introducing such outright ban, as the innovation and capital simply moves elsewhere. The only justified use of a prohibitive regulatory strategy toward blockchain innovation could be to grant the authorities additional time for research and assessment of new innovation in order to enable it later in a controlled and informed fashion.

However, the most common current regulatory approach is that of a “wait-and-see”, due to the novelty, lack of urgency on the part of the regulators and lack of established regulatory precedents. Many regulators also lack expertise, capacity, or resources to formulate adequate and timely responses to blockchain innovation. While regulators wait, innovation can freely develop and mature in such jurisdictions. However, lack of regulatory interest could also deter innovation due to lack of regulatory clarity, or, in the worst-case scenario, compromise consumer protection or even enable fraud if there are no regulatory boundaries. Where existing regulations apply to blockchain, regulators may also choose to be passive, observe and study technological developments in the meantime or issue guidelines to assist the industry, like FINMA did when issuing guidelines for ICOs and then the stablecoins [35]. Among the range of other possible approaches could be the introduction of accelerators, sandboxes, or similar collaborative measures that provide a safe and controlled environment for the innovation to develop under scrutiny but also with the support of authorities. Examples of sandbox regulatory approaches include the

EU PILOT regime or a recent initiative of the Central Bank of Brazil that recently announced a regulatory sandbox allowing stablecoin development under regulatory supervision [50].

Finally, regulators could opt for a bespoke regulatory framework for blockchain innovation. The examples include MiCA, which deals with financial market applications of crypto assets and the Liechtenstein Token Act. MiCA creates a bespoke regulatory framework for crypto assets not covered by existing financial regulation and many of the rules mirror financial regulation. Considering that the regulatory discussions have focussed almost exclusively on financial market applications of DLT, MiCA is a consequent step to address the lack of legal certainty, user protection, and AML/CFT rules. In contrast, the Liechtenstein Token Act is aiming at a much broader scope of application of DLT and therefore offers a completely new, abstract and neutral approach to tokens, those blockchain based and others. Even though MiCA and the Token Act appear as competing approaches to regulation, they are in fact based on similar regulatory concepts and build a complementary set of regulations. If the token economy in this broad sense should be enabled throughout Europe, all countries would potentially need a similar civil law fundament as Liechtenstein, so that all DLT users can benefit from a high level of legal certainty.

Regardless of a particular choice for blockchain regulation, regulators should not approach this topic through the narrow lens of underlying blockchain technology but should remain technology-neutral in their approach and any regulatory efforts should be collaborative and include all stakeholders. Regulation should not hinder innovation and entrepreneurship or impair competition and all market participants should be subject to general principles of transparency, prudence, integrity, and consumer protection.

6 Conclusions

The blockchain phenomenon has seen an extraordinary rise to prominence. The journey of Bitcoin from the publication of the white paper in 2008 to a market capitalization of \$1 trillion in February 2021 (Chavez-Dreyfuss and Wilson [30]) illustrates market acceptance. Blockchain has demonstrated a high degree of resilience and the potential to not only transform existing capital markets but also to create new asset classes. The technology has also grown beyond financial applications and is being adopted in other sectors, from logistics to healthcare. All these developments took place at a revolutionary speed, within little over a decade.

However, laws and regulations tend to develop more incrementally, at a much slower pace and through a cumulative step-by-step process built around geographically divided legal jurisdictions, doctrines, jurisprudence, and legal practice. Also, while startups and IT developers produce new blockchain-based innovation literally

every month, the education—and therefore the understanding—among regulators and policymakers progresses at a much slower speed. It is therefore not surprising that regulators struggled to keep pace with blockchain innovation, which has not only developed rapidly, but also in a decentralized and borderless fashion. Legal and regulatory uncertainties are some of the main obstacles for blockchain innovation, as market participants were often left without clear regulatory guidance how to specifically apply existing laws and regulations—created to cater to centralized and intermediated market design—to blockchain, build around decentralization and disintermediation principles. The rise of DLT is also indicative of a broader economic and societal transformation toward decentralization and peer-to-peer connections.

Slowly, these innovations have attracted the attention of authorities, but their first reactions, views and statements were those of mistrust, caution, and even dismissal. Even though several key regulators and policymakers at the supra-national level issued a report, warning, study, or recommendations on some aspect of blockchain technology, those actions were not only often out of sync with market developments (like in the case of ICOs), but also mostly lacked clear regulatory solutions, regulatory answers, specific regulatory steps, and recommendations. The blockchain potential has not been fully recognized by authorities until only very recently, triggered by the Libra project.

This paper illustrates the road to regulatory recognition of DLT, including cryptocurrencies and crypto assets, in the EU. For quite some time the EU regulator remained passive toward blockchain innovation except for a few inconsequential statements or reports. EU countries tried to address this innovation individually. In the absence of an off-the-shelf regulatory framework model or high-quality regulatory architecture for this new phenomenon, countries mostly attempted to apply existing legal framework to blockchain, with limited success.

Liechtenstein, however, developed a comprehensive, bespoke and unique law that creates an entirely new legal architecture and principles to enable the token economy. The Liechtenstein Token Act grants legal recognition and protection to a token, provides a bridge between tokens and the existing laws, addresses civil law issues around tokens, defines service providers roles and responsibilities to ensure the seamless connection between the digital and physical world and is flexible enough to cater to future technological developments.

Eventually, the EU has also embarked on a path of a unique and bespoke regulation, MiCA. MiCA is of a momentous importance for the entire blockchain ecosystem in Europe and beyond. It can either benefit or prejudice Europe and it will certainly influence and shape regulatory approaches in other countries, possibly setting global standards. MiCA is an applaudable effort by the EU regulator, which not so long ago paid little attention to blockchain innovation. However, such a bespoke, prescriptive, and detailed pan-EU regulation aimed to govern a dynamically developing blockchain technology will shape the future of the entire region and has to be carefully considered and meticulously calibrated.

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