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Legal Aspects of the Custody of Digital Assets

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Abstract

This dissertation was written as part of the LLM in Transnational and European Commercial Law, Banking Law and Mediation/Arbitration at the International Hellenic University. Titled “Legal Aspects of the Custody of Digital Assets”, this dissertation examines a number of modern financial instruments and how they interact with the present financial system. These assets present a number of challenges to the current legal framework, with this dissertation aiming to shed light into the characteristics of these assets, the regulatory structure of the competent authorities and how they attempt to approach these unprecedented asset forms.

This dissertation focuses on a number of sensitive regulatory areas which highlight the difficulties and peculiarities these assets present. Through this process, the competent organizations in various jurisdictions are displayed, along with the latest developments in each field. This piece was written with the reader in mind, aiming to provide useful and enlightening information to readers belonging to various, though interwoven, disciplines. It should, hopefully, live up to that expectation.

I would like at this point to acknowledge the aid of my supervisor, Professor Thomas Keijser. An expert in his field, Professor Keijser provided useful insights and critical literature, along with support in structuring arguments and getting accustomed to academic writing. It was a pleasure collaborating with such an esteemed, yet approachable, professional.

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Keywords: digital assets, blockchain, framework, regulation, ledger

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Table of Contents

Abstract	3
Introduction	5
1. Digital Assets	8
1.1 Digital Assets and underlying technology	8
Blockchain	8
Distributed Ledger Technology	9
1.2 Common types of Digital Assets	10
Cryptocurrencies	10
Tokens	12
2. Legal Aspects and Regulation	15
2.1 The need for regulation	15
Custodian Regulation	16
Nomenclature confusion	18
2.2 Competent jurisdictions	18
National jurisdiction	19
Supranational jurisdiction	19
International jurisdiction	20
2.3 Areas of regulation and challenges raised by digital assets	21
Anti money laundering legislation (AML)	21
Banking Supervision (Prudential Treatment)	22
Securities Law	23
Payment and Securities Systems rules	24
Concluding Remarks	25
2.4 The legal landscape as it stands	25
Anti money laundering legislation (AML)	26
Assessment	29
Banking Supervision (Prudential Treatment)	30
Assessment	32
Securities Law	33
Assessment	38
Payment and Securities Systems rules	38
Assessment	42
3. Conclusion	43
3.1 Norms, not specific frameworks	43
3.2 Outcome	44
Bibliography	45

Introduction

In the ever-changing technological and sociopolitical landscape, every once in a while, a breakthrough takes place. An innovation so advanced and groundbreaking, that the system has no other choice than to propel itself forward. As the discovery of the secrets of the nucleus endowed mankind with next to unlimited potential through readily available cheap energy, it also shrouded it in insurmountable pain through the accident in Chernobyl and the bombings of Hiroshima and Nagasaki. Any advancement can be used towards the public interest, however the very same qualities make it the perfect candidate to be used against it. Enter blockchain and digital assets.

The technology of blockchain is relatively recent (the idea behind it, however, dates back to 1991¹) being introduced to larger audiences through Satoshi Nakamoto's emblematic essay² in 2009 which kickstarted the emergence of Bitcoin, the most popular application of blockchain yet. The Bitcoin typifies as a digital asset.

Everything can be a digital asset, text, audiovisual material, even personal data. However, what are digital assets in the financial sector? Digital assets, or virtual assets, are, in simple terms, digital representations of value³. They can be transferred and traded via digital means. However, they do not include digital representations of fiat, real world currencies. An everyday savings bank account may keep an electronic record of its holder's balance (a nominal value of a fiat currency), however this record does not correspond to a virtual asset. This digital figure may indicate on the remaining nominal amount of a given currency in a specific bank account, acting as an interpretation of value, not a representation of it. In other words, the digital assets *contain* and *represent* value. If the bank account record is erased, the value is not lost – the currency is safe within the bank's vault and the contractual

¹ Narayanan, Arvind; Bonneau, Joseph; Felten, Edward; Miller, Andrew; Goldfeder, Steven (2016). *Bitcoin and cryptocurrency technologies: a comprehensive introduction*. Princeton: Princeton University Press pg.25

² Nakamoto, Satoshi (2009). *Bitcoin: A Peer-to-Peer Electronic Cash System*, (<https://bitcoin.org/bitcoin.pdf>)

³ Financial Action Task Force (2019). *Guidance for a Risk- Based Approach to Virtual Assets and Virtual Asset Service providers*, pg.13 (<https://www.fatf-gafi.org/publications/fatfrecommendations/documents/guidance-rba-virtual-assets.html>)

obligation of the bank to its client still stands. However, in case a digital asset is erased, the value it contained and represented is unrecoverable - the digital equivalent of burning currency or destroying property. It is therefore derived that these assets operate entirely (with exceptions, which will be illustrated further down) on the digital realm⁴.

The definition of these assets is rather broad and could really contain anything. Thus, the scope of this dissertation should be defined at this point. As per the title "*Legal Aspects of the Custody of Digital Assets*", the main focal point will be the legal aspects and the regulatory approaches these digital assets entail, given that their functions and structural models do not comply with the predominant system. It will be illustrated that it's not simply a matter of legal interpretation. The term *Custody* was chosen over *Ownership* or *Handling* so as to point out that the traditional custodians of these instruments (banking institutions, central securities depositories etc.) will be examined further, since the banking regulation demonstrates irregularities in regards of legislation, as is the case here as well.

It should be noted that there's a large category of assets which has transitioned from physical to digital form, maintaining however the characteristics of a conventional title. These are dematerialized assets like stocks, options etc., assets which lost their physical form (or were created ab initio in digital form due to the evolution of technology but don't differentiate from their physical equals) and are transferred digitally through distributed ledger technologies (more on that under *Distributed Ledger Technology* in Chapter 1). They are called intermediated assets, since they adhere to the traditional structure which is based on the existence of multiple intermediaries (banks, CSDs, custodians etc.). These assets will not be covered in this dissertation, for they do not constitute digital assets (or more appropriately, crypto-assets) per se, rather than traditional assets in digital form⁵. They are created in a different manner and they do not act alike, therefore falling out of the scope of this dissertation.

⁴ European Banking Authority (2019). *Report of 9th January 2019 with advice for the European Commission on Crypto-Assets*, pg.9 (<https://eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1>)

⁵ Blandin, Apolline; Cloots, Ann Sofie; Hatim, Hussain; Rauchs, Michel; Saleuddin, Rasheed; Grant Allen, Jason; Zhang, Bryan; Cloud, Katherine (2019). *Global Cryptoasset Regulatory Landscape Study*, University of Cambridge Faculty of Law Legal Studies Research Paper Series, pg. 12 (<https://ssrn.com/abstract=3379219>)

This dissertation aims to provide a complete and up-to-date summary of the legal challenges that have arisen since the advent of virtual assets and regulation approaches thereof, with a special focus on custodian institutions, a practical guide attempting to combine theory and practicality.

In the first Chapter, important distinctions of the different asset types will be made along with a few technical aspects on how these assets are formed and traded, in order to clarify why regulating these assets is cumbersome and what regulators have in mind when approaching the legislation drafts.

Furthermore, in the second Chapter the most important regulation drafting bodies will be introduced, along with their respective areas of regulatory interventions. It is also imperative to demonstrate the most affluent instruments per regulatory area, providing some key aspects and the norms they choose to follow.

Finally, in the third concluding Chapter, having dissected the whole sector's behavior in the previous Chapters, the dissertation will evaluate the situation as it stands including some hints to the future.

One thing is certain. The digital era has spurred a wondrous new age, an age with which – admittedly – the legal system is struggling to keep up. Evolution and law have been two formidable adversaries since time immemorial, a struggle between two opposing forces. It remains to be seen whether the law will manage to reign supreme over the elusive nature of the digital world – or the digital world remains an unregulated *terra incognita*, a place beyond States, laws and regulations.

1. Digital Assets

1.1 Digital Assets and underlying technology

A lot of different asset types form the category of digital assets. It's important to understand that the technology is versatile, and that each different asset is made to accommodate specific needs. That being said, it's a frequent phenomenon to identify assets with wildly different characteristics, even within the same subcategory. Therefore, such a classification shall focus on generic common characteristics, since individual traits differ. In this Subsection, a few different concepts will be examined, mainly regarding the most notable asset categories along with some features about their underlying technology and how they're generally formed.

Blockchain

The technology of blockchain is the backbone behind the whole concept of these digital assets. All assets are simply applications of blockchain. In simple terms, a blockchain is a set of *distributed ledger technologies* which can be programmed in a way to record and track data⁶. For example, medical data, scientific data etc. It is therefore evident that the technology per se is not exclusive to digital assets.

In fact, such "outsider" applications have been growing and growing, with notable examples including the blockchain keeping the entirety of Estonia's medical records⁷, the releasing of scientific data in open blockchains and other exciting applications. The blockchain technology owes its merits to the innovative approach it follows when adding information to the respective ledger. The procedure involves creating a "block", a single entry, and then

⁶Quiniou, Matthieu (2019). *Blockchain: The advent of disintermediation*, ISTE, pg. 21

⁷"KSI Blockchain technology is being used for the system to ensure data integrity and mitigate internal threats to the data" ,as taken from the Government of Estonia's e-Health portal (e-estonia.com/solutions/healthcare/e-health-record)

adding it to the “chain”, thus creating the blockchain. Every new value added, or modified, represents a single block in that chain⁸.

Creating a block is in itself a process which provides security, given that in order to actually produce a block, a computer algorithm has to be solved, in order to fend off tricksters and verify the honesty of the user⁹. Blockchains usually demand even more means of identification. Adding the block to the chain is an entirely different process, examined under *Distributed Ledger Technology*. The blockchain technology is lauded for providing trust, speed and accessibility.

Distributed Ledger Technology

The distributed ledger is the framework through which a blockchain operates. Essentially, the distributed ledger serves as the “chain”, the chain connecting all the blocks, forming the blockchain¹⁰. Its structure is indicated by its mere name. Inspired by its paper counterpart, the technology cherishes the simplicity of a traditional ledger, a record which manages to register multiple values and track their changes over time.

The second term which defines the technology, is “distributed” which in our case translates to “decentralized”¹¹. One of the greatest breakthroughs of the technology is the bypassing of the traditional system of intermediaries – a system dominated by custodians, CSDs, banks and other intermediaries, factors which bog the system down and inevitably impede momentum, a situation acting in complete antithesis to the accelerated rhythm of the modern world. The users are transacting directly, and, taking into account this lack of intermediaries, the process of transferring or registering assets through a distributed ledger is much quicker than what is considered the standard protocol, the intermediaries.

⁸ Wattenhofer, Roger (2016). *The science of the blockchain*, CreateSpace Independent Publishing Platform, pg.86

⁹ Zheng, Zibin, et al. (2017). *An overview of blockchain technology: Architecture, consensus, and future trends*. 2017 IEEE International Congress on Big Data (BigData Congress). IEEE, pg.558

¹⁰ Davidson, Sinclair and De Filippi, Primavera and Potts, Jason (July 19, 2016). *Disrupting Governance: The New Institutional Economics of Distributed Ledger Technology* Available at SSRN: <https://ssrn.com/abstract=2811995> or <http://dx.doi.org/10.2139/ssrn.2811995>, pg. 5

¹¹ Wang, Aries Wanlin (2018). *Crypto Economy: How Blockchain, Cryptocurrency, and Token-Economy Are Disrupting the Financial World*, Simon and Schuster, pg.21

The distributed ledger resembles a P2P (peer-to-peer) network¹², a network where no part is statically a server or a client. All members of the system are part of the same blockchain and could potentially be both, even simultaneously, given the situation at hand. This multitude of users accessing the same data is also key in ensuring that the information being shared across the blockchain is accurate, thus creating trust in the technology.

When adding the block to the chain, a mechanism is in place in order to ensure consensus. Each blockchain uses a different mechanism of this kind, aiming to achieve “Byzantine Fault Tolerance”¹³, a term coined after the classic “Byzantine Generals” logical problem. The most commonly used are the “proof of work” and “proof of stake” methods, with others such as “proof of activity”, “proof of burn” or “proof of capacity” being used extensively as well. Each blockchain may be wildly different from the next one and may serve entirely different purposes, due to the technology’s versatility, hence the wide array of consensus mechanisms used.

1.2 Common types of Digital Assets

Cryptocurrencies

The most popular application of blockchain yet – so popular that, in fact, the greater public had misleadingly believed (and a part of it still does) that the terms “cryptocurrency” and “blockchain” were identical and interchangeable. The truth is, that not only are the cryptocurrencies an application of blockchain, they also served as a vehicle of sorts, through which the technology was introduced to the public.

Furthermore, the cryptocurrencies are the most common form of digital asset in today’s market, with Bitcoin’s market cap clocking in at approximately \$130 billion¹⁴. Other

¹² Kakavand, Hossein and Kost De Sevres, Nicolette and Chilton, Bart (January 1, 2017). *The Blockchain Revolution: An Analysis of Regulation and Technology Related to Distributed Ledger Technologies*. Available at SSRN: <https://ssrn.com/abstract=2849251> or <http://dx.doi.org/10.2139/ssrn.2849251>, pg.3

¹³ Bond, Ian (2018). “Proof of work” vs. “Proof of stake” vs. other Byzantine Fault Tolerances (https://medium.com/@ianbondw/proof-of-work-vs-proof-of-stake-vs-other-byzantine-fault-tolerances-ff01f5de951)

¹⁴ Market cap extracted from the website: coinmarketcap.com/currencies/bitcoin

cryptocurrencies include Ethereum, Litecoin, XRP and many others. The cryptocurrencies are digital assets which operate through their own respective blockchain and distributed ledger¹⁵. There is no central authority which issues or regulates these currencies. They are issued through a process called “mining”, a name inspired by the traditional process of gold extraction¹⁶.

For example, in Bitcoin, this mining procedure involves the solving of a complex mathematical problem, the computer algorithm mentioned above under *Blockchain*. In this case, the algorithm serves as a limit towards the production of Bitcoin. Each time a Bitcoin is created, this algorithm gets more and more complicated, to the point that the algorithm gets unsolvable, thus signaling the end of Bitcoin production. Right now, there are approximately 18.1 million Bitcoins in existence, with 2.9 million remaining, totaling at 21 million¹⁷.

Many factors are contributing towards this explosive popularity cryptocurrencies are experiencing. A lot of them are related to their parent technologies. Due to the distributed ledger they use, transactions are quick and verified. This verification process, both during the mining stage but in everyday transactions as well, ensures trust and security in the whole concept, with many experienced users feeling safe while using it in their daily lives. It should be noted that the transfer process is not instantaneous, since the verification process is quick, but it does take a certain amount of time.

However, the main advantage of these digital assets is denoted by the name itself. The prefix crypto-, deriving from the Ancient Greek verb *κρύπτω*, “to hide, to conceal”, indicates that information about these transactions, and the owners of each asset is not available to the public¹⁸. This is achieved through sophisticated means of cryptography. Therefore, it is evident that much like cash, cryptocurrencies are practically untraceable. Due to this lack of traceability they have been used multiple times for illicit purposes, as will be demonstrated under *The need for regulation*, in Chapter 2.

¹⁵ Antonopoulos, Andreas M (2014). *Mastering Bitcoin: unlocking digital cryptocurrencies* O'Reilly Media, Inc. pg 15

¹⁶ Quiniou, Matthieu (2019). *Blockchain: The advent of disintermediation*, ISTE, pg.13

¹⁷ Data taken from the website: (buybitcoinworldwide.com/how-many-bitcoins-are-there)

¹⁸ Phillip, Andrew; S.K. Chan, Jennifer; Peiris, Shelton (2018). *A new look at Cryptocurrencies*, ISSN 0165-1765 (<https://doi.org/10.1016/j.econlet.2017.11.020>.) pg.3

A very important aspect of cryptocurrencies has to do with their physical storage which arises issues regarding their custody thereof. As they are nothing more than mere computer files, they can be stored as any other, e.g. in a hard drive, a USB stick and others. Specialists are advising against this method¹⁹, with special drives (called “digital wallets”) being introduced to accommodate this need, which are usually adding extra layers of security (passwords, encryption, anonymization etc.). Another option is the storage in online websites such as Coinbase™, which claim that they offer security and safe handling of the stored digital assets, with the past having shown that these solutions are far from perfect.

Tokens

At this point, a pattern may be diagnosed. While these digital assets are something relatively new, the forms they take resemble their more traditional counterparts. For example, cryptocurrency resembles in its characteristics cash, in the sense that they’re anonymous and provide a sense of financial freedom, an ever dwindling sentiment in the modern world of electronic money and tracked transactions. In the same aspect, tokens are a loose equivalent to securities titles, they’re digital assets which, depending on their structure, empower their bearer to control the direction of an enterprise, or gain access to certain functions of said enterprise.

At first, many enterprises trying to secure funds for future projects launched a so-called *Initial Coin Offering*²⁰, a term obviously inspired by the Initial Public Offering which offered tokens. A large number of these were cryptocurrency startups, hence the term “coin”. The participants in the ICO received a digital token, an encrypted digital asset which operates on a distributed ledger, with properties akin to the cryptocurrencies in terms of storage and transferability. This token entitled the bearer to use a given service offered by the startup before the general launch (on an early access basis) or to access parts of the service that the general public wouldn’t, even at launch. This way the token actually held some value, a right

¹⁹ The offline method of storing cryptocurrencies is also called “Cold Storage” (https://en.bitcoin.it/wiki/Cold_storage)

²⁰ Chohan, Usman W.(2019). *Initial coin offerings (ICOs): Risks, regulation, and accountability.*, Cryptofinance and Mechanisms of Exchange. Springer, Cham, pg.3

of use or access. This right could be traded, and if the corresponding project gained traction, then the respective right of use gained in value as well. These are called *utility tokens*, because their sole purpose is usage, not investment²¹.

However, after a while, the whole situation was clouded, with the emergence of tokens that did not simply provide a right of use. These tokens, called *security tokens*²², often represented equity in a company, they shared profits, and even granted voting rights, essentially resembling stocks. These tokens provided the opportunity for investments, by bypassing all securities regulations. The U.S. Securities and Exchange Commission quickly shot down these schemes, and decided to crackdown on ICOs selling securities tokens²³. They enforced securities law, essentially treating them like traditional securities. At that point, the tide in the United States shifted towards the offering of utility tokens once more, since securities laws in the US are stringent and under rigorous scrutiny²⁴.

After these events, ICOs offering securities tokens continued their operations outside the US and China (which presents a strict environment as well), and outside of major exchanges. The U.S. Securities and Exchange Commission ruled in its DAO report²⁵ that tokens passing the Howey test (a series of prerequisites in US law which, when met, indicate that the asset at hand is indeed a security) would be considered securities. It also observed that nearly all ICOs were offering securities, but none of them were registered.

After a while, a new vehicle of offering security tokens emerged. The *Security Token Offering* (a subcategory of the Initial Coin Offering) is governed by securities law and provides a legitimate way of offering bona fide security tokens. These tokens are embracing their

²¹ Lo, Yuen C., and Francesca Medda (2019). *Assets on the Blockchain: An empirical study of Tokenomics*, (SSRN 3309686) pg.3

²² Momtaz, Paul P., Kathrin Rennertseeder, and Henning Schröder (2019). *Token Offerings: A Revolution in Corporate Finance?* (SSRN 3346964) pg.7

²³ Hajric, Vildana (2018). *SEC Crypto Settlements Spur Expectations of Wider ICO Crackdown*, *Bloomberg* (bloomberg.com/news/articles/2018-11-19/sec-crypto-settlements-spur-expectations-of-wider-ico-crackdown)

²⁴ Dale, Brady (2018). *ICOs Iced: A 12-Month Freeze on US Token trading may be beginning*, article available at: (<https://www.coindesk.com/icos-iced-12-month-freeze-us-token-trading-just-beginning>)

²⁵ Securities and Exchange Commission (2017). *Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO*, Release No. 81207 / July 25, 2017

security traits without needing to hide under the utility façade. A number of countries already provide a detailed framework for Security Token Offerings²⁶.

The benefits of securities tokens are numerous. They provide legal certainty, since many countries provide for a full framework of operation²⁷, therefore lessening investor risk. They combine the best of both worlds – the versatility of digital assets with the omnipresence of securities, offering unprecedented capabilities. This denotes that they may be backed by real world assets, thus enabling the “tokenization” of these assets, expanding their maximum potential. For example, an art painting which is backing a security token, may be easily split in numerous parts, through the fractional ownership of the token. This constitutes a scheme that allows for funds to flow freely, given that assets which are hard to liquidize are split up and traded with ease.

Finally, as mentioned before, the security tokens combine traits of both securities and digital assets. Storage wise, this combination entails more options than cryptocurrencies. Like cryptocurrencies, tokens may be stored locally, or on internet databases. However, security tokens are also designed to abide by securities laws, as demonstrated. This does not only refer to their launch through the Security Token Offering, but to their entire lifespan. Therefore, technically, they are also inclined to follow the traditional route, storage in a Central Securities Depository.

Tokens along with cryptocurrencies are the predominant types of digital assets available today. However, the term “digital assets” is not limited to these two types, with reality having shown that the technology of blockchain is merely a tool for fintech (financial technology) enthusiasts and professionals alike to build vehicles which cater to their specific needs. It’s, therefore, highly unlikely that this status quo will remain. The confines are blurred, and many terms are being used interchangeably, with the notable example of cryptocurrencies being called payment tokens as well. This situation presents a major obstacle to prospective legislators. Law requires definition, categorization, and rigorous

²⁶ Darental, Jay (2019). *How Malta Leads Security Token Regulation*, article available at: (<https://thetokenist.io/jay-derenthal-how-malta-leads-security-token-regulation/>)

²⁷ Notable examples include Lithuania and Switzerland.

precision. From that aspect, while a detailed and concrete *lex digitalis* may be underway, the sector is still nascent. Every day, new asset types are being proposed, as well as different methods of asset creation (e.g. airdrop, in which users are given cryptocurrency or tokens for free for promotion purposes, or fork, the emergence of alternative chains in a system).

In the following Chapter, the most affluent regulatory bodies will be introduced along with the perimeter in which they operate. The technical exploration in this Chapter was deemed necessary in order to understand the concepts and regulatory norms applicable.

2. Legal Aspects and Regulation

2.1 The need for regulation

The question of whether the sector even needs regulating has been a matter of dispute since the inception of digital assets. Hardcore supporters of the distributed architecture of cryptocurrencies are opposed to any kind of regulation, arguing that these assets were created specifically to counter the disadvantages of centralized systems. However, with the market cap of cryptocurrencies ever increasing²⁸, and enterprises using tokens as drivers of growth, digital assets nowadays represent a small, yet notable, percentage of the world economy.

This growth has raised concerns over the legal framework regarding digital assets. The concerns rose after the 2013 Silk Road scandal²⁹. Silk Road was an online dark web

²⁸ Bloomberg Crypto Outlook – January 2020 Edition, available at (<https://data.bloomberglp.com/professional/sites/10/Bloomberg-Crypto-Outlook-January-2020-edition.pdf>) pg.2-3

²⁹ Greenberg, Andy (2013). *End of the Silk Road: FBI Says It's Busted the Web's Biggest Anonymous Drug Black Market*, *Forbes*

marketplace for all things illegal. Whoever was interested could order narcotics, weaponry and even death contracts online, through the site. All “merchandise” on Silk Road were paid via Bitcoin. When the Federal Bureau of Intelligence, the Drug Enforcement Administration, the Internal Revenue Service and Customs officials managed to crackdown on the website, they confiscated around 144,000 Bitcoins (worth approximately 122 million dollars at the time) and arrested its founder, Ross Ulbricht³⁰. He is currently serving a life sentence at United States Penitentiary Florence High. Since Silk Road’s demise, a number of other illegal online marketplaces have sprung up in its place, indicating that the organized crime schemes and syndicates of tomorrow will operate online.

Another major issue is tax evasion. Taking into account the untraceability of cryptocurrencies, transaction-wise and storage alike, the task of taxing them is insurmountable. This is a very unpleasant situation for the States, which witness their income revenue dwindling in the advent of digital assets.

Last, but certainly not least, the assets themselves are vulnerable to illegal hacker attacks and theft, given that the everyday user cannot provide for the same level of security

Custodian Regulation

All the aforementioned issues concern the bearers of digital assets. They are the ones who decide to purchase illegal materials and services online through Bitcoin. They also choose to evade taxes. The token issuers are those who decide to evade securities laws through utility tokens. As it stands, regulation tackling the various issues of digital assets should be more bearer oriented than anything else. Why should then the regulation of bank and custodian activities regarding digital assets even be debated?

³⁰ Silk Road operator Ross Ulbricht sentenced to life in prison (2015) article available at (<https://www.theguardian.com/technology/2015/may/29/silk-road-ross-ulbricht-sentenced>)

The question arises when the current status quo of digital asset ownership and custody is examined. The vast majority of digital assets are physically kept by their owner, in an eligible medium (digital wallets, an online space, hard drives, flash drives etc.). This is analogous to an everyday wallet where fiat currency is stored, or a secret cache within a property. These are all means of *personal custody*, means through which a natural person may exert a right of ownership in order to protect such assets.

Nowadays, the modern world is slowly phasing out personal custody, keeping it as an option for constitutional reasons. A commonplace right found in most constitutions of the world³¹, the right of financial freedom states that each person is entitled to act at his or her own discretion regarding his or her financial activities, as long as other people's rights are not affected. Completely excluding personal custody would amount to the demolition of said right. However, *institutional custody*, exerting custody through banks, central securities depositories and other custodians, provides first and foremost adequate safekeeping, sophisticated custodial services and an exquisite legal framework which regulates all aspects of the custodial contractual relationship³². This amounts to increased legal certainty, which in turn bolsters the owner's trust in the institution, strengthening the system as a whole.

Institutional custody solutions regarding digital assets are not yet widely available to the public. This is not simply a matter of company policy. The custodian institutions are reluctant to offer custody for digital assets, for a number of reasons. First of all, while digital assets may be gaining traction, they're still a long shot away from achieving the same uptake as traditional financial assets, which amount to multiple hundreds of trillions of dollars. Commercially, it does not yet make sense to invest time and money into designing a whole new framework to provide custody for digital assets.

Designing this framework is a daunting task by itself. The custodians follow the traditional intermediaries' system, a centralized approach involving multiple parties (custodian banks, central securities depositories, other intermediary banks etc.). The architecture of blockchain is decentralized ab initio and at its core, standing primarily in opposition to the traditional

³¹ Article 5 of the Greek Constitution (as amended in 2008)

³² Loss, Louis (1983). *Fundamentals of securities regulation*. Aspen Publishers Online, pg.146

system. A custodian would therefore need to reiterate a large part of the institution's structure in order to accommodate digital assets.

However, that matter does not fall within the discretion of these institutions. The applications of blockchain are increasing and corporate startups are slowly abandoning the Initial Public Offering, selling tokens to raise funds instead. Institutional custody will be needed, sooner or later, and the legal framework has to already be in place if such services are to be provided. It is, therefore, evident, that it is as needed to regulate custodian activity regarding digital assets as much as the individual bearers of these assets.

Nomenclature confusion

In digital assets jargon there's a number of different concepts and terms which are used interchangeably, given the many different forms these assets may take. Interchangeable terms are a nightmare for legal professionals and authorities alike. Drafting, interpreting and imposing law requires precision, accuracy and consistency in the terms used. In this context, these elements are limited. For example, FATF insists on using the term "virtual assets" and in early reports "virtual currencies". Most organizations ignore the term "Security Token Offering" altogether. With the technology and its penetration still nascent, these are issues that are expected to arise. One could argue that as long as the authorities get a grasp of the real issues at hand, nomenclature is nonsensical.

2.2 Competent jurisdictions

The banking and custodian institutions are among the most sophisticated corporate entities, with an increased presence in every natural and legal person's daily life. Hence, due to their importance, the most part of their activities is regulated by various instruments, through multiple layers of jurisdiction. Each jurisdiction contains multiple authorities which are competent to regulate bank and custodian activities. The different levels are as follows;

National jurisdiction

The national jurisdiction of each State depends greatly of the legal system and structure of this particular State. The separation of powers is a key concept in this regard. In most States, the legislative branch along with the executive power are competent to regulate the institutions in question. In principle, the respective Parliament along with the Ministry of Finance along with that State's Central Bank regulate their State's banking activity³³. Usually, due to the technical nature of this task, this competence is delegated to the Central Bank which was founded for this purpose. In certain legal systems, such as the United Kingdom's common law system, the judicial branch may intervene, given that its rulings may carry legislative effect. In the continental systems, the judicial review serves as an interpretation of the applied statutes, rather than legislation.

That being said, given that the digital assets present technical difficulties and are based on quite exquisite mechanisms, it's highly likely that any sort of measures aiming to regulate this activity in the banking and custodian sector will be coming from the Central Bank which regulates these matters (through standards, guides and guidelines they impose and issue) forming, essentially, the ground level of the sector's regulation process.

Supranational jurisdiction

This jurisdiction is founded on supranational organizations which exercise authority on specific matters delegated to them by the States' own volition. The most notable example is the European Union and the United Arab Emirates. One of the European Union's aims is to harmonize the legislation of its Member States regarding matters which fall within its scope. For matters regarding bank and custodian activities, the European Union has established the European Bank Authority and the European Securities and Markets Authority.

These organizations, along with the European Central Bank, specify the framework of operation of European banks and foreign banks operating within the territory of the

³³ Schiavo, Gianni Lo.(2014). *From National Banking Supervision to a Centralized Model of Prudential Supervision in Europe? The Stability Function of the Single Supervisory Mechanism.*Maastricht Journal of European and Comparative Law 21.1 : pg.17

European Union. They issue guidelines and provide technical knowledge in order to harmonize the functions of European banks, given that a strong and resilient banking system is a prerequisite to the proper movement of funds and capital throughout Europe³⁴.

It is evident that these supranational organizations are playing a decisive role in defining the political and legal norms which will dictate any future banking and custodian regulation regarding digital assets.

International jurisdiction

On the international scene, there's a number of organizations which publish and issue recommendations, standards and other instruments regarding banking and custodian activity. These organizations' objectives vary, and most focus on one specific regulatory area. These organizations include the World Bank, the Bank for International Settlements, the Financial Action Task Force, the Financial Stability Board and others. Their aim is to harmonize the operational framework of banks across the globe in relation to important issues regarding security, cross-border mobility and connectivity, among others.

Given that digital assets are not a specific issue per se, rather than an overhaul of all existing operations, it's more than probable that they will put a number of different regulatory areas under pressure. Hence, a number of different international instruments are expected to be applicable.

A very intrinsic element about bank regulation is the readiness of the sector to comply with non binding instruments. The institutions take pride in claiming that they adhere to the latest and most updated standards, a claim which translates into commercial profit, since the investment public's trust is of paramount importance. This element is the distinguishing feature between the application of non binding instruments on banking and custodian institutions and nearly every other natural and legal person. Most instruments of this nature are only applicable after the explicit permission of a person, or through the implementation

³⁴ Schoenmaker, Dirk (2012). *Banking supervision and resolution: the European dimension*. Law and Financial Markets Review 6.1: pg.6

of the instrument in the supranational level. In the banking world, this explicit permission is thought to nearly already have been given.

2.3 Areas of regulation and challenges raised by digital assets

Bodies and organizations which belong among these three main competent jurisdictions affect various areas of these institutions' activities. In order to examine how digital assets intertwine and relate to the banking legal framework, the regulatory perimeter has to be defined, via scrutiny of the predominant focal points of banking and custodian legislation. A number of regulatory areas have been approached by various authorities belonging in the aforementioned jurisdictions. A non exhaustive list of indicative examples follow.

Anti money laundering legislation (AML)

The anti-money laundering legislation is one of the most important branches of banking law. It's the set of rules, regulations and guidelines which aim to prevent money laundering activities, the legitimization of illegally obtained funds. Banks are essentially required to supervise their clients' transactions and report any unusual activities to the authorities.

The Financial Action Task Force (FATF) along with the International Monetary Fund (IMF) are considered to be the pioneers in anti money laundering legislation³⁵. After the dreadful events of September 11 in 2001, legislation was drafted and promoted in order to tackle terrorist funding, signaling the outset of this branch of banking law. Domestic authorities have further developed explicit anti money laundering frameworks, following international guidelines.

³⁵ FATF(2017). *Anti-money laundering and terrorist financing measures and financial inclusion*. (https://www.masthead.co.za/wp-content/uploads/2017/11/Updated_fatf_financialinclusion.pdf)

Digital assets pose a great challenge to anti money laundering legislation. Their decentralized nature and untraceability stands in direct opposition to the banks' supervision duties imposed by the law. Thus, imposing the current regulatory framework would amount to a complete disregard of these assets' unique characteristics, thwarting potential investments as they'd be deemed dangerous. This path could lead to the distributed ledger technology be deemed obsolete, given that as institutional custody could serve as the stepping stone towards the establishment of digital assets as the foundation of tomorrow's corporate finance structure, impeding progress would be devastating.

However, this does not mean that digital assets should be exempt from anti money laundering regulation while being under institutional custody. These structures cannot afford to create loopholes which would allow for money laundering. This complication merely serves as an indication of the predicaments authorities face while drafting new legislation. Drafting organizations and authorities have to attentively tip the scales in order to balance all rights, interests and obligations involved.

Banking Supervision (Prudential Treatment)

As the banking system is the backbone of the modern financial system, these institutions are playing a pivotal role towards the vitality of the financial world. Hence, it is only evident that after the events of corporate mismanagement and exposure to assets of volatile nature, standards of prudential treatment were put in place. Essentially, bank activity is put under scrutiny in order to minimize risk while making sure that the institution is meeting certain capital requirements which would help alleviate damages in times of distress.

Pioneer in this particular sensitive area of banking regulation is the Basel Committee of Banking Supervision (BCBS). Its aim is to enhance the stability and resilience of banks worldwide. To that end, they have drafted the Basel I, II and III³⁶ regulatory frameworks³⁷. These frameworks rate the risk of a number of different assets and set the required capital deposits in order to safeguard the institution against the posed risk. They are, essentially,

³⁶ Bank for International Settlements. *The Basel Framework* (https://www.bis.org/basel_framework/)

³⁷ Drumond, Ines (2009). *Bank capital requirements, business cycle fluctuations and the Basel accords: A synthesis*. Journal of Economic Surveys 23.5: pg.33-34

guidelines for the bank managers to treat their banks prudently. While these instruments are non binding, the institutions (for reasons explained above under *International Jurisdiction*) follow suit on the Basel Committee's guidelines.

The predicament faced with digital assets is that they are missing entirely from these frameworks. Given that the digital assets' market (especially cryptocurrencies) has presented signs of extreme volatility, assessing the risks involved when investing in digital assets is a cumbersome task. In the absence of specific regulation, investment banking institutions do not opt to expose themselves to digital assets, a development which further impedes digital asset growth.

Securities Law

Securities law is a multifaceted sector of law, ranging from the mere definition of what constitutes a security, to various obligations of organizations issuing and selling securities, in the interest of potential investors³⁸. The spirit of the law is to identify an asset as a security, and then apply the respective regulations. These regulations have been put in place in order to discourage scammers, which in the past have extracted wealth from unsuspecting investors. The law establishes an obligation of increased information provision prior to and after the investment, so that the public invests with full knowledge.

Securities regulation falls within the scope of various bodies throughout jurisdictions. While the matter is predominantly within the scope of domestic authorities (like the Securities and Exchange Committee in the United States of America), there are notable exceptions. For example, within the territory of the European Union, the European Securities and Markets Authority (ESMA) is delegated from the Member – States to coordinate these matters, a fine example of supranational jurisdiction establishment³⁹. Prevalent in the international scene is also the International Organization of Securities Commissions (IOSCO)⁴⁰.

³⁸ Hudson, Alastair (2008). *Securities law*. London: Sweet & Maxwell, pg.798-800

³⁹ Pelkmans, Jacques, and Marta Simoncini (2014). *Mellowing Meroni: How ESMA can help build the single market*. CEPS

⁴⁰ Sommer Jr, A. A (1996). *IOSCO: its mission and achievement*. Nw. J. Int'l L. & Bus. 17: 15.

Integration of digital assets into securities law is one of the biggest challenges raised since their inception. The whole philosophy of digital assets stands in opposition of the traditional power structures, a quasi manifesto against closed systems and architectures of the past. These assets were *built* to completely disregard intermediaries. Incorporating them The sector has exhibited lassitude at one of the most sensitive points of digital assets, perhaps the most vital for their integration. The dissertation will assess further down the steps taken towards that goal.

Payment and Securities Systems rules

These rules are related to more technical aspects of infrastructure. Securities and other related assets under custody need to be cleared and settled, so that their free movement is guaranteed. Explicit provisions regulate all these different stages with precision⁴¹. These payment systems are a vital part in the everyday life of asset holders and custodian institutions alike. Organizations like the Committee on Payments and Market Infrastructures (CPMI) or the European Central Bank exercise authority in this regard.

Digital assets are proving to be very cumbersome to incorporate to present payment systems. The blockchain technology caters for clearing and settlements in its own unique manner, deeming the current procedures obsolete. However, the sector has exhibited resilience in this respect, incorporating diverse payment systems with relative integrity. A notable example is the introduction of Target2 – Securities, a framework which facilitates the communication between Central Securities Depositories across Europe, transferring securities quickly and easily between European nations. Examples like these indicate that the sector is open to new and revolutionary concepts and does not dwell in the bureaucratic notions of the past.

⁴¹ Utrero González, Natalia, and Francisco J. Callado Muñoz (2004). *European payment system and monetary union*. Journal of financial transformation, 2004, vol. 12, pg.16

Concluding Remarks

As mentioned before, integrating digital assets to the current structure of the financial world does not constitute an issue by itself, rather than a complete framework overhaul. As demonstrated above, digital assets affect multiple vital branches of the law. In fact, they affect nearly every branch. From whether they constitute securities and how banks should best treat them, to the avoidance of money laundering and their incorporation to existing payment systems, digital assets prove to be an exasperating factor to a system which seems flabbergasted to their very presence.

Hence, it is evident that the responsibility of integrating them cannot be borne by one organization or authority alone, even within the boundaries of a certain State. A coordinated layered approach is necessary, so that the integration is completed smoothly.

A number of organizations have been working on preliminary guidelines and norms, while some states have taken initiative in a number of aspects. The dissertation will assess these advancements further down in the next Subsection.

2.4 The legal landscape as it stands

Assessing the complete framework of (potential) regulations and their norms thereof regarding digital assets is not a task limited to the mere examination and interpretation of a single codified legal instrument. As digital assets have not yet been incorporated into the financial structure, there have mainly been early instruments and drafts regulating some of the most elementary legal matters. As previously stated, most of these provisions affect mainly the bearers of digital assets and not custodian institutions or banks.

That being said, there has been a fair number of guidelines, recommendations and indications about the direction towards which authorities and organizations in all jurisdictions aim to steer potential regulation. In order to approach and track the progress of

the legislation, the dissertation shall examine each and every vital regulatory area as presented above, with the most notable work from the competent jurisdictions. Afterwards, an assessment of the respective progress will follow so as to acknowledge not only whether legislation is at fruition, but the impact of the desired direction as well.

Anti money laundering legislation (AML)

Money laundering is one of the most sensitive issues raised by digital assets. Their past is woven with scandals of criminal conduct. Therefore, the competent authorities need to exercise caution, since these assets have proven to be valuable in the hands of the wrong people.

These authorities form a comprehensive network of competent bodies, throughout jurisdictions. Most (if not all) countries have established respective authorities which are delegated with the explicit task of monitoring banking institutions and market schemes in order to prevent money laundering within their country's territory. For example, the United States has established the Financial Crimes Enforcement Network, in the United Kingdom this authority is delegated to Her Majesty's Treasury, in the Netherlands the competent authorities are the Netherlands Authority for Financial Markets along with de Nederlandsche Bank (the Dutch Central Bank) and so on⁴².

On the international level, there's a number of expert organizations which coordinate the frameworks of national authorities, like the Financial Action Task Force, the International Monetary Fund and the World Bank⁴³. These organizations are usually manned by officials from domestic authorities, essentially facilitating the communication between them and enabling brainstorming. It is therefore evident, that any progression will first emerge from these establishments and then be incorporated in the domestic authorities. This structure reflects the nature of international financial crime; it knows no boundaries and the attempt

⁴² Lyman, Michael D., and Gary W. Potter (1997). *Organized crime*. Upper Saddle River, NJ: Prentice Hall, pg.402

⁴³ Scherrer, Amandine (2006). *Explaining Compliance with International Commitments to Combat Financial Crime: The G8 and FATF*, Paper Presented at the 47th Annual Convention of the International Studies Association, San Diego, 22-25 March, 2006 (<https://tspace.library.utoronto.ca/bitstream/1807/4892/1/scherrer.pdf>)

to hide funds usually involves offshore companies, proxy banks, escrow accounts and a form of forum shopping – seeking a legal environment friendly to such aspirations.

Digital assets are a global phenomenon as well, and are tackled as such. From very early on, in 2014, the Financial Action Task Force in its Report titled *Virtual Currencies; Key Definitions and Potential AML/CFT Risks*⁴⁴, tried to inform the public about the risks that could arise from digital assets (back then the organization spoke about virtual currencies, referring to Bitcoin, since it was the only known type of digital asset) through a perfunctory examination of their characteristics (anonymity and global reach). The report noticed that as the technology is purely decentralized, it could take advantage of national jurisdictions with weak anti money laundering and combating the financing of terrorism regimes. Furthermore, these thoughts were backed by an aggregation of circumstances where digital assets were involved in wrongdoings, specifically the Silk Road scandal, the Liberty Reserve online money laundering case and the Western Express International, an online international cybercrime group involved in theft and fraud.

This was an essential, though bumpy first step into understanding the money laundering risks associated with digital assets. The Financial Action Task Force, however, did not stop there. It should be noted that, although the International Monetary Fund and the World Bank also have the authority, in principle at least, to opine upon digital asset money laundering prevention, the Financial Action Task Force has been proven to present initiative, an attitude that has been lauded by the other organizations⁴⁵.

A few years later, the organization has come a long way. In October 2018, the *FATF Recommendations*⁴⁶ (the international standards on combating money laundering and the financing of terrorism and proliferation) were amended, in order to include in Recommendation 15 an obligation of countries and financial institutions (a very critical

⁴⁴ FATF (2014). *Virtual Currencies; Key Definitions and Potential AML/CFT Risks*, (<https://www.fatf-gafi.org/media/fatf/documents/reports/Virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf>) pg.2

⁴⁵ FSB(2019). *Crypto-assets: Work underway, regulatory approaches and potential gaps* (<https://www.fsb.org/2019/05/crypto-assets-work-underway-regulatory-approaches-and-potential-gaps/>) pg.9

⁴⁶ FATF(2018). *Recommendations* (<http://www.fatf-gafi.org/publications/fatfrecommendations/documents/fatf-recommendations.html>) pg.7

point) to assess the risks posed by these virtual assets prior to their launch⁴⁷. Furthermore, countries should “ensure that virtual asset service providers are regulated for AML/CFT purposes, and licensed or registered and subject to effective systems for monitoring and ensuring compliance with the relevant measures called for in the FATF Recommendations⁴⁸”. A virtual asset service provider is defined as any natural or legal person⁴⁹ involved with the exchange, transfer or safekeeping of assets. This is a progression which addresses almost directly banking institutions and custodians. The Financial Action Task Force urges the national authorities to regulate⁵⁰ and license banks and custodians prior to launching any service regarding digital assets.

However, the landscape remained uncertain. Apart from the fact that the obligation had been laid down, the national authorities and the potential service providers had essentially no insight on how the FATF Recommendations could be applied in the case of digital assets. To that end, the organization released in June 2019 the *FATF Guidance for a Risk-Based Approach to Virtual Assets and Virtual Asset Service Providers*⁵¹. This guidance contains the Interpretative Note to Recommendation 15 as an Annex, which partly clears out what countries and institutions are expected to do.

The main text of the guidance comprises of detailed instructions on how the States should apply each FATF Recommendation to virtual asset service providers, respecting the special characteristics of digital assets⁵². It defines how the supervision and monitoring process is conducted, the licensing requirements, preventive measures and law enforcement issues⁵³. The Financial Action Task Force proposes a risk-based approach; the different states should evaluate the risk that digital assets pose on their respective jurisdictions and then integrate the Recommendations in a manner they conclude as more reasonable in order to mitigate the arisen risks⁵⁴. This approach involves also consultations with a number of competent

⁴⁷ *ibid.* pg.29

⁴⁸ *ibid.* pg. 15

⁴⁹ *ibid.* pg.70

⁵⁰ *ibid.* pg. 78

⁵¹ FATF (2019). *Guidance for a Risk-Based Approach to Virtual Assets and Virtual Asset Service Providers* (<https://www.fatf-gafi.org/publications/fatfrecommendations/documents/guidance-rba-virtual-assets.html>) pg.15

⁵² *ibid.* pg. 17

⁵³ *ibid.* pg. 19

⁵⁴ *ibid.* pg. 37

authorities, so as to increase awareness and eliminate loophole while securing equal treatment across the spectrum.

Finally, the guidance summarizes a number of States' regulatory approaches to tackling money laundering through digital assets, along with preliminary remarks. The guidance notices that due to the international character of money laundering crime, authorities should cooperate extensively with their counterparts across the border. In this respect, the Financial Action Task Force applauds the approach of the United States of America⁵⁵, which encourage international and intragovernmental cooperation and has elaborate rules for obtaining and preserving evidence, which prove invaluable in a context where evidence can be destroyed easily.

In the European Union context, the fifth Anti Money Laundering Directive⁵⁶ was introduced. This Directive is aiming at applying AML/CFT regulation on digital asset trading platforms and custodian wallet providers, services which provide hosting for the users' private keys. This Directive fills a regulatory void, as the previous Directive ignored digital assets completely. The principles followed in this Directive are similar to those laid down in the FATF Recommendations.

Assessment

The progress in this particular sector has been substantial, given the complexity of digital assets, as well as their elusiveness. The risk-based approach allows the States to act at their own discretion, while being given the tools to assess the dangers involved. After all, money laundering is a crime prosecuted by the State authorities. Therefore, States should have a say in the forming of their own crime deterrence framework as well as their criminal judicial system given that it serves as an extension of their own Constitutional integrity. The risk-based approach strikes a fair balance point between allowing the State authorities to form their own agendas and policies, while also providing guidance and pinpointing the most important issues through extensive research.

⁵⁵ *ibid.* pg. 46

⁵⁶ Deloitte (2019). *AMLD5 has entered into force*, press release found at (<https://www2.deloitte.com/lu/en/pages/risk/articles/amld5-has-entered-into-force.html>)

Banking Supervision (Prudential Treatment)

The Basel Committee on Banking Supervision stands as the main and most important body in the field of banking supervision. The Committee operates under the auspices of the Bank of International Settlements, an international organization housing various committees of bank regulation relevance. The Basel Committee has released the Basel Accord I, II and III frameworks, instruments which harmonize the banking supervision and capital adequacy standards globally⁵⁷. They provide monitoring guidelines, capital adequacy requirements for exposure to risk weighted assets, disclosure obligations and more. The Committee followed a build-up approach, commencing from the harmonization of the most basic of principles, to introducing obligatory capital buffers in order to counteract the effects of the global crisis of 2015. The work of the Basel Committee through these instruments has increased the resilience of the banking system, and has been so influential in fact, that the European Union has opted to incorporate the Basel Accords in EU law through four Capital Requirements Directives packages and one Capital Requirements Regulation. Therefore, for the European Union Member States, the Basel Accords should be considered national law, after their obligatory transposition in the case of the Directives⁵⁸.

Given these instruments' importance and capacity to affect legislation worldwide, it is clear that any regulation or standard involving digital assets should be included in the Basel Accords. However, they are not. The Basel Accords do not contain explicit provisions on how digital assets should be treated, or define any criteria on how the banking institutions should assess the risks they're exposed to when dealing with assets of such nature. The instruments simply contain minimum capital and liquidity requirements for "other assets", a categorization which could include digital assets as a quasi umbrella clause for all non mentioned assets. This is a simple grammatical interpretation and in no circumstance does it serve any justice to the special characteristics of digital assets or is compatible with the

⁵⁷ Lyngen, Narissa (2012). *Basel III: dynamics of state implementation*. Harv. Int'l LJ 53 (2012) pg. 521

⁵⁸ Greenwood, Justin, and Christilla Roederer-Rynning (2015). *The "Europeanization" of the Basel process: Financial harmonization between globalization and parliamentarization*. Regulation & Governance 9.4 (2015): pg.328

systematic interpretation and the spirit of the law, which abides by a proper risk assessment, prior to categorizing each different asset.

The Basel Committee was well aware that simply categorizing digital assets as miscellaneous entailed risking financial and structural stability. Banking institutions which would choose to expose themselves to digital assets, without reasonably assessing the risks involved, could cause further escalation, especially if such exposure happened en masse.

To that end, the Basel Committee issued the *Statement on Crypto – Assets of March 13th 2019*⁵⁹. In this statement, the Basel Committee briefly described digital assets and recognized a number of associated risks across the spectrum of the legislation, including money laundering, credit reassurance, liquidity risks and operational issues. The Committee urged banks and other institutions which are planning to offer services involving digital assets to exercise caution. The Statement laid down a series of de minimis precautions these institutions should keep before conducting business with digital assets. Specifically, the banks shall partake in due diligence of these risks, in order to determine whether they could actually sustain them. Furthermore, they shall assess their inner functions and corporate management so as to integrate digital asset risk assessments in their risk management process, and supervise them at all times. Finally, the Statement encourages digital asset service providers to cooperate with national authorities and engage in dialogue in order to formulate a common approach to digital asset supervision while disclosing important conclusions and remarks.

After that Statement, the Basel Committee issued a Discussion Paper, titled *Designing a prudential treatment for crypto-assets*⁶⁰. The Committee calls all interested parties to comment and generally engage in discussion about integrating assets in the present framework. In the paper, the Committee provides general information about digital assets and their respective characteristics. The Committee strives for equality between traditional and digital assets, anchoring their prudential treatment solely on the risks they pose. Given that the assets in question are not very widely used yet, the Committee proposes a simplistic

⁵⁹ BIS (2019). *Statement on Crypto - Assets* (https://www.bis.org/publ/bcbs_n121.htm)

⁶⁰ BIS (2019). *Designing a prudential treatment for crypto-assets* (<https://www.bis.org/bcbs/publ/d490.htm>)

approach, an approach which builds upon the present system and does not establish one of its own. This approach pursues to keep perplexities at bay, while establishing a minimum standard, the bare essentials upon which the respective national authorities may build at their own discretion and agenda⁶¹. The paper discusses potential capital and liquidity treatment of digital assets, for example exclusion from being calculated in Common Equity Tier 1 capital⁶² due to high uncertainty in their actual value, or exclusion from being used as collateral in a credit risk mitigation context and other indicative examples. Abidance of disclosure requirements under Pillar 3 is also a point under discussion⁶³.

Last but not least, as the Basel Accords have been transposed into EU law, the European Banking Authority exhibits initiative in banking supervision and other important sectors. In the 9th of January 2019 it released the *EBA Report with advice on crypto-assets for the European Commission*⁶⁴, an advisory paper for the European Commission to take into consideration in its drafting process, which highlights once more the risks associated with digital assets and considers how may the current EU framework be applied on them.

Assessment

Progress in this particular sector has been gradual. Digital assets emerged ten years ago and have experienced a meteoric rise in popularity and value alike, yet the competent authorities have only recently taken initiative in trying to understand all the factors involved and develop a detailed framework of incorporation. That being said, the proposed approach has positive as well as negative aspects.

The positive aspects include the deeming of the arisen risk as the sole criterion in determining an asset's prudential treatment, ensuring equality and avoiding the discouraging of potential digital asset bearers. Furthermore, these advancements serve as an excellent opportunity for banks to reevaluate their inner workings and corporate structure in relation to the crypto-assets profile, a real life stress test to determine the actual levels of financial

⁶¹ *ibid.* pg. 8

⁶² *ibid.* pg. 15

⁶³ *ibid.* pg. 12

⁶⁴ EBA (2019). *Report with advice for the European Commission*

(<https://eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retrv=1>)

stability. Moreover, the encouragement of cooperation with national authorities is bound to increase efficiency and the levels of coordination between them.

On the other hand, the simplistic approach might be too simple and may not suffice to regulate such a complex phenomenon as digital assets. The whole discussion does not refer to a new kind of bond loan or a stock option – digital assets present legal challenges when created, transferred, used and abused. It's unlikely that incorporating them will be an easy or simple task. Simple solutions address simple problems, and the problem at hand is not even slightly simple.

Securities Law

Securities law is, as analyzed above, the branch of law which defines what a security is and regulates its overall behavior and market activity. In every country with a stock exchange there's a national authority established in order to regulate matters related to securities and how these are exchanged, for example the United States Securities and Exchange Commission as well as others, the United Kingdom Financial Conduct Authority and other organizations and so on and so forth. These organizations impose various frameworks of regulation related to securities. There are specific rules about what securities are, other rules in respect of securities' issuance, and rules regarding how securities are exchanged. In a structure similar to AML/CFT regulation, the national authorities are coordinated through consultation in international bodies. The prevalent international body in this respect is the International Organization of Securities Commissions, and in the European level the European Securities and Markets Authority⁶⁵.

This area is the most difficult to regulate, as it is the most vital. A simple comparison with the previously examined sectors shall be enlightening. The anti money laundering frameworks and the banking supervision are aiming at regulating the institutions *in case* they end up with digital assets under their custody. Securities law and market regulation aim to puzzle out *how* may digital assets end up under the institutions' custody in the first place. This would be

⁶⁵ Conac, Pierre-Henri (2015). *The European Union's Role in International Economic Fora: The International Organisation of Securities Commissions (IOSCO)*. International Organization of Securities Commissions, Paper 6 (2015). (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2700025) pg. 21

an arduous task even for a “traditional” asset, let alone for a digital one. It should be noted that the term “digital assets” in this section would mostly refer to crypto - securities and utility tokens, and not crypto-currencies. Tokens are more akin to securities and therefore more likely to be placed under similar control. The issues arise due to the decentralized nature of digital assets, which stands in direct opposition of the traditional system. Furthermore, the technology behind digital assets promotes anonymity and that is not compatible with a number of disclosure obligations imposed by these frameworks. Therefore, it is evident that regulators and standard setters are facing a difficult task.

The International Organization of Securities Commissions has approached numerous aspects of digital assets regulation. In January 2018, the Organization issued the *IOSCO Board communication on concerns related to initial coin offerings (ICOs)*⁶⁶, a short statement recognizing the risks associated with digital assets and Initial Coin Offerings, commenting that they are “highly speculative investments” and that investors could potentially lose their invested capital. In the same statement they revealed that they had developed the ICO Consultation Network, a channel of communication through which investors could share their experiences while dealing with tokens.

After a number of consultations, discussion papers and dialogue, the IOSCO issued a Consultation Report titled *Issues, Risks and Regulatory Considerations Relating to Crypto-Asset Trading Platforms*⁶⁷. The Consultation Report is addressed to national authorities, advising them how to proceed when drafting legislation about digital assets. The authorities are advised to use the *IOSCO’s Objectives and Principles of Securities Regulation*⁶⁸ (*IOSCO Principles*) as well as the *Assessment Methodology*⁶⁹, in order to respect investor protection⁷⁰ and regulate their respective markets effectively. The Report aims to regulate so called Crypto-Asset Trading Platforms, places where potential buyers and sellers of digital

⁶⁶ IOSCO (2018). *Board communication on concerns related to initial coin offerings (ICOs)*:
(<https://www.iosco.org/news/pdf/IOSCONEWS485.pdf>)

⁶⁷ IOSCO (2019). *Issues, Risks and Regulatory Considerations Relating to Crypto-Asset Trading Platforms*,
(<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD627.pdf>)

⁶⁸ IOSCO. *Objectives and Principles of Securities Regulation* (<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD561.pdf>)

⁶⁹IOSCO. *Methodology For Assessing Implementation of the IOSCO Objectives and Principles of Securities Regulation*,
available at: (<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD562.pdf>)

⁷⁰ IOSCO (2019). *Issues, Risks and Regulatory Considerations Relating to Crypto-Asset Trading Platforms*, pg. 12

assets meet to transact. These may or may not be Traditional Venues⁷¹, such as Stock Exchanges. These trading platforms may also perform the functions of custodians, clearing houses, transfer agents and others⁷². Also, the Report states that the Organization establishes jurisdiction on whether its member jurisdictions decide that they should regulate digital assets, regardless of their classification as securities, assets or derivatives since this typology could prove problematic. The Organization deems applicable its Principles regarding cooperation⁷³ between national and cross-border authorities and the establishment of secondary supervised markets. It should be noted that most jurisdictions (mostly in the EU) apply their existing framework when they typify digital assets as securities, while others build an explicit framework (like Malta)⁷⁴. Others choose not to regulate Crypto – Asset Trading Platform activity on the basis that they’re not included in their current regulation, with Bermuda being a notable example. In some countries the practice is banned altogether, as in Qatar. The Consultation Report focuses on matters of access to these platforms and their operation, the safety of the assets themselves, the integrity of the market and the discovery of their value.

The approach of the Organization is akin to minimal harmonization, rather than framework uniformity. It’s more important to serve the IOSCO Principles’ aims than dwell on typology, approach which would ensue further complications and impede actual progress. The Organization prefers to let the national authorities decide upon their securities policy, given that these matters do not raise only strictly legal points, but financial and political points as well. The safeguarding of the investment capital and the integrity of the market appear to be imperative.

Another interesting paradigm of securities regulation is ESMA, the European Securities and Markets Authority. ESMA is a financial regulatory agency of the European Union and one of the three bodies which form the European System of Financial Supervisors. ESMA regulates a number of issues adjacent to securities law aiming to preserve the resilience of the EU securities market. The agency has kept a proactive approach in respect of digital assets. In

⁷¹ *ibid.* pg. 6

⁷² *ibid.* pg. 4

⁷³ *ibid.* pg. 6

⁷⁴ *ibid.* pg. 8

the 19th of October 2018, the Securities and Markets Stakeholder Group, a think tank belonging to ESMA, issued the *Own Initiative Report on Initial Coin Offerings and Crypto-Assets*⁷⁵. In it, the Group highlighted to ESMA the benefits, as well as the risks presented by ICOs and cryptocurrencies, examining whether the existing framework could be applied, especially prospectus obligations and the Markets In Financial Instruments Directive (MiFID)⁷⁶, which at the time was not applicable on digital assets.

ESMA answered on the 9th of January 2019 through *Annex 1:Legal qualification of crypto-assets – survey to NCAs*⁷⁷, a report which addressed that very question, whether digital assets fall within the scope of MiFID 2⁷⁸. ESMA examined whether the national competent authorities deemed digital assets as financial instruments under their respective national laws. The answer was a resounding “yes”. Most countries had expressed their willingness to include digital assets under MiFID, and those that hadn’t interpreted the framework more strictly.

The 9th of January 2019 was a rather productive day for ESMA. Along the Annex 1, ESMA released the *Advice on Initial Coin Offerings and Crypto-Assets*⁷⁹, its most comprehensive release yet. ESMA presented the full framework applicable in the case digital assets were considered financial instruments under national laws. The relevant instruments are;

- The Prospectus Directive⁸⁰, an instrument which requires the publication of a prospectus, prior to offering a security within a regulated market which operates in a Member – State. These publications are necessary in investments as they provide valuable information about the security in question and provide for better benefits versus risks assessment.

⁷⁵ Securities and Markets Stakeholder Group (2018). *Own Initiative Report on Initial Coin Offerings and Crypto-Assets* (https://www.esma.europa.eu/sites/default/files/library/esma22-106-1338_smsg_advice_-_report_on_icos_and_crypto-assets.pdf)

⁷⁶ *ibid.* pg. 2

⁷⁷ ESMA (2019). *Annex 1:Legal qualification of crypto-assets – survey to NCAs* (https://www.esma.europa.eu/sites/default/files/library/esma50-157-1384_annex.pdf)

⁷⁸ *ibid.* pg. 17

⁷⁹ ESMA (2019). *Advice on Initial Coin Offerings and Crypto-Assets* (https://www.esma.europa.eu/sites/default/files/library/esma50-157-1391_crypto_advice.pdf)

⁸⁰ *ibid.* pg. 21

- The Transparency Directive⁸¹, an instrument which obligates the prospective issuer of securities in a regulated market to disclose valuable information in respect of financial reports, management statements etc.
- The Markets in Financial Instruments Directive framework⁸²; MiFID 2 and MiFIR is a European Union framework which increases transparency throughout Europe by implementing more disclosure obligations. These measures aim at increasing investor protection. MiFID 2 increased the scope of the original Directive, and MiFIR harmonized some of the framework's most important aspects through a Regulation. These instruments, coupled with the General Data Protection Regulation, and the Securities Enhancing Transaction Regulation form an explicit framework which covers capital requirements, organizational requirements, investor protection provisions, transparency and transaction reporting.
- The Market Abuse and Short-Selling Regulation⁸³, instrument which bans insider trading and market manipulation. Although this Regulation is applied to traditional venues, a potential update could broaden its scope to trading platforms as well. The Report raises a number of points on whether this Regulation could have any real life use, given the peculiarities of digital assets.

The Advice further built upon Annex 1, offering a number of remarks upon the legal challenges that presided the application of MiFID on digital assets. In its *Annual Report of 2018*⁸⁴, released in the 17th of June 2019, ESMA highlighted its progress in this area as a success to its 2018 Objectives.

Assessment

The situation, as it stands, indicates that authorities in every jurisdiction have comprehended the peculiar nature of digital assets. It is a positive sign that the authorities are using their

⁸¹ *ibid.* pg. 23

⁸² *ibid.* pg. 24

⁸³ *ibid.* pg. 29

⁸⁴ ESMA (2019). *Annual Report of 2018*

(https://www.esma.europa.eu/sites/default/files/library/esma_annual_report_2018.pdf)

influence to their full potential. The IOSCO, while not having established jurisdiction for specific matters, urges the national authorities to secure investor protection and transparency. ESMA, on the other hand, appears more lively, utilizing its potential as a part of the European Union, a supranational organization with an extensive regulatory arsenal in its disposal. This arsenal allows the European Union to establish a common framework across Europe and maintain market integrity.

A negative sign is the fitting of the digital assets to the frameworks, rather than the opposite. The authorities have not tried to adapt existing instruments to digital assets, but have proposed an expansion of their scope or other viable interpretations in order to secure protection for potential investors and assess market reactions, prior to retrofitting existing frameworks or introducing bespoke new regulation altogether. From a regulatory perspective, there has been next to none progress, rather than the mere application of existing framework. This tends to be the norm in the other side of the Atlantic as well, with the United States Securities Exchange Commission applying criteria found in their national legislation (Howey test) in order to specify whether a digital asset is a security, or not. If it does qualify as a security, then the SEC applies the bulk of securities laws and domestic fraud prevention regulations. This approach is similar to the one proposed by the European Securities and Markets Authority.

Payment and Securities Systems rules

This explicit set of rules is actually a branch of securities law, in principle. This branch, however, presents a fair number of peculiarities and technical aspects, given that these rules are related to market infrastructure. The custody and transfer of securities require procedures like the settlement and clearing of securities⁸⁵ as stipulated by the *UNIDROIT Convention on Substantive Rules for Intermediated Securities*⁸⁶ and the *EU Settlement and Finality Directive*⁸⁷ in the EU context.

⁸⁵ Loader, David (2019). *Clearing, settlement and custody*. Butterworth-Heinemann, pg. 1-5

⁸⁶ UNIDROIT. *Geneva Convention on Substantive Rules for Intermediated Securities*, (<https://www.unidroit.org/instruments/capital-markets/geneva-convention>)

⁸⁷ European Union (1998). *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*, (<https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31998L0026>)

Traditional procedures include the updating of the trading parties' accounts and arrangements of the imminent transfer (clearing, either bilateral through predetermined steps or through the use of a clearing house). Then, it's time for the actual transfer to take place, through a procedure called "settlement". Essentially, a trusted third party (usually a bank which acts as an intermediary) transfers the funds to the seller and the securities to the buyer⁸⁸. Oftentimes, the securities are held in a Central Securities Depository, with the transfer process being limited to a change in a record value. If the parties would like to transfer the security to another Central Securities Depository, then the procedure gets more complex, although steps have been taken to mitigate this complexity, for example through the introduction of systems like Target2 – Securities⁸⁹ in the European Union which provides a friendly framework for EU cross-border transactions.

Digital assets use their own distributed ledger technology which embeds clearing and settlement procedures in the code of the ledger itself. This allows for quicker transfer of the assets and deems the presence of a trusted third party obsolete. This is one of their strongest points, the ease of transfer and the establishment of trust, through the various mechanisms fixed in the technology of blockchain. In this respect, the digital assets are considered the future and are proving more versatile than their traditional counterparts. However, the present framework is oriented and fixated on the traditional processes, rather than the distributed ledger technology of digital assets. An overview of the applicable regulation to crypto-assets follows.

The Committee on Payments and Market Infrastructures (CPMI) operates under the auspices of the Bank for International Settlements, the same regime that is applicable on the Basel Committee of Banking Supervision. The CPMI observes developments in payment systems, as well as settlement and clearing systems, aiming to strengthen market infrastructure and provide for more efficient clearing and settlement procedures. Back on the 23rd of November 2015, the CPMI published a paper titled *Digital Currencies*⁹⁰. It was one of the earliest

⁸⁸ Goldberg, Linda S., et al (2002). *Securities trading and settlement in Europe: issues and outlook*. Current issues in economics and finance 8.4, pg. 2

⁸⁹ For more information visit (<https://www.ecb.europa.eu/paym/target/t2s/html/index.en.html>)

⁹⁰ CPMI (2015). *Digital Currencies* (<https://www.bis.org/cpmi/publ/d137.pdf>)

attempts in tracing the aspects of the phenomenon and given its premature stage, it yielded a number of interesting observations. The paper signified the importance of the overall regulation framework, or its lack thereof, in the progress of digital asset market penetration. Most importantly, the paper indicated the CPMI's full awareness regarding the revolutionary distributed ledger technology and its complete incompatibility with present clearing and settlement techniques and other basic principles. It also highlighted the possibility that the present intermediary structure could be compromised due to the advent of decentralization.

The Committee addressed digital assets once more after two years, on the 27th of February 2017. The CPMI Paper titled *Distributed ledger technology in payment, clearing and settlement: An analytical framework*⁹¹ is a complete review of the characteristics of distributed ledger technology and its technical design. The Committee examines all pertinent technical aspects in order to assess the roles of the different entities involved in a distributed ledger arrangement. This assessment enables the Committee to compare this newfound technology to present frameworks and determine whether it provides sustainable solutions. The paper states that the key factors for implementing the technology effectively are of environmental, technological and financial nature⁹². The Committee seems well aware of the benefits, and the risks that entail as well. A number of these risks are associated with the assets themselves, such as resilience, security, settlement issues (operational procedures, finality deficiencies), lack of a clear legal framework and the protection of data involved. Implementing this technology could ensue implications which affect the broader market environment through uncoordinated standards development and disregard of the current market architecture.

In another report, titled *Wholesale digital tokens*⁹³ and published on the 12th of December 2019, the Committee explored the concept of using tokens as settlement assets in wholesale transactions. Essentially, as the report states, this concept uses wholesale tokens in order to settle the *payment* leg of a securities transaction. In simpler words, whereas in the present system a security is settled on a Delivery versus Payment (DvP) approach, in this concept a

⁹¹ CPMI (2017). *Distributed ledger technology in payment, clearing and settlement: An analytical framework* (<https://www.bis.org/cpmi/publ/d157.pdf>)

⁹² *ibid.* pg. 11

⁹³ CPMI (2019). *Wholesale Digital Tokens* (<https://www.bis.org/cpmi/publ/d190.pdf>)

token would be used instead of funds versus the delivery of other assets. This approach could provide certain benefits, such as reduced settlement cycles, longer availability of the tokens funds, harmonized communication standards and transparency. The token would be designed in an explicit manner to accommodate all these benefits by following regulatory standards and a specialized transfer mechanism⁹⁴. The risks generally associated with tokens are still present, however they could be mitigated through the proper formation of the token. Of course, such arrangements do not exist yet, they do indicate however the level of familiarity of the authorities with digital assets.

Useful input has also been given from the European Securities and Markets Authority and the European Central Bank. The Advisory Group on Market Infrastructures for Securities and Collateral, a group which belongs to the ECB, released in September 2017 a report titled *The potential impact of DLTs on securities post-trading harmonisation and on the wider EU financial market integration*, which examined the characteristics of DLT in respect to practical issues raised by traditional settlement finality and clearing procedures⁹⁵. In the aforementioned *Advice on Initial Coin Offerings and Crypto-Assets*⁹⁶, ESMA proposed the applicability of the Settlement Finality Directive and the Central Securities Depositories Regulation, instruments which regulate securities settlements and transfer of securities stored in CSDs in respect of digital assets. The Advice raises various concerns of a technical nature, prerequisites which a potential distributed ledger settlement needs to abide by, in order to safeguard market integrity and transparency in the procedure.

Central Banks throughout the world have issued similar statements and reports to the CPMI. This is no surprise, given that the CPMI consists of senior officials of a number of Central Banks, including the Group of Ten, a number of ten affluent and powerful countries which are considered the pioneers of the financial world (the United States of America, the United Kingdom, Germany, France, Italy, the Netherlands, Canada, Belgium, Switzerland, Sweden and Japan).

⁹⁴ *ibid.* pg. 6

⁹⁵ Advisory Group on Market Infrastructures for Securities and Collateral (2017). *The potential impact of DLTs on securities post-trading harmonisation and on the wider EU financial market integration* (https://www.ecb.europa.eu/paym/intro/governance/shared/pdf/201709_dlt_impact_on_harmonisation_and_integration.pdf)

⁹⁶ ESMA (2019). *Advice on Initial Coin Offerings and Crypto-Assets* (https://www.esma.europa.eu/sites/default/files/library/esma50-157-1391_crypto_advice.pdf), pg. 30

Assessment

The payment systems and market infrastructure sector is simultaneously one of the most important and daunting in respect to digital assets, due to the highly technical issues that arise and must somehow be approached in order to determine whether the technology abides by the principles laid down by each State they operate in. That being said, the authorities have approached the technical advancements with an open mindset, weighing positive as well as negative aspects when conducting their assessments. The Committee on Payments and Market Infrastructures has chosen a risk based approach, so as to advise national authorities of potential high risk facets of distributed ledger technology and broader market implications. Furthermore, the Committee does not appear discouraged by the risks, conceptualizing exquisite models of larger securities settlements, experimentation which indicates that the organization is kept up to date with modern business practices. The European Securities and Markets Authority on the other hand chooses a more bureaucratic approach through the application of an existing regulatory framework. This framework proves to be outdated for digital assets, since it is oriented on the traditional structure.

3. Conclusion

3.1 Norms, not specific frameworks

This dissertation followed a build-up approach, pursuant to the intricate nature of an elusive subject being examined by a multilevel structure which consists of private institutions, national authorities, international organizations and supranational entities. This elaborate and complex structure takes into account the global financial market, political considerations, the current status quo and international stability.

This immense structure hardly ever manages to produce a single direction of action. To that end, this dissertation focused on various regulatory areas in order to imprint the norms prevalent in each area through the actions of organizations delegated to assess and set standards for each. Since there are roughly 200 countries in the world (195 to be exact) and each country has authority in its territory, there are 200 different frameworks around the world, impossible to completely harmonize and futile to even try.

That being said, international organizations examined have chosen the minimal harmonization approach, in order to ensure at least the most essential level of protection (investor protection, protection against money laundering etc.). It is only logical that some countries may be pioneers in the field, while others may be struggling to keep up.

For example, Malta is considered one of the most innovative in digital assets regulation. The Maltese government has effectively encouraged the issuance of digital currency and has given numerous reports and different papers that talk about its guideline and advancement, with the aim of catering to the vital legal certainty so this industry thrives. In 2018, Malta put into force the Virtual Financial Assets Act (VFA Act), the Innovative Technology Arrangement and Services Act (ITAS Act), and the Malta Digital Innovation Authority Act (MDIA Act). These instruments provide regulatory certainty, protect the investors of digital assets, and encourage development in the innovative technology sector in Malta. On the other hand,

Qatar has banned digital assets altogether⁹⁷. This is a testament to the large differences between the two ends of the spectrum.

3.2 Outcome

Digital assets are here to stay. While the risks and legal challenges they raise are proving to be a headache for authorities and institutions, the reality of the business world is slowly but steadily moving past them and embracing this new wave. They are not to blame; digital assets provide quick transactions and trust in the transferring process. The world is engaging with the technology of blockchain for other, non financial uses. Sooner or later, through friction and as users become more accustomed with the various aspects of the technology, it will become mainstream in nearly every context, including finance. Then, authorities shall have no option but to welcome these advancements.

This dissertation demonstrated the progress of regulatory authorities and the approaches they choose in each area they intervene. To summarize, in certain areas the authorities exhibit important work and valuable progress, while in others the regulatory standard setters have yet to come up with work which would clarify the landscape.

Closing, I'd like to mention a few words by Pablo Hernández de Cos, Chairman of the Basel Committee on Banking Supervision and Governor of the Bank of Spain. In his speech at the 22nd Euro Finance Week held in Frankfurt⁹⁸, the Chairman reflected upon how technology and finance have always marched hand in hand. Regarding whether fintech technologies are something concrete or simply a spark, he noted; "Even if there may be a degree of hype about fintech, there are at least three good reasons to believe that the recent technological developments may have a lasting effect on the banking sector. First, the current pace of innovation is faster than in previous decades, with the rate of adoption increasing commensurately. Second, a generation of digital natives is growing up with a technological

⁹⁷ *Qatar bans crypto trading, confirms financial regulator*, article by The Block available at (<https://www.theblockcrypto.com/linked/52087/qatar-bans-crypto-trading-report>)

⁹⁸ BIS (2019). *Financial technology: the 150-year revolution*, Keynote speech at the 22nd Euro Finance Week 19 November 2019, Frankfurt (<https://www.bis.org/speeches/sp191119.pdf>)

proficiency that is at the heart of fintech innovation. Third, fintech has been at the forefront of advances in financial inclusion, with large potential growth opportunities.”

The world shall witness an unprecedented change on how business is conducted and how value is perceived in the years that follow. Given the challenges that are presented, it shall be interesting to observe how the regulatory authorities choose to introduce them.

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