

# ЭКОНОМИЧЕСКИЕ НАУКИ

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## FINTECH AND BLOCKCHAIN BASED INNOVATION: «UBERIZATION» OF BANKS, IN THE CONTEXT OF FINANCIAL INTERMEDIARIES THEORY

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Both Fintech and Blockchain are very topical subjects nowadays, and they are of a major importance in the context of the development of new technologies for financial services. The spread of the so-called disruptive technologies, with reference to the prior set-up framework, is radically changing the connotations of financial markets, as the new technologies gain success. The concepts to the base of this type of innovation, despite appearances, are few and quite simple. That is not the first time that information technology and the engineering of procedures populate the world of finance. This time, however, the process follows new channels and pursues different objectives. The spread of structured finance that followed the former applications of ICT, has shown all its limits with the lack of information (asymmetric information) derived from a poorly intelligible innovation. The paper explores the differences between the first digital revolution and the present one, within the context of Financial Intermediaries theory. It also focuses on the analogies with other so-called «disruptive technologies» now well established, from mobility and lodging sectors (Uber and Airbnb being best examples), in order to emphasize some huge differences, and trying to guess future scenarios. Regulation, and new frontiers of Fintech being experienced right now, like tokenomics, are also dealt with. We conclude that the term disruption is inappropriate, as the experience from the sharing economy does prove that the new technologies are now complementing and transforming financial industry, more than disrupting it. And that «uberization» of banks is for financial intermediaries more a matter of embedding, and exploiting new technologies, than being crowded out.

*Ключевые слова:* digital economy, Fintech, Blockchain, cryptocurrencies, distributed ledger technologies, sharing economy, uberization, securitization, financialisation, tokenomics.

### Introduction

Both Fintech and Blockchain are very topical subjects nowadays, and they are of a major importance in the context of the development of new technologies for financial services. The spread of the so-called disruptive technologies, with reference to the prior set-up framework, for instance in the banking sector, is radically changing the connotations of financial markets, as the new technologies gain success.

The concepts to the base of this type of innovation, despite appearances, are few and quite simple, as well as the keywords are.

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cess follows new channels and pursues different objectives. The spread of structured finance that followed the former applications of ICT, has shown all its limits with the lack of information (asymmetric information) derived from a poorly intelligible innovation (and consequently useless, or even harmful, from a social perspective). The benefits brought by the opportunities and the variety of products made possible by ICT reached only a few market actors, at the same time imposing huge costs on the community, as a result of the financial crisis.

From this perspective, the diffusion of the «culture of distributed databases» (better, of the Distributed Ledger Technology – DLT) represents a revolutionary philosophy, because its foundation lies in the immediate, simultaneous and shared dissemination of information related to any «market fact», so making

information asymmetries virtually impossible, or reducing them drastically. Nevertheless, the most known blockchain applications relate for instance to cryptocurrencies that already provide ground for information asymmetries to materialize widely.

According to the new logic, which applies to an endless series of economically relevant cases, the role of networks (networking) becomes predominant. The «ledger», which traces the transactions and retains a memory which may be relied on against third parties (thus validating any transaction), passes from the hands of the individual certifier (bank, insurance, public register, etc.) to a series of nodes (servers), thus making the process irreversible and frauds impossible, as well as misappropriation of funds. Everyone knows everything about each transaction, at the moment when it is finalized.

Given that ICT for Finance and «Fintech» are intimately connected, they do represent two different phenomena. On one hand, ICT means the use of informatics in the financial sector, on the other hand Fintech identifies some sort of business model, some sort of revolutionary way of intermediating funds and influence markets, a new philosophy.

Fintech and the Blockchain technologies developed at different paces in various ecosystems in Western Europe, the United States of America, China and Russia, just to mention a few of the global hubs of these technologies.

Whatever article, or volume had been produced by academics risks becoming «obsolete» in a relatively short time, so that the literature related to this topic is often not qualitatively reliable. Instead, as a consequence of the interest by innovators, investors and financial markets' participants, a considerable literature about crypto-currencies has been developing during the last few years. Crypto-currencies represent a somehow marginal implementation of Blockchain as a concept and technology. This is why this contribution would be original in comparison with previously published works, as it deals with Fintech (as a business model) and the technology behind cryptocurrencies, and not just with cryptocurrencies themselves.

Many observers, especially from the fintech sector and mass media, have found inspiration in similarly disruptive technologies and applications in other industries, such as mobility and lodging, to describe the disruption potential of DLT and blockchain on banking and finance<sup>1</sup>.

Some have even gone further to predict a revolutionizing disruption of the banking and financial systems, mimicking the impact of Uber and Air BnB on traditional sector that were transformed and «disrupted». This line of thought has led to the expression of «Uberization of banks», by which it is expected that traditional banking will be disrupt-

ed in the same way Uber transformed – and is transforming – the mobility sector.

In this paper we refer to Uber as the symbolic representative of the cohort of Transportation Network Companies that rely on Internet technologies to connect mobility service providers (often unlicensed) to users. There is a plethora of Transport Network Companies that operate on the concept of «sharing economy» and use technology platforms to connect drivers with users, such as Bolt, Cabify, Careem, DiDi, Gett, Grab, Haxi, Lyft, Pathao, Uber. By the same token, we refer to Air BnB as representative of the short-term rental and accommodation facilitation companies such as FlipKey, HomeAway, HomeToGo, HouseTrip, Tripping.com, VRBO, Wimdu.

The research problem of this paper hinges on the interest in gauging whether the technological developments and innovations that are bringing about new patterns of banking and financial intermediation equate to the developments and disruptions observed in the sectors of mobility and lodging and understanding whether such a comparison is at all meaningful.

The raise in the phenomenon of the «sharing economy» empowered by technology applications and «always on connectivity» is spurring creativity and innovation in several sectors, among which on-demand services, fashion and food delivery seem to land themselves to potential creative disruptions<sup>2</sup>.

At first sight, one should recognize that similarities do exist and also provide for interesting examples of user-driven mechanisms such as monitoring and feedback loops. One of the theoretical underpinnings of this paper is the delegated monitoring theory in fact, by which individuals delegate the role of monitoring to a bank / intermediary rather than independently monitoring borrowers<sup>3</sup>.

The aim is to assess the real implications and changes that the second wave of technological innovation is bringing into the banking and financial systems and put forward a method to evaluate the impact of new technologies, their actual degree of disruption and potential regulatory implications. This paper wishes to stir the debate on the disruptive impact of innovation on the banking and financial sectors and, with a certain provocative attitude to deflate the hype while providing options to gauge the disruptive (or rather, innovative) impact that new technologies and practices can have on financial innovation.

## 1. Stylised facts

Since the 1950s, the debate about the role and function of financial intermediaries revolved around the key themes of the social role of banks,

their relevance and contribution to socio-economic development. In academic circles, innovative – and at times, provocative – thinking led to questioning the essence of banks, suggesting even the option of not needing banks in the first place, representing a useless layer of intermediation in the circulation of money and facilitation of credit. This innovative and provocative thinking was also gaining momentum on the premise of growing concerns about the issue of asymmetry of information that have always characterized the debate about the role of financial intermediaries and facilitation of financial intermediation, that took place at a later stage since the 1970s and 1980s.

Such provocative thinking is currently being revamped by the second wave of technological developments that is investing the financial and banking sector with innovations such as blockchain, fintech and peer-to-peer intermediation that have an impact on banks as well as Non-Banking Financial Intermediaries, users, etc. Such phenomenon is not relegated only to financial intermediation and banking services, but interests also the non-banking financial intermediaries, above all the insurance sector that is poised to being affected by technology applications such as big-data and Internet of Things.

The first wave of technological development of the 1980s and 1990s (often referred to as «FinTech 1.0») changed the financial and banking sector by providing innovative tools and solutions that made intermediation easier and faster, led to new business models and interaction modalities between banks and clients<sup>4</sup>.

In some instances, the technological advancements led to the fast obsolescence of what were considered successful applications: above all the example of phone banking that was, in a relatively short period of time, replaced by the advent of faster and more reliable connectivity coupled with – almost – ubiquitous ICT hardware. Specifically, the advent of smartphones allowed the introduction of «home banking» superseding «phone banking» thanks to increased convenience for customers and cost-cutting opportunities for providers.

The first technology revolution of the industry changed the way banks and clients interacted and accelerated the development of new products. On the one hand, technologies led to the categorization of functions within the banking sector, defining clearer boundaries and interactions between the so-called front-office and back-office. On the other, technologies allowed to by-pass «internal intermediaries» within the financial institutions between the bank and the client (automated transactions through machines and personal computers) as well as developing new products (electronic payment systems that are also challenging the validity and use of plastic money, although credit cards remain

the underlying and backing mechanism for such innovative payments).

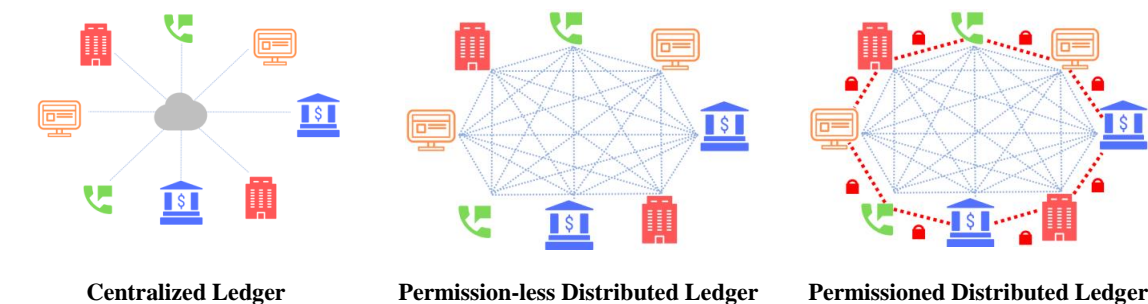
Another considerable impact of the first wave of technological change came from the advancements in computational capacity that allowed the development of innovative financial products thanks to enhanced means and methods to gather, collate, crunch and process large amounts and flows of data. Technological advancements coupled with innovative modelling techniques led to the proliferation of financially engineered products that, in different forms and for various reasons, paved the way to the financial crisis with the banks and financial intermediaries as the main perpetrators<sup>5</sup>. Nonetheless, the origin and motivation for derivatives was a virtuous (since the 1920s in the Chicago trading floor) mechanism for hedging operational and business risks. The evolution of such instruments lead to financial engineering and structured finance *strictu sensu* that resulted in a mechanism to rise funds irrespective of the credit worthiness of companies beyond the scope of conventional forms of «on balance sheet securities» (bond, debt and equity<sup>6</sup>), reversing the innate purpose of structured finance.

Thanks to technological advancements, the introduction of innovations in forms of payment such as credit/debit cards and automation in transaction intermediation such as phone and e-Banking were accompanied by innovation in financial products. Such innovative products covered the whole cycle of banking services and financial intermediation, from saving and investment products like ETFs and structured products, lending that was enhanced by automated credit scoring and algorithms to accelerate credit worthiness assessment and risk management techniques that used derivatives and asset securitization.

Securitization and related financial products were soon deemed the main culprit of the financial crisis, notwithstanding that financial innovation was just one prong of a multifaceted system that led to the global financial crisis (i.e. excessive risk taking by financial firms, uncontrolled information asymmetries, increased complexity of structured financial products combined with weak corporate governance systems and lax regulatory oversight and/or lagging regulation).

The second wave of technology innovations that are now interesting the financial sector and banks are the above mentioned DLTs and blockchain (often referred to as «FinTech 2.0»). Such innovations are poised to redefine the way financial intermediation is structured and carried out, potentially overcoming barriers to access to financial services, facilitating interaction and by-passing intermediaries.

Ledgers have been used since ancient times to keep track and record transactions, ensure certainty



All parties direct and settle their local databases with a centralized electronic ledger that is operated by a trusted central party.

Every node of the network retains a full and up-to-date copy of the entire ledger. Any element added to the ledger by a network participant is shared to all the nodes. In turn, nodes collectively validate the change through algorithmic consensus. Once the validation is accepted, the new addition is automatically added to the ledgers for sake of data consistency across the network.

In order to participate in the network, each node requires explicit permission from a central party, which defines access criteria.

Pic. 1. Distributed Ledger Technologies

and provide transparency in commerce and finance. In the financial industry, each bank and financial intermediary keeps their own repository of information and data about transactions, assets and actors.

This requires the presence of intermediaries that ensured interoperability, transparency and certainty of transaction, such as clearing houses. The first technological revolution in banking and financial intermediation was the introduction of electronic ledgers that informatized and automated the crucial function within banks to keep track and record transactions.

The «FinTech 2.0» technologies promise to transforming the way information about assets and transactions are collected, collated, stored, processed and shared: the concept of distributed ledgers allows the processing of data across shared ledgers (record of data) across different parties that are linked through the Internet. This generates a network that, coupled with cryptography and algorithms, allows to process and record data in an absolute manner, as none of the participants in the network can revert operations and none of the participants in the network has the sole control of information, data and processes.

This epitomizes the value of DLTs as the «silver bullet» to overcome the steps and actors of traditional intermediation and the need for a third party that centralizes interactions with inevitable layers and associated transaction costs and processing time.

Distributed ledgers are divided into public, in which any «peer» or «node» can participate without access restrictions, and private, in which a central party that launches the ledger sets access criteria.

In this instance, the distinguishing element is the presence of an authentication process that empowers the central party to allow only those nodes that meet certain requirements<sup>7</sup>.

Another layer of distinction for distributed ledgers is between permission-less and permissioned ledgers:

- Permission-less ledgers allow any node to participate in the ledger and execute any sort of transaction. In this type of ledger, there is no «owner» and any node are free to operate. Each node has access to the same copy of the ledger

- Permissioned ledgers are those that entail an authorization for nodes to carry out specific activities and play specific roles in the network. For instance, within the same ledger some nodes can have the role of initiator, validator, executor. In this type of ledgers, there are a number of owners / operators (or even one) who started the network and manage it (or defined access criteria when launching it). The operator provides access interface to nodes that then hold a copy of a given ledger, depending on their role.

As such, the DTL seems to have the potential of eliminating the need for intermediaries breaking the silos of individual repositories of information, replacing them with a transparent and safe mechanism.

These innovative features of DLT and blockchains are triggering a vivid debate among practitioners and academia on the potentially disruptive impact on traditional banking and finance<sup>8</sup>.

The topics for debate all revolve around the key themes of safety, stability, consumer protection, need for regulation and depth of public sector in-

Table 1

<b>Technology Revolutions in Banking and Finance</b>			
	Traditional Banking	First ICT Innovations FinTech 1.0	Blockchain & Banks FinTech 2.0
Consumer Experience	<ul style="list-style-type: none"> <li>– Uniform scenarios</li> <li>– Homogenous service</li> <li>– Poor customer experience</li> </ul>	<ul style="list-style-type: none"> <li>– Rich scenarios</li> <li>– Personalized service</li> <li>– Good customer experience</li> </ul>	<ul style="list-style-type: none"> <li>– Rich scenarios</li> <li>– Personalized service</li> <li>– Good customer experience</li> </ul>
Efficiency	<ul style="list-style-type: none"> <li>– Many intermediate links</li> <li>– Complex clearing process</li> <li>– Low efficiency</li> </ul>	<ul style="list-style-type: none"> <li>– Many intermediate links</li> <li>– Complex clearing process</li> <li>– Low efficiency</li> </ul>	<ul style="list-style-type: none"> <li>– Point-to-point transmission, disintermediation</li> <li>– Distributed ledger, transaction= clearing</li> <li>– High efficiency</li> </ul>
Cost	<ul style="list-style-type: none"> <li>– Large amount of manual inspection</li> <li>– Many intermediate links</li> <li>– High costs</li> </ul>	<ul style="list-style-type: none"> <li>– Small amount of manual inspection</li> <li>– Many intermediate links</li> <li>– High costs</li> </ul>	<ul style="list-style-type: none"> <li>– Completely automated</li> <li>– Disintermediation</li> <li>– Low costs</li> </ul>
Safety	<ul style="list-style-type: none"> <li>– Centralized data storage Can be tampered</li> <li>– Easy to leak users' personal information</li> <li>– Poor safety</li> </ul>	<ul style="list-style-type: none"> <li>– Centralized data storage can be tampered</li> <li>– Easy to leak users' personal information</li> <li>– Poor safety</li> </ul>	<ul style="list-style-type: none"> <li>– Distributed data storage Cannot be tampered</li> <li>– Use of asymmetric encryption,</li> <li>– Users' personal information is more secure</li> <li>– Good safety</li> </ul>

tervention, role of governing bodies and regulatory authorities such as Central Banks and so on. Some of them (depth of public sector involvement and role of Central Banks) being always debated upon by practitioners and scholars.

## 2. From securitization to tokenomics

As mentioned above referring to the role of securitization in the context of the global financial crisis, the «financialization» and financial engineering changed the playing field of traditional fundraising and risk management for both corporate and retail financial intermediation. This phenomenon paved the way to a new paradigm shift from «risk warehousing» to externalization.

The use of DLTs spurred the development of innovative financial services and products, among which the one that goes under the name of «tokenomics», the framework in which digital tokens are used by blockchain projects to raise capital. Tokenomics hence is an innovative form of fundraising that hinges on blockchain technology: a new model of Initial Coin Offering (ICO) is gaining momentum especially in the sphere of innovative start-ups in high-tech sectors.

In «tokenomics» an initiator (i.e. a company) launches the creation of tokens to raise capital through an ICO for a business proposition that is based on the use of the tokens. As opposed to an Initial Public Offering (IPO) by which investors acquire shares of a company, in an ICO the investor purchases tokens that may become tradable at a later stage (this would be a «security token» that entitles to a share of the company once the business

becomes operational) and/or entitles the bearer to access products or services provided by the company (in this case it would be a «utility token»). Tokens are denominated in a cryptocurrency that then allows for the trading and exchange of the tokens within and outside the ICO's ecosystem for which they were created.

Notwithstanding the increasing popularity of ICOs, uncertainty persists with regards to the nature of the tokens, often referred to as «crypto assets», which are difficult to classify as a commodity, currency or investment/security. Such uncertainty has relevant ramifications for various elements of investors' protection, liability, and so on. The definition of «crypto-asset» in itself is deceiving and is dangerously close to the neologisms of structured finance, such as «alternative», «hybrid», «grey», «repackaged», «synthetic», «contingent», «collateralized», «parallel», «backed», «linked» and even the most commonly used «over the counter».

The innovative instrument of ICOs has raised interest as an alternative means for SME financing and its potential has been initially investigated in a recent OECD study that highlights a few salient challenges, in particular in the domain of valuation of tokens.

If tokens are considered as currencies, their valuation would hinge on the cash and/or cryptocurrency of reference: this would lead to instability due to the high volatility of the cryptocurrencies (just as a reference, Bitcoin recently traded at 3,920\$, down from its peak of almost 20,000\$).

If the ICO issues utility tokens, their value would be based on the commercial value of the service/product to be launched by the initiator: this would imply a high degree of uncertainty as a func-

tion of the type of service/product whose value can be of difficult estimation.

If the token is an investment (security or equity stake), the value of the token would rely upon the company's valuation, and also in this case there is a high degree of uncertainty as ICOs' initiating companies are seldom valued using traditional corporate finance techniques and investment metrics.

ICOs are an innovative instrument, and it is hence too early to draw conclusions on their robustness and validity. Nonetheless, recent studies of ICO examples raise concerns about their viability. While in principle tokens valuation should follow market dynamics to establish a «fair value», initial comparative studies indicate that tokens' valuation hinges upon simplistic indicators, such as such as Twitter followers and social media activity, rather than robust business metrics.

Moreover, the same research provides interesting insights on returns and survival rates of ICOs, with average returns of 179% between ICO price and the value of the token on its first day of trading, while less than 50% of projects surviving after 120 days from ICO.

The purpose here is not to delve into the aspects of ICOs and tokenomics, reference to which is made to lead to a key message of concern: tokenomics and ICOs provide worrisome similarities to the misuse of securitization that contributed to triggering the global financial crisis, in combination with excessive risk taking, dramatic information asymmetries, complexity of financial products, weak governance mechanisms and loose regulatory oversight.

Using the lenses of a skeptical reader, ICOs may provide dangerous entry points for reckless initiatives. With the intent of being provocative, tokenomics appear as «no-asset-backed securities» (or «Nothing-Backed Securities», NBSs) denominated in cryptocurrencies in an unregulated environment.

As such, notwithstanding the great merit of ICOs as innovative financial instruments that are poised to provide new forms of intermediation, it appears that tokenomics is a mechanism still in its infancy that requires a clear definition of actors, products and services for it to materialise their potential.

The above considerations lead to the vexing issue about regulatory frameworks and attitudes for DLTs, blockchain and crypto-currencies.

### 3. Current regulation

The use of distributed ledgers and the involvement of many actors scattered across various networks in a virtually uncontrollable mechanism, lends blockchain applications – in particular crypto-currencies – for being used in transactions often

associated with not very transparent, if not outright illegal, activities. The adoption of crypto-currencies has seen a spike in those countries characterized by high political instability and corruption, a case in point for all is the case of Venezuela. A World Bank paper establishes statistically significant inverse correlations between bitcoin adoption and the four elements of «Rule of Law», «Regulatory Quality», «Political Stability» and «Control of Corruption».

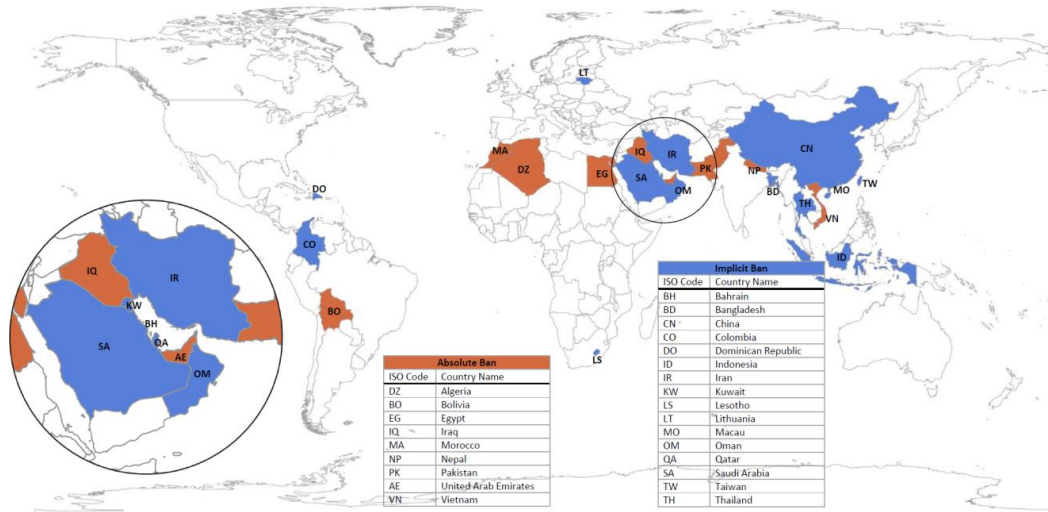
Crypto-currencies and ICO volumes are in aggregate still negligible to be considered a systemic risk for the global financial system. Nonetheless, regulators are on the alert and constantly monitor the evolution of the DLT and cryptocurrencies. In addition to investors' protection and transparency, other priority concerns relate to Know Your Customer, money-laundering, financing of terrorism and other illicit activities. In this sense, Central Banks, regulatory authorities and supervisory bodies are all keen to ring-fence potential negative impact and in most instances maintain the behavior of external observers.

Cryptocurrency and blockchain was high on the agenda of the meeting of the Central Banks' representatives of the G20 countries in Buenos Aires in 2018. Paragraph 25 of the G20 Joint Statement and G20 Leaders' Declaration is all about DLTs, blockchain and cryptocurrencies: «We look forward to continued progress on achieving resilient non-bank financial intermediation. We will step up efforts to ensure that the potential benefits of technology in the financial sector can be realized while risks are mitigated. We will regulate crypto-assets for anti-money laundering and countering the financing of terrorism in line with FATF standards and we will consider other responses as needed».

The G20 statement is representative of a generalized policy shift from previously softer stance to a more proactive attitude towards regulation and «other responses» on a need basis and on either individual (i.e. country/ies specific) or collective (i.e. international efforts under the aegis of international fora and/or organizations) initiatives.

Nonetheless, regulatory approaches towards cryptocurrencies are still developing, with a handful of countries with outright bans of the technology to a few countries devising control systems and mechanisms. The most recent and reliable effort to take stock of regulation of cryptocurrencies at international and global is the USA Library of Congress' survey of cryptocurrency regulation around the world of 2018 that provides a very interesting picture of the regulatory landscape and diverse attitude towards blockchain, cryptocurrencies and ICOs.

A first takeaway is the fragmentation in the definitions and terms used to describe the same phenomena: digital currency (Argentina, Thailand, and



Pic. 2

Source: Regulation of Cryptocurrency Around the World, June 2018; The Law Library of Congress, Global Legal Research Center

Australia), virtual commodity (Canada, China, Taiwan), crypto-token (Germany), payment token (Switzerland), cyber currency (Italy and Lebanon), electronic currency (Colombia and Lebanon), and virtual asset (Honduras and Mexico).

Second, the survey reveals that most of the countries have official notices to warn investors and consumers about the risks associated with innovative financial instruments, products and investments based on DLTs, blockchain, ICO or cryptocurrency. Such warnings establish direct linkages between such innovative products and potential frauds, corruption, illicit activities, money laundering and terrorism financing.

Conversely, in a handful of countries cryptocurrencies are accepted as a means of payment: in selected Swiss local authorities, cryptocurrencies are accepted as a means of payment by government agencies. The Isle of Man and Mexico allow cryptocurrencies as a means of payment along with their national currency. The government of Antigua and Barbuda allows the funding of projects and charities through government-supported ICOs.

Some countries also address ICOs: banning them (mainly China, Macau, Pakistan) or trying to define regulatory boundaries of ICOs, like New Zealand where obligations may apply depending on whether the token offered is categorized as a debt security, equity security, managed investment product, or derivative.

The regulatory landscape is poised to evolve as technology solutions and products will become more mature, widespread and significant (both in terms of number and volumes of intermediation). As highlighted by the G20 Statement, there is growing attention by the part of governments and regulatory agencies/authorities to clear the ground from uncertainties and safeguard investors while reducing the risks of illicit behaviors.

As any evolution, blockchain technologies will have an impact on products, processes and intermediaries, hence we foresee a “transformation” rather than a “disruption”, in which once technology solutions are tested and validated, and once business models are mature, trusted intermediaries (i.e. the incumbents at the various layers of financial intermediation) will adopt those solutions, technologies and business models to provide “intermediation” services (with the understanding that the concept of intermediation, number and types of actors may vary as a result of such an evolution).

#### 4. More on uberization

##### 4.1. Extrapolating from Transport Network Companies in the Mobility Sector

Reference to the term «Uberization of banking» links the disruption (or changes) that Uber brought about in the mobility industry, facilitating the way people choose solutions and pay for their mobility needs. What appears to be a «democratization» process, in reality is leading towards a consolidation of what was a highly fragmented industry, with a plethora of service providers that now converge towards the use of a single platform – Uber – to seek customers.

The real impact of Uber, hence, seems to be a disaggregation of the supply with a consolidation of the demand and vertical integrations<sup>9</sup>:

Uber has empowered individual drivers to provide mobility services irrespective of licensing requirements, so that an unauthorized driver can offer riding services. On the demand side, Uber has centralized and consolidated the market, channeling requests through a single platform. What is worth noting in the case of urban mobility, is that the



Table 2

Defining the Participants			
	Mobility	Lodging	Financial Services
Users	Individual	Tourist	Corporate Retail
Provider	Individual	Individual	Individual
Incumbent	Taxi	Hotels	Banks

providers still need to abide by regulations while providing their services, namely the drivers still need to comply with road-code and traffic regulations.

Translating this model in the financial intermediation system, DLTs provide a platform to «decentralize» supply, enabling multiple participants to provide financing to a single entity, but once the financing is provided there is no «regulatory net» policing the transaction, i.e. there are no «road-codes» and «traffic regulations» still governing the relationship between supplier(s) and recipient of financing. While not being necessarily unregulated, this would result in financial intermediation occurring in a grey area with softened regulatory pressures, which would be coherent with a noninvasive regulatory approach that would risk to limit innovation and curb potentially positive socio-economic spillovers. This resembles in financial intermediation the phenomenon of «shadow banking»<sup>10</sup>.

This leads to an evident vacuum that generates inherent risks.

Still using the analogy of Uber, the transaction of urban mobility is typically characterized by elements that would be foreign to a DLT facilitated financial intermediation, such as:

- Clearly identified pick-up location.
- Clear destination.
- Predefined and agreed terms and conditions, such as fares, indicative duration of the service, characteristics of the means of transport, etc.
- Precautionary measures, such as cancelling the order or interrupting the service.
- Recourse mechanisms such as complaints mechanisms with the centralized application.
- Regulatory certainty, or predictability, as most typically Uber transactions do not have a cross-border nature, being both Point A and Point B in the same jurisdiction.
- Feedback loops that allow to rate the provider, serving the purpose of building reputation, transparency and reliability.

This last element of feedback loops appears to be a crucial and pivotal element of applications like Uber in the mobility sector. Feedback help generate trust in a mechanism of «self-regulation» sustained by users (both providers and clients) and facilitated by the platform that behaves as an «honest broker», as an entrusted entity or third party.

Such third party's «authority» is supported by the continued use of participants (both providers and clients) in a mechanism that is initiated and self-sustained to establish reputation and legitimacy. The model above establishes clear incentives to behave from all the participants thanks to the immediacy of the transaction, clarity of conditions and ability to provide feedback.

Nonetheless, the feedback mechanism also provides for vulnerability in the mechanisms of online reputation due to possible fake and/or biased reviews<sup>11</sup>.

All in all, the typical Uber transaction would resort to transportation services from point A to point B with recourse mechanisms to manage contingencies and the plausible expectation that the provider (and the user) still have an incentive to behave due to enforced regulations that constraint the provider (road-code and traffic regulations). Moreover, the negligible nature of the service (short haul mobility) and amount of the transaction may compensate for any inconvenience.

None of those elements above would considerably apply to financial intermediation that would entail more significant implications: financial intermediation could entail more meaningful transactions both qualitatively (a loan on which a business venture or an education may depend upon, as opposed to a short ride from Point A to Point B) and quantitatively (an intermediation of thousands of EUR as opposed to a transaction of dozens of EUR).

When it comes to comparing Uber or other TNCs to banking and financial intermediation, more considerations come to mind along a series of elements that may not find direct application in the context of financial intermediation facilitated by DLTs:

- The mobility service provider, while not (necessarily) fully licensed to provide mobility services, at the very least holds a drivers' license certifying her/his ability to operate a vehicle, a condition certified by a public authority.
- The car used to deliver the service is (or should be) in appropriate conditions for circulation, a situation of «fit for purpose» that is certified by competent authorities accredited by public agencies
- The provider of the service is bound to rules and regulations that apply to any car in circulation (as mentioned above).
- The user has relevant knowledge about the provider (allowing for feedback, complaint and recourse mechanisms).
- The user has full real-time traffic information to discern routing options and assess quality of service.
- The provider has full knowledge of the user: name, contact info, order history, and most importantly has certainty about the payment.



In the example provided above, the application addresses asymmetries of information and provides for a high degree of transparency that may not necessarily be guaranteed in the case of financial intermediation, unless with the direct inclusion of certification mechanisms that provide for reliability (such as drivers' license, traffic regulations, car conditions, etc. mentioned above).

As an application that allows for democratization of service provision, Transport Network Companies may also provide opportunities for loopholes to replicate traditional business models in an unregulated environment. A phenomenon that is currently developing – and is almost unknown or not noticed – is the mechanism of structured Uber providers, with an investor that establishes an informal company with a fleet of cars that are rented to drivers. Drivers sign-up as TNC providers, and in addition to paying the daily rental of the car to the informal company, pay the due commission to the application and a commission to the owner of the car. This model is replicating a traditional taxi company but in a completely unregulated setting, whereby the owner of the fleet completely bypasses incorporation laws, licensing requirements, fiscal reporting and employment regulations.

While not representative of the entire model of sharing economy of systems based on Network Transport Companies, the example above can provide valuable insight on how DLTs could provide opportunities to by-pass regulation and control mechanisms established to govern financial intermediation, provide certainty and ensure consumer protection.

The «shadow providers» would hence be able to break into service provision avoiding regulatory and/or market barriers to entry that would not otherwise allow them to operate.

The advent of technology innovation may raise concerns about the risks associated with innovative means of financial intermediation and innovative financial products. Extrapolating from the example above, for instance, a similarity can be drawn into a case where a large holder of funds (regulated or not) could use DLTs or other innovations to enter the mainstream financial intermediation segment by-passing regulations and oversight measures put in place by regulatory agencies for sake of transparency and consumer protection.

When looking at the impact of applications like Uber to the mobility sector, there are tangible and concrete examples of efficiencies that were brought about at systemic level:

- Widened the supply, empowering drivers to offer services irrespective of a licensing requirement.
- Lowered costs of service thanks to (unconventional) competition.

- Increased transparency by allowing feedback mechanisms of rating.

Transport Network Companies are also triggering regulatory efforts in many countries, each with different approaches towards licensing and/or fiscal requirements up to banning of TNC services.

#### 4.2. Extrapolating from Short-Term Rental Application in the Accommodation and Lodging Sector

Other applications that are considered to have disrupted traditional sectors are the applications that opened up the lodging industry<sup>12</sup>. We will refer to Air BnB as the most widely recognized application representative of the short-term rental segment.

Short-term rental applications allow private providers to offer accommodation and short-term rental of properties outside of the mainstream hotel sector. While in the mobility segment, the service provided by the incumbent and the new providers are very similar (a car ride), in the case of hospitality the service of the short-term rental providers may differ considerably from the traditional hotel services (for instance, hotels may provide additional services such as room service, food and beverage, concierge and so on). Air BnB is often referred to as an example of an Internet Based Service Firm whose disruption in a traditional sector can serve as an example of how DLTs can disrupt traditional banking and financial services.

A key feature of applications like Air BnB is the feedback loops that allow users to rate providers, establishing a branding and reputation to establish trust and reliability. Another interesting feature is the process of «self-regulation» that is characterizing those applications, with service suppliers defining terms of use and policies, as well as different pricing schemes. In a sense, the feedback mechanisms, coupled with the self-regulatory approach, are somehow compensating for the lack of regulatory supervision and licensing requirements: providers establish rules and terms of use that are transparently communicated to potential users; users provide feedback about their experience.

This combination addresses asymmetries of information and provide a functioning model that promotes intermediation while widening supply and potentially lowering costs.

In the case of Air BnB, what was an initially unregulated and uncontrolled phenomenon is evolving into a more mainstream service provision, due to the perceived potential negative socio-economic impact (depopulation of neighborhoods) consumer protection concerns (safety regulations) and fiscal implications (taxation and revenues for public finances, especially at city level).

A new phenomenon among city and local governments is to regulate the phenomenon of short

rentals: the trend is not prohibition but rather control, with cities establishing requirements concerning number of guests, occupancy rates, compliance with minimum safety requirements and/or residency requirements from the tenant. Most of those efforts aim to minimizing neighborhood impacts rather than regulating the unconventional lodging sector. Key challenges persist on the implementation and enforcement mechanisms<sup>13</sup>.

The debate about the real positive socio-economic impact of Air BnB is far from over: recent studies challenge some of the efficiencies brought about by Air BnB and suggest that a regulatory approach should be considered to level the playing field of the lodging sector as well as mitigating possible negative social impacts<sup>14</sup>. In December 2018, the City of Los Angeles approved an ordinance regulating short-term rentals, allowing only primary residents for a maximum of 120 days of occupancy. Other cities around the world, like Paris, Barcelona, New York, have regulated short-term rentals.

## 5. Summing-up from sharing economy models

When looking at the evolution of technology and its impact on the banking system, it is possible to argue that technology greatly impacted on the rationale for the real existence of banks as financial intermediaries. When defining the rationale for banks' role, technology has already challenged two of the three main motivations for the

1. Money circulation: banks have always existed to ensure certainty and predictability in the circulation of money.

2. Credit capacity: attitude of banks to repack-age risky assets in form of risk-free deposits thanks to their experience, competence and technology.

3. Information Asymmetry Management (new view).

Having technology and service evolutions already undermined the pillar of money circulation and somehow affected the credit capacity, the key research question of this paper remains as whether the DLTs will make banks and financial intermediaries obsolete.

Elaborating on the similarities suggested by observers that the process of «Uberization» of banks has started and is inevitable, we provide an alternative perspective, suggesting that DLTs definitely provide fertile grounds to streamline financial intermediation but will not replace banks as we know them for the years to come.

A first consideration to be made is that neither Uber nor Air BnB have replaced taxi and hotels; those applications widened competition allowing new entrants (unconventional providers) into tradi-

tional markets. Their greatest merit is that they triggered and accelerated efficiencies that are beneficial to both supply and demand sides, leading to:

- Further segmentation and specialization of services from incumbent providers that face an innovative competitive pressure;

- Enhanced economic opportunities for new entrants;

- Lower barriers to entry in heavily regulated and traditional industries;

- Innovative public policies and regulatory approaches, including industry self-regulation.

The evolution of Uber in the mobility sector provides interesting elements and similarities. The case of Uber is an interesting model that allows to observe an initial disruption of the sector (mobility services provided openly and without limitations). Uber has then evolved from disruptive to a “mature” mechanism in which the business model is the same (transportation services from Point A to Point B) but with an evolution in the service provision. Such evolution of service provision has created an innovative playing field in which incumbents (official taxi providers) resisted or adjusted to new competitive pressures. In the meantime, this playing field has allowed also for new entrants to compete with Uber, testified by the proliferation of similar platforms in different geographical contexts.

An interesting case in point is provided by Uber entry into the Russian and CIS markets: rather than entering the market with its brand name, Uber opted for a merger with Yandex.Taxi to start operations in 127 cities in Russia, Armenia, Azerbaijan, Belarus, Georgia and Kazakhstan. Such partnership does not preclude competition nor coexistence of different operational models. In countries like Armenia there is room for other Transport Network Companies such as the local GG Taxi service provider. In the countries where Yandex.Taxi operates, users can use indifferently Yandex.Taxi and Uber, on which drivers from official taxi companies, licensed drivers and «free-lancers» advertise their services indifferently (example of coexistence).

A similar model of disruption, maturity and diverse playing field may possibly occur in banking and financial intermediation. New technologies are poised to sustain the development of new products and business models, improving service provision with possibly a plethora of new entrants that will potentially consolidate (or simply disappear due to competitive pressures and maturing of the market) and incumbents that will adjust to new products, means and technologies. The question will be to see which services, with which operational modalities and technologies such innovations will occur and how effectively will affect consumers' choices and behaviors. Moreover, banks and financial in-

intermediaries not only enjoy incumbent position in the market, but also have a competitive advantage by having experience, expertise and ICT savviness and investment capacity.

Hence, rather than «disruption» that will lead to the disappearance of banks, we shall prepare for a new way of banking and financial intermediation provided by new entrants and a new way of «doing banking» with traditional banks innovating and adjusting servicing and products. Hence, we suggest that the advent of new technologies will not necessarily disrupt the banking and financial intermediation, rather will trigger innovation and evolutions that may lead to a «new breed of banks and financial intermediaries» that will adjust to those evolutions and embed such innovations.

A similarity that can be drawn from the examples of Uber and Air BnB is their initial disruption, evolution into maturity and an adjustment period that led to a segmentation of the market, increased competition, differentiation in service provision and, to a certain extent, increased transparency and trust.

The applications like Uber and Air BnB that disrupted mobility and lodging industries provide interesting inputs into the debate of how technology can change banking and finance, but remain far from being the role model as similar impacts cannot be reasonably expected: while DLTs can improve certainty, transparency and efficiency in intermediation, banks will remain a key player in financial intermediation, adopting (and adapting) DLTs and new technologies to widen their service provision.

A second consideration is that both Uber and Air BnB led to regulatory efforts to provide a level playing field and ensuring minimum consumer protection and safety standards. While in some cases regulatory efforts were promoted by interest groups representing the incumbents of the traditional sectors (i.e. taxi and hotel companies), safety and consumer protection, together with fiscal and revenue concerns, are leading to diverse regulatory approaches that are still evolving.

Examples of regulatory approaches vary. A local legislation passed in New York City in December 2018 caps the number of for-hire vehicles per year and sets minimum wage for drivers. In different states of Australia, Transport Network Companies' operators are subjected to different requirements that range from background checks of drivers, vehicle inspections to insurance requirements and payment of fees. In the Member States of the European Union there is a high degree of fragmentation in regulatory approaches to Transport Network Companies, with different approaches from banning to laissez-faire. A recent judgement from the Court of Justice of the European Union of December 2017 (Case C-434/15 Asociación Profesional Elite

Taxi v Uber Systems Spain SL) ruled that Uber services are tantamount to taxi services, rather than a mere digital intermediation service, letting individual Member States to regulate it as such<sup>15</sup>.

This reflects the evolving nature of those applications from «disruptive» to «mature» models of intermediation in traditional sectors. The gradual public sector intervention is also an indication of a public policy and regulatory approach of letting the market evolve to gauge the social and economic impact of those applications before devising regulatory frameworks.

Notwithstanding the above concerns, an interesting feature of Uber and Air BnB is in the relationship between provider and user that is facilitated by a network with functionalities that can apply to the financial intermediation world, such as:

- Transparent information
- Clear terms and conditions
- Feedback loops
- Reputation-based transactions.

The above elements, translated in financial intermediation environments, could provide interesting inputs into an innovative mechanism in which the interaction between «Principal» and «Agent» are reversed.

## Conclusions

Uberization of banking has been often referred to as the disruptive impact of new technologies and applications such as DLTs, Blockchain and cryptocurrencies on the banking sector and financial intermediation. Nevertheless, the term in itself is neither appropriate nor relevant. First, there is an issue of definitions: Uber as well as other Transportation Network Companies have not «disrupted» the urban mobility sector: rather than interrupting, altering or destroying the sector, those companies are complementing and transforming the industry with innovative business models that are pushing for innovation (and revision) of market dynamics and regulatory approaches. As such, disruption may not be the most appropriate way to describe the impact of those innovation on traditional industries and sectors. Second, the dynamics of banking and financial intermediation do not lend themselves to being associated with the intermediation in urban mobility, hence making the reference to «Uber» in banking and finance daring. Financial intermediation is about financial empowerment and inclusion: financial transactions concern key aspects of people's life (education, health, employment, business, and so on) that require and demand certainty, regulatory oversight and protection. In a typical Uber ride, the small monetary value of the transaction and the short duration of the service alter the dy-

namics of consumer protection: by nature, the transactions, industries and even the new technologies/innovative services are different. Third, banking and finance have been evolving over the past decades with the advent of new technologies and products. As such, banks appear to be well positioned to absorb – and adjust to – any disruptive impact of DLTs and blockchain by developing new services and capitalizing on their dominant position by embedding those technologies and services. Nevertheless, a few key elements of the rationale for the existence of banks are challenged by those innovations: DLTs and blockchain are yet another novelty that undermines the money function of banks. More, these technologies are poised to becoming an effective means to manage information asymmetries to the benefit of transparency.

On a separate note, there is the need to «distinguishing» between blockchain and cryptocurrencies. Blockchain applications can provide valuable solutions in specific segments, such as certainty of transactions (not only financial, but also administrative, especially in the case of sectors and/or countries affected by low transparency and high levels of corruption), «serving the underserved» (blockchain applications for cross-border payments and financial intermediation that could overcome the lack of reliable payment systems and banking infrastructure, as is the case of remittances), overcoming fragmentations along value chains (as could be the case of international trade and commercial transactions with multiple layers of intermediation). Those positive elements of blockchain may be undermined by the low awareness and understanding of the technologies involved: often blockchain is indifferently associated to cryptocurrencies by the general public.

In addition, tokenomics and its dynamics dangerously resemble the reckless financial product innovation that contributed, together with many concurring factors, to the international financial crisis. The lack of a regulatory framework, the hype of innovative financial instruments (in addition always associated with «high-tech» or other appealing ventures) coupled with no supervision and governance mechanisms may lend tokenomics to providing opportunities and venues for financial frauds. This may serve as an entry point for industry participants and regulators to seek innovative mechanisms of consumer/investor protection, as the concept of tokenomics is undermining and reversing yet again the models of creditworthiness, financial and business decision making based on due-diligence assessment and valuation.

The above stresses the need to tackle regulatory aspects: it is exactly in this domain that lies the real disruption of DLTs, blockchain and cryptocurrency. Those technologies and innovations are trigger-

ing diverse approaches that range from banning to laissez faire. While regulation may hinder innovation limiting the ability of technology to push the boundaries of new services and applications, consumer protection, transparency and money laundering are all legitimate concerns of regulators. Identifying the right balance and regulatory depth will be the most pressing challenge. In the current regulatory vacuum, alternative measures can be undertaken to prevent – or at least minimize the impact of – possible negative applications of the new technologies and services: increased awareness among the public (tailored for specific target groups) as well as transparency about information and data available on new products and services. Although, this last element of transparency and availability of information would in any case require some forms of monitoring (ideally from a public agency) and/or impose some forms of reporting. Just as an example, ICOs should be in any case reported and/or prepared with adequate information disclosure clauses and procedures. Light reporting requirements may be developed for those businesses, ventures and initiatives benefitting from ICOs to monitor their survival rates.

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#### ИННОВАЦИИ НА ОСНОВЕ ФИНТЕХ И БЛОКЧЕЙН: «УБЕРИЗАЦИЯ» БАНКОВ В КОНТЕКСТЕ ТЕОРИИ ФИНАНСОВЫХ ПОСРЕДНИКОВ

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Финтех и блокчейн в настоящее время очень актуальны и имеют большое значение в контексте развития новых технологий для финансовых услуг. Распространение так называемых «подрывных инноваций» оказывает радикальное воздействие на принципы функционирования финансовых рынков. Банковский сектор переживает новую волну цифровизации и финансового реинжиниринга, однако на этот раз процесс обновления идет по новым каналам и преследует иные цели. Распространение структурированного финансирования, закрепившегося в результате прежнего применения ИКТ, выявило проблемы, связанные с дефицитом информации или информационной асимметрией в отношении сложных для понимания инновационных продуктов. В статье проводится сравнительный анализ воздействия первой и второй волны цифровизации в контексте теории финансовых посредников. Рассматриваются вопросы распространения и регулирования передовых финансовых технологий и токеномики. Авторы приходят к выводу, что нельзя квалифицировать технологические изменения, происходящие в финансовом секторе, как «подрывные инновации», поскольку другие примеры экономики совместного пользования, такие как Uber и Airbnb, говорят о том, что новые технологии дадут новый импульс развитию финансовой индустрии, не вытесняя ее.

*Ключевые слова:* цифровая экономика, финтех, блокчейн, криптовалюта, экономика совместного пользования, уберизация, технология распределенного реестра, секьюритизация, финансиализация, токеномика.