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Tokenization: Financialization's new guise or demise?

Abstract

The aim of the paper is to analyze the relation between tokenization and financialization. Recent developments in digital technologies shed new light on the nature of financialization and demand its accepted views be reconsidered. In particular, advances in blockchain and related technologies put into question the legitimacy of the concept's conventional emphasis on the role of financial institutions and markets by demonstrating that some of their functions can be replaced with technology. Tokenization facilitates financial disintermediation and brings to the fore the mediating capacity of transactional representations of assets and rights. The paper offers a new definition of financialization, accommodating transformations triggered by digital technologies while staying truth to the fundamental meaning of the term, and applies it to study the said relation.

Introduction

Financialization is easy to acknowledge and much harder to define. The perception of the growing presence of finance in the business and consumer world can possibly be matched only by that of technology – both have become so ubiquitous that they can be seen as hallmarks of the present-day capitalism. Symptomatically, with the advent of a new era of fintech following the 2008 crisis (Alt, Beck, Smits, 2018; Arner, Barberis and Buckley, 2016) the two have increasingly come together and fused in the new domain of blockchain (Voshmgir 2019)[1].

Simply put, financialization means the rise of finance (e.g., Kippner, 2005), and is a process of forming financialized capitalism (e.g., Lapavitsas 2013; Sawyer, 2013), or finance-led capitalism (e.g., Boyer, 2000). What exactly financialized or finance-led capitalism is and how financialization should be measured remains debatable, and various perspectives on the subject have been proposed in the literature. Most often, financialization is interpreted as the growth of the financial sector (Sawyer 2013), a new pattern in accumulation (Arrighi 1994;

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[1] It is manifested, for example, by different categorizations given to bitcoin – a currency, commodity, security, asset, software code (i.e., part of application) – and a growingly accepted interpretation that bitcoin is all of these (see, e.g., Introna and Pecis 2020).

Krippner, 2005; Stockhammer, 2007; Ząbkowicz 2009), shift in gravity of economic activity from production to finance (Boyer, 2000; Filar 2019; Foster, 2007) and the related increasing economic and political power of the financial sector (Guttmann, 2008; Lapavitsas 2013) or the rentier class (Epstein and Jayadev, 2005; Palley, 2013), the shareholder value primacy (Froud et al., 2000; Lazonick and O'Sullivan, 2000; Useem, 1996), the boom in speculation in financial instruments (Cheng and Xiong, 2014; Philips, 1996), increasing frequency and severity of financial crises, changes in the sphere of ownership – investor myopia and ownership without responsibility (Ratajczak, 2012), and a systemic transformation of capitalism (Baran and Sweezy, 1966; Krippner 2005; Lapavitsas 2013), or a new stage of capitalism (Minsky, 1992; Sawyer, 2013). All these interpretations can be viewed as manifestations of financialization in its broad sense, which is the increasing autonomy of the financial sphere relative to the productive ("real") economy (e.g., Zwan 2014), and, in some aspects, the precedence of the former over the latter (Ratajczak, 2012; Urban 2020).

The picture of financialization that emerges in the literature is that of a multifaceted process and a concept lacking a clear focal point and solid, unifying theoretical foundation. Academics usually content themselves with bringing into focus and analyzing selected facets of the growing role of finance in the economy (Urban, 2020). This results in the financialization literature being fragmented into competing perspectives, each of which addresses only certain aspects of the complex concept. To remedy this shortcoming, the present paper takes as a starting point theoretical models demonstrating that financial systems – markets, institutions, instruments, regulations and techniques (e.g., Rose and Marquis, 2011) – arise to mitigate the effects of information, enforcement and transaction costs (e.g., Levine, 1997; 2005), which will be called in this paper "the purpose of finance". It then builds on these models by proposing that the purpose of finance is the driving force behind processes that produce – directly or indirectly – all the aspects and manifestations of financialization described in the literature. This is not to say that the purpose of finance motivates financial decisions by individuals or financial and non-financial firms. Rather than that, their self-interested decisions in their totality should result in mitigation of information, enforcement and transaction costs, otherwise they would attract institutional or regulatory intervention that would bring the financial system back in line. Therefore, in the long run, interdependencies and interactions between the components of the financial system are expected to advance the purpose of finance. Failure to do so results in excesses that eventually become unsustainable.

Grounding financialization in the purpose-of-finance theorizing, firstly, emphasizes the fundamental principle underlying the rise of finance. Secondly, it provides the common ground to the many interpretations of the concept presently in use. And thirdly, it can serve to identify further aspects or manifestations not yet defined in the literature or not yet fully materialized in the real world. Such an approach absolves financialization of its present link to the context of "mature capitalism" (highlighted in, e.g., Baran and Sweezy 1966; Lapavitsas 2013; Zwan 2014) and can provide guidance and help interpret systemic and structural changes unfolding in the economy in terms of financialization. Most importantly, however, the unifying perspective provides the conceptual groundwork to distill the essence of financialization. Following this line of reasoning, the paper puts forward a new definition of financialization as the increasing liquidity of assets and rights in the economy. The definition suggests that the growth in liquidity of assets and rights economy-wide is the core, indispensable quality to the growth of finance, common to all aspects of the concept. Emphasizing the essence of financialization abstracts it from many context-specific processes that have developed around it or that it enabled, and which enrich the picture but also distract from the core message. For the same reason, the definition disregards any roles of economic agents or institutions involved in increasing liquidity, that is the "whos" and "whys", focusing exclusively on the "what".

The increasing liquidity of assets and rights in the economy is predicated on the growing scope of entities (physical, digital, legal) being perceived – and acted upon – as first and foremost "investible", that is as objects of valuation and trade (investment, speculation or hedging). These entities (assets and rights) then need to have their transactional representations created (issued) and transactions facilitated Transactional representation is defined as a representation created with the main purpose of facilitating trade of underlying value (i.e., asset or right), whether it meets the criteria of financial instrument or not[2], and liquidity of assets and rights refers to their ease of trade (i.e., the ease with which they can be converted into purchasing power without compromising on their price). Other things being equal, the more assets and rights have their transactional representations created and the better their trade is facilitated by their internal characteristics or external structures, the larger the information base in the economy and more efficient pricing (i.e., the purpose of finance better fulfilled). The more assets and rights become investable and easy to trade, the bigger the role of finance in the economy.

[2] As they are typically defined in a largely exemplary and circular manner (Callens, 2020).

The novelty and originality of the proposed approach consist, first and foremost, in that it does not presuppose the role(s) of any economic agents or institutions, traditionally emphasized in financialization literature (e.g., Davis and Kim 2015, Epstein 2005b). Instead, it focuses on representations of assets and rights and points to their role as "mediators" configuring relations between economic actors. It acknowledges the mediating role of objects as structuring conditions shaping socio-economic processes (e.g., Beyes, Holt, Pias 2020b, including technological mediation in human-computer interactions (HCI) (Kaptelinin, 2014), and adapts this logic to financial (and quasi-financial) instruments and their affects and effects, specifically the reduction of information, enforcement and transaction costs. The emphasis on objects ("representations") has the advantage over orthodox approaches of not presupposing any roles or responsibilities of economic agents or institutions, which, as it will be argued, is vital given technology-driven deep transformations of the present-day economy. Therefore, this shift in focus is intended to accommodate and help interpret changes taking place in the field of finance, and to understand the condition of financialization at the beginning of 2020s.

The definition invites a number of research questions, including measurement, the limits of financialization, regulation, social and cultural context, and the role of technology. The scope of the paper at hand is limited to the last issue and, more specifically, the impact of the much-hyped blockchain technology (c.f., Tapscott and Tapscott 2016) and its arguably most transformative application of tokens and tokenization (Voshmgir, 2019) on the condition of financialization.

The invention of the blockchain technology and its application to finance is arguably the most consequential development in financial technologies (fintechs) in recent years (Tapscott and Tapscott, 2016, 2017). Its first application – Bitcoin – was designed as digital private money system to replace central banks and sovereign currencies (Nakamoto, 2008). Its spectacular price rise in 2010-2017 attracted enormous attention of investors, financial institutions, the public and scholars alike. Bitcoin was soon followed by other so-called cryptocurrencies, each of which aimed to serve as digital private money, and by much misunderstood tokens. Despite being often mistaken for cryptocurrencies, tokens are not intended as digital money – rather than that, they can represent any existing digital or physical asset, or rights of access to assets owned by someone else (Voshmgir, 2019). Thus, tokenization, that is the disintermediated process of creating tokens (technically speaking: identifiers), can potentially reach an unprecedented scale and disrupt the financial system and its relation to the real economy.

Given its potentially transformative impact on the world of finance, tokenization provides an ideal setting for studying the condition of financialization at the beginning of 2020s.

The aim of the paper is to analyze the relation between tokenization and financialization. Given the theoretical background assumed in the paper, the lens of information asymmetry and transaction costs is used to analyze the potential impact of tokenization on the processes of financialization, including the participation and roles of financial instruments, institutions, non-financial enterprises and consumers It is proposed that, firstly, blockchain technology partially eliminates the need for intermediaries in financial transactions, thus reducing the cost of intermediation; while transparency of blockchains decreases information asymmetries for all market participants. Secondly, the ease of tokenization disintermediates the process of creating easy-to-trade representations (i.e., tokens), facilitating monetization of up-till-now illiquid and indivisible assets, such as works of art. The scope of assets and rights potentially subject to tokenization is larger and the cost of tokenizing them is lower than for creating more traditional financial instruments by incumbent financial firms. Thus, tokenization can be expected to increase significantly the size of financial economy and give price information on increasing number of assets and transactions, thereby increasing transparency, information base and market efficiency. Thirdly, issuances of so-called utility tokens enable funding previously "unfundable" (or hard to fund) open-source software by prospective users, triggering the growth of new type of ecosystems, which eliminate the need for traditional financial institutions. Such tokens give their holders rights to blockchain product/service value rather than to software developer cash flow. Thus, blockchain funding model by design replaces shareholder value maximization orientation with stakeholder orientation and "community building". As at the moment of issuing tokens blockchain projects are early stage, tokenization opens the startup funding market widely to the public, thus democratizing finance. All in all, financialization can largely proceed independently of traditional financial intermediaries, as the latter can be to a large extent replaced with technology, and the profits previously amassed by intermediaries can accrue to users. Financialization is not retreating, but its institutional characteristics and competitive conditions are changing dramatically. Tokenization can be viewed as a conduit of financialization and a hallmark of its new stage.

The paper is organized in five sections. In the following section, the concept of financialization is outlined. The third section explains the need for a new definition of financialization and then proposes such a definition and justifies the choice. The fourth

section introduces the notions of tokens and tokenization, and the fifth section analyzes the relation between tokenization and financialization. Concluding remarks follow.

Financialization: An outline

Financialization is one of the terms most often used to describe present-day capitalism (Sawyer, 2013). The origins of the term are vague, although it began gaining popularity in 1990s (Foster, 2007). The processes to which it is referred date form mid or late 1970s (Epstein, 2005a; Krippner, 2005; Lapavitsas, 2013), late 1960s (Foster, 2007), or are even viewed as ongoing for millennia (but in present form since circa 1980) (Boyer, 2000; Sawyer 2013). Most typically, the beginning of financialization of capitalist economies is related to the declining profitability of manufacturing in 1960s (Boyer, 2000), the globalization of production and deregulation of labor and financial markets, initiated in late 1970s, and, as importantly, to the collapse of the Bretton Woods Agreement in 1971-1973 (e.g. Seccareccia, 2013), which put an end to the convertibility of the US dollar into gold, resulting in unprecedented instability of exchange and interest rates, thereby spurring the growth of financial markets, including international ones (Lapavitsas, 2013). Finally, the Washington Consensus, defined in 1989, opened up national economies broadly to international capital flows (e.g. Williamson, 2009).

Despite the existence of many perspectives on financialization, mentioned in the Introduction, they all seem to share the basic understanding of the term as the growing presence or role of finance in the economy, reaching beyond its traditional depiction as the provision of capital for the productive (”real”) economy (c.f., Davis and Kim 2015, Zwan 2014). As finance is defined as the management of a supply of money (Cambridge Dictionary), and the academic discipline of finance is supposed to deal with how money is used (Farlex Financial Dictionary, 2009), a literal meaning of financialization would suggest the growing importance of the management of money. In fact, two most widely cited definitions of financialization follow this line rather closely. According to Epstein (2005a: 3), “financialization means the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies.” And Krippner (2005: 174) defines financialization as “a pattern of accumulation in which profits accrue primarily through financial channels rather than through trade and commodity production”. The role of financial motives, or profits, is central to both definitions, accompanied by the emphasis on the management of money. Beyond that core, however, the understanding of

what is meant by the growing role of finance in the economy differs widely and the concept remains notoriously vague and elusive (e.g.,Aalbers 2019, Zwan 2014).

Interpretations of financialization – referred to in the Introduction – are typically grouped into three interdependent broad categories: (1) transformation of the economy, (2) pattern of accumulation, and (3) financialization of daily life, and the corresponding units of analysis: financial institutions and markets, non-financial firms, and households, respectively (e.g., Aalbers 2019; Urban 2020)[3].

Within the first category, there are two main approaches to the study of financialization: the analysis of the expansion of the financial sector (financial markets and institutions), and the examination of systemic changes in capitalism potentially leading to a new stage in capitalism (Sawyer, 2013). The former approach concerns issues like the expansion of financial markets, deregulation of the financial system, propensity to form asset bubbles, growing role of institutional investors, dominance of finance over industry, growing leverage, consumption sustained by capital gains or credit, and a particular culture (Ratajczak 2012, Sawyer, 2013). The latter approach concerns the perceived change in the relationship between the financial sector and the productive ("real") economy. Sawyer (2013) and Epstein (2005b) points at a diminished role of governments and growing role of markets, and the growth of international financial transactions, thus connecting financialization to the rise of neoliberalism and globalization. For Ratajczak (2020), both the private sector and the state contribute to processes of financialization that shape the present-day form of capitalism. And for Davis (2009) the rise of finance shapes the shift from industrial to postindustrial economy. This stream of literature addresses the stages in economic development (Rostow 1962; Porter, 1990) and/or varieties of capitalism (Amable, 2003; Hall and Soskice, 2001) perspectives and criticizes some of their assumptions (Zwan 2014).

An alternative perspective on financialization is to study the (growing) weight of finance in the economy (a macroeconomic perspective). Two such approaches can be distinguished: "activity-centered" and "accumulation-centered" (Krippner, 2005). The standard approach to studying structural change in the economy is to examine changes in employment or contribution of different sectors to GDP, although some authors (e.g., Boyer, 2000; Krippner, 2005) argue that an alternative approach which looks at where profits are generated in the economy gives a more "systemic", deeper view and is therefore preferable.

[3] For more categorizations see, e.g., Aalbers (2019) and Zwan (2014).

The second category of conceptualizations – the accumulation-regime perspective on financialization relates to the re-orientation of corporate governance away from the stakeholder orientation towards the primacy of shareholder value (see, e.g., Useem 1996). This perspective on financialization (e.g., Froud et al., 2000; Lazonick and O'Sullivan, 2000) deplores investor short-termism leading to an excessive (i.e., detrimental to the long-term health of enterprises) extraction of capital from listed companies and distributing it to shareholders. The shareholder value critique emphasizes the "predatory" nature of contemporary capital market, as it views the business enterprise as a value-creation entity and the stock market as a value-extracting institution (e.g., Lazonick and Shin, 2020). The growing power of the latter has forced enterprises to switch the financial priorities from retain-and-reinvest to downsize-and-distribute (Ibid.). From this perspective, financialization is about losing the balance between value creation and value extraction, which leads to issues with enterprise sustainability and the loss of middle-class jobs. This stream of research is related to the transformation of economy approach to financialization by emphasizing the growing role of financial activities in non-financial firms.

The third category of interpretations of the concept is least developed, with authors addressing topics related to the finance encroaching on the practices of everyday life, for example the rise of consumer as investor (e.g., Sawyer, 2013), overemphasizing exchange value over use value of housing, and the resulting subjecting of consumer to the power of financial markets, (Aalbers, 2008; 2019), as well as the recognition of cultural factors (such as narratives related to the individual's responsibility and risk-taking) in the processes of financialization (Zwan 2014).

Financialization is also studied from the "classical" political economy perspective, with clear Marxist references, and this approach cuts across all the three categories of conceptualizations. For example, Lapavitsas (2013) defines financialization as a systemic transformation of capitalism and analyzes changing relations of non-financial enterprises, financial firms and workers. And Epstein and Jayadev (2005) examine the "rentier share" in national accounts, which is defined as profits of financial firms and interest income of non-financial firms and households.

A major issue with the financialization literature is that the field is dominated by the macroeconomic and political economy perspectives, although it has attracted interest of scholars representing a variety of schools of thought and disciplines, including economic history, institutional economics, political science, geography, management, anthropology and

sociology (e.g., Aalbers, 2019; Zwan, 2014). Macroeconomic approach typically focuses on reporting the share of financial services in employment or contribution to GDP, and political economy perspective emphasizes the role of interest groups (defending or promoting the interests of the financial sector or capital owners) in the evolution of the socio-economic system. While both are valuable and document the multifaceted nature of the studied concept, these approaches are badly equipped to address the epochal shift taking place in the sphere of finance, triggered by technology. To make sense of the transformation, a new perspective on financialization is needed, deeply rooted in the immutable purpose of finance serving as an organizing principle and instrumental in assimilating the recent fintech revolution.

New definition of financialization

Financialization is not the only term used to depict the growing role of finance in the economy. Financial development is a much more widely used concept, as suggested, for example, by the number of Google Scholar entries (c.a. 77 500, including British spelling, and 247 000 entries, respectively, as of December 2020). Determining how the two concepts relate and weighing their corresponding merits and limitations should allow to illuminate their co-existence; it also provides a convenient starting point for substantiating the need for a refined view of financialization.

The term "financialized capitalism", to which financialization is currently directly linked, signals an essential role of finance in the capitalist regime (e.g. Sawyer 2013), and the related "finance-led capitalism" implies not just a positive relation between the growth of finance and economic development, but also points at finance as a key driver of economic growth (Boyer, 2000). Importantly, the pattern is specific to the current stage of capitalism, or a present-day model of capitalism (e.g., Zwan, 2014), known also by related terms of investor capitalism (Useem, 1996) and casino capitalism (Sinn, 2010; Strange 1986). Financial development, in turn, refers to the growth of the financial sector (e.g., Levine 1997, 2005; Rajan and Zingales 1998, 2001) in any historical context or economic regime. Thus, the first major difference between the concepts of financial development and financialization is the universality of the former and specificity of the latter. Second, financial development refers to a quantitative change (e.g., growth, structural change, efficiency), whereas financialization is a multifaceted concept covering to a large extent descriptive, qualitative variables. As such, financialization gives a much more nuanced and richer picture of the nature of changes taking place in the sphere of financial activities, seeking to address their "hows" and "whys" and capture the totality of aspects and manifestations. This makes financialization a much broader term,

applicable to various framings beyond the relation between financial development and economic growth or other macroeconomic variables. Consequently, different methodologies are applied to study financialization and financial development, often (albeit not exclusively) qualitative and interpretive research for the former and quantitative analyses for the latter. Finally, financial development literature typically focuses on financial markets and institutions (e.g., Levine 1997, 2005; Rajan and Zingales 1998, 2001; Svirydzenka 2016) whereas financialization covers also rules and norms in non-financial businesses (e.g., Boyer, 2000), including shareholder value primacy doctrine (Froud et al., 2000; Lazonick and O'Sullivan, 2000), and the rise of consumer as investor (financialization of everyday life) (e.g., Sawyer, 2013, Zwan 2014). In both financial development and financialization narratives financial instruments play the role of financial contracts created and handled by intermediaries, and in the case of financialization, also as conduits of firms' reorientation from production to finance[4]. To sum up, financialization and financial development are distinct concepts, each with its own merits and limitations. They are studied with different methodologies and address different questions, although by some interpretations (e.g., Krippner 2005) financialization is viewed as encompassing financial development. By the same token, measures of financial development quantify some aspects of financialization.

What follows, not only does the concept of financialization give a deeper understanding of what is behind financial development and the logic governing its process but it also sets a much more ambitious agenda. One key advantage of the of financial development literature is, however,/its firm establishment on theoretical arguments on the role of finance in the economy ("the purpose of finance") (e.g., Levine 1997, 2005). The lack of such universal theoretical foundation can be viewed as crippling the academic potential of the concept of financialization, limiting its usefulness for framing research problems. The multiplicity of approaches and interpretations results in the concept's vagueness and fragmentation of the literature (e.g., Aalbers, 2019; Zwan, 2014), and should be viewed as limiting its appeal to the academia[5]. The interest in selected facets, implications and mechanisms inhibits finding a common ground around which scholars could gather and which would form the basis for further disciplined conceptualization. The paper at hand addresses this deficiency by proposing a new perspective on financialization, rooted in theoretical models of the purpose of finance, which relate its rise to the existence of information, enforcement and transaction

[4] Viewing innovative and complex financial instruments as enablers of separation of value extraction from value creation (Styhre 2015) is a notable exception.
[5] However, Aalbers (2019) views it as one of the sources of the popularity of the term.

costs. Such models derive from the financial development literature, where they are used to explain the rise of the financial sector – intermediaries and markets – and to justify its costs (e.g., Levine, 1997, 2005). The new approach proposed herein, however, puts central stage the mechanisms of pursuing the purpose of finance – acquiring information, enforcing contracts and making transactions (Levine 2005) – and it does not take for granted any roles depicted in the financial development literature. The basic rationale behind this stance is that the concept of financialization should be defined by "what", and not "who", therefore it should not presuppose any roles or structures[6].

This approach on the one hand directs and disciplines the debates, and, on the other, it opens up the concept to new standpoints, processes and practices afforded by the rise of fintechs. In particular, the traditional roles and responsibilities of long-established financial institutions (e.g., banks, brokerages, centralized exchanges and clearing houses) are not taken for granted, instead, they are viewed as subject to innovative efforts and disruption triggered by new digital technologies. Borrowing from the activity theory (Engeström 1987; Leontiev 1981) and actor-network theory (Latour 1987; Law and Lodge 1984), which study subject (i.e., human) – object interactions, and their application to human-computer interaction research (e.g., Kaptelinin, 2014), the active role ("mediation") of objects in structuring human interactions is recognized and applied to the financial sphere. It is then connected to the notion of technological mediation (e.g., Nagle, Seamans and Tadelis, 2020; Rückriem 2009; Sharma and Sheth, 2010; Van Den Eede, 2011) and its application to financial interactions (e.g., Allen, Hawkins and Sato, 2001; Economides, 2001; Su, Wang, Yan, 2018). The paper builds on the concepts of object and technology mediation to propose that enhanced with digital technologies, financial or quasi-financial instruments (such as tokens) play the role of technological media and not just financial contracts linking economic agents. As such, they merge technology and finance, potentially enabling new forms of interactions that would be impossible without these technologies (cf. Rückriem 2009), and this concerns in particular the emergence of decentralized finance (DeFi).

This perspective brings out the power of instruments relative to intermediaries and markets. By assuming the role of technological media, they may limit dependence on traditional financial institutions to support the purpose of finance. Moreover, in the same vein as the medium affects its content (message) and how it can be received, and create its own

[6] The questions of "who", "how" and "why" should certainly be addressed in the course of individual analyses, but not in determining the scope nor essence of the concept.

dynamics, said instruments can take on a function other than that with which in mind they were created. For example, utility tokens, attracting heated discussions concerning their nature, can be viewed as evolving from playing the function of securities at the moment of issuance (when the blockchain project is still being developed) as they are typically used to fund the project, to taking on functionalities provided for in the computer code once the project is operational. Thus, they no longer should be recognized as securities but as pieces of the computer code, i.e., parts of the application for which they were created (De, 2020) and which they power.

The approach emphasizing the role of instruments clearly differs from the dominant perspectives on financialization, in which financial instruments are recognized as components of the financial system but play the role of objects loaded with information (rights, price, etc.), and thus conduits of financial activity by economic agents, rather than agential (mediating) forces that configure relations and shape behaviors. This makes them objects of information asymmetries and transaction costs (a view characteristic of mainstream finance) rather than "mediators" on their own.

It should be stressed at this point that the perspective developed in this paper does not negate the role of intermediaries in the growth of finance. Instead, it recognizes that, given the recent advances in digital technologies, many of their tasks can be taken over by such technologies, particularly distributed ledger systems (Voshmgir 2019). Since technology can at least partially replace intermediaries, their role become contextualized and cannot serve as a stable, immutable basis for analyzing the nature of financialization. The notable role of intermediaries may be characteristic of a certain stage in the growth of finance, or even drive it, and then lose relevance and be replaced by other mechanisms, processes and drivers. The same logic applies to the other subjects of financialization analyzed in the literature, namely centralized exchanges, non-financial firms and consumers (households) – their roles and relative importance may change in the course of evolution of financialization. Hence the need for a new perspective and the emphasis on the immutable purpose of finance. The task at hand is to come up with a conceptual common denominator to the multiple processes, aspects, manifestations and interpretations of financialization that have developed over time, that is the most fundamental mechanism underlying the growth of finance over time and across settings.

It is proposed that increasing liquidity of assets and rights in the economy is such a common denominator, an indispensable quality that conditions the progress and evolution of financialization and hence, it is its essence. Given the plethora of interpretations of the

concept, the definition is focused on what is argued to be a timeless, fundamental quality and common, albeit often implicit, component to all perspectives on financialization. In the case of such a complex and multifaceted concept, definitions that attempt to be broad and comprehensive, giving an all-encompassing depiction of the totality of its facets run the risk of overgeneralization and lack of substance.

Elaborating on this definition entails distinguishing three aspects of increasing liquidity. Firstly, the process of increasing liquidity of assets and rights in the economy demands ever more entities (physical, digital, legal) be recognized (and acted upon) as stores of value, engaging capital which can potentially be freed and redeployed to alternative purposes or endeavors. Thus, they are subject to valuation and can be traded or kept, following the logic of maximizing (or building) capital. The growing scope of such entities may cover, for example, the emergence of so-called alternative investments (new asset classes), but also the phenomenon of firms being perceived and perceiving themselves as financial entities and not just legal fiction, production units and social structures, leading them to assume the shareholder value orientation (in itself an important aspect of financialization), and viewing housing through the lens of exchange value rather than use value (again an important aspect of financialization). Similarly, public goods can be traded (indirectly, as CO2 emissions permits), followed by natural world phenomena (e.g. futures on weather in California as affecting crops), and even volatility measures (VIX futures).

Secondly, it involves the creation of transactional representations of assets and rights (including rights of access) which facilitate their trade. These two aspects are related to the concept of "assetization" (Birch, 2015, 2017), that is "turning things into assets". That concept, however, does not distinguish between the cognitive aspect (developing an understanding of the idea) and its implementation, that is the creation of abstract representations, as indicated above. Moreover, "assetization" refers to resources (both tangible and intangible), thus excluding economic entities, and serves primarily the purpose of valuation (Ibid.), whereas the concept developed in this paper concerns also businesses and other economic entities, and goes a step beyond valuation to emphasize the role of liquidity. A good example would be the creation of instruments representing portions of previously indivisible items, such as pieces of art. Thirdly, the definition allows for other factors, such as financial institutions, infrastructure, regulation or algorithms, which can assist in facilitating trade in these items, whereas their limitations can hinder the trade. Thus, facilitation of transactions can be internal to representations (specific qualities and technologies) and/or

external (as in the traditional view). The value of these three aspects of increasing liquidity should be analyzed in terms of economics of information production, contract enforcement and transaction execution.

Tokens and tokenization

The financial crisis of 2008-2009 is often viewed as marking the beginning of a new era in fintech development (Alt, Beck, Smits, 2018; Arner, Barberis and Buckley, 2016). Fintech, defined as the application of technology to improve financial activities (Schueffel, 2016), in the post-crisis era is characterized not so much by new products and services as by how technologies are applied to them and who delivers them (Arner, Barberis and Buckley, 2016). Arguably the most path-breaking post-crisis development in this domain is the emergence of distributed software (think distributed ledger and blockchain), enabling new financial business models and institutional order. The main idea behind applying distributed software to finance is to eliminate the need for financial intermediaries and regulators, and to replace them with algorithms (Lavazova, Dehling and Sunyaev, 2019).

At the basic technical level blockchain is a distributed digital ledger technology. A ledger is a way of recording and storing information in a database (i.e., an accounting technology), and producing consensus about the facts that are necessary for transacting (Davidson, De Filippi and Potts, 2016). A key selling point of blockchains is that they produce such consensus in a decentralized manner (using so-called consensus protocols) and store information in a distributed network of computers, thus eliminating the need for and dependence on trusted intermediaries who would guarantee (validate and enforce) transactions, and virtually eliminating the risk of tampering with once recorded data (Ibid.).

The concept of blockchain was introduced in a 2008 white paper – published by pseudonymous Satoshi Nakamoto – to underpin Bitcoin – the world's first cryptocurrency and electronic peer-to-peer transaction system independent of states and intermediaries. Launched in 2009, Bitcoin was in succeeding years followed by other digital currencies (dubbed cryptocurrencies) with more or less similar aims and protocols. However, as Tapscott and Tapscott (2016) note, blockchains can be programmed to record and transact virtually anything of value and importance – not only money but also titles, deeds, contracts, and virtually all other kinds of assets and rights. Thus, blockchain technology can have a much wider range of possible applications relevant to finance than just secure transfers of digital currencies. One development with a particularly disruptive potential to the financial system is

the invention of blockchain-based smart contracts and, particularly, token contracts, in short, tokens (Voshmgir, 2019).

Cryptographic tokens remain an understudied topic, particularly given their novelty, disruptive potential and poorly understood nature. The idea of tokens is not new – they have been around since the prehistoric times. In tribal societies tokens were tangible representations of facts or qualities, e.g., used to confer authority; in modern societies they were vouchers (coupons) that could be exchanged for goods or services, e.g., as part of promotional offers (lexico.com). Present-day crypto tokens represent a utility or asset and are issued on blockchains using blockchain protocols (e.g., Coin Metrics, 2019). For financial applications (i.e., decentralized finance software) almost all tokens are issued on the Ethereum blockchain, and take the form of so-called ERC-20 smart contracts (Voshmgir, 2019). A smart contract is computer code deployed in a blockchain environment, which self-executes when conditions stipulated in the script are met (e.g., De Filippi and Wright, 2018, De Filippi, Wray, Sileno 2021), and ERC-20 is a user-friendly standard allowing tokens to be easily created, exchanged for each other, and integrated within decentralized applications (e.g., Coin Metrics, 2019; Voshmgir, 2019). Tokens can be defined as programmable contracts issued on a blockchain; they describe conditional rights assigned to their holders, which can refer to any existing digital or physical asset, or rights of access to assets owned by someone else (Voshmgir, 2019).

Tokens and tokenization, i.e., the process of creating them, ideally in a disintermediated manner, have a few key attributes that set them apart from previous-era financial instruments and their issuances. Firstly, a distinguishing characteristic of token contracts is the ease of creating them, allowing anyone with a basic coding competence to issue simple tokens with a few lines of code (Voshmgir, 2019). Secondly, tokens can also be issued to fund complex projects, thus resembling traditional financial instruments, however, the disintermediated process is cheaper and quicker (Ibid.). Thirdly, technically they are part of the application and not a security (Teutsch, Buterin and Brown, 2017), although their nature attracts heated debates. For example, SEC Commissioner, H. Peirce argues that a token may appear to have the qualities of a security at launch but mature to the point where it no longer appears to be one (De, 2020). In a mature form, tokens combine the qualities of (1) claims to product/service value and (2) automation of contract execution. Fourthly, tokens provide an opportunity to fund open-source infrastructure projects (2014), “unfundable” by traditional finance (Kastelein, 2017) and incentivize its adoption. This concerns specifically shared

infrastructure open-source blockchain projects, by the nature of open-source movement offering free and unrestrained access to the source code, and therefore ease to use and modify it for other purposes. Therefore, blockchain open-source software is designed to require specific tokens (called utility tokens) to use it, and such tokens become means of payment granting their owners access to services offered by the blockchain project thus funded (2014). Since blockchain project success depends heavily on building an ecosystem of complementors and consumers, token issuances should aim not at maximizing their value but maximizing participation (building user community) and transparency (thus reducing information costs) (Teutsch, Buterin and Brown, 2017). Therefore, such projects should ideally be funded by prospective users – consumers and application developers issuing their own tokens [on top of existing blockchain infrastructure]. This allows them to participate financially (i.e., to profit) in the success of innovative blockchain startups, thus democratizing finance (Tapscott and Tapscott, 2017) and disrupting the traditional business angel/venture capital model of entrepreneurial finance. What follows, tokens can share the characteristics of money, commodity, security, asset, governance instrument, business model component, and software code (i.e., part of application).

Tokenization and financialization

In the traditional view, market frictions – information, enforcement and transaction costs – create incentives for the emergence of the financial system. Different costs of acquiring information, enforcing contracts and making transactions motivate distinct financial arrangements (markets, contracts and intermediaries), which in turn affect the incentives and constraints of parties to a transaction (e.g., Levine 1997, 2005). Before analyzing the implications of tokenization it is therefore pertinent to look at how financial systems alleviate information, enforcement and transaction costs, that is at their value-added functions. These functions have been variously categorized by academics, for example as monetary, capital allocation, and controlling (Pietrzak, Polański and Woźniak, 2008), or transfer of resources, risk management, clearing and settlement of payments, pooling of resources, information aggregation in prices, and mitigating agency costs (Bodie and Merton, 2000). In a widely-accepted categorization Levine (1997, 2005) points at five broad categories of financial systems' functions: (1) production of information ex ante and allocation of capital, (2) monitoring of investments and implementation of corporate governance, (3) facilitation of trade in financial instruments, diversification and risk management; (4) mobilization and pooling of savings, and (5) facilitation of exchange of goods and services in the real economy.

Firstly, individual savers may not have the ability (competence, time) to collect and process information on possible investments (i.e., on firms, managers, economic conditions), thus preventing the capital from flowing to its most productive uses. Intermediaries may undertake the costly process of producing such information for others, economizing on information acquisition and processing costs. Also large and liquid markets increase incentives to produce information as it is easier to profit from this information by trading in big and liquid markets. Secondly, the difficulty of monitoring managers to act in the best interest of providers of capital may disincentivize mobilization of capital from separate sources and directing it to the most productive investments, and financial markets regulations increase availability of information ex post, whereas increased threat of takeovers in public markets enhances corporate governance, and introducing debt contracts lowers monitoring costs. Furthermore, delegated monitoring by financial intermediaries (like institutional investors and market analysts, e.g., at brokerages) economize on aggregate monitoring costs, and effective stock markets allow investors to link management compensation to equity prices, thus aligning interests of managers with those of capital owners. Thirdly, financial contracts, markets and intermediaries facilitate trading, hedging and pooling of risks through diversification, intertemporal risk sharing and ameliorating liquidity risk. Fewer risky projects would be financed without them. By facilitating trade stock markets reduce liquidity risk. Fourthly, mobilizing capital from various sources (savers) is costly. It involves dealing with transaction costs associated with collecting savings and overcoming the informational asymmetries associated with making savers feel comfortable in giving up control over their savings. These frictions can be mitigated by various financial arrangements, in particular bilateral contracts, like in the case of the legal entity of stock company, and pooling may also involve intermediaries (e.g., various funds). Furthermore, mobilization frequently involves the creation of small denomination instruments, helping savers build diversified portfolios. Finally, easing exchange of goods and services by reducing transaction costs can promote specialization (as it requires more transactions), with positive implications for productivity improvement. The emergence of money is a key invention lowering the transaction costs as it eliminates the need to barter goods. Barter is very costly because it involves high costs of evaluating the attributes of products or services offered by the other side to a transaction, it may be also very costly to find a transaction partner offering goods with characteristics we demand (Levine, 2005).

Before delving into analyzing the implications of the development of the blockchain technology and the prospects before tokenization, it is pertinent to sketch a broader perspective and consider the impact of digitalization. Digitalization can be expected to affect the operation of financial markets, contracts and intermediaries, and their relative position within the financial systems (i.e., financial arrangements) inasmuch as it involves lowering information, enforcement and transaction costs. The emergence of the internet, and the development of ever more advanced data processing technologies facilitate access and production of information on possible investments for individual savers and intermediaries alike. Digitalization of exchanges and online trading improves access and timeliness of information, increasing liquidity and incentives to produce information. It can play a role in monitoring of managers as it improves overall transparency of financial markets, lowers costs of comparing financial, disclosure and corporate governance practices of listed companies, and helps them reach investors and other constituents in a timely manner. Thirdly, digital technologies vastly improve the possibilities of portfolio management and by facilitating trade in financial instruments they increase liquidity of financial markets and reduce owners of capital' liquidity risk. They also lower the costs of creating new financial instruments (e.g. derivatives and structured products). Fourthly, increasing transparency (e.g. daily valuation of funds' investment units) can increase the willingness of savers to deploy their money to financial markets. Fifthly, digital platforms – both two-sided and multi-sided – play a key role in facilitating transactions and thus lowering transaction costs. They create value by bringing different users and user groups together and enabling direct interactions between two (or more) distinct types of users. Online payment systems can reduce the costs of handling money. All in all, although new types of institutions (such as software developers) enter the arena, traditional components of the financial systems retain their roles in mitigating information, enforcement and transaction costs.

In the post 2008-crisis fintech era, the "traditional" roles of financial intermediaries, non-financial firms and consumers get disrupted, new actors come into play, and the working of financial (or quasi-financial) "mediators" (i.e., representations) takes the center stage as mediating in interaction between parties involved in financial interactions. Traditionally, these parties involved financial institutions (including public ones, e.g., central banks), non-financial firms, consumers, and regulators. Given the technologically advanced mediation processes involved in the blockchain technology, traditional roles are being challenged. Software developers design representations and processes that take over some of the functions

traditionally played by financial intermediaries and allow to partially eliminate the need for supervision by regulators ("from code is law to law is code", see: De Filippi, Hassan, 2018b), at the same time reducing their capacity, and the role of non-financial firms and consumers go beyond that of simply consuming financial products, given the ease of creating simple tokens and the need to use a distributed network of computers (network nods) for transacting. Moreover, blockchain technology enables novel financial arrangements going beyond the traditional combination of financial intermediaries, markets and instruments as blockchain platforms coordinate economic activities using distributed ledgers and enable new organizational forms of "spontaneous organizations" (alternatively called distributed organizations), which are neither organizations per se nor markets (Davidson, De Filippi and Potts 2016; Lumineau, Wang, Schilke, 2021).

In the extant literature the concept of financialization is invariably linked to (1) the profit motive and (2) the growth of the financial intermediation sector, measured typically in terms of either contribution to GDP, employment, or the expansion of banks (asset value) and financial markets. Tokenization on the other hand (1) enables funding otherwise "unfundable" open-source blockchain projects by substituting ownership interest in the developer company with product utility rights, effectively replacing shareholder primacy doctrine with stakeholder perspective, and (2) can disintermediate processes of instrument (token) issuance and trade. With tokenization, anything of value can be "investible", that is to become object of tokenization and trade in hope of future gains. Given the ease and low cost of tokenization, it is not necessary that the asset or right be highly standardized and have adequately large scale, it suffices that the process of tokenization is standardized. And there are sufficiently close substitutes or the value can be estimated based on other data. Therefore, tokenization can release enormous amounts of money up-till-now locked in illiquid assets (or rights). Moreover, tokenization facilitates splitting such assets into smaller units, supporting their tradability and, consequently, liquidity. Growing base of tokenized assets or rights and ease of access to information about them, stored on blockchains, rises transparency in the economy, increasing informativeness of prices and thus, market efficiency. Thereby, tokenization strengthens financialization.

The revolutionary nature of blockchain consists in that it shifts trust from institutions towards algorithms (e.g., Lavazova, Dehling and Sunyaev, 2019), which potentially can dramatically reduce transaction costs. However, there is more to blockchain than just a trustworthy ledger. Namely, it can implement business rules in the form of so-called smart contracts. Smart

contract is a code-based ("pre-programmed") contract stored on a blockchain which executes autonomously (i.e. without the need for active human engagement) whenever conditions stipulated in the code are met. Automating transaction execution can significantly reduce enforcement and transaction costs (De Filippi, Wray, Sileno 2021). As smart contracts execute autonomously when stipulated conditions are met, they eliminate the risk of human opportunism or error, thus eliminating the need to trust the transaction partner. Moreover, aforementioned decentralized autonomous organizations replace hierarchical coordination with algorithms, thus promising to rid of many problems plaguing hierarchical organizations, including large overheads and agency problems, and thus dramatically reducing severe transaction costs. Finally, properly designed and distributed tokens which are medium of exchange on a given blockchain and give rights to its governance align interests of protocol developers, developers of applications, nods and users, addressing the main concern of the political economy approach to financialization.

Conclusions

The paper is a call for a new definition of financialization accommodating recent technological developments fundamentally affecting the functioning of the financial sphere. The need for a new definition of financialization reflects the limitations of dominant approaches, which became exacerbated by the rise of the blockchain technology and the profound changes in the structure of contracts it enabled. Whereas mainstream approaches emphasized the role of financial institutions and markets, blockchain technology to a large extent eliminates the need for financial intermediaries and reduces the power of regulators, replacing them with algorithms, and tokens at the center of finance, emphasizing their mediating function.

Financialization is not about financial intermediation, markets nor regulation. It is about money and its transformation. It is about giving assets or rights a liquid form to facilitate transactions and release capital (value) locked in them. It is about making previously indivisible assets accessible to anyone by partitioning them, and thus making the smaller units affordable, facilitating diversification of risk.

Tokenization can have positive socio-economic effects in the form of mitigating information, enforcement and transaction costs. With the blockchain technology, financialization is entering a new stage which can be called democratization of finance. Now a liquid form can be given to any asset or right, not just conventional asset categories and previous-era alternative

investments. Blockchain-era alternative investments can entail rights to portions (tokenized units) of pieces of art or other one-of-a-kind objects or rights (non-fungible tokens – NFT). Finally, with crowdfunding or token issuances anyone can now participate in previously illiquid and largely inaccessible startup funding market, giving people a chance to participate financially in the fortunes of young, promising ventures. Financialization is about liquidity and financial participation, and tokenization is instrumental in democratizing finance.

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