Fintech framing financial ecologies: Conceptual and policy-related implications

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Abstract

PURPOSE: *Financial ecologies (FEs) are place-based governance forms of financial services provision, currently undergoing a transformation through financial technologies (Fintech). The idea of FEs is socially and economically relevant, since they reach toward underserved or excluded market segments and intermediate for territorial development across industries and sectors of private and public entities. At the same time, the FE remains at the early stage of conceptualization and empirical corroborations, in particular regarding how Fintech affects its core elements and related policy implications. In response to the theoretical and practical relevance, and early stage of theorizing the recent Fintech developments in the FE, this article aims to identify how Fintech frame FEs and to propose the resulting conceptual and policy-related implications.* ***METHODOLOGY:*** *To frame the FE concept, we used the methodological lens of construct clarity principles and the concept reconstruction. The research method includes a systematic literature review of 48 publications selected from Scopus and WoS databases.* ***FINDINGS:*** *We have analyzed the concept of FE according to its major elements and related concepts. The FE remains at the intersection of other outcome-oriented ecosystems that focus on territories, but it can also be treated as an independent phenomenon and research object. The idea of FE has been shaped by Fintech-driven developments in all its constituent elements with conceptual and policy consequences formulated as a set of propositions.* ***IMPLICATIONS:*** *The findings are relevant for future theory development and empirical corroborations of the FE. They can also enhance the integration of research communities of practice to accumulate knowledge. Despite standardization brought about by technological innovations, the availability, usefulness, and effects*

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of financial ecosystems depend on the multiscalar spatial contexts that differ in socio-economic and institutional dimensions. ***ORIGINALITY AND VALUE:*** *First, the article frames the understanding of FE as financial services governance based on technological advancements and focused on territorial projects and communities. Second, the FE concept was clarified according to major properties and relationships to other adjacent ideas of spatial networking for socioeconomic development. Third, propositions and research areas were formulated for further investigations.*
Keywords: *financial ecologies, financial ecosystems, Fintech, financial technologies, policy-related implications*

INTRODUCTION

Financial technologies are understood as ICT-based financial innovations and business entities based on these innovations (Lai & Samers, 2021; Langley & Leyshon, 2021; Wójcik, 2021b). Like other technological innovations, Fintech not only influences technical parameters of products and services, but also transforms the economic organization of firms and industries (Baldwin, 2020; Sanchez & Mahoney, 2013). ICT solutions in the financial sector complement the existing services (e.g., payment platforms), substitute human work and tangible assets (e.g., robo-advisers), and generate new solutions (e.g., mobile wallets). Furthermore, Fintech transcends borders and geographical frontiers, as exemplified by crowdfunding in financial centers accessible to start-ups and growth firms from peripheral locations (Bonini & Capizzi, 2019; Spigel, 2022). However, the ongoing digital transformation of financial services has a strong spatial and multiscalar dimension and takes various forms and outcomes, depending on the socioeconomic and institutional specifics (Leyshon, 2020; Baranauskas, 2021; Coe, 2021).

The financial sector has recently been conceptualized as a financial ecosystem to reflect its exposition to dynamics and occasional disruptive change (Leyshon, 2020). Within a broadly defined financial ecosystem, two interrelated structures can be identified according to spatial characteristics (Gancarczyk, Łasak, & Gancarczyk, 2022; Lai, 2020). The first comprises global networks of financial centers and large investment banks, that is, global financial networks (GFNs), largely spanning over the borders of countries and regions (Coe, Lai, & Wójcik, 2014; Coe, 2021). The other forms are financial ecologies as segments of the financial ecosystem that are delimited by particular territories (Lai, 2016; Leyshon et al., 2004; Leyshon et al., 2006; Langley & Leyshon, 2020).

Being subunits of the financial ecosystem, FEs represent interrelated financial intermediaries and other economic agents, focused on the provision and access to financial services in particular territories (Beaverstock et al.,

2013; DawnBurton, 2020; Lai, 2016; Leyshon et al., 2004; Leyshon, 2020). In this vein, FEs can be considered as governance modes comprising private and public entities, such as banks, Fintech, BigTech, public agencies, enterprises, and customers, and relationships among these entities. The actors and relationships are delimited by a given location, such as a region or city (Langley, 2016; DawnBurton, 2020; Chen & Hassink, 2021; Appleyard, 2020).

The relevance of the FE concept is based on the disproportionate outcomes that small ecologies may raise for comprehensive systems, as evidenced by the subprime market failure in the USA, affecting the subsequent financial and economic crisis of 2007-2009 (Leyshon, 2020), with relevant effects on many economies such as the European economy (Rodil-Marzábal & Menezes-Ferreira-Junior, 2016). Therefore, investigating small but critical points within the larger financial ecosystem is crucial for policy. It is also theoretically justified since the financial ecosystem has been predominantly studied as a general abstraction of the financial sector. Subsystems remain less explored, especially in the granularity of the spatial context.

Since FEs are context-specific and undergo co-evolutionary dynamics with this context, they also transform as a phenomenon and a concept (Lai, 2020; Wójcik, 2021a). One of the main influences comes from the recent technological developments raised by Fintech. The growing empirical evidence in this area calls for understanding consequences for the FE construct (Welch, Rumyantseva, & Hewerdine, 2016) and adequate policy responses. Resonating with the said research gaps and an early stage of the development of the FE idea, this article aims to identify how Fintech frames FEs and propose the related conceptual and policy implications.

To frame the FE concept, we use the methodological lens of construct clarity principles (Suddaby, 2010; Simsek et al., 2017) and concept reconstruction (Welch et al., 2016). The method includes a systematic literature review, which represents a unique approach, since the existing theorizing of FEs has been either in the form of conceptual papers or narrative reviews (Lund et al., 2016).

Our findings raise conceptual and policy-related contributions. First, the article conceptually reframes the understanding of FE as financial services governance enhanced by technological advancements and focused on territorial projects and communities. Second, the concept of FE was clarified according to its main elements and its relationships with other adjacent ideas of spatial networking for socioeconomic development. Third, research propositions and areas for further investigation were proposed.

In the following, we present the literature review to justify our aim and research questions. The methodology section presents the conceptual lens for our discussion of the FE as a construct shaped by Fintech; it also

specifies the method of a systematic literature review. Results, discussion, and conclusion proceed in the next sections.

CONCEPTUAL FOUNDATIONS

Financial ecosystems were institutionally introduced to the policy framework and gained widespread recognition in research since the Federal Reserve Bank of New York conference in 2006 (Leyshon, 2020). FEs have become a new theoretical abstraction of the financial services sector as an alternative to the neoclassical equilibrium-based doctrine (Leyshon, 2020). The main difference was in acknowledging radical dynamics within the sector treated as an ecosystem with a diverse and flexible set of financial intermediaries, institutional investors and supporting entities, such as exchanges, data providers, and regulators (Bose, Dong, & Simpson, 2019). The abstraction of complex adaptive systems has often been recalled as a broad framework to understand the functioning and change in the financial sector. Consequently, theoretical perspectives of evolution and coevolution, and in particular, the network governance concept to cope with complex coordination issues, demonstrate explanatory power in studying FEs (Chen & Hassink, 2021; Ponte & Sturgeon, 2014; Chen & Hassink, 2021, 2020; Coe & Yeung, 2019).

The lens of the financial ecosystem was intended to provide concepts and methods that would address environmental and regulatory shocks and prepare for future breakthrough changes to the financial system (Leyshon, 2020; Fasnacht, 2018). Furthermore, within this idea, the classical goals set for the financial sector, such as optimizing capital allocation, matching savers and investors, and signaling scarcity and abundance, were expanded by sustainability and social responsibility goals that go beyond purely economizing (Bose et al., 2019; Fasnacht, 2018).

The focus on the financial ecosystem as a model or abstraction of the financial sector predominated over what is the core of ecosystems, the interrelated actors embedded in particular socio-economic and institutional environments (Strumeyer & Swammy, 2017; Bose et al., 2019; Lai, 2020; Wojcik, 2021). Although the legal frameworks of financial ecosystems are intensely studied, the remaining context, such as socioeconomic environment and informal institutions, remain much less explored (Gancarczyk et al., 2022). These contextual factors are specific to individual territories within the financial ecosystem (Ponte & Sturgeon, 2014; Chen & Hassink, 2021, 2020; Coe & Yeung, 2019).

Since the systemic approach assumes interrelations and mutual influences among its parts, changes or weaknesses in a subsystem affect the

whole. A painful recognition for this gap happened just after the indicated 2006 turn to the financial sector as an ecosystem, with the shock of the 2007-2009 crisis. The latter originated in the smaller subunit of the ecosystem of the US subprime market. The following pandemic and political breakthroughs, as well as technological developments, raised new challenges, adaptations, and structural changes to the financial ecosystem (Leyshon, 2020). However, they were implemented differently in different spatial contexts, which stimulated a more granular approach of the financial ecosystem as a collection of place-based subsystems, that is, financial ecologies (Lai, 2016). Another justification for the more place-based perspective is that localized supply chains might require localized financial systems or ecologies (Sarawut & Sangkaew, 2022). Wójcik and Iannou (2020) argue that local and regional financial centers are expected to lose their position, and that the territories outside the core regions and financial centers will have to rely on retail banking and the public sector to fund investment and sustainable development. These smaller ecologies will coexist with global financial networks, which are worldwide networks of financial centers and investment banks (Lai, 2020).

The concept of FE originated in the field of economic geography to reflect the spatial specifics and uneven distribution of financial ecosystems, and to address the crucial issues in financing for the particular territorial populations, such as inclusion, financialization, surveillance, and over-indebtedness (DawnBurton, 2020). Consequently, the FE concept *recasts the financial system as a coalition of smaller constitutive ecologies, such that distinctive groups of financial knowledge and practices emerge in different places with uneven connectivity and material outcomes* (Lai, 2016). The relevance of the FE phenomenon and concept consists of a more fine-grained approach to understanding uneven access to financial services and uneven connectedness to the financial system (DawnBurton, 2020; Leyshon, 2020). Furthermore, research on FEs signals weak and strong points in subsystems that can affect the efficiency of the entire financial system.

FEs represent interrelated financial intermediaries and other economic agents focused on the provision of and access to financial services in particular territories (Leyshon, 2020). As systemic phenomena, they comprise both actors and their relationships, in which actors form various configurations of private and public entities, such as banks, public agencies, enterprises, and customers. The actors and relationships are delimited by a given location that forms a spatial context, that is, a set socioeconomic conditions of a territory, be it a region, city, or a country, and acknowledging multiscalar contexts (Langley, 2016; DawnBurton, 2020; Chen & Hassink, 2021; Appleyard, 2020). The context of a particular ecology should also be considered in a wider, multiscalar perspective. Multiscalarity of the context

is an idea that advocates a multilevel analysis of a spatial unit (Chen & Hassink, 2021). The example of this approach is a regional financial ecology that should be analyzed in the context of the region, country, and relevant international environments. Due to the multiscalar perspective, spatially focused FEs do not lose a broader framework of the financial system in larger units and globally (Chen & Hassink, 2020).

Taking into account the nature of the FE presented above, the main elements of this construct include actors, relationships among actors, outcomes, and contexts. While the scope of actors and contexts has been outlined above, the systemic relationships and outcomes of the FE require further explanation. The FE relationships are often captured as governance, whereby governance represents the sets of institutions (rules, norms) that affect the functioning of a particular socioeconomic system and its efficiency (Colombo, Dagnino, Lehmann, & Salmador, 2019; Ostrom, 1986; Williamson, 2000). In this vein, governance can be described according to the rules of collaboration and competition, and power relations (Lai, 2018). Types of governance range from the firm to hybrids, such as networks, and to markets (Gereffi, Humphrey, & Sturgeon, 2005; Williamson, 2000). The outcomes of FE represent the terms of and access to financing, with a more general effect on financial inclusion or exclusion and on the overall territorial development.

With the wider financial systems, FEs share such constitutive elements as actors and their relationships centered around financial services supply and demand (Bose et al., 2019; Fasnacht, 2018; Lai, 2020). Moreover, they similarly focus on the coordination of the system through the lens of governance (DawnBurton, 2020; Langley & Leyshon, 2021). However, FEs also demonstrate some unique characteristics in relation to wider financial ecosystems, such as clear delimitation of a territorial space, be it a city, region, or country, and acknowledgment of an associated socioeconomic and institutional context (DawnBurton, 2020; Leyshon et al., 2004).

The focus on a particular territory does not ignore the systemic nature of economic relationships in the globalized world, since FEs are considered in a multiscalar context (Chen & Hassink, 2020; Leyshon, 2020). Connectivity of given populations to a broader financial system becomes one of the major issues to ensure the infusion of external sources (Coe et al., 2014). The focus on relationships between commercial banks and retail customers, as well as underserved and unbanked individuals or enterprises, differentiates FEs from GFNs (Beaverstock et al., 2013; Coe et al., 2014; DawnBurton, 2020). The latter consider global networks of investment banks and financial centers liaising over peripheral and noncore territories (Coe et al., 2014; DawnBurton, 2020; Lai, 2018). This global perspective is also related to the governance approach

in the framework of global value chains, which extends to financial activity (Milberg, 2008; Coe et al., 2014; Seabrooke & Wigan, 2017).

The emphasis on socioeconomic effects for disadvantaged market segments and particular industries and projects represents an additional feature of FEs as outcome-oriented systems. While financial ecosystems are primarily targeted at economic efficiency and stability of the system itself, FEs emphasize territorial target groups and projects (Langley, 2016; Langley & Leyshon, 2017). Regarding governance, the focus of FEs has been on network governance of a complex and multi-actor adaptive system (Leyshon, 2020). Network governance is considered not only from the perspective of power relations and resource allocation, but also from learning and financial practices (Lai, 2016).

As evolutionary and dynamic phenomena, financial ecosystems and FE undergo substantive and conceptual developments. One of the ongoing breakthrough transformations stems from Fintech. Financial ecosystems are increasingly reconceptualized as the ultimate mode of financial services governance transformed by financial technologies (Wójcik & Ioannou, 2020; Łasak & Gancarczyk, 2022; Gancarczyk et al., 2022). Similarly, the intensive development of FEs is closely related to technological changes that enable a flexible establishment of new forms of cooperation between economic entities (Arsanian & Fischer, 2019). Fintech increase efficiency and availability of existing and launch of new financial products (Hill, 2018; Livesey, 2018; Nicoletti et al., 2017; Sabatini, Cucculelli, & Gregori, 2022; Scardovi, 2017). However, negative effects are also reported, such as over-indebtedness of risky customers, Fintech surveillance, and exclusion of some customers due to computer illiteracy (Kong & Loubere, 2021; Łasak & Gancarczyk, 2021; Brooks, 2021). The economic and social outcomes of the emerging FEs transformed by Fintech have not been fully understood and systemized (Langley & Leyshon, 2021; Wójcik, 2021b).

Given technological influences, the FE undergoes developments in its core elements, i.e., actors, governance, and outcomes, acknowledging spatial contexts. Despite the increasing stock of empirical findings that describe the impact of Fintech on the functioning of FEs, we lack a synthesis reflection to reconsider FEs from this perspective. Therefore, we formulate the following research questions:

RQ1) How does Fintech affect the FE phenomenon in the area of its actors, governance, and outcomes in various spatial contexts?

RQ2) What are the conceptual and policy-related implications of Fintech influencing FEs?

METHODOLOGY

Our methodology follows the principles of construct clarity (Suddaby, 2010; Simsek et al., 2017; Mazzei, 2018) and reconceptualization of existing constructs (Welch et al., 2016). Construct clarity principles are intended to ensure that a given concept is well formed and described. Since this research aims to explain how Fintech frames the FE phenomenon and concept, we need to acknowledge all the constitutive dimensions of FE affected by Fintech comprehensively. Welch et al. (2016) propose that the review of extant case-based studies informs own research to reconsider the concept. We adapt this approach to form a synthesis from the review of empirical research on FEs that is by nature case-based, since delimited by the contexts of particular locations.

According to Suddaby (2010), the principles of concept clarity are as follows.

i) The definition of the concept should properly reflect the essential properties of the phenomenon. Guided by this principle, we will check whether and how the core elements of FE have been affected by Fintech. We will consider the following elements of FE described in the Conceptual Foundations. Namely, we will focus on the actors (entities forming FEs), governance (rules of competition and cooperation, public and private involvement, governance modes of market, hybrid, and the firm), as well as outcomes (financial inclusion or exclusion, territorial development), and contexts (spatial units defining FEs).

ii) Clear constructs are coherent, not only in their definitions but also per logical relationships among their elements or dimensions. Consistent with this recommendation, we describe the relationships among the FE elements affected by Fintech. Thus, we follow the systemic approach by embracing the elements of the system (actors) and their interrelationships captured as governance.

iii) The scope conditions of the concept need to be acknowledged, such as temporal and spatial aspects. Following this principle, we will recognize the socioeconomic contexts of FEs transformed by Fintech and derive policy implications.

iv) Clear constructs should explicate relationships with other adjacent constructs relevant to understanding the phenomenon. Consequently, we explore how the Fintech transformation of FEs is described through adjacent concepts.

The principles of clarifying how Fintech affects the FE are coherent with the RQs. Namely, principles (i), (ii), and (iii) will directly guide the exploration of RQ1 that focuses on the impact of Fintech on the actors, governance,

outcomes, and contexts of FEs. The exploration of RQ2 will follow principle (iv) regarding conceptual implications and principles (i)-(iii) regarding policy implications of Fintech transforming FEs.

Based on the above assumptions, a systematic literature review was designed (Lund et al., 2016; Tranfield, Denyer, & Smart, 2003). The review was performed in Scopus and WoS, widely used as comprehensive and complementary data sources. The search was done in the period from 2000 till the present, since the first conceptualizations of the FE were published after 2000. The selection of sources was not limited to journal articles, but also included books and conference papers due to the early phase of the research on FEs.

The search embraced the following expression: *"finan* ecosystem*"* or *"finan* ecolog*"* or *"Fintech* ecosystem*"* or *"Fintech* ecology,*"* sought in the title, abstract, and key words of Scopus, and in the abstracts of WoS. The rationale for choosing this search key was to cover not only the term of FE, but also spatially defined financial ecosystems, since the initial screening revealed the studies applying these terms interchangeably or as synonymous with the delimitation of FE through a clearly defined territory (Lai, 2020). A similar conjunction of the meaning can be found with Fintech ecosystems or Fintech ecologies. As territorially bounded, they are equivalent to industrial clusters of Fintech businesses' agglomerations in particular territories, thus forming an ecology of financial services provision backed by territorial socioeconomic structures (Wójcik, 2021a). Since we sought to study systemic relationships and not merely the occasional presence of Fintech, the keywords of Fintech ecosystems or Fintech ecologies were chosen.

The search in Scopus yielded 359 results, which were later refined to 153 by excluding the subject areas beyond the core fields of social sciences, such as medical, computer, chemistry, or a pharma sciences. We found that publications beyond social science do not address our research purpose and the search criteria that seek understanding of transformation of FEs as social systems rather than the technical side of financial innovations. After removing reviews, notes, erratum and retracted papers, and limiting the sample to English-language publications, we obtained a set of 136 sources. The search in WoS produced 83 results, which were fully filtered according to the same criteria and limited to 70 relevant references. In the next step, the two sets of Scopus and WoS were merged to remove repetitions, which resulted in the intermediate sample of 128 items for a comprehensive analysis (Hiebl, 2021).

The initial four key terms were useful to possibly expand the number of relevant references. When selecting the intermediate sample, we followed the four keywords as alternative and necessary but still not sufficient to address the nature of the phenomenon we were studying. Therefore, the

ultimate selection sought to retain those empirical studies that comprise the core properties of FE, including the focus on financial services provision and absorption in a given spatial context and with a variety of stakeholders involved. Given the focus of this research, the recognition of Fintech as technologies or businesses was also a necessary selection criterion. Therefore, the final selection embraced empirical studies that are best suited to reflect the core of the FE concept or can be treated as 'most likely' manifestations of FEs affected by financial technologies (Welch et al., 2016). Based on this procedure, we accomplished the final sample of 48 items, including 41 peer-reviewed journal articles, two books, two book chapters, and three conference papers.

In the next step, we performed theoretical (selective) coding, based on the coding themes originating from the principles of construct clarity and the crucial elements of FEs (Villiger, Schweiger, & Baldauf, 2021). The coding was manual; we tabulated quotes and paraphrases according to the main coding themes (Locke, Feldman, & Golden-Biddle, 2022). The coding themes included the actors, outcomes, governance, and spatial context described as affected by Fintech. We separately analyzed the results for each theme and, ultimately, by the iterative process of matching theory and empirical findings, we formulated analytical generalization as a set of propositions (Piekkari & Welch, 2018; Silverman, 2015; Yin, 2018).

RESULTS

Fintech framing actors in financial ecologies

Actors are considered the core of FEs, since their power and interests determine types of governance and outcomes from these systems. Fintech affects both the number (density) and composition of actors in FEs and their roles (Table 1). Regarding density, we observe an increase in the number of players in ecosystems (Alijani & Karyotis, 2019; Lai, 2020; Senyo et al., 2022). Taxonomies of FE participants include banks, nonbank financial institutions (venture capital, hedge funds, asset managers), Bigtech, Fintech startups, state entities, industry partners, financial regulators, investment community, B2B, social entrepreneurs and non-profit organizations, and customers (Alijani & Karyotis, 2019; Dalal, 2022; Grafe, 2020; Lehner, 2021; Moskalenko et al., 2022; Purkayastha, Tripathy, & Das, 2020; Zhang-Zhang, Rohlfer, & Rajasekera, 2020). The increased number of actors is due to new, ICT technology-based entrants and a broadened opportunity to participate in financing projects by established entities using technology means, such as incumbent banks offering online services or mobile banking, and international development institutions.

Table 1. Fintech and actors in financial ecologies

Spatial context	Findings	Selected references
Global reach with the emphasis on spatial differences	Complex interactions among stakeholders with opposing objectives and antagonistic assets; the role of social enterprises in the concurrent pursuit of social objectives and sustainable business	(Alijani & Karyotis, 2019)
London, UK, retail services for elites	A prime segment of financial services market: investment bankers, corporate lawyers, senior employees in finance-related advanced producer and professional service firms, and private equity and hedge fund partners who have played a significant role in shaping processes of financialization	(Beaverstock et al., 2013)
Food entrepreneurs operating less than three years in the USA	Actors perform decision-making within a dense web of relationships, including buyers and sellers, and non-human actors (algorithms).	(Carolan, 2019)
Financial ecologies of urban infrastructure provision in London (UK) and Mumbai (India)	'Avatars' are a colony from one ecology within another. Avatars represent a new financial market expertise that evaluates and abstracts local projects to standardized metrics; the latter determines a viability and financing of the project. Information among actors is not equal and transparent, leading to power asymmetries.	(Grafe, 2020)
The cases of the ecologies generated by the Singaporean bank DBS and the British bank RBS	Critically evaluated the potential of Fintech to banks' disintermediation; banks continually setting the rules of competition and collaboration. Five main types of actors in Fintech ecosystems: banks, non-bank financial institutions (venture capital, hedge funds, asset managers), Bigtech, Fintech startups, state entities	(Lai, 2020)
Ecosystem of microfinance institutions (MFIs) in India	Lax regulations and ill competition among MFIs led to the microfinance crisis that spilled over from the local level to the entire India.	(Purkayastha et al., 2020)
Mobile money in Ghana	The relationships between the new and old actors, as well as the actors at the meso-level and macro-level determine financial inclusion; the state should provide incentives for these actors to collaborate.	(Senyo et al., 2022)
Development finance ecosystems for the countries of the Global South	Private non-profit and for-profit actors in development financing and the change of the role of governments from providers of global public goods to brokers of private financing.	(Tan, 2022)

Spatial context	Findings	Selected references
Fintech start-ups and Quebec's financial cluster	Comfort zoning by incumbent banks and Fintech, who refuse collaboration hinder innovation and mutually supportive ecosystem.	(Turcan & Deák, 2022)
Financial ecosystem in the Middle East and North Africa	Regulators constraining Fintech; the call for the support of Fintech expansion by regulators	(Zalan & Toufaily, 2017)
China ecosystems centered around Alibaba and Tencent	Financial industry transformed not only by Fintech startups, but also BigTech as cross-sector players.	(Zhang-Zhang et al., 2020)

Regarding the composition of actors, the research reports old or incumbent actors, such as banks and financial advisors (Lai, 2016), and new ones, including Fintech, Bigtech and individuals or peers acting as crowd suppliers of financing (e.g., crowdfunding or P2P lending platforms) (Alijani & Karyotis, 2019; Grafe, 2020; Purkayastha et al., 2020; Zhang-Zhang et al., 2020). Another taxonomy of actors includes human and nonhuman entities, with the latter exemplified by algorithms and robo-advisors (Carolan, 2019). The latter embody Fintech and perform some decision-making functions, such as credit rating and assessment, and standard advisory. Nonhuman actors impose standardized rules of finance provision, which are often abstracted from human and spatial specifics (Carolan, 2019). Their entry into the ecosystem enhances the financialization of everyday lives for both the prime and subprime markets (Beaverstock et al., 2013; Lai, 2016). Among the new topics, Bigtech is a cross-sector actor, expanding from its high-tech business sector to financial services (Zhang-Zhang et al., 2020). The roles of Fintech entrants include being suppliers of outsourced services by banks, e.g., payment platforms, subjects to acquisitions by banks, or independent competitors (Lai, 2020). Bigtech has the power to establish their roles as leaders in the sector, in addition to traditional bank organizations (Zhang-Zhang et al., 2020).

Regarding old or incumbent actors, banks underwent outsourcing to Fintech and thus shortening the scope while concentrating on the core activities. The shortened scope and the challenge of new players have undermined the exclusive position of banks. They became a part of the wider network and multisided platforms engaged in partnerships for service delivery (Turcan & Deák, 2022). However, despite the claims of disintermediation and democratization of FE, banks are expected to maintain their dominant position, even though sharing this dominance with Bigtech (Lai, 2020; Zhang-Zhang et al., 2020).

Fintech not only expands the number of actors, but also increases their multiscalar participation. Actors from one financial ecology work in collaboration with other relevant ecologies (Grafe, 2020). The participants of local funding projects are often meso- or macrolevel organizations (e.g., from regions or countries) using electronic platforms for microcredits and loan provision (Senyo et al., 2022). The latter act as 'avatars' of external goals that are reinforced in particular communities (Grafe, 2020). This can lead to a displacement of local missions by more general goals, such as gender or environmental issues (Senyo et al., 2022; Tan, 2022).

The changing roles are observed among private and public actors, with the increasing involvement of private enterprises (e.g., Fintech platforms providing microfinance for small firms and farmers in developing countries) (Tan, 2022). Private enterprises enhanced by dedicated Internet websites take over some of the financing functions that were previously performed by governments and public entities (Grafe, 2020; Senyo et al., 2022). Global platforms of Fintech, banks, and Western enterprise link local ecologies with global financial networks, while displacing some of the earlier traditional and local networks, such as those of agrarian communities (Tan, 2022). Fintech-enhanced ecosystems can also be effective in the supply of finance for startups and early-stage projects that would otherwise apply for government funding (Festa et al., 2022; Owen et al., 2019; Spigel, 2022). P2P lending and crowdfunding platforms are also a friendly and opportunistic venue for established players, such as business angels and venture capital finds (Konhäusner et al., 2022).

Overall, on the supply side, actors' configurations are increasingly open and not bound to territories, going through different spatial, sectoral, and ownership dimensions (Beaverstock et al., 2013; Grafe, 2020; Senyo et al., 2022; Zhang-Zhang et al., 2020). On the demand side, actors are still defined by their spatial contexts and place-based heterogeneous needs (Carolan, 2019; Purkayastha et al., 2020; Senyo et al., 2022). Consequently, the observation of FE is often pessimistic with respect to conflicting goals and interests among banks, Fintech and Bigtech, as well as between territorial communities suppliers of financing that impose private efficiency goals and external interests (Grafe, 2020; Soloviev, 2018; Tan, 2022; Turcan & Deák, 2022).

Fintech also frame target groups on the demand side of FE, which are rarely prime and elite customers, and predominantly belong to the disadvantaged by traditional institutions, such as startups, social entrepreneurs, non-profit actors, and precarious retail customers (Langley & Leyshon, 2017). This resonates with an emphasis on the spatial context of the Global South, developing countries, and peripheral or rural territories (Carolan, 2019; Purkayastha et al., 2020; Zalan & Toufaily, 2017). Fintech

opens the opportunities for these market segments and territories; however, they also induce standardization and de-contextualization. This may cause a disparity between place-based goals and the interests of external finance providers. Based on the above considerations and related policy implications, we formulate Proposition 1.

Proposition 1. *Fintech changes the density and composition of actors in the FE, with the demand side being largely decontextualized and less focused on the specificity of territorial communities. In addition to broadening the financing opportunities, this results in a gap between the needs of the places and the development objectives and the financing suppliers' goals.*

Resonating with the argument in Proposition 1, the reviewed research includes recommendations towards more active government involvement as a regulator. Policymakers are called to facilitate the integration of Fintech into FEs to broaden financing opportunities and, at the same time, to protect the interests of territorial communities (Grafe, 2020; Purkayastha et al., 2020; Senyo et al., 2022; Zalan & Toufaily, 2017). One of the key challenges for policymakers is to resolve conflicts of interests and ensure the entrance and expansion of Fintech balanced with the protection of consumers.

Fintech framing governance in financial ecologies

In conjunction with the Fintech-driven reconfigurations of FE actors, the research reports on technological advancements affecting the governance of financial ecologies (Table 2). The entrance of new powerful players, such as Bigtech and growing Fintech businesses, causes the shift from public governance to private governance in the financial sector (Łasak & Gancarczyk, 2022). This process not only includes crowdfunding opportunities that replace public support for commercial start-ups, but also for development goals in poorer countries (Green, 2022; Tan, 2022). Tan (2022) calls emerging private governance a 'contractual governance', since it largely follows private standards, indicators, and audit systems, substituting for legal and public policy frameworks, and thus undermines political accountability of financial aid providers.

Another profile of Fintech-enhanced governance captures the impact of external international entities as '*club-like* governance,' dominated by a transnational policy elite of donor states, private investors, and transnational civil society actors from the Global North (Tan, 2022). This 'hybrid transnationalism' is constituted less by spatial location and political

framework and more by thematic goals (infrastructure development, microfinance, gender equality) (Green, 2022; Tan, 2022).

Table 2. Fintech and governance in financial ecologies

Spatial context	Findings	Selected references
P2P lending platforms in Chinese market	Platforms run by the state-owned entities, banks, and private equity capital demonstrate a higher net cash inflow rate; private platforms have lower cash inflows. The impact of the regional Fintech ecosystem on P2P lending platforms (geographical, policy and environmental factors)	(Chen, Hu, & Ben, 2021)
Financial ecological environment and internal audit outsourcing in China	The influence of the financial ecological environment on the corporate governance of internal audit and thus collaborative networks.	(Du, Li, Lin, & Wu, 2021)
Financing agrarian change; credit and debt in the Global South	Agrarian finance, inherently rooted in rural relationships and practices, increasingly shaped by global finance governed by entities at multiple scales The power of the state limited and depending on the position within the global financial system	(Green, 2022)
Mobile money adoption in five countries of the sub-Saharan Africa	To advance the digital financial ecosystem, mobile money regulators and standard setting bodies should engage with stakeholders.	(Koomson, Bukari, & Villano, 2021)
Practices of financial advisors in the UK	The professional practices of financial advisors affected by governance structures; both practices and governance territorially defined by national regulations and cultural norms	(Lai, 2016)
North vs Global South	Trends from public governance to private governance; evolutionary transition from hierarchical to heterarchical to hierarchical governance	(Łasak & Gancarczyk, 2022)
The UK setting for crowdfunding	Crowdfunding structures and processes can replicate rather than change institutional arrangements and practices of funding; crowdfunding questioned to be open and egalitarian	(Langley & Leyshon, 2017)
The Chinese financial ecology of expertise	A technocratic financial governance that reduces the government administrative and fiscal functions; precarious knowledge of investors who call for the state to intervene and safeguard their actions; Conflicts among formal and informal financial experts, state institutions, local banks, and individual investors	(Maso, 2021)

Spatial context	Findings	Selected references
Vizag Fintech Valley in India	The stages of ecosystem emergence as a complex adaptive system; from the *Envisioning* stage, the *Enacting* stage and finally to the *Enlivening* stage The need for a dynamic, agile and proactive regulation that would acknowledge market conditions, consumer demands and complex stakeholder relationships	(Muthukannan, Tan, Gozman, & Johnson, 2020)
The context of Global South and developing countries	The shift to private from public governance in the development finance; 'contractual governance' (private agreements of standards, indicators, audit systems) replacing law and policy-making; abstracted from political contestation (depoliticized). 'Club-like' governance dominated by a transnational policy elite of Western donor states, private investors, Northern bureaucrats and transnational civil society actors 'Hybrid transnationalism' constituted less by spatial location and political framework and more by thematic goals (infrastructure development, microfinance, gender equality)	(Tan, 2022)
Financial ecology of strategic emerging industries in China	The internal financing ecology has a regulating effect on the external financing ecology; internal and external financing ecology as alternative forms of governance in strategic emerging industries The role of central government in maintaining regional economic stability; local government should support scientific and technological innovation.	(Xu, Geng, & Wei, 2019)

The FE governance revolves both around market segments, such as rural communities, startups, retail customers, and social enterprises, and around particular projects (Green, 2022; Lai, 2016; Muthukannan et al., 2020; Tahiri Jouti, 2019). Therefore, we observe networks of local and international origins focused on retail customers and projects delimited by geographical contexts (Tan, 2022).

Studies emphasize the importance of a financial, ecological environment for the internal governance of companies and their efficiency, as well as the professional practices of financial agents, such as advisors (Chen et al., 2021; Du et al., 2021; Lai, 2016). In the Chinese context, private digital platforms demonstrate lower efficiency than those led by institutional actors (e.g., state agencies, banks, and private equity). On the other hand, Xu (2019) reports that internal governance efficiency acts as a substitute for a less developed FE.

Despite the importance of efficient internal corporate governance, most studies demand more government involvement to ensure stability, efficiency,

and implementation of place-based objectives (Koomson et al., 2021; Langley & Leyshon, 2017; Maso, 2021; Muthukannan et al., 2020; Tan, 2022; Xu et al., 2019). The state is recommended to act as a facilitator of information flow to reduce information asymmetry among investors, reconcile conflicting objectives of stakeholders. It is also called to establish development processes for the FE, by linking regulation with the provision of infrastructures and the support for innovations (Koomson et al., 2021; Kotarba, 2016; Maso, 2021; Muthukannan et al., 2020; Xu et al., 2019). On the other hand, when pursuing public procurement and friendly legislation for financial innovation, policy-makers should avoid the dominance of increasingly powerful and global Fintech businesses over consumers in particular ecologies. These claims signal a tension between the privatization processes of FE and the desired role of the government. This role should be performed acknowledging the nature of FEs as complex adaptive systems of numerous actors undergoing evolutionary and gradual development, and affected by existing formal and informal institutions, that is, path dependent (Lai, 2016; Łasak & Gancarczyk, 2022; Muthukannan et al., 2020). Based on the FE governance characteristics driven by Fintech, we formulate Proposition 2.

Proposition 2. *The Fintech-driven governance dynamics of FEs features the tension between the increased role of global private governance and a demanded public governance to ensure the advancement of FEs and reconcile efficiency with social objectives. These processes follow an evolutionary pattern determined by the interactions of FE actors and adaptations to the FE contexts.*

Fintech framing the outcomes of FEs

The selected research sample allows one to extract the range of outcomes from and roles of Fintech in FEs rather than identify tendencies or determine their unequivocal impact (Table 3). Here, we can discriminate between the ultimate impact and intermediate effects. The ultimate impact is discussed as financial inclusion or exclusion, microeconomic efficiency, and wealth generation. Intermediate or side effects include financialization of retail customers, learning, organizational practices, and influence on social networks (Coppock, 2013; Koomson et al., 2021; Muralidhar et al., 2018; Okello Candiya Bongomin & Munene, 2021).

In a cross-country and quantitative study, Lyons et al. (2022) found a strong and positive effect of Fintech on financial inclusion, understood as access to financial services. However, they admit that the availability of financing is not equal to using this opportunity. Fintech links households

and large socioeconomic with the global financial system (Coppock, 2013; Koomson et al., 2021; Mejia-Escobar, González-Ruiz, & Duque-Grisales, 2020). They also have a positive effect on income increase and industrial integration (Ge, Li, Tang, Xu, & Boamah, 2022; Ge, Tang, Zhou, Tang, & Boamah, 2022; He, 2013), financial support, and resilience to external shocks within family and social networks (Koomson et al., 2021).

Table 3. Fintech and the outcomes of FEs

Spatial context	Findings	Selected references
Retail financial services for London elites	New financial technologies drive financialization and stratify customers within the wealth management ecology The super-rich transnational class ecology reproduced through the governance performed by financial service providers	(Beaverstock et al., 2013)
Financialization of individuals and households in rural England	Fintech expanded the availability of financial products to diversified customers and stronger linked households with the global financial system; distinct ecologies of financial inclusion and exclusion within and outside of the mainstream finance	(Coppock, 2013)
Digital financial technologies changing the consumer debt industry in UK	The new Fintech debt ecology threatening with financial exclusion; the time and place convenience and individualization of digital debts, but also manifestation of financial exclusion and dependence on an algorithm assessment; differential pricing of debt collection disfavoring the poorer	(DawnBurton, 2020)
Rural China	The development of digital financial inclusion and rural tertiary industry integration from the perspective of policy impact; regional differences in the financial inclusion	(Ge, Li, et al., 2022)
Rural China	Digital inclusive finance enhancing the income of local farmers and their neighboring farmers; the speed up the of the inclusive finance development and stronger government supervision proposed	(Ge, Tang, et al., 2022)
City infrastructures, digital debt provision for agrarian sector in the Global South	Standardized metrics of customer and project assessment imposed by external financing institutions, which promote own efficiency goals and thematic missions over individual and place-based needs of particular ecologies.	(Grafe, 2020; Green, 2022)
Worldwide country-level analysis of Fintech ecosystems	Rather than spatial dispersion, the Fintech sector spatial agglomeration in few centers increases this sector's competitiveness.	(Jiao, Shahid, Mirza, & Tan, 2021)

Spatial context	Findings	Selected references
Mobile money in five sub-Saharan countries	The adoption of mobile money associated with an increase in financial support transfer within the family and social communities as a response to external shocks; female-headed and rural households benefit from mobile money adoption in the face of idiosyncratic shocks	(Koomson et al., 2021)
Fintech in the context of demand for financial services in 16 the world's largest emerging economies	Strong and positive relationship between the Fintech development and financial inclusion (access to finance); the access not necessarily translated to a greater usage of financial services; heterogeneities of effects across population groups and regions	(Lyons, Kass-Hanna, & Fava, 2022)
Brazil, Columbia, Argentina	Private financial institutions of Brazil, Colombia, and Argentina leading the development of social and green financial products, based on regulatory and government mechanisms; the Brazilian Fintech ecosystem featuring a greater financial inclusion and digitalization of financial services, as well as products for agricultural sector	(Mejia-Escobar et al., 2020)
Auto-rickshaw drivers in Karnataka, India	Learning and organizational efficiency outcomes; intended and unintended consequences of the digital application (platform) adoption: enhanced workflows, but reduced field agents' flexibility	(Muralidhar et al., 2018)
Entrepreneurial ecosystem for females in Northern Ireland	The financial entrepreneurship ecosystem highly gendered; the role of the financial eco-system in promoting or limiting female entrepreneurship	(Ogunjemilusi, Johnston, & Boyd, 2021)
Taizhou in China	Credit availability for SMEs not dependent on financial ecosystems but on the enterprise characteristics; policy-based credit guarantee is not among the major determinants as well.	(Xu et al., 2020)

There are also negative effects reported. Digital debt financing can lead to stratifying customers according to impersonal metrics and dividing them according to gender or wealth, to either exclude from financing or increase debt pricing, ultimately resulting in the debt loop and over-indebtedness (DawnBurton, 2020; de la Cuesta-Gonzalez, Paredes-Gazquez, Ruza, & Fernandez-Olit, 2021; Ogunjemilusi et al., 2021). These mixed evaluations of Fintech impact are even more complex when considering the evidence by Xu et al. (2020), who did not find any relationships between the quality of the financial ecosystems and SME financing in Taizhou, China.

Evaluation of the outcomes from the Fintech transformation of FEs should also acknowledge the influence of spatial contexts and government intervention (Mejia-Escobar et al., 2020). Studies point to strong spatial

heterogeneities and uneven distribution of inclusion and exclusion within and outside mainstream finance (Coppock, 2013; Gün, 2019). Empirical evidence is primarily focused on the ecologies of the Global South and retail, often precarious or disadvantaged individuals and organizations in Western countries. Although some claims were made regarding the location of Fintech ecosystems in other than financial centers, they still enhance spatial polarization by concentrating in technological knowledge centers (Jiao et al., 2021; Mejia-Escobar et al., 2020; Pollio & Cirolia, 2022). A unique feature is attention to wealth elite segments of financially literate individuals, particularly in Anglo-American economies, who benefit from new financial products and availability of funding within the international financial system (Beaverstock et al., 2013).

Based on the above considerations of the mixed socio-economic effects of Fintech in FEs, we formulate Proposition 3.

Proposition 3. *The outcomes of FEs transformed by Fintech are dependent on the characteristics of the spatial context of particular ecologies, as well as on the government intervention in setting out the rules of Fintech expansion and the enhancement of socio-economic objectives of territorial communities.*

Fintech framing the concepts related to FEs

By attracting other concepts that can be explanatory of the financial ecology phenomenon, the understanding of the FE and its theoretical message increase (Wójcik, 2021a). This results in a more comprehensive knowledge of the FE and enables profiling it from different thematic angles (Mazzei, 2018; Simsek et al., 2017; Suddaby, 2010). The related concepts are treated in a wider sense as both those ideas and constructs that are the approximations of the phenomenon in focus and those acting as theoretical explanations of this concept (Suddaby, 2010) (Table 4).

Regarding the concepts acting as approximations, they tend to be used as synonymous, that is, equivalent ideas, or umbrella concepts, that is, wider ideas embracing the FEs as one of their dimensions. Theoretical approximations are also used as theoretical explanations of Fintech-driven processes in FEs. These double-role concepts include financial ecosystems, entrepreneurial ecosystems, Fintech ecosystems, networks, open innovation systems, digital platforms, and complex adaptive systems. The financial ecosystem acts as an umbrella concept for FEs when delimited by the focus on particular market segments, such as the science ecosystem, and by particular territories (Junfang & Mu, 2022; Lai, 2020; Leyshon, 2020; Muthukannan et al., 2020).

Table 4. Fintech and the concepts related to FEs

Approximation or a synonym of the FE	Theoretical explanation	Concepts and their application	Selected references
X	X	Financial ecosystem as an umbrella concept with thematic scopes or spatial focus, such as science ecosystem or/and financial ecosystem defined by particular territories; the use of taxonomies of financial ecosystems	Lai, 2020; Muthukannan et al., 2020)
X	X	Entrepreneurial ecosystems as an umbrella concept; the use of the outcome-oriented and relationship-focused approach	(Spigel, 2022; Ogunjemilusi et al., 2021)
X	X	Fintech ecosystems as synonymous but not sufficient coverage of the FE; spatial agglomerations or clusters of the Fintech industry; the use of agglomeration economies	(Jiao et al., 2021; Wójcik, 2021a)
X	X	Networks as a form of ecosystem relationships; the use of the network economies concept	(Alijani & Karyotis, 2019; Lai, 2020; Wójcik, 2021b)
X	X	Open innovation systems defined by spatial contexts; the focus on the innovative output from FEs	(Fasnacht, 2018)
X	X	Complex adaptive systems; the use of complexity theory and multi-actor approach; actors jointly adapting to external environments	(French et al., 2011; Muthukannan et al., 2020)
X	X	Digital platforms organizational form based on relationships between the platform and the ecosystem of firms; the use of digital platform economies (digital financial economies); the platform political economy of Fintech as a new governance of achieving efficiency	(DawnBurton, 2020; Langley & Leyshon, 2021; Lyons et al., 2022; Muralidhar et al., 2018; Wójcik, 2021b)
	X	Coopetition as a form of governance targeted at win-win strategies through a combination of competition and collaboration; the explanation of the desired outcomes of and relationships in FEs	(Zhang-Zhang, Rohlfer, & Rajasekera, 2020)

Approximation or a synonym of the FE	Theoretical explanation	Concepts and their application	Selected references
	X	Stakeholder approach to understand a variety of actors with conflicting interests; the explanation of relationships among the actors in FEs	(Alijani & Karyotis, 2019; Mejia-Escobar et al., 2020)
	X	Evolutionary perspective as a gradual development in time, from less to more organized ecosystems and ecologies, explaining the emergence and decline, and associated structural differences in the FE	(Dragos & Wilkins, 2014; Zhang-Zhang et al., 2020)
	X	Governance denoting power relations among entities and influencing the outcomes of the FE (finance availability, meeting social objectives, roles of private and public actors)	Wójcik, 2021a)

Considering the use of financial ecosystems as a theoretical background, FEs adopt a large part of related taxonomies, with their own focus on particular groups of actors entering the system due to technological advancements.

Another umbrella concept used both as an approximation and a theoretical approach is the entrepreneurial ecosystem (Leyshon, 2020; Ogunjemilusi et al., 2021; Spigel, 2022). FEs are, in principle, one of its dimensions, but also defined as synonymous or equivalent ideas, namely, a financial entrepreneurial ecosystem (Ogunjemilusi et al., 2021). FEs buy from entrepreneurial ecosystems an outcome-oriented approach, relevant for pragmatic policymaking, and a relationship lens.

Fintech ecosystems are often synonymous, but certainly do not have sufficient coverage of the FE. Their spatial focus invokes the cluster theoretical approach and related agglomeration economies to explain the competitive advantage of FE (Jiao et al., 2021; Pollio & Cirolia, 2022; Wójcik, 2021b). FEs are also treated as a type of network, and the concept of network economies is adopted to explain the benefits of actors organized around a given ecology (Alijani & Karyotis, 2019; Lai, 2020; Wójcik, 2021b). The network approach resonates well with the framework of complex adaptive systems that capture FEs through the lens of the complexity theory and multi-actor adaptations to external environments (French et al., 2011; Muthukannan et al., 2020).

Ultimately, the concept of digital platforms is adopted as an approximation of FEs. This concept denotes an organizational form aggregating and analyzing data, and using ICT infrastructures to capture value from intermediation (DawnBurton, 2020; Langley & Leyshon, 2021;

Lyons et al., 2022; Muralidhar et al., 2018; Wójcik, 2021a). A related idea of digital platform economies describes network and scale efficiencies from Fintech (Langley & Leyshon, 2021).

The adjacent concepts that serve as a theoretical background are used to explain the relationships among the actors in FE, FE dynamics, and outcomes. The explanations of the relationships among FE actors stem from the stakeholder approach (Alijani & Karyotis, 2019; Mejia-Escobar et al., 2020) and a game-theoretic perspective of coopetition (Zhang-Zhang et al., 2020). FE dynamics are captured through an evolutionary approach that describes the emergence and decline, and associated structural differences in FEs (Dragos & Wilkins, 2014; Zhang-Zhang et al., 2020). The outcomes of FEs are derived from approaches such as coopetition (Zhang-Zhang et al., 2020) and governance (Tan, 2022; Wójcik, 2021b).

FEs represent the multiactor and multidimensional object of study, therefore, it would be difficult or even simplistic to search for only one explanatory theory. Therefore, we deal with a plethora of adjacent concepts that profile the nature and outcomes of FEs as transformed by Fintech. This profiling reflects the complexity of the phenomenon and it can be considered as a relevant approach, at least at this early stage of the FE idea development.

DISCUSSION

In accordance with the aim, this research has identified how Fintech frames FEs and proposed the resulting conceptual and policy-related implications. Recently, Leyshon (2020), Lai (2020), and Wójcik (2021a, 2021b) have synthesized the origins of the FE and pointed to their relationships with the adjacent frameworks of financial ecosystems and entrepreneurial ecosystems. The current contribution expands the theorizing on FEs by an explicit recognition of their dynamics in response to technological transformations. We have organized the accomplishments of the extant research around a consistent framework that follows the principles of construct clarity (Suddaby, 2010). This ensured a theory-informed guidance over the systematic literature review. A systematic literature review is unique in the research on FEs since existing reviews are narrative syntheses to define the FE concept (Lai, 2020; Leyshon, 2020; Wójcik, 2021a, 2021b). The rigorous approach and analyzed evidence allowed us to address two research questions and derive a set of assumptions as research propositions.

In response to RQ1, we have described how Fintech affects the FE phenomenon. The literature review shows that financial technologies exert the impact on all constitutive elements of FE, namely, the actors,

their relationships captured as governance, and outcomes, acknowledging spatial contexts. Technological advancements allowed for the increased density and various configurations of FE participants. In particular, financing providers broadened their reach to FEs in various spatial locations, peripheral communities, and unbanked or previously excluded participants. This expansion required standardization of procedures, such as credit assessment, and Fintech offered adequate tools in this regard. The demand side of FEs featured an expansion of financing opportunities; however, their needs and financial capacity remained heterogeneous and less prone to standardization by Fintech-driven algorithms. Overall, the customer side remained rooted in the spatial context, while financing suppliers tend to decontextualize their markets. This general observation was reflected in Proposition 1, assuming a gap between place-based needs and development objectives and the targets of the finance suppliers. Proposition 1 reflects mixed results of existing research in terms of customization and meeting the heterogeneous needs of customers through Fintech, and calls for a more granular and cautious approach between enthusiastic and pessimistic views on the interests and benefits of the actor (Lai, 2020; Lyons et al., 2022; Wójcik, 2021b).

The changing composition and roles of actors in FEs and the gap between place-based and decontextualized interests raise direct consequences for the FE governance, which was summarized in Proposition 2. The latter assumes a tension between the increased role of global private governance and a demand for public governance to ensure the advancement of FEs and reconcile efficiency with social objectives. Moreover, it asserts that the observed processes follow an evolutionary pattern, determined by the interactions of FE actors and the adaptations to the FE contexts (Chen & Hassink, 2021; Gong & Hassink, 2019).

Following the logical relationships among the major elements of FEs, governance is assumed to affect the efficiency and broader outcomes of financial ecologies. The reviewed evidence allowed the formulation of Proposition 3 that intends to resolve the equivocal results reported from Fintech-driven FEs. According to this proposition, the ambiguous results can be justified and explained by the heterogeneity of spatial contexts and socioeconomic differences among FEs, as well as by various policy responses (Chen & Hassink, 2020; Zhang-Zhang et al., 2020).

RQ2 explored the conceptual and policy-related implications of Fintech that influences FE. The conceptual implications were addressed through the review of how the technological transformation has been captured by concepts related to FE. Compared to existing theorizing on FEs, our research is unique in a comprehensive systemization of relevant conceptual frameworks (Lai, 2020; Lai & Samers, 2021; Leyshon, 2020). This was done

according to theories and constructs that are approximations or synonyms and those acting as theoretical explanations of the phenomenon in focus. In general, the FE concept remains at the intersection of other outcome-oriented ecosystems that focus on territories, but it can also be treated as an independent phenomenon and research object.

Our results justify the FE as a clearly defined concept and unit of analysis. This allows scientific validity in capturing the dynamics of this concept in response to external developments, such as Fintech expansion. However, as a complex phenomenon and early stage idea, it does not have a unique theoretical framework but is rather profiled or theoretically explained through other adjacent frameworks. With an advancement of the knowledge of the phenomenon and its empirical corroborations, we can expect a tailored and unique theoretical approach to Fintech-driven FEs. However, it is also possible that the profiling approach will remain dominant, as in the case of other complex constructs (Mazzei, 2018; Simsek et al., 2017; Suddaby, 2010).

The results also address RQ2 with regard to policy implications, as reflected in Propositions 2 and 3. According to Proposition 3, in addition to the overall socioeconomic context, a particular explanatory factor for the outcomes of the FE is the participation of the government. The public intervention demanded includes the establishment of rules and resources for economic stability and technological infrastructure, collaboration among the actors of FE and protection of place-based interests. Proposition 3 also establishes a research program in which context specifics and government involvement are juxtaposed with the outcomes of particular FEs. The policy implication of Proposition 2 is the evolutionary logic in government intervention. The policy design and implementation should follow evolutionary logic, determined by the interactions of FE actors and adaptations to the FE contexts. The proposed logic is a novel approach to government intervention, predominantly viewed as unidirectional and top-down rather than open to interactions with stakeholders to both design and implement policy objectives (Gong & Hassink, 2019, 2020).

CONCLUSION

This research provides conceptual and policy-related contributions. First, it conceptually reframes the understanding of FE as financial services governance focused on territorial projects and communities and enhanced by Fintech. The research community can benefit from the accumulation and synthesis of knowledge regarding the recent dynamics of the FE phenomenon and

concept. Profiling of FE from the angle of adjacent concepts can be a useful approach, at least at this early stage of idea in focus (Wójcik, 2021a, 2021b).

Second, the concept of FE was clarified according to its main elements and its relationships with other adjacent ideas of spatial networking for socioeconomic development. This contribution is relevant for the theoretical validity and methodological rigor of future studies (Suddaby, 2010). The benefits include a transparent delimitation of FEs as study objects, as well as the usefulness of the systemized adjacent concepts in addressing particular research aims.

Third, research proposals and areas for further investigation were proposed. The referred set of propositions not only tackles the crucial elements of FEs, but also points to their logical relationships, making the assumptions derived a coherent framework. Furthermore, the propositions can be further specified in evidence-based hypotheses (Breslin & Gatrell, 2020; Silverman, 2015; Yin, 2018).

Our results are not free from limitations that require justification and explanation of how they were tackled and alleviated. First, our research sample is not homogeneous according to the types of sources. These should preferably be peer-reviewed articles (Lund et al., 2016; Tranfield et al., 2003). At this early stage of research on FEs, we had to source both from peer-reviewed journals and other reliable formats, such as conference proceedings, books, and book chapters. The quality of the research sample was ensured through a thoughtful selection process, with theory-driven and transparent criteria for inclusion and exclusion (Hiebl, 2021). As empirical corroborations grow, future studies can rely on consistent samples of peer-reviewed articles. Second, the research sample is not uniform in terms of the method, since it includes the papers addressing territorially delimited FEs with both qualitative and quantitative approaches. This does not allow for meta-analysis and statistical generalization. However, the assumed focus on spatially defined FEs ensures case-based insights and analytical generalization of socioeconomic processes (actors, their relationships, and resulting outcomes) (Piekkari & Welch, 2018; Yin, 2018).

FEs are emerging constructs and economic phenomena; therefore, we need both further conceptualizations and studies that would put these ideas to empirical testing (Lai & Samers, 2021; Wójcik, 2021b; Kleibert, 2020). In terms of conceptual challenges, the FE idea deserves more in-depth and sympathetic criticism to refine its understanding. The ecosystem approach in social science is a promising lens. However, it also raises concerns reported in discussions of more mature ecosystem concepts, such as entrepreneurial ecosystems. The critics include blurred delimitation versus adjacent concepts, complexity, and multivariate nature, whereby the issues of target groups and

outcomes often remain unclear (Aguilar, 2021; Spigel, 2022; Stam, 2015; Wurth, Stam, & Spigel, 2021). Further studies of FE should face and resolve similar conceptual challenges.

Moreover, the idea of FE should be supported with a relevant theoretical background and clarified with respect to the relationships with other business and enterprise ecologies and ecosystems. The promising theoretical lens might include evolutionary and institutional theories, as well as governance theories (Chen & Hassink, 2020, 2021; Williamson, 2005; 2010; North, 2005; Ostrom, 2010; Hodgson, 2015). Moreover, the important research gaps refer to the mechanisms of the FE governance, such as regulatory frameworks, e.g., financial reporting and sandboxing, types of involved entities and their relationships, power relations, types of contracts, value and intellectual property sharing, as well as learning and adapting by FE participants. Since FEs are focused on territories, their idiosyncrasies should be acknowledged by exploring FEs in variegated socio-economic and institutional contexts of countries and regions (Ponte & Sturgeon, 2014; Chen & Hassink, 2021, 2020; Coe & Yeung, 2019).

In terms of empirical challenges, future research can focus on place-based qualitative and quantitative studies. These would enable qualitative analytical generalization on the mechanisms of FEs affected by Fintech, and metaanalytical reports for statistical generalization in this area.

This issue contains articles, selected through a rigorous peer-review process, which contribute to our understanding of how Fintech frames the financial ecosystem and its particular ecologies. As detailed in the following, the content addresses diverse but complementary topics, providing a comprehensive and updated view of the central theme.

Kutera (2022) is the author of the article entitled ***'Cryptocurrencies as a subject of financial fraud'***, which aims to review the current scope of research on this topic by examining current trends, the most popular crimes related to cryptocurrencies, and identifying potential opportunities for further research. The findings of the detailed bibliometric and descriptive analysis reveal that cryptocurrencies as a subject of financial fraud are an emerging area of scientific research. Moreover, this work finds that money laundering and financial pyramids – based on the Ponzi scheme – are currently the most common frauds.

The article entitled ***'The interplay of entrepreneurial ecosystem actors and conditions in Fintech ecosystems,'*** authored by Avarmaa et al. (2022), focuses on the growing role that financial technology (Fintech) plays in the process of expanding financial ecosystems. In this sense, this paper is an original approach that aims to contribute to the emerging research on this specific topic within the needs of analysis that justify this special issue.

The work by Bartolacci et al. (2022), entitled ***'An analytical framework for strategic alliance formation between incumbent banks and Fintech start-***

ups: theoretical proposals and empirical findings,' analyses the conditions of strategic alliance formation between incumbent banks and Fintech start-ups. Specifically, it seeks to fill the research gap in the literature and identify the explanatory factors of successful strategic alliances by examining two specific entities as case studies: the *Banca Popolare di Cortona* and the *NetFintech start-up*. The findings allow improving the knowledge about the best conditions for incumbent banks and Fintech start-ups strategic alliances, serving as a basis for further research in this area.

The research entitled ***'Heterogeneity of motivations among crowd investors: Evidence from the football industry',*** authored by Kosciolek (2022), takes as its starting point the controversy surrounding the motivations of crowd investors. This work focuses specifically on the study of the heterogeneous motivations of crowd investors in football clubs by using a survey research method, segmenting them according to their investment motivations. Although no cluster with a predominance of extrinsic motivations was found, this research provides evidence that a homogeneous group in terms of crowd investment activity can still be heterogeneous in terms of crowd investment motivations. The results can be useful for sports managers as they provide information on the market segments of crowd investors to make crowdfunding campaigns more effective.

Finally, the work by Khan (2022), entitled ***'How funding matters: Reinitiating of New Product Development and the moderating effect of extramural R&D,'*** aims to analyze the effect of financial obstacles on the innovative behavior of firms. In particular, this article examines the effect on the probability of undertaking previously suspended (or abandoned) innovation projects for new product development by focusing on selected South Asian economies. It also analyzes whether extramural R&D and R&D collaboration mitigate the relationship between financial constraints and the probability of restarting this innovative activity. The findings corroborate that the optimization of innovation outcomes by firms requires the maintenance of a balance between their internal knowledge base and extramural R&D. Meanwhile, extramural R&D has positive effects, such as reducing the financial dependence of firms, improving access to finance, and increasing R&D productivity in new product development.

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Abstrakt

CEL: *Finansowe ekologie (FE) stanowią formy koordynacji nastawione na podaż usług finansowych oraz skoncentrowane na określonym terytorium. Obecnie, formy te podlegają transformacji pod wpływem technologii finansowych (Fintech). Idea FE jest istotna pod względem społecznym i ekonomicznym, gdyż zwraca uwagę na segmenty rynku słabo obsługiwane przez rynki finansowe lub z nich wykluczone. FE stanowią platformy łączące branże oraz podmioty z publicznego i prywatnego sektora. Jednocześnie, finansowe ekologie pozostają na wczesnym etapie rozwoju jako koncepcja i przedmiot badań empirycznych. Słabo zbadane pozostają wpływ Fintech na ekosystemy finansowe oraz związane z tym implikacje dla polityki gospodarczej. W odpowiedzi na teoretyczne i praktyczne znaczenie oraz wczesny etap badań nad transformacją FE pod wpływem Fintech, artykuł ma na celu określenie, w jaki sposób Fintech kształtują FE oraz wskazanie związanych z tym implikacji koncepcyjnych oraz dotyczących polityki gospodarczej.* ***METODYKA:*** *Podejście badawcze odwołuje się do zasad spójności koncepcji oraz rekonstrukcji koncepcji. Zastosowano metodę systematycznego przeglądu literatury 48 publikacji, wyselekcjonowanych z baz Scopus i WoS.* ***WYNIKI:*** *Zanalizowano główne elementy koncepcji FE oraz perspektywy teoretyczne pokrewne wobec tej idei. FE stanowią element innych ekosystemów zorientowanych na wyniki a zarazem koncentrowanych na określonym terytorium. Mogą być także traktowane jako niezależne zjawisko i przedmiot badań. Wskazano, że idea FE podlega rozwojowi pod wpływem Fintech w zakresie wszystkich elementów tworzących to zjawisko. Sformułowano zestaw zało-*

żeń co do wynikających z tej transformacji konsekwencji dla rozumienia zjawiska finansowych ekosystemów i dla polityki gospodarczej. ***IMPLIKACJE:*** *Wyniki systematycznego przeglądu literatury są istotne dla rozwoju podstaw teoretycznych oraz badań empirycznych nad FE. Mogą także sprzyjać integracji środowiska naukowego wokół rozwoju i akumulacji wiedzy w tej dziedzinie. Mimo standaryzacji wywołanej innowacjami technologicznymi, dostępność, użyteczność oraz efekty ekosystemów finansowych zależą od kontekstów geograficznych, które różnią się pod względem społeczno-ekonomicznym i instytucjonalnym.* ***ORYGINALNOŚĆ I WARTOŚĆ:*** *Artykuł pogłębia rozumienie FE jako form koordynacji usług finansowych, opartych na innowacjach technologicznych oraz zorientowanych na terytorialne projekty i społeczności lokalne. Usystematyzowano główne element koncepcji FE oraz relacje z pokrewnymi ideami sieciowej współpracy dla rozwoju społeczno-gospodarczego. Określono zestaw założeń i wskazano obszary przyszłych badań nad zjawiskiem FE.*
Słowa kluczowe: *finansowe ekologie, finansowe ekosystemy, Fintechy, technologie finansowe*

Biographical notes

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Conflicts of interest

The authors declare no conflict of interest.

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