W O R K I N G P A P E R

Measuring International Finance · Part IV

FinTech Ecosystems and the Performance of International Financial Centers

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June 2026

Keywords: FinTech, FinTech ecosystem, International Financial Centers, performance measurement, regulation, regulatory sandboxes, innovation hubs, financial geography, digital finance, open banking, tokenization, digital assets, FinTech adoption, FinTech rankings.

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Abstract

International financial centers compete increasingly on the strength of their FinTech ecosystems. This paper, the fourth in the working paper series on measuring international finance, asks three questions: (i) what are the constitutive characteristics of a FinTech ecosystem; (ii) how should its performance be measured; and (iii) how does that performance feed back into the performance of the financial center in which it is embedded?

Building on the performance framework for international financial centers developed in Part II, this paper argues that no single index or composite KPI captures FinTech ecosystem performance, that a diagnostic multi-dimensional approach is needed, and that the FinTech ecosystem affects every dimension of the IFC performance framework, with innovation capacity as its primary home and resilience as its most underestimated locus of impact. Nine practical recommendations are offered for financial center leadership, regulators, and industry associations.

Foreword

In 2015/2016, I had the pleasure of co-managing an important project for FinTech in Frankfurt, the so-called Dialogforum FinTech Frankfurt Rhein Main. More than 60 local and national institutions discussed ways to improve the FinTech ecosystem in Frankfurt across 13 working groups. I learned a lot about FinTech ecosystems and their success factors, which encouraged me to continue researching in the years that followed. After attending many events on this topic over the past ten years, writing several research reports on specific ecosystems such as Germany and Hong Kong, and working with FinTech associations globally, I want to summarize the lessons learned in this working paper.

1. Introduction

This paper is the fourth in the working paper series "Measuring International Finance." Part I provided a critical review of the existing financial center indices, including the GFCI, OFEX, GPCI-FC, FCCI, and the New Financial IFC Index (Biedermann, 2026a). Part II proposed a functional performance framework comprising four dimensions: domestic impact, international contribution, international connectivity, and attractiveness, as shown in Figure 1. They are supplemented by three complementary factors: innovation capacity, reputation and trust, and resilience (Biedermann, 2026b). Part III applied that framework to artificial intelligence and concluded that AI is best understood as the integration layer across a diversified technology agenda rather than as a standalone strategic priority (Biedermann, 2026c). Part IV turns to FinTech ecosystems.

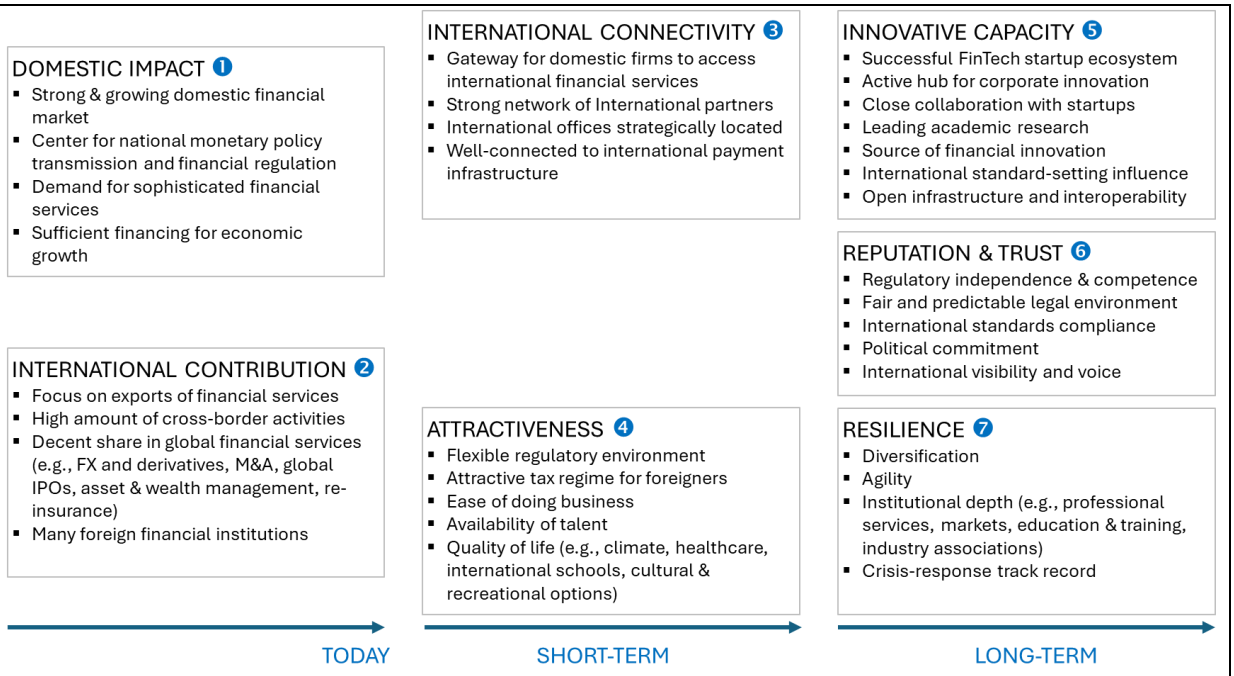

Figure 1: Framework for measuring the performance of a financial center (Biedermann, 2026b)

The timing matters. Global FinTech investment is rebuilding after the post-2021 correction. BCG and FT Partners report a 22% growth in global FinTech revenues, a 53% increase in equity funding (to USD 58 billion), and a 50% increase in IPOs (to 42) from 2024 to 2025. FinTech now accounts for about 4% of global financial services revenue. (BCG; Financial Technology Partners, 2026)

KPMG and CB Insights report that capital is now concentrating in fewer, more mature firms with proven unit economics (KPMG, 2025), (CB Insights, 2025). McKinsey has framed the next phase of FinTech around three forces: artificial intelligence, digital assets, and embedded finance (McKinsey, 2026), and the Cambridge Center for Alternative Finance has documented that more

than half of all FinTechs surveyed worldwide expect to deploy generative AI in core products within twelve months (CCAF, 2026). At the policy level, already in 2020, more than fifty jurisdictions operated FinTech regulatory sandboxes or dedicated innovation hubs (Buckley, Arner, Veidt, & Zetzsche, 2020), (Cornelli, Doerr, Gambacorta, & Merrouche, 2020), (Restoy, 2021), (Mills & Wardle, 2024), and the Financial Stability Board has placed tokenization and stablecoins on its 2024 work program (FSB, 2024a).

FinTech, in other words, is no longer a peripheral curiosity for financial center policy: it is a central determinant of competitiveness.

Three questions structure this paper:

1. What is a FinTech ecosystem, and what makes one work?
2. How should its performance be measured at the firm and ecosystem levels?
3. How does the performance of a FinTech ecosystem feed back into the performance of the financial center that hosts it?

1.1. Structure of this Paper

Section 2 introduces the concept and identifies the constitutive characteristics of a FinTech ecosystem. Section 3 surveys measurement approaches (firm-level KPIs, the major global rankings, and the academic measurement literature) and proposes a diagnostic structure consistent with the IFC performance framework. Section 4 maps FinTech ecosystem activity onto the seven dimensions of that framework. Section 5 distills nine practical recommendations. Section 6 concludes.

2. Characteristics of a FinTech Ecosystem

2.1. What is FinTech?

Despite a decade of intense scholarly and practitioner attention, the definition of FinTech remains contested. In an early attempt to discipline the term, Schueffel surveyed more than 200 publications in 2016 and settled on the working definition of FinTech as "a new financial industry that applies technology to improve financial activities," a deliberately broad formulation that encompasses both incumbent and start-up actors (Schueffel, 2016). The comprehensive volume by Buckley, Arner, and Zetzsche treats FinTech as the union of three interacting layers: financial services, technology, and regulation (Buckley, Arner, & Zetzsche, 2024).

The most influential historical framing is that of Arner, Barberis, and Buckley, who distinguish three FinTech eras. FinTech 1.0 (1866–1987) describes the first wave of cross-border financial technology, beginning with the transatlantic telegraph and ending with the introduction of the ATM. FinTech 2.0 (1987–2008) is the era of incumbent digitization: SWIFT, electronic trading, and internet banking. FinTech 3.0 (2009–present) is the post-crisis phase in which start-ups directly challenged incumbents in retail finance, enabled by mobile internet, cloud computing, and a regulatory environment that, in their view, was reset after the global financial crisis (Arner, Barberis, & Buckley, 2015).

For the purposes of this paper, "FinTech" denotes any firm — incumbent or new entrant — whose value proposition depends on the application of digital technology to financial activities. This includes (but is not limited to) the sectoral verticals of payments, lending, asset and wealth management, insurance, regulatory, capital markets, digital assets, and embedded finance. The boundary with BigTech in financial services is treated as porous: the entry of large technology platforms is part of the FinTech story rather than separate from it (Frost, Gambacorta, Huang, Shin, & Zbinden, 2019).

2.2. What is a FinTech Ecosystem?

An ecosystem, in the sense used here, is a population of interdependent actors connected by formal and informal relationships, supported by shared infrastructure, and shaped by an enabling environment.

Strategy& (Diemers, Lamaa, Salamat, & Steffens, 2015), in their influential GCC FinTech ecosystem report, highlight four critical design elements that support the development of a FinTech ecosystem (also shown in Figure 2):

- Business environment/access to markets
- Government/regulatory support
- Access to capital

- Financial expertise

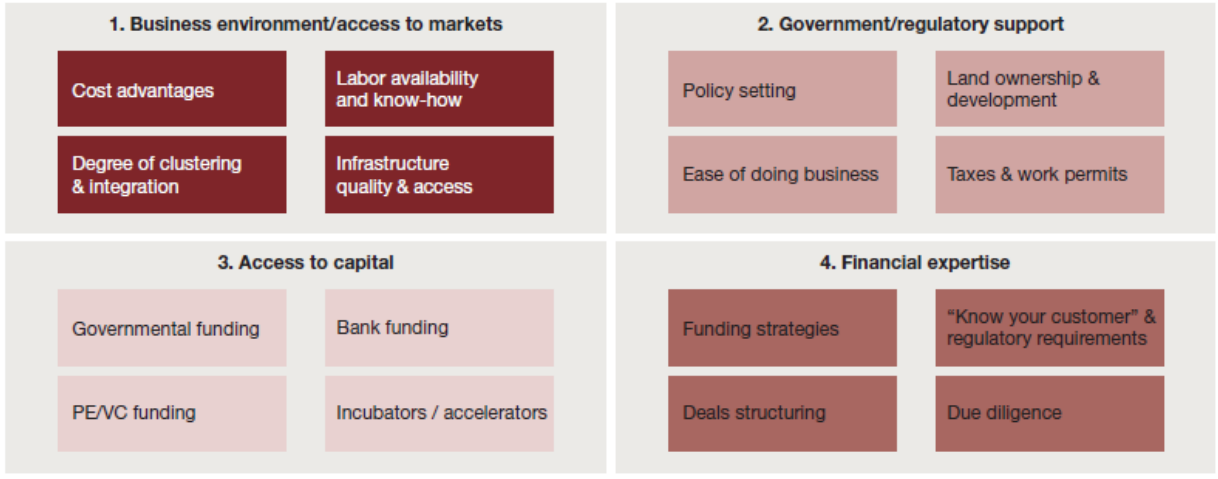

Figure 2: Strategy& FinTech ecosystem development framework (Diemers, Lamaa, Salamat, & Steffens, 2015)

Lee and Shin's taxonomy identifies five constitutive elements (Lee & Shin, 2018):

- FinTech start-ups, the source of disruptive product and business-model innovation;
- Technology developers, including providers of cloud, big data, mobile, social, and analytics infrastructure;
- Government, comprising both regulators and policy makers;
- Financial customers, individuals, and corporates whose adoption decisions complete the value chain; and
- Traditional financial institutions, the incumbents who variously compete, partner, acquire, or invest in start-ups.

TFSA's study, in partnership with Accenture and McMillan, also focuses on the roles of

- Incubators & accelerators;
- Venture capital; and
- Universities & research institutes (as sources of talent),

as shown in Figure 3 (TFSA; Accenture; McMillan, 2017).

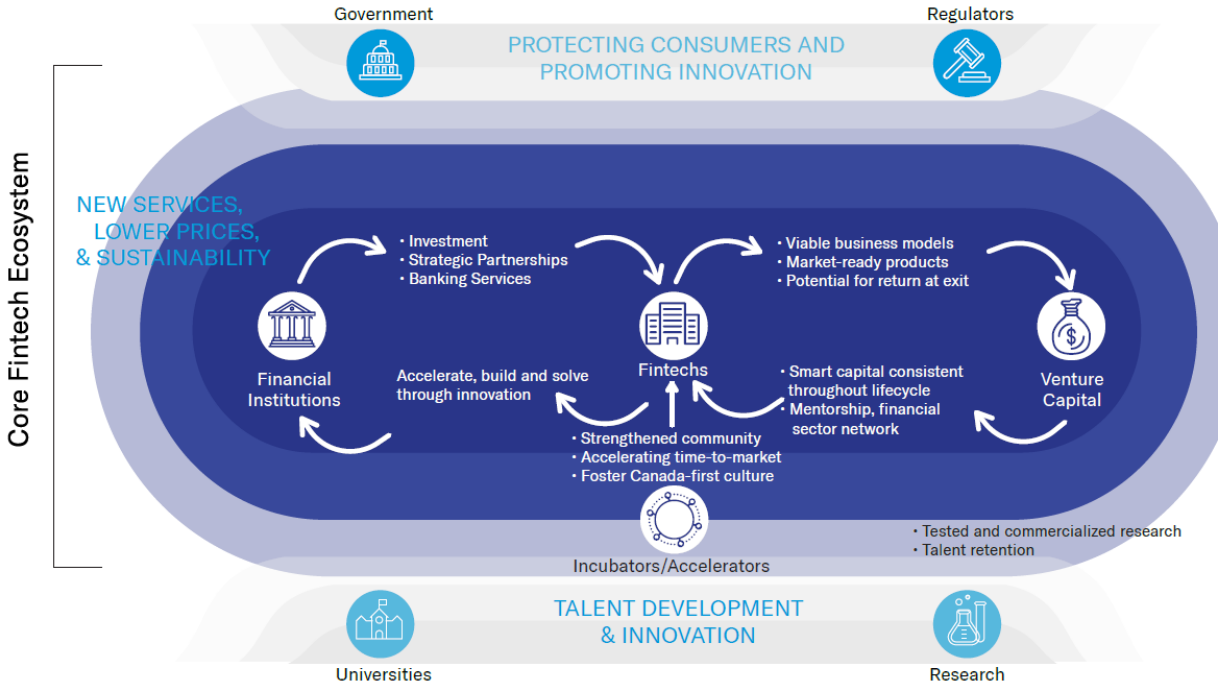

Figure 3: With a focus on Toronto, Accenture analyzed FinTech ecosystem participants and their interactions (TFSA; Accenture; McMillan, 2017)

EY's ecosystem framework, popularised through the EY FinTech Ecosystem Playbook (EY & Singapore FinTech Association, 2018), distills the architecture into five enabling pillars: Sustained demand, Access to capital, Talent availability, Regulatory openness, and an Enabling environment. More recent academic work has emphasized the dynamic, co-evolutionary character of these ecosystems around Talent, Capital, Demand, Policy & Infrastructure (Figure 4).

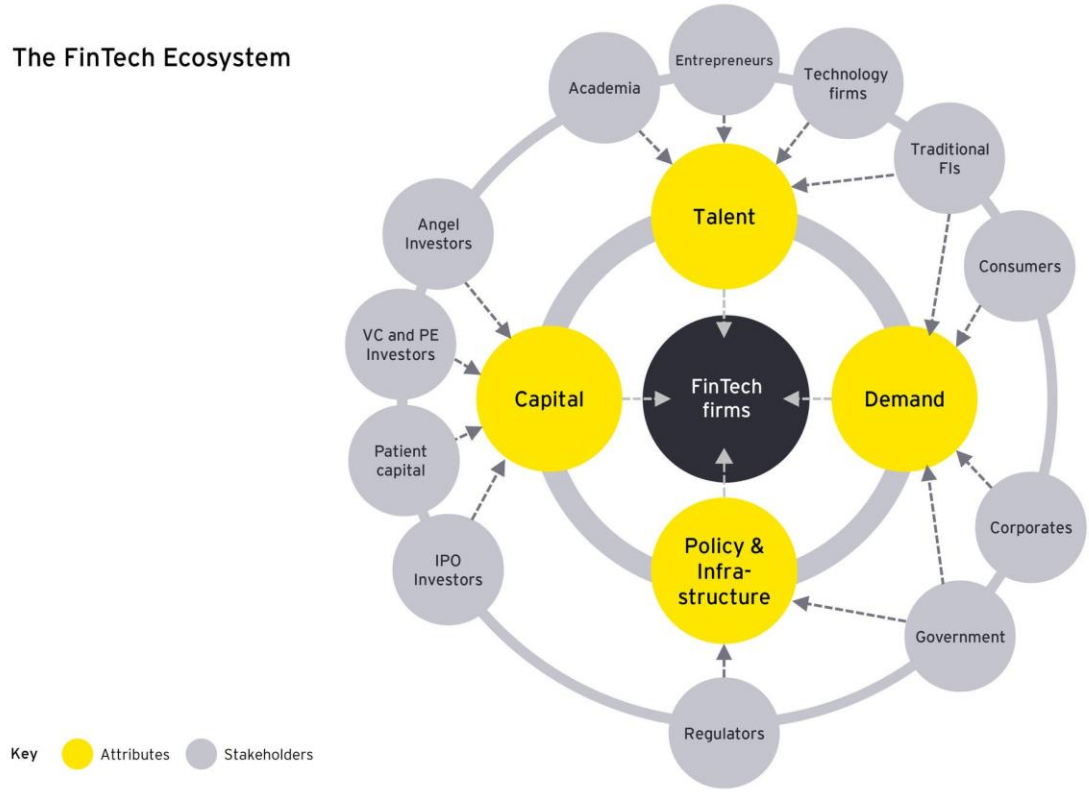

Figure 4: The FinTech Ecosystem (EY, 2023)

Muthukannan et al. traced the emergence of the Vizag FinTech Valley in India by applying complex adaptive system theory and showed that ecosystems do not appear from a static set of inputs; they are actively assembled through the coordinated action of their stakeholders over three stages: “Envisioning,” “Enacting,” and “Enlivening” (Muthukannan, Tan, Gozman, & Johnson, 2020).

Avarmaa et al. illustrate the interplay of ecosystem actors and conditions and emphasize the crucial role of regulators and supervisors in FinTech ecosystems (Figure 5). They stress that support for FinTech cluster organizations is essential and highlight facilitating university–industry cooperation as one of their contributions (Avarmaa, Torkkeli, Laidroo, & Koroleva, 2022).

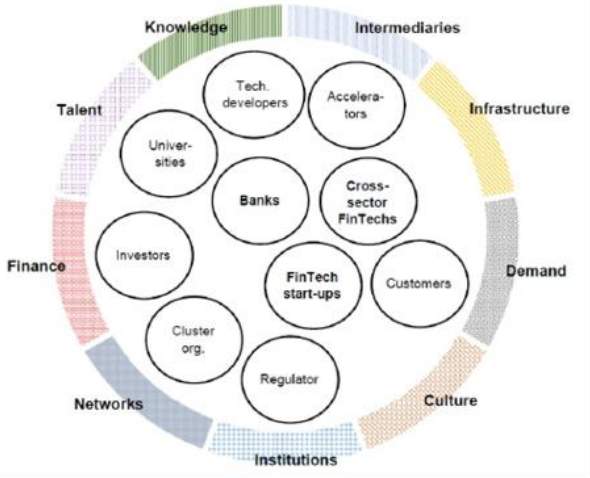

Figure 5: A framework of FinTech actors and ecosystem conditions (Avarmaa, Torkkeli, Laidroo, & Koroleva, 2022)

Koroleva, drawing on entrepreneurial ecosystem theory, also distinguishes between several input dimensions (formal institutions, entrepreneurship, physical infrastructure, demand, networks, leadership, talent, finance, new knowledge, intermediate services) and productive entrepreneurship as the output. Koroleva demonstrates that the strength of an input does not mechanically translate into a corresponding output — a finding that has direct implications for measurement and is taken up in Section 3 (Koroleva, 2022).

Laidroo et al. reach a similar conclusion at the firm level: FinTech business models differ in similarity in ways that resist simple cross-country aggregation (Laidroo, Koroleva, Kliber, Rupeika-Apoga, & Grigaliūnienė, 2021).

Two strands of work add nuance. First, Hendrikse et al. introduced the concept of "strategic coupling" among finance, technology, and the state to describe how incumbent financial centers actively cultivate FinTech ecosystems to preserve rather than disrupt their existing structures (Figure 6). Their argument inverts the conventional disruption narrative: in many financial centers, FinTech is enrolled into the incumbent agenda rather than rebelling against it (Hendrikse, van Meeteren, & Bassens, 2020).

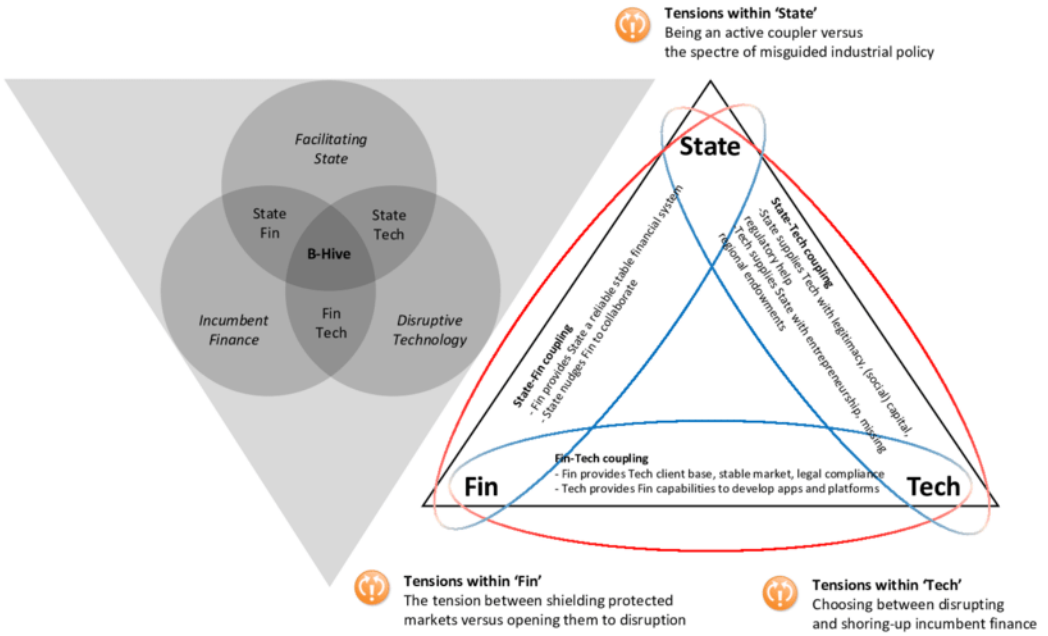

Figure 6: The Fin-Tech-State triangle (Hendrikse, van Meeteren, & Bassens, 2020)

Second, Cojoianu et al., in a study of cross-country FinTech start-up emergence, identified two ingredients that consistently predict where FinTech ecosystems take root: lower trust in financial services incumbents and knowledge-creation capacity. They found that knowledge generated in the IT sector is more salient to FinTech ecosystems than that generated in financial services. The implication is that ecosystems cannot be assembled merely by writing cheques and passing FinTech-specific laws; they require deeper civic and intellectual foundations (Cojoianu, Clark, Hoepner, Pažitka, & Wójcik, 2021).

Finally, Blakstad and Allen, Gagliardi, Leong and Sung, and the Sinai Lab's Global FinTech Hub Report all argue that ecosystems are best understood as platforms for value co-creation (Blakstad & Allen, 2018), (Gagliardi, 2019), (Leong & Sung, 2018), (Sinai Lab, ZIBS, IDR, ZAIF, FIRST, 2020). The most resilient ecosystems are those in which actors do not merely coexist but actively transact, share data, and build on shared infrastructure — a point picked up by the open finance literature in 2.4.

2.3. Why FinTech Ecosystems Tend to Concentrate in Financial Centers

FinTech, despite its digital and sometimes even decentralized character, is geographically concentrated. The financial geography literature has produced one of the most consistent empirical findings in the field: FinTech firms cluster in or close to established international financial centers. Wójcik's two-part survey maps the global distribution of FinTech firms and demonstrates

that the cities at the top of the GFCI — New York, London, Hong Kong, Singapore, Shanghai — are also the cities with the highest FinTech density (Wójcik, 2021a), (Wójcik, 2021b).

Lai and Samers, in their programmatic essay on the economic geography of FinTech, argue that FinTech is an opportunity for smaller international financial centers in terms of conventional capital markets, financial services, and commercial activities, such as San Francisco, Boston, or Stockholm, which could carve out new roles as FinTech centers due to their established high-tech economies and start-up culture, strong venture capital markets and financial actors who are familiar with the opportunities and limitations of conventional finance industry offerings amidst technological change (Lai & Samers, 2021).
In the meantime, new breeds of financial centers have emerged, such as Hangzhou and Berlin, that are almost exclusively built on FinTech ecosystems.

Findexable stated in 2020 that "FinTech causes a declining reliance on the 'usual suspects' of global finance" and that "smaller cities and remote regions with a fintech-focused mindset can punch well above their weight in building world-leading advanced financial services hubs." The Findexable team observed that "8 of the world's 20 most important financial centers do not feature in the world's 20 biggest FinTech hubs" (Findexable, 2019).

Knight and Wójcik, in their introduction to the special issue of Environment and Planning A on FinTech, as part of their discussion of FinTech controversies (Figure 7), questioned whether FinTech will become "a spatially dispersed industry, creating new hubs away from established financial centers" (Knight & Wójcik, 2020).

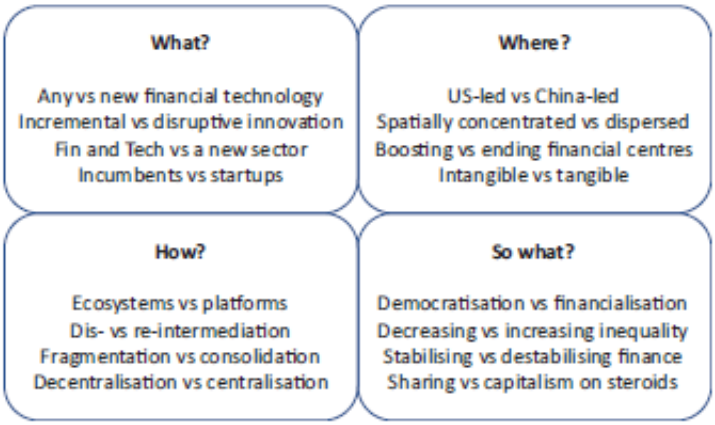

Figure 7: Selected FinTech controversies (Knight & Wójcik, 2020)

The empirical evidence consistently favors spatial concentration. For instance, Andrikopoulos and Dassiou show in their empirical study that changes in bank market power positively affect the performance of FinTech companies. Their finding is consistent with strategic coupling but inconsistent with simple disruption narratives (Andrikopoulos & Dassiou, 2024).
Sohns and Wójcik document the heterogeneous impact of Brexit on London's FinTech ecosystem and find that, despite the diversion of some activity to Amsterdam, Dublin, Paris, and Frankfurt, London's position has proved remarkably persistent (Sohns & Wójcik, 2020).

Specialized financial-geographic work has examined particular vertical segments. Haberly et al. treated asset management as a digital platform industry. They showed that a small number of financial centers (chiefly New York and Boston) have captured platform rents (Haberly, MacDonald-Korth, Urban, & Wójcik, 2019).

Langley and Leyshon developed a critical political-economy account of FinTech as a process of "reintermediation, consolidation and capitalization," arguing that platform FinTechs frequently concentrate financial activity in the hands of a small number of firms, even as they purport to disrupt incumbents (Langley & Leyshon, 2021).

The convergence of these findings yields a simple proposition: FinTech ecosystems do not float freely above geography. They embed themselves in established financial centers and inherit those centers' strengths and weaknesses. Conversely, this paper advances the proposition, developed and qualified in Section 4, that the trajectory of a FinTech ecosystem can serve as a leading indicator of the future performance of its host financial center, since FinTech activity responds to shifts in talent, capital, and regulatory posture before those shifts register in conventional center-level metrics. The claim is directional rather than deterministic: the link is conditional on the policy and incumbent-interaction channels mapped in Section 4, and it is offered here as an organizing hypothesis rather than a settled empirical result.

2.4. The Current Frontier

FinTech in 2026 is qualitatively different from FinTech a decade ago. Three frontiers are reshaping the field.

The first is **artificial intelligence**. McKinsey has placed AI at the center of "the next age of FinTech" (McKinsey, 2026), and the World Economic Forum, in collaboration with the Cambridge Center for Alternative Finance, has produced two successive editions of The Future of Global FinTech, showing that the FinTech firm population is being reshaped by the embedding of AI in core operations (WEF & CCAF, 2025). The Cambridge Center's 2026 Global AI in Financial Services Report finds that AI adoption is now systemic across incumbents and FinTechs alike (CCAF, 2026).
The full implications of AI for financial center performance were discussed in Part III of this series (Biedermann, 2026c) and are not repeated here.

The second is the **digital asset and tokenization** frontier. Banerjee et al., partners at McKinsey, stated in 2024 that "tokenization, the process of creating a unique digital representation of an asset on a blockchain network, has reached a tipping point after many years of promise and experimentation" (Banerjee, Sevillano, & Higginson, 2024). Their base-case estimate puts the potential value of tokenized assets at around USD 2 trillion by 2030. Agur et al., in an IMF FinTech Note, argue that tokenization could eliminate substantial inefficiencies in fragmented OTC markets (Agur, Villegas-Bauer, Mancini-Griffoli, & Martinez Peria, 2025). KPMG reports that the US accounted for the vast majority of investment in digital assets in H2 2025 (KPMG, 2026), and JPMorgan notes that the sector attracted 45% of all US FinTech investment in Q1 2026 (JPMorgan, 2026). According to CB Insights, global digital asset equity funding totaled USD 2.3 billion in Q1 2026, only trailing payments (USD 3.1 billion) (CB Insights, 2026b).

On the other hand, IOSCO states in its recent tokenization report that “the tokenization ecosystem is still nascent, with a lack of cross-blockchain interoperability and credible settlement assets limiting the scalability of tokenization arrangements in the financial sector” (IOSCO, 2025). The Financial Stability Board has documented the financial stability implications of tokenization in detail (FSB, 2024b). Furthermore, Aramonte et al. of the BIS warn against the "decentralization illusion" in DeFi (Aramonte, Huang, & Schrimpf, 2021).

Closely related to tokenization is the rapid institutionalization of stablecoins as a settlement asset. Two regimes now anchor the field: 1. the European Union’s Markets in Crypto-Assets Regulation (MiCA), which divides stablecoins into two main categories: E-Money Tokens and Asset-Referenced Tokens. MiCA applies to these token categories since mid-2024, with a final authorization deadline of 1 July 2026 (European Union, 2023). 2. The United States GENIUS Act, enacted in July 2025, restricts payment-stablecoin issuance to regulated institutions and mandates full reserve backing in cash and short-term Treasury instruments (United States, 2025). The two frameworks are converging on a common core — licensed issuance, conservative and transparent reserves, and enforceable redemption rights — even as they differ in scope.
For financial centers, regulated stablecoins and wholesale central bank digital currency (wholesale CBDC) are the two candidate settlement assets that would make tokenized markets viable at scale; IOSCO’s observation that the absence of a credible settlement asset currently limits tokenization is, in effect, a statement about the maturity of this layer. Centers that establish clear stablecoin and wholesale-settlement regimes early will be better positioned to host tokenized capital-markets activity.

The third is **open banking and open finance**. Babina et al., exploiting the introduction of UK and EU open-banking mandates, document that customer-data access materially increases FinTech entry (Babina, et al., 2024). The Cambridge Center for Alternative Finance’s Global State of Open Banking and Open Finance Report (2024) tracks the international diffusion of open-data regimes (CCAF, 2024); OECD (2024) examines the specific case of Sub-Saharan Africa (OECD, 2024); Plaitakis and Staschen of CGAP examine the financial-inclusion dimension (Plaitakis & Staschen, 2020).
While the EU Financial Data Access (FIDA) regulation is, as of May 2026, in a phase of political uncertainty, with trilogue negotiations in the EU suspended for the time being amid strong resistance from traditional financial industry players, Brazil serves as a global benchmark for rapid open finance adoption (Strategy&, 2024a), (Strategy&, 2024b). In the US, the Consumer Financial Protection Bureau (CFPB) Dodd-Frank Act Section 1033 rulemaking is taking effect this year, which requires banks to provide consumers with safe data access without relying on volatile screen-scraping technology. However, its implementation faces industry litigation. A new regime, called the GUARD Financial Data Act, which should complement Section 1033, is in the political process.
Overall, open finance shifts FinTech ecosystems away from the start-up-versus-bank dichotomy of FinTech 3.0 toward an interoperability paradigm in which value is created at the interfaces between actors.

The cross-cutting effect of these three frontiers is to raise the technical floor for FinTech ecosystems. An ecosystem in 2026 needs access to compute, structured open data infrastructure, regulatory frameworks for digital assets, and an AI governance regime, in addition to the more familiar requirements of capital and talent. This is examined in detail in Section 5.

2.5. The Constitutive Characteristics of a FinTech Ecosystem

Synthesizing the literature reviewed above, a successful FinTech ecosystem can be characterized by ten constitutive features. The list is intentionally architectural rather than aspirational; each feature corresponds to a measurable construct that will be picked up in Section 3.

1. **Critical mass of FinTech firms** across multiple verticals (e.g., banking, payments, lending, asset & wealth management, insurance, regulatory & compliance, capital markets, digital assets, sustainable finance), measured both by count and by aggregate scale (FIRST, 2025), (FinTech Consult & Contextual Solutions, 2023), (FinTech Consult & FTAHK, 2023).
2. **Strong incumbent participation**: banks, insurers, asset managers, exchanges, and market-infrastructure providers that act as customers, partners, acquirers, or co-investors (Hornuf, Klus, Lohwasser, & Schwienbacher, 2021).
3. **Venture capital**: a layered investor base from angels through seed, Series A–D, and growth equity, ideally including FinTech-dedicated funds (CB Insights, 2026a), (Innovate Finance, 2025), (Finch Capital, 2025), (KPMG, 2025).
4. **Talent**: financial domain expertise plus technical skills (engineering, data science, AI), supported by university programs and immigration pathways (HKU; Standard Chartered; Cyberport; hkpc, 2022), (SFA, 2025).
5. **Demand**: digitally engaged consumers and corporates whose adoption is sufficient to support unit economics (EY, 2017), (EY, 2019).
6. **Enabling regulation**: clear FinTech licensing regimes, regulatory sandboxes and innovation hubs, principles-based supervision, and a posture of regulatory engagement rather than retreat (Buckley, Arner, Veidt, & Zetzsche, 2020), (Zetzsche, Buckley, Arner, & Barberis, 2017), (Mills & Wardle, 2024), (Kindermann, 2026).
7. **Open and shared infrastructure**: open-banking APIs, instant-payments rails, digital identity, data-sharing trusts, and — increasingly — tokenization rails (Babina, et al., 2024), (CCAF, 2024), (Plaitakis & Staschen, 2020).
8. **Knowledge institutions**: universities, research centers, and applied institutes that produce the human capital and ideas on which the ecosystem depends (AIF, Sinai Lab, CCAF, ZAIF, 2018).
9. **Enablers**: industry associations, accelerators, incubators, FinTech hubs (e.g., LHoFT in Luxembourg, Cyberport in Hong Kong, Level39 in London, FinTech Poland in Warsaw),

and convening events that lower the search cost of finding partners and customers (FinTech Poland, 2025), (InvestHK, 2025).

10. **International connectivity**: cross-border regulatory cooperation, recognition agreements, FinTech corridors[1], and active participation in international standard-setting bodies (Hutukka, 2024), (IBA, 2023), (Bromberg, Godwin, & Ramsay, 2018).

These ten features are not equally weighted in every successful ecosystem. Some FinTech ecosystems are regulation-led (Singapore, the United Kingdom under the FCA, the United Arab Emirates through the DIFC and ADGM); some are demand-led (China, India, Brazil, Indonesia); some are talent-led (Tel Aviv, Berlin); and some are infrastructure-led (the United Kingdom's Faster Payments and Open Banking, India's UPI, Brazil's PIX). What they share is the presence — in varying mixes — of all ten features. The absence of any one of them is the characteristic failure mode.

> → **A FinTech ecosystem is the product of ten constitutive features acting in combination. The relevant question for a financial center is not which feature is missing but how the ten interact and where the cycle from input to output breaks down. This question motivates Section 3.**

Later in this paper, we will aggregate the ten constitutive features into six interdependent pillars, adapted from the EY FinTech Ecosystem Playbook (EY & Singapore FinTech Association, 2018):

1. actors (FinTech firms, incumbents, infrastructure providers, enablers),
2. capital (venture, growth, public-market),
3. talent (technical and financial, knowledge),
4. demand (consumers, businesses, government),
5. enabling infrastructure (digital identity, payment rails, open data, cloud, connectivity),
6. regulation (licensing, supervision, sandboxes, consumer protection).

[1] Examples: UK-Singapore FinTech Bridge, UK-China FinTech Bridge, UK-Korea FinTech Bridge, Australia-Singapore FinTech Bridge, UK-Australia FinTech Bridge, ADGM-Australia FinTech Bridge, Hong Kong-UK FinTech Bridge

3. How to Measure the Performance of a FinTech Ecosystem

Measuring the performance of a FinTech ecosystem requires distinguishing two analytical layers that are often conflated in practitioner discourse.

The first is the firm level: the set of operating, financial, and product metrics that determine whether an individual FinTech is performing well.

The second is the ecosystem level: the aggregate of conditions, actors, and outputs that determine whether a city or country has a FinTech ecosystem worth the name.

Strong firm-level performance does not automatically aggregate into a strong ecosystem; nor does a well-functioning ecosystem guarantee that any individual firm will succeed. The two layers are linked but not the same thing, and they require different metrics.

This section treats both. 3.1 reviews firm-level KPIs. 3.2 and 3.3 examine the major global rankings of FinTech ecosystems. 3.4 identifies the limitations of existing approaches. 3.5 proposes a diagnostic structure consistent with the IFC performance framework developed in Part II, and 3.6 maps existing indices to that structure.

3.1. Firm-Level KPIs

Firm-level FinTech KPIs are most usefully grouped under five headings: customer economics, product engagement, financial performance, operational efficiency, and regulatory and risk metrics. Finro lists many KPIs across these categories and explains them in detail (Finro Financial Consulting, 2025).

Customer economics centers on Customer Acquisition Cost (CAC), Customer Lifetime Value (LTV), and the LTV/CAC ratio. A widely cited rule of thumb is that LTV should exceed CAC by a factor of three for a FinTech business to be sustainable (Janes, 2025). Payback period (the time required to recover CAC through customer revenue) is a closely related indicator. Net Promoter Score (NPS) measures customer advocacy and is empirically correlated with organic growth in retail FinTech.

Product engagement metrics include Daily Active Users (DAU), Monthly Active Users (MAU), the DAU/MAU ratio as a measure of stickiness, transaction frequency, and Gross Merchandise Value (GMV) for marketplace and payments FinTechs. For lending FinTechs, the relevant set is loan origination volume, default and delinquency rates, and the share of loans originated to underserved segments.

Financial performance metrics include revenue growth, gross margin, take rate (the share of GMV captured as revenue), contribution margin per customer, unit economics, and runway. Burn

multiple, defined as net burn divided by net new revenue, has become a standard measure of capital efficiency in venture-backed FinTech.

Operational efficiency metrics capture the ratio of headcount and infrastructure spend to revenue or transactions processed. For technology-platform FinTechs, per-transaction infrastructure costs and uptime/availability are key.

Regulatory and risk metrics include compliance cost as a share of revenue, fraud loss rates, KYC costs, and the count and severity of regulatory incidents and related penalties.

These KPIs naturally aggregate into ecosystem-level indicators: the share of FinTechs in a center that achieve LTV/CAC > 3, the median burn multiple of the local cohort, and so on. Most existing rankings, however, do not collect or publish these data.

3.2. The Major Global Rankings of FinTech Ecosystems

A small number of recurring rankings dominate ecosystem-level measurement. Each captures a different facet of FinTech ecosystem performance; none is comprehensive. The methodological lessons from Part I of this series, applicable to financial center indices generally, carry over directly to FinTech rankings: composite scores hide more than they reveal, survey-based components are vulnerable to mobilization effects, and city-versus-country attribution is genuinely difficult (Biedermann, 2026a).

Deloitte Hub Review

Deloitte, in collaboration with All Street Research, created one of the first FinTech hub rankings in 2016, covering 21 hubs worldwide, (surprisingly) comprising both cities and countries (Deloitte, 2016). The methodology for the FinTech hub comparison comprises three sections: hub selection, index performance score, and hub indicators. “Hub selection” and “hub indicators” are essentially self-assessments of the 21 FinTech hubs. The “index performance score” is an aggregate of the Z/Yen’s GFCI, the World Bank’s Doing Business index, and the Cornell University, INSEAD, and WIPO Global Innovation Index. Table 1 shows the ranking.

Table 1: Deloitte Hub Review Ranking

Rank	2016
1	UK
1	Singapore
3	New York
4	Silicon Valley
5	Hong Kong
6	South Korea
7	Switzerland
8	Frankfurt
9	Sydney

10	Canada
11	Shanghai
12	Ireland
12	Netherlands
14	France
15	Luxembourg
16	Israel
17	Belgium
18	Mexico
19	South Africa
20	India
21	Kenya

The Findexable Global FinTech Index

The Findexable Global FinTech Index is the most cited city- and country-specific ranking dedicated to FinTech. Its inaugural report, “The Global Fintech Index 2020,” was published in late 2019 and was based on data from 230 cities across 65 countries (Findexable, 2019). Its 2021 "Bridging the Gap" report (Findexable, 2021) ranked 264 cities and 83 countries (Table 2); the index has since migrated to a continuously updated online platform.

Methodologically, it combines three pillars: Quantity (the number of FinTech firms and supporting institutions), Quality (a weighted measure of capital raised, performance, and the value of "key" firms), and Environment (a composite measure of the regulatory and infrastructure context). Its principal strength is geographic coverage; its principal weaknesses are limited transparency about data sources and the platform’s methodology, which has been revised more than once without a comprehensive reversion of historical rankings.

Table 2: Findexable Global FinTech Index Ranking

Rank	2021	2020
1	San Francisco	San Francisco
2	London	London
3	New York	New York
4	Sao Paulo	Singapore
5	Tel Aviv	Sao Paulo
6	Berlin	Los Angeles
7	Boston	Bangalore
8	Los Angeles	Boston
9	Hong Kong	Berlin
10	Singapore	Mumbai
11	Sydney	Hong Kong
12	Amsterdam	Toronto
13	New Delhi	Sydney
14	Stockholm	Chicago
15	Atlanta	Paris
16	San Diego	New Delhi
17	Beijing	Tokyo
18	Moscow	Tel Aviv
19	Tokyo	Atlanta

20	Bangalore	Miami

The FIRST / Zhejiang University Global FinTech Hub Report

The Global FinTech Hub Report was originally a joint product of Zhejiang University's Academy of Internet Finance (AIF), the Cambridge Center for Alternative Finance (CCAF), and the Zhejiang Association of Internet Finance (ZAIF), published in 2018 (AIF, Sinai Lab, CCAF, ZAIF, 2018). In the 2020 Report (based on 2019 data), the CCAF was no longer involved (Sinai Lab, ZIBS, IDR, ZAIF, FIRST, 2020). Since 2021, the lead has shifted to the Beijing Frontier Institute of Regulation and Supervision Technology (FIRST), still in collaboration with Zhejiang University (FIRST, AIF, ZIBS, ZAFT, 2021), (FIRST, AIF, ZIBS, ZAFT, 2022), (FIRST, AIF, ZIBS, ZAFT, 2023). The report's composite Global FinTech Hub Index (GFHI) comprises the FinTech Industry Index, the FinTech Consumer Experience Index, and the FinTech Ecosystem Index, all calculated from 50+ indicators, which are not disclosed in the publications.

The 2024 edition explicitly framed the global pattern as "Divergence & Change" (FIRST & Zhejiang University, 2024); the 2025 edition (FIRST, 2025) added an explicit comparative analysis of the Chinese FinTech trajectory. The series' strengths are its multidimensional construction and the fine-grained granularity of its Chinese data; its weakness is an emphasis on Chinese cities relative to other rankings (Table 3).

Table 3: FIRST / Zhejiang University Global FinTech Hub Index

Rank	2018	2019/2020	2021	2022	2023	2024	2025
1	Beijing	Beijing	Beijing	Beijing	Beijing	Beijing	Beijing
2	San Francisco	San Francisco	San Francisco	San Francisco	San Francisco	San Francisco	New York
3	New York	New York	New York	New York	New York	New York	San Francisco
4	London	Shanghai	Shanghai	London	London	London	London
5	Shanghai	London	Shenzhen	Shanghai	Shanghai	Shanghai	Shanghai
6	Hangzhou	6. Shenzhen	London	Shenzhen	Shenzhen	Shenzhen	Shenzhen
7	Shenzhen	6. Hangzhou	Hangzhou	Hangzhou	Hangzhou	Hangzhou	Hangzhou
8	Chicago	Chicago	Singapore	Singapore	Singapore	Singapore	Singapore
9	Singapore	Singapore	Chicago	Chicago	9. Chicago	Sydney	Hong Kong
10	Hong Kong	Sydney	Sydney	Tokyo	9. Sydney	Hong Kong	Paris
11	Sydney	Tokyo	Tokyo	Sydney	Hong Kong	Paris	Tokyo
12	Seattle	Atlanta	Paris	Paris	Paris	Chicago	Chicago
13	Tokyo	Paris	Guangzhou	Hong Kong	Tokyo	Toronto	Sydney
14	Boston	Guangzhou	Hong Kong	Guangzhou	Guangzhou	Mumbai	Atlanta
15	Paris	Hong Kong	Melbourne	Melbourne	Mumbai	Guangzhou	Toronto
16	Guangzhou	Melbourne	Atlanta	Atlanta	Toronto	Tokyo	Switzerland
17	Stockholm	Seattle	Seattle	Mumbai	Melbourne	Switzerland*	Mumbai
18	Atlanta	Stockholm	Mumbai	Seattle	Switzerland*	Atlanta	Guangzhou
19	Los Angeles	Nanjing	Seoul	Boston	Atlanta	Melbourne	Nanjing
20	Seoul	Mumbai	Nanjing	Seoul	Seattle	Nanjing	Boston

* Zurich and Geneva

The Startup Genome Global FinTech Ecosystem Report

Startup Genome's inaugural Global FinTech Ecosystem Report (Startup Genome, 2020) and its 2022 successor, the "Global Startup Ecosystem Report: FinTech Edition" (Startup Genome, December 2022), embed FinTech within the broader Startup Genome methodology (Table 4). The current methodology ranks ecosystems on Performance, Funding, AI-Native, Market Reach, Talent & Experience, and Knowledge. Startup Genome uses the following proprietary data sources for that purpose: expert interviews; 2017–2022 startup ecosystem survey with close to 100,000 participants; startup data from Crunchbase, Dealroom, PitchBook, CB Insights, and local partners.

The principal strength is comparability across sectors; the principal weakness is that the FinTech-specific report has not been updated since 2022, leaving practitioners to infer the FinTech picture from the broader Global Startup Ecosystem Report. The methodology, however, is a useful template for any ecosystem measurement effort.

Table 4: Startup Genome Global FinTech Ranking

Rank	2022	2020
1	Silicon Valley	Silicon Valley
2	New York City	New York City
3	London	London
4	Singapore	Singapore
5	Hong Kong	Beijing
6	Beijing	Shanghai
7	Toronto-Waterloo	Boston
8	Los Angeles	Hong Kong
9	Boston	9. Paris
10	Paris	9. Chicago
11	Shanghai	Los Angeles
12	Mumbai	Toronto-Waterloo
13	Sydney	Mumbai
14	Chicago	Sydney
15	Zurich	São Paulo
16	São Paulo	Amsterdam
17	Atlanta	17. Jakarta
18	Seattle	17. Atlanta
19	Tel Aviv	Tel Aviv-Jerusalem
20	Stockholm	Stockholm

The GFCI FinTech Sub-Index

Z/Yen's Global Financial Centres Index publishes a FinTech sub-ranking alongside its main index. As of GFCI 39 (March 2026), the FinTech sub-index ranks 116 financial centers based on a combination of instrumental factors and survey responses (Table 5) (Z/Yen, 2026). Its principal strength is the embedding of FinTech in a broader financial-center assessment with a 20-year time series; its principal weakness, as Part I of this series argued, is the survey methodology (Biedermann, 2026a). FinTech sub-rankings are particularly vulnerable to perception lag, since

respondents' mental models of "FinTech leaders" tend to update more slowly than the underlying activity.

Table 5: Z/Yen Global Financial Centres Index – FinTech Sub-Ranking

Rank	GFCI 39 / 2026	GFCI 38 / 2025
1	Hong Kong	Hong Kong
2	Shenzhen	Shenzhen
3	New York	New York
4	Singapore	Singapore
5	London	London
6	Shanghai	San Francisco
7	San Francisco	Shanghai
8	Guangzhou	Seoul
9	Dubai	Dubai
10	Seoul	Guangzhou
11	Washington DC	Washington DC
12	Chengdu	Boston
13	Chicago	Chicago
14	Beijing	Beijing
15	Tokyo	Los Angeles
16	Busan	Chengdu
17	Stockholm	Zurich
18	Abu Dhabi	Tokyo
19	Los Angeles	Toronto
20	Zurich	Paris

In the GFCI 39 survey, Z/Yen asked respondents to identify the four most important elements for generating a competitive environment for FinTech providers. Figure 8 shows the results.

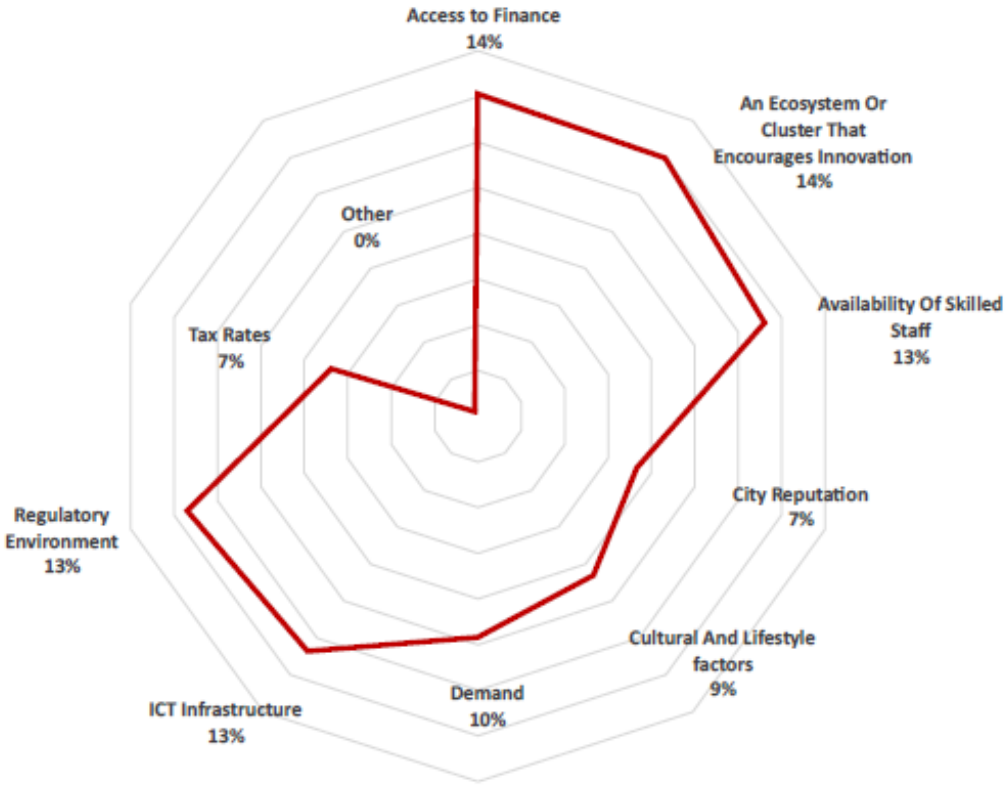

Figure 8: Most Important Elements In Generating A Competitive Environment For FinTech Providers (Z/Yen, 2026)

Startup Blink

Startup Blink's ranking evaluated 287 cities with substantial Fintech startup activity in 2023 and 314 in 2024. Table 6 shows the top 10 for 2024. Unfortunately, no additional data are publicly available.

Table 6: Startup Blink Top Cities for Fintech Startups

Rank	2024
1	San Francisco
2	New York City
3	London
4	Sao Paulo
5	Bangalore
6	Los Angeles
7	Paris
8	Berlin
9	Singapore
10	New Delhi

HSLU FinTech Hub Ranking

The Institute of Financial Services Zug (IFZ) of the Lucerne University of Applied Sciences and Art (HSLU) has published its IFZ FinTech Study since 2016, which includes a global FinTech Hub

Ranking (HSLU, 2016) … (HSLU, 2025). It conducts a comprehensive research study that identifies the regions with the most robust FinTech ecosystems, using factors generally associated with driving entrepreneurship and innovation, as well as indicators related to financial technologies (Table 7). In its 2025 report (which includes the 2024 ranking), the ranking comprises 71 publicly available indicators, grouped into four categories: political & legal, economic, social, and technological (HSLU, 2025). The list of indicators is updated annually; indicators older than 2 years are excluded, and new indicators are added to reflect recent trends.

Table 7: HSLU FinTech Hub Ranking, 2017-2024

Rank	2024	2023	2022	2021	2020	2019	2018	2017
1	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore
2	Zurich	Stockholm	Zurich	Zurich	Zurich	Zurich	Zurich	Zurich
3	Geneva	Zurich	Stockholm	Stockholm	Geneva	Geneva	Geneva	Geneva
4	Stockholm	Geneva	Geneva	Geneva	Stockholm	London	London	Toronto
5	New York City	Asmterdam	New York City	Amsterdam	Amsterdam	Amsterdam	Amsterdam	New York City
6	San Francisco	New York City	Amsterdam	New York City	Toronto	Toronto	Toronto	San Francisco
7	Asmterdam	San Francisco	London	London	New York City	New York City	Stockholm	Amsterdam
8	London	London	San Francisco	San Francisco	Hong Kong	San Francisco	New York City	London
9	Berlin	Toronto	Toronto	Hong Kong	London	Hong Kong	San Francisco	Hong Kong
10	Frankfurt	Berlin	Hong Kong	Toronto	San Francisco	Stockholm	Hong Kong	Stockholm
11	Toronto	Hong Kong	Frankfurt	Berlin	Berlin	Tokyo	Frankfurt	Tokyo
12	Sydney	Frankfurt	Sydney	Frankfurt	Sydney	Sydney	Berlin	Sydney
13	Seoul	Oslo	Berlin	Sydney	Frankfurt	Berlin	Sydney	Frankfurt
14	Hong Kong	Sydney	Oslo	Oslo	Oslo	Frankfurt	Oslo	Berlin
15	Paris	Seoul	Seoul	Dublin	Tokyo	Vienna	Vienna	Oslo
16	Oslo	Vienna	Vienna	Tokyo	Vienna	Oslo	Tokyo	Paris
17	Tokyo	Tokyo	Tokyo	Vienna	Seoul	Dublin	Dublin	Dublin
18	Dublin	Tallinn	Dublin	Seoul	Dublin	Seoul	Paris	Tel Aviv
19	Vienna	Dublin	Tallinn	Luxembourg	Paris	Paris	Luxembourg	Dubai
20	Tallinn	Luxembourg	Luxembourg	Paris	Luxembourg	Luxembourg	Tel Aviv	Milan

Regional Rankings

Some regional rankings provide deeper coverage at the cost of cross-country comparability. Finch Capital covers European FinTech in their State of European FinTech series (Finch Capital, 2025). The Cambridge Center, the Asian Development Bank Institute, and FinTechSpace produced the ASEAN FinTech Ecosystem Benchmarking Study, which remains the most comprehensive regional benchmarking exercise for South-East Asia (CCAF, ADB Institute & FinTechSpace, 2019).

3.3. KPI and Metric Frameworks

In addition to the rankings, there are a few dedicated KPI frameworks. The EY Global FinTech Adoption Index (EY, 2019) measures consumer adoption of FinTech services in 27 markets and remains the most widely cited consumer-side indicator. The EY FinTech Ecosystem Playbook

operationalizes its pillars of a FinTech ecosystem into a checklist of measurable elements (EY & Singapore FinTech Association, 2018). PwC India proposes a framework specifically for measuring innovation at financial institutions (Figure 9) (PwC India, 2018).

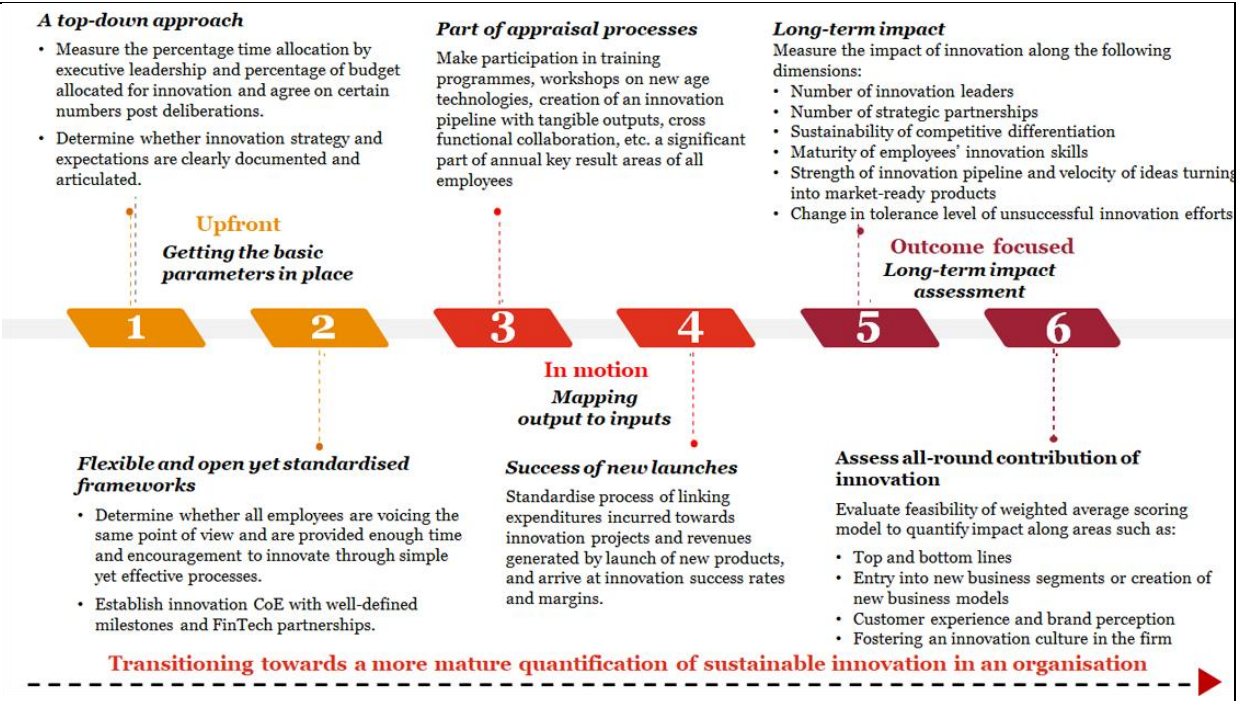

Figure 9: Measuring innovation at financial institutions at various stages of the journey (PwC India, 2018)

On the practitioner side, the KPMG Pulse of FinTech (KPMG, 2025) and CB Insights State of FinTech (CB Insights, 2026a) provide the most up-to-date investment flow data, updated quarterly or semiannually. The Innovate Finance FinTech Investment Landscape (Innovate Finance, 2025) and the Finch Capital State of European FinTech (Finch Capital, 2025) provide regional equivalents. The Cambridge Center for Alternative Finance's 2nd Global Alternative Finance Market Benchmarking Report (Ziegler, Shneor, Wenzlaff, & et.al., 2021) remains the most comprehensive volume-based dataset for non-traditional credit and equity raising.

The interactive Cambridge FinTech Ecosystem Atlas constitutes the most ambitious attempt at an integrated, multi-country ecosystem measurement infrastructure. The two World Bank & CCAF Global FinTech Regulator Surveys provide complementary regulator-side data (World Bank & CCAF, 2019), (World Bank & CCAF, 2022), and the World Bank's FinTech and the Future of Finance integrates regulatory and ecosystem perspectives (World Bank, 2023).

3.4. Limitations of Existing Indices and Metrics

The limitations of the existing measurement landscape can be grouped under five headings.

First, definitional inconsistency. Different rankings use different definitions of "FinTech firm," leading to non-trivial differences in firm counts. The boundary problem is particularly acute for embedded-finance offerings by non-financial firms and for crypto-native firms whose FinTech status is debated.

Second, the city/country attribution problem. Countries with multiple centers (the United States, China, Germany, the United Arab Emirates) are particularly poorly served by city-level rankings, as FinTech activity is often spread across multiple urban centers. Country-level rankings, conversely, lose the granularity that matters most for FinTech, which is overwhelmingly an urban phenomenon.

Third, survey biases. Rankings that rely on practitioner surveys (notably the GFCI FinTech Sub-Index) are vulnerable to mobilization effects: financial centers can encourage their local FinTech communities to participate, shifting the rankings without any change in underlying activity. Geographic biases in respondent populations compound the effect.

Fourth, input-output conflation. Most rankings combine input metrics (talent, capital, regulation) with output metrics (firm count, capital raised, revenues) into a single composite score. This conflation obscures precisely the diagnostic information policymakers need: whether the ecosystem's problem lies on the input or output side.

Fifth, the dynamic-firm problem. Some FinTechs scale to become multi-jurisdictional incumbents; some pivot away from finance; some lose their FinTech status through acquisition by an incumbent. Static snapshot rankings struggle to handle this dynamism, and the resulting noise makes time-series comparisons harder than they should be.

3.5. A Proposed Diagnostic Framework

The arguments above point toward a diagnostic framework rather than a single composite score:

1. Knowledge generation
2. Entrepreneurial ecosystem
3. Regulatory innovation
4. Adoption and diffusion
5. Enabling infrastructure

The framework proposed here is consistent with and complementary to the IFC performance framework developed in part II of this series (Biedermann, 2026b). It treats the FinTech ecosystem as having four dimensions plus an enabling layer, paralleling the four sub-dimensions of innovation capacity.

Table 8 operationalizes the dimensions above by separating inputs from outputs — following Koroleva's input/output distinction — and by naming candidate data sources, so that a center can

locate where in the chain a gap lies: strong inputs with weak outputs indicate a translation problem, whereas strong outputs with weak inputs indicate a sustainability problem.

Table 8: Inputs, outputs, and candidate data sources for the diagnostic dimensions

Dimension	Input indicators	Output indicators	Candidate data sources
Knowledge generation	University FinTech programs & enrollments; applied research centers; IT-sector knowledge base; public R&D funding	FinTech patents & registered IP; research output & citation impact; university spin-outs; university-industry collaborations	WIPO/PATSTAT; Scopus/Web of Science; Global Innovation Index; university data
Entrepreneurial ecosystem	VC and FinTech-dedicated investors & funds; angel networks; accelerator/incubator density; corporate venture arms	Firm-formation rate; survival and scaling rates; active FinTech count by vertical; scale-ups and unicorns; capital raised; exits and M&A;	Crunchbase; Dealroom; PitchBook; CB Insights; KPMG Pulse; Innovate Finance; local registries
Regulatory innovation	Quality of FinTech licensing regimes; cross-regulator coordination; Sandbox/innovation-hub capacity; tiered FinTech licensing; SupTech capacity; crypto, open-finance and AI frameworks	Sandbox throughput (admitted vs graduated firms launching products); time-to-license; licenses granted; standard-setting participation; international adoption of the center's regulatory models	World Bank/CCAF Regulator Surveys; Cambridge Regulatory Innovation Dashboard; regulator annual reports
Adoption and diffusion	Digital-identity coverage; instant-payment availability; internet/smartphone penetration; open-data participation	Consumer & SME FinTech adoption; incumbent integration of FinTech; export of products & infrastructure; international diffusion of regulatory models	EY Global FinTech Adoption Index; FIRST Consumer Experience Index; central-bank payment statistics; World Bank Findex
Enabling infrastructure	Cloud/compute availability; open-banking APIs; real-time payment rails; data-sharing trusts; tokenization rails; physical hubs; digital identity; cybersecurity infrastructure	API call volumes; instant-payment transaction share; system uptime/reliability; hub throughput	Central-bank infrastructure data; BIS; open-banking implementation entities; hub operators

The three taxonomies used in this paper describe the same architecture at different levels of resolution: ten descriptive characteristics, six independent pillars (both from 2.5), and five diagnostic dimensions. Table 9 maps them onto one another.

Table 9: The ten constitutive characteristics mapped to the six pillars and the diagnostic dimensions

Constitutive characteristic	Pillar	Diagnostic dimension
Critical mass of firms across verticals	Actors	Entrepreneurial ecosystem
Strong incumbent participation	Actors	Entrepreneurial ecosystem; Adoption & diffusion
Venture capital	Capital	Entrepreneurial ecosystem
Talent	Talent	Knowledge generation; Entrepreneurial ecosystem
Demand	Demand	Adoption & diffusion
Enabling regulation	Regulation	Regulatory innovation
Open & shared infrastructure	Enabling infrastructure	Enabling infrastructure
Knowledge institutions	Talent / Actors	Knowledge generation
Enablers (associations, accelerators, hubs)	Actors	Entrepreneurial ecosystem; Enabling infrastructure
International connectivity	Cross-cutting	Adoption & diffusion

The framework is deliberately diagnostic. As in (Biedermann, 2026b), the value of measurement lies in the patterns across dimensions, not in a single composite score. Several characteristic profiles can be identified. The profiles below are offered as illustrative, stylized patterns to show how the diagnostic reads, rather than as empirically validated classifications of the centers named.

- An ecosystem strong in knowledge generation but weak in the entrepreneurial ecosystem is producing research and talent that is commercialized elsewhere: an innovation drain.
- A strong entrepreneurial ecosystem but a weak regulatory one is a market that thrives despite, rather than because of, its regulators: a profile that limits scalability and tends to drive mature firms to relocate or seek licenses offshore.
- An ecosystem strong in regulatory innovation but weak in adoption (e.g., well-designed sandboxes that few firms use, or licensing regimes for activities that the local market does not in fact want) indicates a regulatory architecture that outpaces the underlying ecosystem's maturity.
- An ecosystem strong in all creation-side categories but weak in adoption and diffusion is the classic "innovation laboratory" profile: outputs are produced locally but commercialized globally. Several European centers have shown elements of this pattern.

Each pattern implies different policy responses, and the diagnostic dashboard makes those responses identifiable. Aggregating into a single ranking would obscure exactly the information that financial center leadership needs.

3.6. Mapping Existing Indices onto the Proposed Framework

It is useful to ask which dimensions each existing ranking actually captures. The Deloitte Hub Review only briefly touches on these dimensions. The Findexable Global FinTech Index is strong in the entrepreneurial ecosystem and decent in the enabling environment, but weak in adoption and diffusion. The FIRST / Zhejiang University Global FinTech Hub Index is the only ranking that systematically addresses adoption (through its Consumer Experience Index). The GFCI FinTech Sub-Index measures perception, which correlates with several dimensions but does not pin any of them down precisely. The EY Adoption Index addresses adoption directly but is consumer-only. KPMG Pulse of FinTech and CB Insights State of FinTech address only the entrepreneurial ecosystem, with a near-exclusive focus on capital flows. The HSLU FinTech Hub Ranking touches on all dimensions with some indicators, thanks to its large indicator universe, but the vast majority of them cover enabling conditions at best.

No single ranking comprehensively covers all five dimensions.

→ **A financial center seeking to assess its FinTech ecosystem should triangulate across at least three rankings rather than rely on any single one, and should treat all five dimensions explicitly. The diagnostic value is in the gaps and patterns, not in any aggregate score.**

4. How a Successful FinTech Ecosystem Impacts the Performance of its Financial Center

4.1. The Mapping Framework

Part II of this series proposed a seven-dimensional framework for measuring the performance of an international financial center: four functional dimensions — domestic impact (❶), international contribution (❷), international connectivity (❸), and attractiveness (❹) — and three complementary factors: innovation capacity (❺), reputation and trust (❻), and resilience (❼) (Biedermann, 2026b). This section asks: how does a successful FinTech ecosystem affect each dimension?

The honest answer is that FinTech is a cross-cutting capability rather than a single dimension. Its effects ripple across the entire framework – see Table 10.

Table 10: Proposed framework and its impact on the IFC performance framework

Dimension	Cross-dimensional impact on the IFC framework
Knowledge generation	Innovation capacity (❺); attractiveness (❹) via talent supply
Entrepreneurial ecosystem	Innovation capacity (❺); international contribution (❷) via cross-border firms; resilience (❼) via institutional diversity
Regulatory innovation	Reputation and trust (❻); international connectivity (❸); innovation capacity (❺); attractiveness (❹)
Adoption and diffusion	Domestic impact (❶); international contribution (❷); resilience (❼)
Enabling infrastructure	Infrastructure layer of attractiveness (❹); international connectivity (❸); resilience (❼)

The most direct impact is on innovation capacity — FinTech is, in the first instance, the entrepreneurial expression of innovation in financial services — but the indirect effects on the four functional dimensions are arguably more consequential, and the implications for resilience are systematically underestimated. The structure of this section mirrors the framework: each subsection examines one dimension and asks how FinTech affects it.

The mapping is not always positive. FinTech can erode incumbent franchises (Vives, 2019), (Ben Naceur, Candelon, Elekdag, & Emrullahu, 2023), introduce new sources of cyber and operational risk (Vučinić & Luburić, 2022), and concentrate financial intermediation in a small number of platform firms (Frost, Gambacorta, Huang, Shin, & Zbinden, 2019), (Langley & Leyshon, 2021). A serious analysis must take both the positive and negative effects into account.

4.2. Domestic Impact

The domestic impact dimension captures the size, depth, and effectiveness of the financial center's contribution to its national economy: financing domestic firms and households, transmitting monetary policy, and providing sophisticated financial services to domestic users. FinTech affects all three.

Financial inclusion is the most extensively documented domestic effect. Sahay, von Allmen, Lahreche, Khera, Ogawa, Bazarbash, and Beaton, in an IMF Departmental Paper drawing on data from 52 countries, find that FinTech adoption has materially expanded access to credit, savings, and payments services, particularly in emerging markets (Sahay, et al., 2020). The World Bank's FinTech and the Future of Finance report reaches the same conclusion at greater depth, identifying mobile money, digital lending, and digital insurance as the three most consequential channels (World Bank, 2023). Plaitakis and Staschen, writing for CGAP, examine how open banking regimes can be designed to advance inclusion (Plaitakis & Staschen, 2020). Bakker et al. document the rise and impact of FinTech in Latin America, where digital payments have shifted financial inclusion outcomes within a single decade (Bakker, et al., 2023).

The second domestic-impact channel is bank performance and competition. Ben Naceur et al., in the IMF's working paper "Is FinTech eating the bank's lunch?", point to a negative impact of a growing presence of FinTechs on the profitability of traditional financial institutions, primarily due to reduced interest income and increased operational costs. They demonstrate that "FinTech activity is attracted to more competitive, profitable, and developed financial systems. At the same time, incumbents in countries with stronger regulatory standards benefit from increased FinTech penetration. This indicates that well-designed regulations can foster a level playing field" (Ben Naceur, Candelon, Elekdag, & Emrullahu, 2023).
Vives provides the canonical theoretical treatment of digital disruption in banking (Vives, 2019). Murinde et al. survey both opportunities and risks (Murinde, Rizopoulos, & Zachariadis, 2022). Hornuf et al., working from German data, document that incumbents that actively partner with or invest in FinTechs perform better than those that do not (Hornuf, Klus, Lohwasser, & Schwienbacher, 2021). This finding supports the strategic-coupling thesis of Hendrikse, van Meeteren, and Bassens (Hendrikse, van Meeteren, & Bassens, 2020).

The third channel is industry transformation. Brandl and Hornuf trace the post-digitalization evolution of the German financial industry (Brandl & Hornuf, 2020); Frost et al., in their BIS Economic Policy article, document the entry of BigTech firms into financial intermediation and the resulting structural changes (Frost, Gambacorta, Huang, Shin, & Zbinden, 2019). Thakor provides the synthesizing treatment (Thakor, 2020). The collective implication is that a strong FinTech ecosystem can shift the size and composition of the domestic financial sector, affecting employment, productivity, and the cost of financial services for domestic users.

→ **FinTech expands and reshapes the domestic financial market. The dominant effect is positive (deepening, inclusion, productivity), but the distributional consequences for incumbents and their employees are real and must be managed.**

4.3. International Contribution

The international contribution dimension measures the financial center's exports of financial services and its share of cross-border financial activity. FinTech contributes through three principal channels.

First, FinTech firms are themselves exporters of financial services. The cross-border footprint of firms such as Stripe, Adyen, Wise, Revolut, Ant Group, Nubank, and others now constitutes a meaningful component of financial services exports from their home centers. Innovate Finance documents the role of FinTech in the United Kingdom's financial-service export trade (Innovate Finance, 2025). Frost et al. show how BigTech firms have extended financial services across borders in ways that conventional banks cannot easily match (Frost, Gambacorta, Huang, Shin, & Zbinden, 2019).

Second, FinTech enables the export of financial infrastructure services. Open-banking platforms, payment rails, and digital-identity systems developed in one center are increasingly exported to others. The Cambridge Center for Alternative Finance's Global State of Open Banking and Open Finance Report tracks the international diffusion of UK-style open banking (CCAF, 2024). India's UPI infrastructure has been licensed or replicated in several countries; Brazil's PIX is similarly of interest.

Third, regional integration. The Cambridge Center for Alternative Finance, Asian Development Bank Institute, and FinTechSpace provide the most comprehensive benchmarking study of the ASEAN FinTech ecosystem, documenting the integration effects of cross-border FinTech corridors (CCAF, ADB Institute & FinTechSpace, 2019). Tokenization has the potential to shift cross-border capital markets activity toward centers that move first to provide regulated tokenization rails. The FSB's work on financial-stability implications (FSB, 2024b), the IMF analysis (Agur, Villegas-Bauer, Mancini-Griffoli, & Martinez Peria, 2025), and the observations of IOSCO's Fintech Task Force (IOSCO, 2025) are the most authoritative current treatments.

4.4. International Connectivity

Connectivity is the dimension most transformed by FinTech.

Open banking and open finance, in particular, have shifted the technical and regulatory infrastructure of cross-border financial activity. Babina, Buchak, and Gornall provide the most

rigorous econometric evidence to date: the introduction of open-banking mandates in the UK and EU has materially increased FinTech entry and cross-border activity (Babina, et al., 2024).

A second connectivity channel is data and regulatory interoperability. The Cambridge Global Regulatory Innovation Dashboard documents the international convergence of regulatory frameworks. The two World Bank & CCAF Global FinTech Regulator Surveys provide regulator-side data (World Bank & CCAF, 2019), (World Bank & CCAF, 2022). Hutukka compares the FinTech-law architectures of the EU, the United States, and China (Hutukka, 2024). Lessambo provides a G-20 comparative perspective (Lessambo, 2023). The cumulative picture is one of growing connectivity, but with persistent gaps in cross-border recognition that remain a real friction for FinTech firms seeking to operate at scale.

4.5. Attractiveness

Attractiveness is the dimension on which financial centers compete most directly for FinTech firms. The literature identifies four channels through which a strong FinTech ecosystem makes a center more attractive.

The first is regulation. Zetzsche et al. develop the broader concept of "smart regulation" — regulation that is principles-based, technology-neutral, and adaptive (Zetzsche, Buckley, Arner, & Barberis, 2017). Goo and Heo provide empirical evidence that regulatory sandboxes increase FinTech industry growth, with significant interaction effects with open-innovation strategies (Goo & Heo, 2020).

The second channel is talent. The presence of FinTech talent itself is a magnet for additional FinTech firms; reputation begets reputation. Centers that have deliberately developed FinTech talent pipelines through universities, professional certifications, and immigration fast-track programs tend to outperform centers that rely on residual flows from the broader technology sector.

The third channel is capital. The presence of FinTech-specialized investors is a structural advantage that compounds over time, as repeat investors develop domain expertise and pattern recognition. Innovate Finance documents the concentration of specialized FinTech capital in London (Innovate Finance, 2025).

The fourth channel is infrastructure: the physical and digital scaffolding of the ecosystem. FinTech hubs and incubators lower the search cost of finding partners and customers. FinTech Consult and the FinTech Association of Hong Kong highlight Cyberport’s role in Hong Kong's story (FinTech Consult & FTAHK, 2023). FinTech Poland does the same for Warsaw (FinTech Poland, 2025).

4.6. Innovation Capacity — the Direct Link

Innovation capacity is where FinTech most directly enters the IFC performance framework. Part II identified four sub-dimensions of innovation capacity: knowledge generation, the entrepreneurial ecosystem, regulatory innovation, and adoption and diffusion (Biedermann, 2026b). The mapping to a FinTech ecosystem is one-to-one.

Knowledge generation in the FinTech context comprises financial-technology research output, FinTech patents, other registered intellectual property, the presence of applied research centers, and FinTech-specialized university programs. The Cojoianu et al. finding that knowledge-creation capacity predicts the emergence of FinTech firms applies directly here (Cojoianu, Clark, Hoepner, Pažitka, & Wójcik, 2021).

The entrepreneurial ecosystem is the dimension on which most FinTech rankings concentrate. Firm formation rates, unicorn counts, venture capital flows, corporate venture activity, and accelerator/incubator density all fall under this heading. Hendrikse, van Meeteren, and Bassens emphasize that the most successful entrepreneurial ecosystems are not those in which FinTech replaces incumbent finance but those in which the two are strategically coupled (Hendrikse, van Meeteren, & Bassens, 2020).

Regulatory innovation, as 3.5 has argued, is the most consequential single differentiator. New framework development (FinTech licensing, crypto-asset regimes, open banking, AI governance), experimental mechanisms (sandboxes, innovation hubs), regulatory velocity, and international standard-setting influence all map directly from the Part II framework.

Adoption and diffusion is the sub-dimension most often missing from FinTech rankings. Domestic adoption rates, the integration of FinTech into incumbent service delivery, the international diffusion of regulatory models, the export of FinTech products and platforms — these are the indicators that close the innovation cycle from idea to impact. As Part II argued, an ecosystem strong in creation but weak in adoption is an innovation laboratory whose outputs are commercialized elsewhere (Biedermann, 2026b).

4.7. Reputation and Trust

FinTech's effect on reputation and trust is double-edged. On the positive side, a thriving FinTech ecosystem signals a forward-looking, competent regulatory environment and an institutional culture that can accommodate innovation. The trust-and-knowledge finding from Cojoianu et al. operates in both directions: ecosystems are built on trust, and a successful ecosystem reinforces trust (Cojoianu, Clark, Hoepner, Pažitka, & Wójcik, 2021).

On the downside, FinTech ecosystems are vulnerable to reputational risks. Cyber risk, as surveyed by Vučinić and Luburić, is now an existential threat to FinTech firms and — by extension

— to the centers that host them (Vučinić & Luburić, 2022). Crypto-asset failures have damaged the reputation of every FinTech ecosystem with a meaningful crypto presence. The Financial Stability Board's 2024 report on tokenization explicitly identifies reputational and confidence risks as a transmission channel for stability concerns (FSB, 2024b).

Survey-based reputation, e.g., captured by the GFCI's perception scores (Z/Yen, 2026), is particularly vulnerable to the cumulative effect of small reputational accidents. As Part II of this series argued, perception lags reality on the way up but tracks reality on the way down (Biedermann, 2026b). Centers that build FinTech ecosystems have a reputational asset to protect, and protecting that asset requires both effective supervision and consistent communication.

4.8. Resilience

Resilience is the dimension on which FinTech's effects are most underestimated. The conventional view treats FinTech as additive: more firms, more institutional types, more diversification. Part II of this series, however, argued that resilience is best decomposed into diversification, agility, and institutional depth (Biedermann, 2026b). FinTech affects all three, both positively and negatively.

Regarding diversification, FinTech adds new sub-sectors and institutional types, increasing institutional diversity and potentially lowering the Herfindahl-Hirschman concentration in the financial sector. To that extent, it is positive. The complication is that FinTech also introduces new concentration risks: many FinTechs depend on the same handful of cloud providers, payment rails, and KYC/AML vendors. If the underlying infrastructure providers are concentrated, the apparent diversification of the FinTech firm population is partly illusory. Frost et al. and Langley and Leyshon document the parallel concentration of the BigTech-in-finance population across platforms (Frost, Gambacorta, Huang, Shin, & Zbinden, 2019), (Langley & Leyshon, 2021).

In terms of agility, FinTech ecosystems generally enhance the agility of their host financial centers. Regulatory sandboxes are, in Part II's phrase, themselves an agility mechanism (Biedermann, 2026b). The cross-regulator coordination that FinTech regulation has required (e.g., Hong Kong's GenA.I. Sandbox++ across HKMA, SFC, IA, and MPFA) has built coordinative muscle that the center can deploy to other novel challenges (Biedermann, 2026c).

In terms of institutional depth, FinTech contributes new market participants, new professional service providers (specialized legal, audit, and consulting capabilities), and new educational institutions, all of which add to the underlying "thickness" of the financial center. The complication is that many FinTech firms are short-lived, and a shallow base of long-lived FinTechs is less of a resilience asset than a deep base of short-lived ones.

Cyber and operational risks are the most direct downside to resilience. Vučinić and Luburić document the elevated cyber risk exposure of FinTech-intensive financial centers (Vučinić & Luburić, 2022). Aramonte et al. document the operational fragility of DeFi protocols (Aramonte, Huang, & Schrimpf, 2021). The FSB flags the systemic implications of tokenization (FSB, 2024b). A center with a strong FinTech ecosystem must invest proportionately in cyber-resilience infrastructure, lest its gains in innovation be offset by elevated tail-risk exposure.

4.9. Reinforcing Cycles and Tensions

Part II identified two integrating dynamics within the IFC performance framework: reinforcing cycles, in which strength in one dimension feeds strength in others, and tensions or trade-offs, in which strength in one dimension comes at the cost of another (Biedermann, 2026b). FinTech makes both dynamics visible.

The principal reinforcing cycle is: a strong FinTech ecosystem improves attractiveness (❹), which draws talent and capital, which strengthens the entrepreneurial side of innovation capacity (❺), which produces more FinTech firms, which further strengthen attractiveness. International contribution (❷) is the natural overflow of this cycle, as FinTech firms internationalize. International connectivity (❸) is enhanced through open banking and tokenization infrastructure. Reputation and trust (❻) are enhanced when regulatory innovation is well executed.

The principal tensions are: between regulatory accommodation (which improves attractiveness in the short term) and consumer protection / financial stability (which protects reputation and resilience in the long term); between openness to BigTech entry (which deepens the ecosystem) and concentration risk (which weakens resilience); and between specialization (which builds attractiveness in a niche) and diversification (which builds resilience).

→ **The FinTech ecosystem is not an additive dimension but a cross-cutting capability that touches every dimension of the IFC framework. The reinforcing cycles are powerful; the tensions are real. Both must be measured and managed.**

5. Recommendations

The diagnostic framework set out in Section 3 and the impact mapping developed in Section 4 yield recommendations for policymakers, regulators, financial center promoters, and ecosystem actors who wish to build or strengthen a FinTech ecosystem to serve their international financial center. The recommendations are organized from diagnosis, through ecosystem architecture, to strategic positioning and the technology frontier. They are deliberately framed as recommendations rather than as a recipe: the comparative literature is clear that no single FinTech ecosystem trajectory generalizes.

5.1. Diagnose Before Prescribing

The first recommendation is methodological. Too many FinTech strategies begin with a target: “become a top-five FinTech hub,” “attract one hundred FinTech firms,” “establish a sandbox,” without first establishing where the ecosystem currently stands and which of its constitutive elements are strong, which are weak, and which are missing entirely. The result is an emphasis on visible interventions (a sandbox, an accelerator, a marketing campaign), regardless of whether they address the actual binding constraint.

Authorities should begin with a structured diagnostic across the five dimensions proposed in 3.5: knowledge generation, entrepreneurial ecosystem, regulatory innovation, adoption and diffusion, and enabling infrastructure, as well as the input/output distinction set out by Koroleva (Koroleva, 2022). Strong inputs without strong outputs suggest a translation problem: the raw material is present, but is not being converted. Strong outputs without strong inputs suggest a sustainability problem: the activity is real, but the foundations are thin. Different gaps require different remedies.

Several jurisdictions have begun to publish such diagnostics. The Hong Kong FinTech Report (FinTech Consult & FTAHK, 2023) and FinTech Ecosystem Report 2025 (InvestHK, 2025), the Innovate Finance UK FinTech Investment Landscape (Innovate Finance, 2025), the “German FinTech Market” Report (FinTech Consult & Contextual Solutions, 2023) and the Finch Capital State of European FinTech (Finch Capital, 2025) are useful exemplars, each combining quantitative indicators with qualitative assessment.
The interactive Cambridge FinTech Ecosystem Atlas provides a methodology that can be adapted to the country and city levels. The recommendation is not that every center should produce its own report, but that every center should be able to answer, with evidence, where it stands on each of the five dimensions and which gaps are binding.

→ **Build the diagnostic before designing the strategy. Strategy without diagnosis is decoration.**

5.2. Treat Regulation as Competitive Infrastructure

Section 3 identified regulatory architecture as the most consequential differentiator across FinTech ecosystems. Regulatory innovation sandboxes, innovation hubs, proportionate licensing regimes, and regulatory guidance functions as competitive infrastructure for FinTech ecosystems, much as physical infrastructure once did for trade. Centers that have built sophisticated regulatory infrastructure have used it to attract firms; centers that have not have lost activity to those that have.

The recommendation is twofold. First, regulators should design FinTech-specific regimes proportionate to the risks involved: not a single license covering all activities, but tiered regimes calibrated to scale and function. Second, regulators should equip themselves to learn at the pace of FinTech's evolution. The case studies of cross-regulator coordination, of agile regulatory design, and of recent multi-regulator sandbox models are instructive: they show that the institutional question - how do regulators talk to one another, and how do they talk to firms - is at least as important as the substantive rules.

A related point: regulation should not be confused with regulatory marketing. Several jurisdictions have launched sandboxes that admit very few firms and produce few graduates. A sandbox that does not change behavior, either by enabling firms to launch products that would otherwise be blocked or by enabling regulators to learn about products before they fall within the regulatory perimeter, is theatre. The test of regulatory infrastructure is whether it changes outcomes.

→ **Regulation is the most powerful FinTech-policy lever a financial center has. Use it deliberately, calibrate it carefully, and measure whether it works.**

5.3. Address All Six Pillars of the Ecosystem

The literature on FinTech ecosystems converges on six interdependent pillars (see also 2.5): actors (FinTech firms, incumbents, infrastructure providers, enablers), capital (venture, growth, public-market), talent (technical and financial, knowledge), demand (consumers, businesses, government), enabling infrastructure (digital identity, payment rails, open data, cloud, connectivity), and regulation (licensing, supervision, sandboxes, consumer protection). Weakness in any one pillar constrains the whole. A center with abundant capital but no talent cannot scale firms; a center with talent and capital but weak infrastructure cannot deploy them efficiently; a center with all five non-regulatory pillars but adversarial regulation will see firms relocate.

The recommendation is to assess each pillar independently, identify the binding constraints, and target interventions accordingly.

Capital gaps may be addressed through co-investment funds, tax incentives, or facilitated access to public markets. Talent gaps may be addressed through visa regimes, university partnerships, and re-skilling programs. Demand gaps may be addressed through anchor procurement (governments and large incumbents using FinTech services), digital identity infrastructure that reduces transaction friction, and consumer protection regimes that build trust. Infrastructure gaps may be addressed through investments in digital identity, real-time payments, and open banking APIs. The point is not that every center must invest in everything, but that every center must understand what it has and what it lacks.

→ **FinTech ecosystems are systems. Treat them as such: balance the pillars, target the gaps, and resist the temptation to invest only in what is most visible.**

5.4. Foster Collaboration Between FinTechs and Incumbents

Early FinTech narratives framed FinTech firms and incumbent banks as adversaries, with the former disrupting the latter. The empirical literature has settled into a more nuanced picture (Hornuf, Klus, Lohwasser, & Schwienbacher, 2021), (Brandl & Hornuf, 2020), (Vives, 2019), (Murinde, Rizopoulos, & Zachariadis, 2022). In most markets, the dominant pattern is collaboration rather than displacement. Banks acquire FinTechs, license their technology, partner on distribution, run corporate venture-capital arms, and increasingly co-design products. The strategic-coupling framework of Hendrikse (Hendrikse, van Meeteren, & Bassens, 2020) is helpful here: FinTech ecosystems thrive when local firms successfully couple into global financial-services value chains, and incumbents are typically the local nodes of those chains.

The recommendation is to design ecosystem interventions that explicitly include incumbent participation.

Sandboxes should admit incumbents as well as start-ups. Innovation hubs should host both. Open-banking and open-finance regimes should be designed to enable, not punish, well-behaved incumbents. Conferences, working groups, and trade associations should bridge the two communities. The under-theorized roles of the corporate venture arm and bank-led acquisitions deserve explicit policy attention: in many ecosystems, these channels do more to scale FinTech firms than the venture capital community alone.

→ **Incumbent banks are not the obstacle to a FinTech ecosystem. In most cases, they are the channel through which it scales.**

5.5. Build Ecosystem Density

The economic-geography literature is consistent on one point: financial activity concentrates because density generates externalities that isolated firms cannot replicate. Talent flows between firms; ideas circulate through informal networks; trust is built through repeated interaction; specialized legal, accounting, and consulting services emerge to serve the cluster. FinTech is no exception. Successful FinTech ecosystems are characterized not only by firms themselves but also by dense connective tissue: conferences, accelerators, co-working spaces, university departments, and professional associations.

The recommendation is to invest deliberately in such a connective tissue. Physical clustering matters: dedicated FinTech hubs (e.g., LHoFT in Luxembourg, Cyberport in Hong Kong, Level39 in London, Hub71 in Abu Dhabi, TechQuartier in Frankfurt) function as concentration mechanisms even in an era of remote work. Convening matters: regular FinTech weeks, conferences, and demo days create the rhythm of an ecosystem. University-industry coupling matters: the Cambridge Center for Alternative Finance, the Oxford Saïd Entrepreneurship Center, and the Singapore Management University Sim Kee Boon Institute demonstrate the contribution of research institutions in shaping the global FinTech research agenda. Trade associations matter: bodies such as Innovate Finance, FinTech Poland, the European Digital Finance Association, and the Africa FinTech Network articulate ecosystem voice and channel it into regulatory dialogue.

> → **FinTech ecosystems are not lists of firms. They are networks of relationships. Invest in the network, not just in the nodes.**

5.6. Plan Explicitly for Resilience

Section 4 argued that resilience is the most underestimated dimension of FinTech impact. The FinTech ecosystem can deepen resilience by diversifying providers, channels, and risk-management tools, but it can also weaken resilience by concentrating activity on a small number of cloud providers, payment processors, or DeFi protocols whose failure would have systemic consequences. The 2022 collapses of FTX and Terra/Luna, the recurring outages of major payment platforms, and numerous cyber incidents illustrate the risks.

The recommendation is to plan for resilience at the same level of seriousness as for innovation. Specifically: (i) cyber-resilience should be a first-class supervisory priority, not a checkbox. The BIS guidance, the FSB cyber-incident reporting framework, and emerging EU standards (DORA) provide a baseline; (ii) concentration risk in cloud providers, payment infrastructure, and FinTech nodes should be monitored and, where necessary, mitigated through diversification mandates or critical-third-party regimes; (iii) DeFi and digital-asset ecosystems require the same prudential discipline as traditional finance, despite the technological packaging; (iv) cross-border crisis-

management arrangements should reflect the cross-border nature of FinTech; (v) institutional depth (the rule-of-law, dispute resolution, and supervisory capability that allow a financial center to absorb shocks) must not be sacrificed to the speed of FinTech growth.

> → **Resilience is not a constraint on FinTech ambition. It is the condition that makes FinTech ambition durable.**

5.7. Internationalize Early

FinTech is, almost by construction, a cross-border industry. Payment rails, lending platforms, data infrastructure, and digital-asset markets span jurisdictions; the regulatory and supervisory questions follow. Centers that participate actively in cross-border standard-setting (the Financial Stability Board, IOSCO, the Bank for International Settlements, the OECD, the Cambridge Center for Alternative Finance regulatory network) shape the rules under which FinTech operates everywhere; centers that do not participate are rule-takers.

The comparative literature shows substantial variation in how jurisdictions regulate digital assets, open banking, and AI in finance, and substantial gains from cross-border cooperation: mutual recognition of sandboxes, passporting of FinTech licenses, and common standards for digital identity (Lessambo, 2023), (Hutukka, 2024), (IBA, 2023), (OECD, 2024).

The recommendation is for centers, even small ones, to invest deliberately in international engagement: membership in standard-setting bodies, bilateral FinTech cooperation agreements, sandbox-to-sandbox referral arrangements, contributions to cross-border data-flow frameworks, and participation in cross-border atlases and benchmarking exercises that shape the global comparative narrative. The goal is not just to be ranked; it is to shape the criteria by which one is ranked.

> → **FinTech rules are made internationally. Centers that do not participate in their creation are condemned to live by rules made by others.**

5.8. Position the Ecosystem Clearly

Part II of this series argued that international financial centers benefit from a clear strategic position (Biedermann, 2026b).

FinTech amplifies this argument.

The global FinTech industry is too large and too varied for any one center to be a leader across the board. Some centers will excel in payments; some in wealth management technology; some in Islamic FinTech; some in regulation technology and supervisory technology; some in digital

assets; some in financial inclusion FinTech – just to name a few. Specialization is not a sign of weakness; it is a sign of strategic clarity.

The recommendation is to develop a positioning that is honest about strengths, deliberate about choices, and communicated consistently. The literature on financial-center reputation suggests that perception lags reality by years; centers that do not communicate their position consistently will not be perceived to occupy it.

→ **Strategic clarity beats strategic ambition. A center that knows what it is excels; a center that wants to be everything excels at nothing.**

5.9. Embrace the Next Frontier Carefully

The frontier of FinTech is shifting from the product layer (digital banks, payments apps, online lending) to the infrastructure and integration layers: artificial intelligence as the cognitive layer of finance, tokenization as the next-generation settlement layer, and open finance as the next-generation data layer. Each of these frontiers is more demanding than the FinTech wave that preceded it: each requires deeper regulatory engagement, more sophisticated risk management, and tighter integration with incumbent infrastructure.

The recommendation has two parts.

First, do not sit out the frontier. Centers that have not yet integrated AI into supervision, developed a tokenization policy, or implemented an open-finance regime will see their FinTech competitiveness erode within a few years.

Second, do not carelessly embrace the frontier. The lessons of FTX, Terra, and the likes are that frontier technologies fail in ways that legacy systems do not, and that the consumer-protection and financial-stability costs of those failures fall on regulators and the centers that hosted the activity. The discipline of the BIS, FSB, and IOSCO standard-setters (“same activity, same risk, same regulation”) should be the starting point, with technology-specific calibration on top of it.

→ **The frontier is not optional. Neither is the discipline that makes the frontier safe.**

5.10. Synthesis

The nine recommendations above are interconnected. Diagnosis (5.1) precedes everything; without it, the rest is guesswork. Regulation (5.2) and the six pillars (5.3) are the architectural foundations. Collaboration (5.4) and ecosystem density (5.5) are the social fabric. Resilience (5.6) is the boundary condition. Internationalization (5.7) and positioning (5.8) are the strategic choices. The frontier (5.9) is where the next decade of competitiveness will be decided.

No financial center will execute all 9 simultaneously, and the order of priorities will vary depending on the starting position. A center with strong incumbents but weak entrepreneurs will prioritize 5.4 and 5.5; a center with thin regulatory capacity will prioritize 5.2; a center losing relevance will prioritize 5.8 and 5.9. The diagnostic recommended in 5.1 is the device that translates this generic list into a specific agenda. The burden of strategic choice cannot be outsourced to a framework, but a framework can ensure that the choice is made with full awareness of its consequences.

6. Conclusion

This paper has examined how to measure the performance of a FinTech ecosystem and how a successful FinTech ecosystem affects the performance of the international financial center that hosts it. It is the fourth in a series that has previously addressed the architecture of financial-center indices (Biedermann, 2026a), the performance of international financial centers themselves (Biedermann, 2026b), and the role of artificial intelligence in financial centers (Biedermann, 2026c). Six conclusions follow.

Conclusion 1: FinTech ecosystem performance is distinct from, but tightly linked to, financial center performance

FinTech ecosystem performance and financial center performance are not the same thing. A center can host a thriving FinTech ecosystem and still lose share in international finance overall if its other dimensions weaken; conversely, a center can perform well as an international financial center while its FinTech ecosystem stagnates if its incumbents and infrastructure remain strong. The two phenomena require separate measurement: the diagnostic framework set out in Section 3 for FinTech ecosystems is distinct from, and complementary to, the seven-dimensional framework set out in Part II for financial centers.

However, the two are tightly linked. Section 4 mapped the channels: a successful FinTech ecosystem strengthens domestic impact through inclusion and bank productivity, strengthens international contribution through FinTech exports and infrastructure spillovers, strengthens international connectivity through cross-border data and settlement integration, and, most directly, raises innovation capacity, which Part II argued is one of the three complementary factors that condition the durability of every other dimension. The link is not automatic, but where it holds, it is powerful.

Conclusion 2: No single index or KPI captures FinTech ecosystem performance

Section 3 reviewed the major FinTech rankings, the principal KPI frameworks, and the academic frameworks. Each is informative; none is sufficient.

The principal limitations are conceptual: most rankings privilege inputs over outputs (or vice versa), measure static stocks rather than dynamic flows, conflate firm-level success with ecosystem-level success, and are constructed at the city-level when much of the relevant policy is national. Subsection 3.5 proposed a diagnostic framework with five dimensions (knowledge generation, entrepreneurial ecosystem, regulatory innovation, adoption and diffusion, enabling infrastructure) that addresses these limitations by separating inputs from outputs, by including dynamic indicators, and by mapping each dimension to the seven-dimensional IFC framework.

The recommendation is that this diagnostic, or a comparable one, should sit alongside (not replace) the existing rankings.

Conclusion 3: FinTech impacts all seven dimensions, with innovation capacity primary and resilience most underestimated

Mapping FinTech onto the seven-dimensional framework yields three findings of unequal weight. First, the most direct impact is on innovation capacity: the FinTech ecosystem is, almost by construction, an innovation ecosystem, and its performance maps closely onto the four sub-dimensions of innovation capacity set out in Part II (knowledge generation, entrepreneurial ecosystem, regulatory innovation, adoption & diffusion). Second, the most under-appreciated impact is on resilience: FinTech can both deepen and weaken resilience, and the literature is now extensive on the channels through which it does both. Third, the impact on the four functional dimensions and on reputation is real but conditional: it depends on policy choices, regulatory architecture, and the interaction between FinTech and incumbents.

The implication for measurement is that any assessment of how FinTech is changing a financial center must consider all seven dimensions, not just innovation capacity. The policy implication is that resilience deserves at least as much attention as innovation.

Conclusion 4: Regulatory architecture is the most consequential differentiator

Across the comparative literature and the case studies of Hong Kong, the United Kingdom, Singapore, Lithuania, Bahrain, and Switzerland, a single conclusion recurs: regulatory architecture is the most consequential differentiator across FinTech ecosystems. Other pillars (capital, talent, demand, infrastructure) condition outcomes and can become binding constraints, but regulation is what most often determines whether a FinTech ecosystem flourishes or fails to coalesce.

This conclusion reinforces a broader theme of the paper series. Part II argued that regulatory innovation is one of the four sub-dimensions of innovation capacity. Part III argued that AI in finance is fundamentally a supervisory and governance question. This paper extends the same argument to the FinTech ecosystem as a whole. In modern finance, the regulator is not an external constraint on the ecosystem but a constitutive participant in it.

Conclusion 5: The frontier is shifting; financial centers that do not adapt will lose relevance

The frontier of FinTech is moving from the product layer to the integration layer: AI as the cognitive layer, tokenization as the settlement layer, and open finance as the data layer. Each of these frontiers requires deeper engagement than the FinTech wave that preceded it: deeper regulatory

capacity, more sophisticated risk management, and tighter integration with incumbent infrastructure.

The strategic implication is asymmetric. Financial centers that successfully integrate the frontier will see their FinTech ecosystems compound; centers that do not will find their relevance eroding, even if their other dimensions remain strong. The Bank for International Settlements, the Financial Stability Board, IOSCO, the OECD, and the Cambridge Center for Alternative Finance are now producing the standards and benchmarks that will shape the next decade. The centers that participate in setting those standards will host more of the activity that they govern.

Conclusion 6: FinTech is a cross-cutting capability, not a standalone dimension

Perhaps the most important conclusion of this paper is the one most easily overlooked. FinTech is not a self-contained sector that can be measured, promoted, or regulated in isolation from the rest of the financial center. It is a cross-cutting capability that touches every dimension of financial-center performance: domestic and international, functional and complementary, present and future.

This has methodological consequences (FinTech belongs in every dimension of the framework, not in a separate one), policy consequences (FinTech strategy is not a department; it is a discipline that runs through every department), and strategic consequences (the choice is not whether to have a FinTech strategy, but how consciously to integrate FinTech into financial-center strategy as a whole). The successful financial centers of the next decade will be those that recognize this integration and act on it. The centers that continue to treat FinTech as an adjacent activity, a sandbox, an accelerator, or a marketing campaign will find themselves overtaken by those that have absorbed it into how they think about everything else.

→ **FinTech is now financial services. The question is no longer whether to integrate it into a financial center strategy, but how to do so consciously.**

During the preparation of this work, the author used AI tools for research and to improve language and readability. After using these tools, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

Bibliography

Agur, I., Villegas-Bauer, G., Mancini-Griffoli, T., & Martinez Peria, M. (2025). *Tokenization and Financial Market Inefficiencies.* International Monetary Fund. Retrieved from https://www.imf.org/en/publications/fintech-notes/issues/2025/01/29/tokenization-and-financial-market-inefficiencies-561256

AIF, Sinai Lab, CCAF, ZAIF. (2018). *Global FinTech Hub Report: The Future of Finance is Emerging: New Hubs, New Landscapes.* Academy of Internet Finance Zhejiang University; Sinai Lab; Cambridge Centre for Alternative Finance, University of Cambridge; Zhejiang Association of Internet Finance; TongBanJie. Retrieved from https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2018-ccaf-global-fintech-hub-report-eng.pdf

Andrikopoulos, A., & Dassiou, X. (2024). Bank market power and performance of financial technology firms. *International Journal of Finance and Economics, 29*(1), 1141-1156. Retrieved from https://openaccess.city.ac.uk/id/eprint/29020/1/accepted-Manuscript%20IJFE%2014_10_22.pdf

Aramonte, S., Huang, W., & Schrimpf, A. (2021, December). DeFi Risks and the Decentralisation Illusion. *BIS Quarterly Review*. Retrieved from https://www.bis.org/publ/qtrpdf/r_qt2112b.pdf

Arner, D. W., Barberis, J. N., & Buckley, R. P. (2015). The Evolution of FinTech: A New Post-Crisis Paradigm? Retrieved from https://hub.hku.hk/bitstream/10722/221450/1/Content.pdf

Avarmaa, M., Torkkeli, L., Laidroo, L., & Koroleva, E. (2022). The interplay of entrepreneurial ecosystem actors and conditions in FinTech ecosystems: An empirical analysis. *Journal of Entrepreneurship, Management and Innovation, 18*(4), 79-113. Retrieved from https://doi.org/10.7341/20221843

Babina, T., Bahaj, S., Buchak, G., Marco, F. D., Foulis, A., Gornall, W., . . . Yu, T. (2024). Customer Data Access and FinTech Entry: Early Evidence from Open Banking. *Journal of Financial Economics*. Retrieved from https://www.sciencedirect.com/science/article/pii/S0304405X24001739

Bakker, B. B., Garcia-Nunes, B., Lian, W., Liu, Y., Marulanda, C. P., Siddiq, A., . . . Yang, Y. (2023). *The Rise and Impact of FinTech in Latin America.* Washington DC: International Monetary Fund. Retrieved from https://www.imf.org/-/media/files/publications/ftn063/2023/english/ftnea2023003.pdf

Banerjee, A., Sevillano, J., & Higginson, M. (2024). *From ripples to waves: The transformational power of tokenizing assets.* McKinsey & Company. Retrieved from https://www.mckinsey.com/industries/financial-services/our-insights/from-ripples-to-waves-the-transformational-power-of-tokenizing-assets#/

BCG; Financial Technology Partners. (2026). *Global FinTech Report 2026: From Recovery to Resurgence.* New York: Boston Consulting Group. Retrieved from https://www.ftpartners.com/fintech-strategic-insights/bcg-global-fintech-report-2026/

Ben Naceur, S., Candelon, B., Elekdag, S., & Emrullahu, D. (2023). *Is FinTech Eating the Bank's Lunch?* International Monetary Fund. Retrieved from https://www.imf.org/-/media/Files/Publications/WP/2023/English/wpiea2023239-print-pdf.ashx

Biedermann, J. (2026a). *Measuring International Finance Part I: A Critical Review of Existing Financial Center Indices.* Frankfurt. Retrieved from https://financial-centers.org/publications/financial-center-indices/

Biedermann, J. (2026b). *Measuring International Finance Part II: Measuring the Performance of International Financial Centers.* Frankfurt. Retrieved from https://financial-centers.org/publications/financial-center-performance/

Biedermann, J. (2026c). *Measuring International Finance Part III: Artificial Intelligence and Financial Centers.* Frankfurt. Retrieved from https://financial-centers.org/publications/ai-financial-centers/

Biedermann, J., Zhu, K. Q., & Zhuang, V. Y. (2024). *Status and Assessment of Asian Fintech Ecosystems.* Beijing. Retrieved from https://www.afca-asia.org/Portal.do?method=detailView&returnChannelID=231&contentID=1820

Blakstad, S., & Allen, R. (2018). *FinTech Revolution: Universal Inclusion in the New Financial Ecosystem.* Palgrave Macmillan. Retrieved from https://digilib.stiestekom.ac.id/assets/dokumen/ebook/feb_23af701c5cb6a8ff8fd695caa9696c769a2fd548_1658938966.pdf

Brandl, B., & Hornuf, L. (2020). Where Did FinTechs Come from, and Where Do They Go? The Transformation of the Financial Industry in Germany after Digitalization. *Frontiers in Artificial Intelligence, 3*, 8. Retrieved from https://www.frontiersin.org/journals/artificial-intelligence/articles/10.3389/frai.2020.00008/pdf

Bromberg, L., Godwin, A., & Ramsay, I. (2018). Cross-Border Cooperation in Financial Regulation: Crossing the Fintech Bridge. (O. U. Press, Ed.) *Capital Markets Law Journal, 13*(1), 59-84. Retrieved from https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=3105141

Buckley, R. P., Arner, D. W., & Zetzsche, D. A. (2024). *FinTech: Finance, Technology and Regulation.* Cambridge University Press.

Buckley, R. P., Arner, D. W., Veidt, R., & Zetzsche, D. A. (2020). Building FinTech Ecosystems: Regulatory Sandboxes, Innovation Hubs and Beyond. *Washington University Journal of Law & Policy, 61*, 55-98. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3455872

CB Insights. (2025). *State of FinTech 2024.* New York. Retrieved from https://www.cbinsights.com/research/report/fintech-trends-2024/

CB Insights. (2026a). *State of FinTech. Global 2025 Recap.* New York. Retrieved from https://www.cbinsights.com/research/report/fintech-trends-2025/

CB Insights. (2026b). *State of Fintech Q1'26 Report.* New York. Retrieved from https://www.cbinsights.com/research/report/fintech-trends-q1-2026/

CCAF. (2024). *The Global State of Open Banking and Open Finance Report.* Cambridge Centre for Alternative Finance, University of Cambridge. Retrieved from https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/the-global-state-of-open-banking-and-open-finance-report/

CCAF. (2026). *The 2026 Global AI in Financial Services Report: Adoption, Impact and Risks.* Cambridge Centre for Alternative Finance, University of Cambridge. Retrieved from https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/2026-global-ai-in-financial-services-report/

CCAF, ADB Institute & FinTechSpace. (2019). *ASEAN FinTech Ecosystem Benchmarking Study.* Cambridge Centre for Alternative Finance, University of Cambridge. Retrieved from https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2019-ccaf-asean-fintech-ecosystem-benchmarking-study.pdf

Cojoianu, T. F., Clark, G. L., Hoepner, A. G., Pažitka, V., & Wójcik, D. (2021). Fin vs. Tech: Are Trust and Knowledge Creation Key Ingredients in FinTech Start-Up Emergence and Financing? *Small Business Economics, 57*, 1715-1731. Retrieved from https://link.springer.com/content/pdf/10.1007/s11187-020-00367-3.pdf

Cornelli, G., Doerr, S., Gambacorta, L., & Merrouche, O. (2020). *Regulatory Sandboxes and Fintech Funding: Evidence from the UK.* Basel: Bank for International Settlements. Retrieved from https://www.bis.org/publ/work901.pdf

Deloitte. (2016). *Connecting Global FinTech: Hub Review.* London. Retrieved from https://www.finextra.com/finextra-downloads/newsdocs/fintech-hub-review-2016.pdf

Diemers, D., Lamaa, A., Salamat, J., & Steffens, T. (2015). *Developing a FinTech Ecosystem in the GCC: Let's Get Ready for Take Off.* Strategy& (PwC). Retrieved from https://www.strategyand.pwc.com/m1/en/reports/developing-a-fintech-ecosystem-in-the-gcc.pdf

European Union. (2023). Regulation (EU) 2023/1114 of the European Parliament and of the Council on Markets in Crypto-Assets (MiCA). *Official Journal of the European Union, L 150*, 40–205. Retrieved from https://eur-lex.europa.eu/eli/reg/2023/1114/oj/eng

EY & Singapore FinTech Association. (2018). *EY FinTech Ecosystem Playbook.* Retrieved from https://www.researchgate.net/profile/Varun-Mittal-9/publication/330702088_EY_FinTech_Ecosystem_Playbook/links/5c4fff11a6fdccd6b5d1752f/EY-FinTech-Ecosystem-Playbook.pdf

EY. (2017). *EY FinTech Adoption Index 2017: The rapid emergence of FinTech.* Ernst & Young. Retrieved from https://eyfinancialservicesthoughtgallery.ie/wp-content/uploads/2017/07/FinTech_Optimized-1.pdf

EY. (2019). *Global FinTech Adoption Index 2019: As FinTech Becomes the Norm, You Need to Stand Out from the Crowd.* Ernst & Young Global Limited. Retrieved from https://eyfs.ie/wp-content/uploads/2019/09/ey-global-fintech-adoption-index.pdf

EY. (2023). *FinTech and Ecosystems.* Ernst & Young Global. Retrieved from https://www.ey.com/en_gl/industries/banking-capital-markets/fintech-ecosystems

Finch Capital. (2025). *State of European FinTech.* Retrieved from https://finchcapital.com/research-reports/State_of_European_Fintech_2025_All.pdf

Findexable. (2019). *The Global Fintech Index 2020.* Findexable. Retrieved from https://findexable.com/wp-content/uploads/2019/12/Findexable_Global-Fintech-Rankings-2020exSFA.pdf

Findexable. (2021). *Global FinTech Rankings Report: Bridging the Gap.* Retrieved from https://findexable.com/wp-content/uploads/2021/06/Global-Fintech-Rankings-2021-v1-23-June-21.pdf

Finro Financial Consulting. (2025). *FinTech KPIs: The Metrics That Define Success in Financial Technology.* Retrieved from https://www.finrofca.com/news/fintech-kpi-guide

FinTech Consult & Contextual Solutions. (2023). *The German FinTech Market.* Frankfurt & Berlin: FinTech Consult. Retrieved from http://fintech-consult.com/downloads/The%20German%20FinTech%20Market%20Report%20FinTech%20Consult%20Contextual%20Solutions%202022.pdf

FinTech Consult & FTAHK. (2023). *Hong Kong FinTech Report.* Hong Kong: FinTech Consult. Retrieved from https://fintech-consult.com/wp-content/uploads/2023/11/Hong-Kong-FinTech-Report-2023.pdf

FinTech Poland. (2025). *How to Do FinTech in Poland: Report.* Warsaw: FinTech Poland. Retrieved from https://financial-centers.org/publications/How-to-do-Fintech-in-Poland-report-2025-2.pdf

FIRST & Zhejiang University. (2024). *Global FinTech Hub Report: Tackle The Toughest, Find The Breakthroughs.* Beijing: Beijing Frontier Financial Regulatory Technology Research Institute & Zhejiang University. Retrieved from https://bj-

first.org.cn/admin/files/2024%E5%85%A8%E7%90%83%E9%87%91%E8%9E%8D%E7%A7%91%E6%8A%80%E4%B8%AD%E5%BF%83%E5%9F%8E%E5%B8%82%E6%8A%A5%E5%91%8A.pdf

FIRST. (2025). *The Global FinTech Hub Report: Global Landscape and China Watch.* Beijing: Beijing Frontier Financial Regulatory Technology Research Institute. Retrieved from https://www.bj-first.org.cn/admin/files/2025%E5%85%A8%E7%90%83%E9%87%91%E8%9E%8D%E7%A7%91%E6%8A%80%EF%BC%9A%E4%B8%96%E7%95%8C%E6%A0%BC%E5%B1%80%E4%B8%8E%E4%B8%AD%E5%9B%BD%E8%A7%82%E5%AF%9F-%E8%8B%B1%E6%96%87%E7%89%88.pdf

FIRST, AIF, ZIBS, ZAFT. (2021). *Global FinTech Hub Report: How Many Roads to Global FinTech Leadership?* Beijing: Beijing Frontier Financial Regulatory Technology Research Institute; Academy of Internet Finance; Zhejiang University International Business School; Zhejiang Association of FinTech.

FIRST, AIF, ZIBS, ZAFT. (2022). *Global FinTech Hub Report: Riding On The Wind, Rising To The Challenge.* Beijing: Beijing Frontier Financial Regulatory Technology Research Institute; Academy of Internet Finance; Zhejiang University International Business School; Zhejiang Association of FinTech. Retrieved from https://v4-upload.digoodcms.com/files_981/1695264198_2022%20%E5%85%A8%E7%90%83%E9%87%91%E8%9E%8D%E7%A7%91%E6%8A%80%E4%B8%AD%E5%BF%83%E5%9F%8E%E5%B8%82%E6%8A%A5%E5%91%8A.pdf

FIRST, AIF, ZIBS, ZAFT. (2023). *Global FinTech Hub Report: Divergence in The Changing World.* Beijing: Beijing Frontier Financial Regulatory Technology Research Institute; Academy of Internet Finance; Zhejiang University International Business School; Zhejiang Association of FinTech. Retrieved from https://v4-upload.digoodcms.com/files_981/1699786442_2023%E5%85%A8%E7%90%83%E9%87%91%E8%9E%8D%E7%A7%91%E6%8A%80%E4%B8%AD%E5%BF%83%E5%9F%8E%E5%B8%82%E6%8A%A5%E5%91%8A.pdf

Frost, J., Gambacorta, L., Huang, Y., Shin, H., & Zbinden, P. (2019). BigTech and the Changing Structure of Financial Intermediation. *Economic Policy, 34*(100), 761-799. Retrieved from https://www.bis.org/publ/work779.pdf

FSB. (2024a). *Financial Stability Implications of Artificial Intelligence.* Basel: Financial Stability Board. Retrieved from https://www.fsb.org/uploads/P14112024.pdf

FSB. (2024b). *The Financial Stability Implications of Tokenisation.* Basel: Financial Stability Board. Retrieved from https://www.fsb.org/uploads/P221024-2.pdf

Gagliardi, D. (2019). *Vision Outlook on the FinTech Ecosystem.* Alliance Manchester Business School, University of Manchester. Retrieved from https://www.researchgate.net/profile/Dimitri-Gagliardi/publication/342840738_VISION_OUTLOOK_ON_THE_FINTECH_ECOSYSTEM_The_FinTech_Ecosystem/links/5f086c8c299bf18816103cfe/VISION-OUTLOOK-ON-THE-FINTECH-ECOSYSTEM-The-FinTech-Ecosystem.pdf

Goo, J.-J., & Heo, J.-Y. (2020). The Impact of the Regulatory Sandbox on the FinTech Industry, with a Discussion on the Relation between Regulatory Sandboxes and Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity, 6*(2), 43.

Haberly, D., MacDonald-Korth, D., Urban, M., & Wójcik, D. (2019). Asset Management as a Digital Platform Industry: A Global Financial Network Perspective. *Geoforum, 106*, 167-181. Retrieved from

https://www.researchgate.net/publication/336961320_Asset_Management_as_a_Digital_Platform_Industry_A_Global_Financial_Network_Perspective/fulltext/5e6022124585152ce80906b8/Asset-Management-as-a-Digital-Platform-Industry-A-Global-Financial-Network-Perspect

Hendrikse, R., van Meeteren, M., & Bassens, D. (2020). Strategic Coupling between Finance, Technology, and the State: Cultivating a FinTech Ecosystem for Incumbent Finance. *Environment and Planning A, 52*(8), 1516-1538. Retrieved from https://www.researchgate.net/publication/337189918_Strategic_coupling_between_finance_technology_and_the_state_Cultivating_a_Fintech_ecosystem_for_incumbent_finance

HKU; Standard Chartered; Cyberport; hkpc. (2022). *HKU FinTech Talent Study.* Hong Kong: The University of Hong Kong. Retrieved from https://fintechacademy.cs.hku.hk/wp-content/uploads/2022/11/FinTech-Talent-Survey_Full-Report.pdf

Hornuf, L., Klus, M., Lohwasser, T., & Schwienbacher, A. (2021). How Do Banks Interact with FinTech Startups? *Small Business Economics, 57*, 1505-1526. Retrieved from https://link.springer.com/content/pdf/10.1007/s11187-020-00359-3.pdf

HSLU. (2016). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://www.hslu.ch/-/media/campus/common/files/dokumente/w/ifz/studien/fintech-studie-160303.pdf/?sc_lang=de-ch

HSLU. (2017). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://www.hslu.ch/-/media/campus/common/files/dokumente/w/ifz/studien/fintech-study-englisch-170103.pdf/?la=de-ch

HSLU. (2018). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://hub.hslu.ch/retailbanking/wp-content/uploads/sites/7/2018/06/IFZ-FinTech-Study-2018.pdf

HSLU. (2019). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://hub.hslu.ch/retailbanking/wp-content/uploads/sites/7/2019/03/IFZ-FinTech-Study-2019_Switzerland.pdf

HSLU. (2020). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://hub.hslu.ch/retailbanking/wp-content/uploads/sites/7/2020/03/IFZ-FinTech-Study-2020.pdf

HSLU. (2021). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://www.six-group.com/dam/download/company/report/Studies/ifz-fintech-study-2021.pdf

HSLU. (2022). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://www.six-group.com/dam/download/company/report/Studies/ifz-fintech-study-2022.pdf

HSLU. (2023). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://www.greaterzuricharea.com/sites/default/files/2023-03/IFZ_FinTech_Study_2023.pdf

HSLU. (2024). *IFZ FinTech Study.* Lucerne University of Applied Sciences and Arts. Retrieved from https://hub.hslu.ch/retailbanking/wp-content/uploads/sites/7/2024/03/IFZ_FinTech_Study_2024.pdf

HSLU. (2025). *IFZ FinTech Study.* Institute of Financial Services Zug. Lucerne University of Applied Sciences and Arts. Retrieved from https://documents.swisscom.com/product/filestore/lib/47d9994a-177e-44e5-845f-f1c6d9c81e6d/ifz-fintech-studie-2025.pdf

Hutukka, P. (2024). FinTech Law in the European Union, the United States and China: Regulation of Financial Technology in Comparative Context. *Maastricht Journal of European and Comparative Law*. Retrieved from https://journals.sagepub.com/doi/10.1177/1023263X241298416

IBA. (2023). *FinTech: How Is the World Shaping the Financial Innovation Industry?* London: International Bar Association Banking Law Committee. Retrieved from https://www.ibanet.org/New-IBA-report-outlines-fintech-regulatory-frameworks-of-39-jurisdictions-across-the-world

Innovate Finance. (2025). *FinTech Investment Landscape.* Retrieved from https://www.innovatefinance.com/capital/fintech-investment-landscape-2025/

InvestHK. (2025). *Hong Kong FinTech Ecosystem Report.* The Government of the Hong Kong Special Administrative Region. Retrieved from https://www.investhk.gov.hk/media/jznd3b5p/202503-21_hong-kong-fintech-ecosystem-report-2025-1.pdf

IOSCO. (2025). *Tokenization of Financial Assets.* Madrid: International Organization of Securities Commissions. Retrieved from https://www.iosco.org/library/pubdocs/pdf/IOSCOPD809.pdf

Janes, D. (2025). *LTV/CAC Ratio: What It Is & How to Calculate It.* Cambridge: Harvard Business School. Retrieved from https://online.hbs.edu/blog/post/ltv-cac

JPMorgan. (2026). *Sector spotlight: Fintech.* New York: JPMorgan Chase & Co. Retrieved from https://www.jpmorgan.com/content/dam/jpmorgan/documents/cb/insights/technology/jpm-2026-fintech-industry-trends-report.pdf

Kindermann, B. (2026). FinTechs Playing in the Regulatory Sandbox — The Effect of Interacting Signals on Funding. *Information Systems Journal*. Retrieved from https://onlinelibrary.wiley.com/doi/epdf/10.1111/isj.70004

Knight, E., & Wójcik, D. (2020). FinTech, Economy and Space: Introduction to the Special Issue. *Environment and Planning A: Economy and Space, 52*(8), 1490-1497. Retrieved from https://journals.sagepub.com/doi/epub/10.1177/0308518X20946334

Koroleva, E. (2022). FinTech Entrepreneurial Ecosystems: Exploring the Interplay between Input and Output. *International Journal of Financial Studies, 10*(4), 92. Retrieved from https://www.mdpi.com/2227-7072/10/4/92

KPMG. (2025). *Pulse of FinTech H2 2024.* KPMG International. Retrieved from https://assets.kpmg.com/content/dam/kpmgsites/xx/pdf/2025/02/pulse-of-fintech-h2-2024.pdf.coredownload.inline.pdf

KPMG. (2026). *Pulse of FinTech H2 2025.* Belgium: KPMG International. Retrieved from https://assets.kpmg.com/content/dam/kpmgsites/be/pdf/Pulse-of-Fintech-H2-2025-Report.pdf

Lai, K., & Samers, M. (2021). Towards an Economic Geography of FinTech. *Progress in Human Geography, 45*(4), 720-739. Retrieved from https://durham-repository.worktribe.com/OutputFile/1267050

Laidroo, L., Koroleva, E., Kliber, A., Rupeika-Apoga, R., & Grigaliūnienė, Ž. (2021). Business Models of FinTechs — Difference in Similarity? *Electronic Commerce Research and Applications, 46*, 101034. Retrieved from https://dspace.lu.lv/bitstreams/96d025e0-e3e9-4680-8058-66a2b3a42510/download

Langley, P., & Leyshon, A. (2021). The Platform Political Economy of FinTech: Reintermediation, Consolidation and Capitalisation. *New Political Economy, 26*(3), 376-388. Retrieved from https://www.researchgate.net/profile/Paul-Langley-2/publication/341523948_The_Platform_Political_Economy_of_FinTech_Reintermediation_Consolidation_and_Capitalisation/links/5f293401458515b729008539/The-Platform-Political-Economy-of-FinTech-Reintermediation

Lee, I., & Shin, Y. J. (2018). FinTech: Ecosystem, Business Models, Investment Decisions, and Challenges. *Business Horizons, 61*(1), 35-46. Retrieved from https://de.scribd.com/document/548465369/E10696-IranArze

Leong, K., & Sung, A. (2018). FinTech (Financial Technology): What is It and How to Use Technologies to Create Business Value in FinTech Way? *International Journal of Innovation, Management and Technology, 9*(2), 74-78. Retrieved from https://www.ijimt.org/vol9/791-M775.pdf

Lessambo, F. I. (2023). *FinTech Regulation and Supervision Challenges within the Banking Industry: A Comparative Study within the G-20.* Palgrave Macmillan.

McKinsey. (2026). *The Next Age of FinTech: AI, Digital Assets, and New Paths to Success.* McKinsey & Company. Retrieved from https://www.mckinsey.com/industries/financial-services/our-insights/the-next-age-of-fintech-ai-digital-assets-and-new-paths-to-success

Mills, S., & Wardle, M. (2024). *An Enabling Regulatory Framework for Innovation, Web3, and FinTech.* London / Hong Kong: Z/Yen Group; Hong Kong Financial Services Development Council. Retrieved from https://www.longfinance.net/documents/3930/An_Enabling_Regulatory_Framework_For_Innovation_Web3_FinTech_2024.10.23_v1.0.pdf

Murinde, V., Rizopoulos, E., & Zachariadis, M. (2022). The Impact of the FinTech Revolution on the Future of Banking: Opportunities and Risks. *International Review of Financial Analysis, 81*, 102103. Retrieved from https://www.sciencedirect.com/science/article/pii/S1057521922000734/pdfft

Muthukannan, P., Tan, B., Gozman, D., & Johnson, L. (2020). The Emergence of a FinTech Ecosystem: A Case Study of the Vizag FinTech Valley in India. *Information & Management, 57*(8), 103385. Retrieved from https://www.academia.edu/download/113978548/j.im.2020.10338520240430-1-xzl3dv.pdf

OECD. (2024). *Open Finance and Open Banking in Sub-Saharan Africa.* Paris: OECD Publishing. Retrieved from https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/digital-finance/Open-Finance-in-Africa-and-Open%20Banking-in-sub-Saharan-Africa.pdf

Plaitakis, A., & Staschen, S. (2020). *Open Banking: How to Design for Financial Inclusion.* Washington, D.C.: CGAP (Consultative Group to Assist the Poor). Retrieved from https://documents1.worldbank.org/curated/en/351881625136775280/pdf/Open-Banking-How-to-Design-for-Financial-Inclusion.pdf

PwC India. (2018). *Measuring Innovation in FinTech.* Retrieved from https://www.pwc.in/industries/financial-services/fintech/fintech-insights/measuring-innovation.html

Restoy, F. (2021). *FinTech Regulation: How to Achieve a Level Playing Field.* Financial Stability Institute, Bank for International Settlements. Retrieved from https://www.bis.org/fsi/fsipapers17.pdf

Sahay, R., von Allmen, U., Lahreche, A., Khera, P., Ogawa, S., Bazarbash, M., & Beaton, K. (2020). *The Promise of FinTech: Financial Inclusion in the Post COVID-19 Era.* International Monetary Fund. Retrieved from https://www.imf.org/-/media/files/publications/dp/2020/english/pffiea.pdf

Schueffel, P. (2016). Taming the Beast: A Scientific Definition of FinTech. *Journal of Innovation Management, 4*(4), 32-54. Retrieved from https://www.researchgate.net/profile/Patrick-Schueffel/publication/331886527_Taming_the_Beast_A_Scientific_Definition_of_Fintech/links/5ca2eeab299bf1116956bf10/Taming-the-Beast-A-Scientific-Definition-of-Fintech.pdf

SFA. (2025). *Singapore FinTech Talent Report.* Singapore: Singapore FinTech Association. Retrieved from https://singaporefintech.org/wp-content/uploads/2025/11/SFA-Fintech-Talent-Report-2025-3.pdf

Sinai Lab, ZIBS, IDR, ZAIF, FIRST. (2020). *Global FinTech Hub Report: When Thousands of Boats Compete to Sail, the Best Built Wins.* Beijing: Sinai Lab from Academy of Internet Finance; Zhejiang University International Business School; Institute of Data & Risk, Zhejiang University;

Zhejiang Association of Internet Finance; Beijing Frontier Institute of Regulation and Supervision Technology. Retrieved from http://www.aif.zju.edu.cn/en/upload/at/file/20200916/16002340155283449C7B.pdf

Sohns, F., & Wójcik, D. (2020). The Impact of Brexit on London's Entrepreneurial Ecosystem: The Case of the FinTech Industry. *Environment and Planning A, 52*(8), 1539-1559. Retrieved from https://journals.sagepub.com/doi/10.1177/0308518X20946334

Startup Genome. (2020). *Global FinTech Ecosystem Report.* Retrieved from https://startupgenome.com/report/global-fintech-ecosystem-report-2020

Startup Genome. (December 2022). *The Global Startup Ecosystem Report FinTech Edition.* Retrieved from https://startupgenome.com/insights/startup-genome-releases-the-global-startup-ecosystem-report-fintech-edition

Strategy&. (2024a). *Panorama do mercado de serviços financeiros: Volume 3 – Oportunidades de negócio em Open Finance no Brasil.* PwC Strategy& do Brasil. Retrieved from https://www.strategyand.pwc.com/br/pt/relatorios/Panorama-Servicos-Financeiros_Open-Finance-Brasil_PUB_Strategy_2024.pdf

Strategy&. (2024b). *Panorama do mercado de serviços financeiros: Volume 4 - Oportunidades com o Open Insurance no Brasil.* PwC Strategy& do Brasil. Retrieved from https://www.strategyand.pwc.com/br/pt/relatorios/tl-panorama-open-insurance_pub-strategy_2024.pdf

TFSA; Accenture; McMillan. (2017). *Seizing the Opportunity: Building the Toronto Region into a Global Fintech Leader.* Toronto: Toronto Financial Services Alliance.

Thakor, A. V. (2020). FinTech and Banking: What Do We Know? *Journal of Financial Intermediation, 41*. Retrieved from https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3429223_code17186.pdf?abstractid=3429223&mirid=1

United States. (2025). Guiding and Establishing National Innovation for U.S. Stablecoins (GENIUS) Act. *Public Law No. 119-27*. Retrieved from https://www.congress.gov/bill/119th-congress/senate-bill/1582/text

Vives, X. (2019). Digital Disruption in Banking. *Annual Review of Financial Economics, 11*, 243-272. Retrieved from https://blog.iese.edu/xvives/files/2020/01/Digital-Disruption-in-Banking_Nov.2019.pdf

Vučinić, M., & Luburić, R. (2022). FinTech, Risk-Based Thinking and Cyber Risk. *Journal of Central Banking Theory and Practice, 11*(2), 27-53. Retrieved from https://www.researchgate.net/publication/360294242_Fintech_Risk-Based_Thinking_and_Cyber_Risk/fulltext/626dd6100df856128f8bf765/Fintech-Risk-Based-Thinking-and-Cyber-Risk.pdf?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InB1YmxpY2F0aW9uIiwicGFnZSI6InB1YmxpY2F0aW9u

WEF & CCAF. (2025). *The Future of Global FinTech, Second Edition 2025.* World Economic Forum; Cambridge Centre for Alternative Finance. Retrieved from https://reports.weforum.org/docs/WEF_Future_of_Global_Fintech_Second_Edition_2025.pdf

Wójcik, D. (2021a). Financial Geography I: Exploring FinTech — Maps and Concepts. *Progress in Human Geography, 45*(3), 566-576. Retrieved from https://ora.ox.ac.uk/objects/uuid:82ee552a-f1a2-43f3-8702-8e9f135adc92/files/rgb19f628m

Wójcik, D. (2021b). Financial Geography II: The Impacts of FinTech — Financial Sector and Centres, Regulation and Stability, Inclusion and Governance. *Progress in Human Geography, 45*(4), 878-889. Retrieved from https://ora.ox.ac.uk/objects/uuid:8d347468-720a-42aa-8e61-c5e785fb4339/files/rh415p999s

World Bank & CCAF. (2019). *Regulating Alternative Finance: Results from a Global Regulator Survey.* Washington, D.C.: World Bank & Cambridge Centre for Alternative Finance, University of Cambridge. Retrieved from https://documents1.worldbank.org/curated/en/266801571428246032/pdf/Regulating-Alternative-Finance-Results-from-a-Global-Regulatory-Survey.pdf

World Bank & CCAF. (2022). *The 3rd Global FinTech Regulator Survey.* World Bank Group and Cambridge Centre for Alternative Finance, University of Cambridge. Retrieved from https://www.jbs.cam.ac.uk/wp-content/uploads/2022/11/2022-ccaf-third-global-fintech-regulator-survey.pdf

World Bank. (2023). *FinTech and the Future of Finance.* Washington, D.C. Retrieved from https://documents1.worldbank.org/curated/en/099735504212234006/pdf/P173006069 5b370090908c0bf80ed27eba6.pdf

Z/Yen. (2026). *Global Financial Center Index 39.* London. Retrieved from https://www.longfinance.net/media/documents/GFCI_39_Report_2026.03.26_v1.1.pdf

Zetzsche, D. A., Buckley, R. P., Arner, D. W., & Barberis, J. N. (2017). Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation. *Fordham Journal of Corporate & Financial Law, 23*, 31-103. Retrieved from https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3051540_code722134.pdf?abstractid=3018534&mirid=1

Ziegler, T., Shneor, R., Wenzlaff, K., & et.al. (2021). *The 2nd Global Alternative Finance Market Benchmarking Report.* Cambridge: Cambridge Centre for Alternative Finance, University of Cambridge. Retrieved from https://www.jbs.cam.ac.uk/wp-content/uploads/2021/06/ccaf-2021-06-report-2nd-global-alternative-finance-benchmarking-study-report.pdf