



Regulatory Shifts and Market Adoption in Embedded Fintech

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Received: 07-11-2025

Revised: 22-12-2025

Accepted: 15-01-2026

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ABSTRACT

Fintech has revolutionised the way financial services are delivered by bringing payments, lending, insurance, banking, investment and other financial services into non-financial digital services. Embedded fintech allows financial services to be integrated into ecommerce platforms, marketplaces, mobility apps, accounting software, social media, enterprise-resource-planning systems and other digital spaces — eliminating the need for consumers and businesses to engage with banks and financial institutions individually. This change has helped drive increased take-up in the market, while also bringing new consumer protection, data governance, cyber security, licensing, operational resilience, financial stability, competition and accountability concerns. The research design adopted was structured secondary-data research design which focused on the relationship between regulatory shift and market adoption of embedded fintechs. The data was gathered from regulatory publications, policy documents, institutional reports, peer-reviewed research, and documented developments in the key embedded-finance markets. The qualitative content analysis, regulatory thematic coding, comparative analysis and conceptual regression analysis was used to identify the main regulatory and market-adoption mechanisms. The results show that overall regulatory clarity, open-banking and data access regimes, digital payment systems, proportional licensing, consumer protection rules and technical interfaces have been supportive for embedded fintech. Regulatory fragmentation, uncertainty regarding liability, data-privacy restrictions lacking interoperable standards, cybersecurity concerns, and high compliance costs have held back adoption, by contrast. The study also shows that there is no blanket good or bad on the impact of regulation on embedded fintech. Whether its effect relies upon uncertainty being reduced with regulatory measures, whilst maintaining consumer trust and competitive access. The best market adoption environment is created when regulators adopt a technology-neutral approach to supervision and implement proportionate licensing, interoperable payment systems, consumer-controlled data sharing, risk-based compliance and a clear division of responsibilities between banks, fintech companies and non-financial players. The outcomes enhance the literature of the fintech and financial-services industry by shifting the focus from compliance constraints towards regulation as a determinant of embedded fintech adoption. The study argues for going beyond institution-based to activity-based and ecosystem-based supervision to support the sustainable development of embedded fintech.

Keywords: Fintech regulation, embedded fintech, embedded finance, market adoption, open banking, digital payments, financial innovation, regulatory technology, financial inclusion, platform economy

INTRODUCTION

Background of Study

Digital technologies have revolutionized the financial product and its distribution and consumption, changing the core of the financial-services industry. The earliest sign of fintech was a niche area of business where technology-based companies sought to find new ways to conduct payments, lending,



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investing, insurance, and financial management. The distinction between fintech and traditional financial services has become more blurred in recent years, as financial services are increasingly being embedded in non-financial digital platforms. The term "embedded fintech" or "embedded finance" is often used for this phenomenon. (Arner et al., 2016; Gomber et al., 2017).

Embedded finance is the inclusion of financial services in non-financial customer experiences, digital platforms, software and business-to-business transactions. A consumer using an e-commerce portal to buy products might make an embedded payment, check out with financing offered, book insurance during a booking process or use a digital wallet without the interaction with a traditional bank. Likewise, a small company that is utilizing accounting software or marketplace software might discover integrated working-capital loans, acceptance of payments, payroll or insurance within the exact same software. (Langley & Leyshon, 2025; Tuncer Çalışkan, 2025).

Embedded finance, according to recent academic research, is the technological embedding of money and financial services in social interaction and economic transactions carried out by non-financial companies (Langley & Leyshon, 2025). This shift rescues the model of financial-intermediation from its traditional starting point, which is a bank, to a non-financial platform such as the customer. Banks, payment institutions, fintech companies, technology providers, and platforms, then, do so in the context of interdependent ecosystems with multi-organizational responsibility for financial activity.

Embedded fintech has delivered lots of advantages. These range from convenience, lower transaction friction, better access to financial products, personalisation, lower distribution costs, quicker credit decisions and higher opportunities for financial inclusion. According to Financial Stability Board (FSB, 2017), fintech innovation can bring about some of the following benefits: increased efficiency, competition, transparency, resilience, financial inclusion, and economic growth. Meanwhile, the FSB noted that the rise in interconnectedness and new financial intermediation models can introduce institution-specific and systemic risks to the financial system as a whole in the context of fintech. (Financial Stability Board, 2017; Arner et al., 2016).

Embedded-fintech development has thus become a key driver of regulation. The traditional financial regulation had been largely developed for recognisable financial entities like banks, insurers, securities companies and payment institutions. The embedded fintech approach challenges this institutional method as one particular transaction can involve one or more of each of these entities: a technology platform, fintech intermediary, licensed financial institution, payment processor, data provider, cloud-service provider and the consumer. (Kwon & Ko, 2023; Buckley et al., 2021).

As a result the regulatory landscape has turned in a few crucial directions. Regulators have recently introduced open-banking and financial-data-access regimes, provided enhanced consumer-data rights, updated payment laws, tightened up digital-payment obligations, created fintech licensing schemes and set tougher requirements for cybersecurity and operational resilience. For instance, in the U.S., the Consumer Financial Protection Bureau (CFPB) published its Personal Financial Data Rights Rule in October 2024, which mandates that covered financial institutions share certain financial data with consumers and third parties under specific circumstances. (Aggarwal, 2025; Babina et al., 2025).

The European Union has also been looking at modernization in the form of proposals to amend the Payment Services Directive, a financial-data-access framework, and a Payment Services Regulation. Consumer control, competition, security, standardized interfaces and responsible access to financial



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information have been highlighted by the European Commission. (European Commission, 2023a, 2023b; Muthukannan, 2026).

But there are also important regulatory developments in emerging markets. The Securities and Exchange Commission of Pakistan, for instance, issued a circular to regulated entities to implement and showcase digital payment solutions such as Raast QR codes as part of the framework for creating a cashless digital-payment system in Pakistan. In the case of embedded fintech, such regulations fortify the infrastructure in which it operates.

Even so the academic literature is rather summited. Fintech adoption, digital payments, open banking, financial inclusion, platform economics and regulatory technology have been studied separately so far. There has been less research focus on the interaction between regulatory changes and the uptake of embedded-fintech in various institutional settings. (Tuncer Çalışkan, 2025; Muthukannan, 2026).

This study aims to fill this gap by exploring regulatory and market frameworks in which embedded fintech grows or is stunted. The study is focused specifically on five questions:

1. 1 What are some of the key regulatory changes in the embedded-fintech landscape?
2. What are the regulatory attributes that facilitate market entry?
3. What are the regulatory challenges for embedded-fintech?
4. What are the implications of consumer protection, data controls, payment systems, and licensing on adoption?
5. What is the appropriate regulatory framework to achieve an optimal balance between innovation, competition, financial inclusion and systemic robustness?

LITERATURE REVIEW

Concept of Embedded Fintech

Embedded fintech is a shift from standalone financial apps to financial functions that are seamlessly integrated into other digital experiences. Traditional fintech often requires the consumer to identify the financial provider, and then actively choose a financial service. Embedded fintech helps to diminish this separation by making the financial component a part of another commercial or social undertaking. (Gomber et al., 2017; Langley & Leyshon, 2025).

One of the most matured forms is embedded payments. Payment capabilities are built into e-commerce sites, ride-hailing apps, food delivery apps, markets, travel sites, and business-management software. Embedded lending takes this concept one step further by embedding credit into customer journeys. The other embedded services are embedded insurance, embedded investment, embedded banking and embedded payroll, where financial services are embedded in non-financial platforms. (Bugvi & Endress, 2023; Tuncer Çalışkan, 2025).



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According to Bugvi and Endress (2023), better user experiences are also key drivers for embedded-finance use. The embedded finance concept is becoming ubiquitous in payments, buy-now-pay-later, travel services and other digital transactions, they write.

The change is critical, as it shifts the source of customers. The bank had traditionally owned the customer relationship and financial products were traditionally distributed by the bank. With embedded finance, the platform could have the customer relationship while the bank/fintech are in the background supplying financial infrastructure. As specialized financial technology becomes part of our daily online lives, this is another step toward the growing invisibility of fintech, according to Langley and Leyshon (2025).

Theoretical Foundation

The research adopts four complementary theoretical frameworks, namely: the Technology Acceptance Model (TAM), Diffusion of Innovation Theory, Institutional Theory and platform/network theory. (Gomber et al., 2017; Vives, 2019).

Technology Acceptance Model

The TAM holds that the perceived usefulness and perceived ease of use affect technology acceptance (Davis, 1989). Embedded fintech hits the nail on the head by having one of its primary consumer propositions as convenience. If every aspect of payment, financing, insurance or other financial services are part of the same digital journey, then users have fewer steps to take and lower cognitive costs.

Perceived usefulness and trust is indirectly enhanced by regulatory clarity. Consumers are more likely to use an embedded financial product if the service “looks” secure, reliable, transparent, and legally protected. (Briones de Araluze & Cassinello Plaza, 2023; Ryu, 2018).

Diffusion of Innovation Theory

The characteristics that affect innovation adoption are identified by Rogers (2003) as relative advantage, compatibility, complexity, trialability and observability. The relative advantage of embedded fintech is evident because it mitigates transaction friction. It is also highly compatible, as financial functions are integrated into platforms which are used by consumers.

But uncertainty about regulation can complicate things up. A lack of consumer confidence in who has their money, who is offering credit, who is handling complaints, and who may be at fault in case of a data breach, can hinder adoption. (Briones de Araluze & Cassinello Plaza, 2023; Ryu, 2018).

Institutional Theory

Institutional theory focuses on the importance of formal rules, norms, and regulatory institutions on the behavior of organizations (Scott, 2014). The fintech market is particularly well-suited to illustrate the point, as licensing policies, payment legislation, data-protection laws, consumer-protection laws and supervisory expectations are all directly affecting the market. (Arner et al., 2019; Kwon & Ko, 2023).



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Regulation is thus more than just a limitation. It provides institutional credibility and sets the terrain for firms' investments in new business models.

Platform and Network Theory.

Multi-sided platforms are what embedded fintech does; they bring together consumers, merchants, financial institutions, technology providers and more. The more other users and providers join the ecosystem, the more its value is added by network effects. (Muthukannan, 2026; Langley & Leyshon, 2025).

Concentration can also develop due to network effects, however. Langley and Leyshon (2025) suggest that embedded finance can give power to the big tech firms and lead to monopolisation. (Muthukannan, 2026; Vives, 2019).

Regulatory changes in Embedded Fintech.

From Institution based to activity based regulation

One of the most important regulatory changes is the shifting of the focus from institution-based to activity-based regulation. Traditional regulation was largely based on the question of whether an organization is a bank, insurer, payment institution or securities firm. Embedded fintech necessitates regulators to wonder what is occurring, irrespective of the entity that is doing it.

For instance, a non-financial platform might not be a bank, but provide a banking-like customer experience via a licensed banking partner. Likewise, a tech company can also provide credit without advertising itself as a lender.

This raises regulatory issues around licensing, disclosure, liability, capital requirements, consumer protection and supervision.

Consumer protection, platform concentration, embedded lending, embedded payments, and the lack of existing regulatory frameworks are all issues Kwon and Ko (2023) cite as examples of the challenges embedded finance faces.

Open Banking and Financial Data Access

Data access has emerged as a key regulatory cornerstone for embedded fintech. Financial services rely more and more on instant access to transaction histories, account information, payment information and other financial data.

The 2024 Personal Financial Data Rights Rule by the CFPB sets standards for covered lenders and other financial institutions to make specific types of financial information accessible to consumers and to permit third parties to access that information while simultaneously mandating privacy, security, and data use obligations.



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The regulation is especially applicable to embedded fintech because data portability means the platforms and fintech companies can develop services using financial data without needing to use traditional, bank-controlled interfaces.

But U.S. regulatory conditions also illustrate that regulatory environments can be volatile. In 2026, a court had blocked compliance dates for the Personal Financial Data Rights Rule, and the CFPB was reviewing parts of the rule, it reported. This illustrates that the regulatory environment can be a key variable of risks to fintech investment and adoption.

European Payment Regulation

The European Union has been working on the modernization of payment law with proposals featuring the Payment Services Regulation and PSD3. The package will enhance the security of electronic payment, consumer protection, competition and cross-border payment services with the European Commission.

The framework for financial data access in the EU also aims to introduce uniformity in technical interfaces, data rights and responsibilities, and a greater degree of control for the data user.

The benefits of these reforms are particularly relevant in the embedded fintech space as they help eliminate technological fragmentation and streamline connectivity between platforms and financial-service providers.

Digital Payment Regulation in Emerging Markets

Digital payments are seen by emerging markets as a vital national asset. Regulatory involvement has thus evolved from regulating financial institutions to fostering digital-payment ecosystems.

One example would be Pakistan. The SECP instructed regulated entities to roll out and showcase digital-payment solutions, especially the Raast QR, at business outlets. Regulatory requirements provide for more infrastructure for digital payments and thus more room for the development of embedded payment solutions.

The implication in the latter part is significant: in addition to embedding fintech via permissions, embedded fintech can be fostered also through infrastructure-building and via market-standardization.

RESEARCH METHODOLOGY

Research Design

The study was conducted using a secondary research design approach with a qualitative approach that was oriented to the structure. The study used a quantitative oriented secondary research design with a qualitative approach supporting the structure, namely a structured regulatory analysis. Information was gathered from regulatory sources, international forums, academic research, and market observations. The primary sources comprised publications of the Financial Stability Board, Consumer Financial Protection Bureau, European Commission, Securities and Exchange Commission of Pakistan and peer-reviewed academic research.



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The research was concentrated on the following four dimensions:

- regulatory clarity;
- data-access and interoperability;
- consumer-protection requirements; and
- market-adoption conditions.

Embedded-fintech adoption was the dependent phenomenon and regulatory characteristics were the explanatory factors for the analysis.

Data Collection

The research was conducted using structured analysis of regulatory and academic literature on embedded finance, fintech adoption, digital payments, open banking, consumer financial data and platform-based financial services.

The following criteria were used to include subjects:

1. they discussed fintech, embedded finance, digital payments, open banking, financial-data access, or fintech regulation; or 2. they discussed more than one of these topics;
2. source provided identifiable regulatory, institutional, market or adoption information; and
3. the source is from a peer-reviewed regulatory body, international body, academic publisher or reputable research source; and
4. the information was relevant to the relationship between regulation and embedded-fintech adoption.

The regulatory developments were specifically selected as they are the current regulatory developments in the embedded-fintech environment, which is quickly evolving.

Variables

The conceptual empirical model contained the following variables:

- Dependent variable
- Incorporated Fintech Market Adoption (EFMA)
- Independent variables
- Regulatory Clarity (RC)
- Create and share data in an open way.



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A government initiative to promote electronic payments. A government initiative to encourage electronic payments.

- Consumer Protection (CP)
- Licensing Proportionality (LP)
- Moderating variables
- Cybersecurity Environment (CE)
- Market Competition (MC)

The relationship of concepts was expressed as:

$$EFMA = \beta_0 + \beta_1 RC + \beta_2 ODA + \beta_3 DPI + \beta_4 CP + \beta_5 LP + \beta_6 CE + \beta_7 MC + \varepsilon$$

which is the embedded-fintech market adoption rate (EFMA) plus the unexplained component (ε).

Data Analysis Techniques

Four complementary techniques were used in the analysis.

A descriptive analysis was conducted to identify dominant regulatory characteristics, as follows:

Second, we applied thematic content analysis to identify whether regulatory trends could be grouped into any common themes, such as licensing, access to data, payments, consumer protection, cybersecurity, competition, and financial stability.

Third, comparative regulatory analysis was employed to perform a comparative analysis of the regulatory paths of the key markets.

Third, a conceptual multivariate regression model was developed to help interpret the direction of the relationships between regulatory conditions and market adoption. The regression model was not used as a proof of the statistical relationship that is not possible without a reproducible numerical dataset.

This is significant for academic honesty: The present paper does not report fabricated observations from the survey as evidence collected in the field. It is based on the secondary evidence documented and systematically analysed in the context of regulatory developments, leading to the following empirical findings.

DATA ANALYSIS

Regulatory Theme Analysis

The analysis identified seven dominant regulatory themes.



Regulatory dimension	Effect on embedded fintech adoption	Main mechanism
Regulatory clarity	Positive	Reduces uncertainty
Open financial-data access	Positive	Enables innovation and interoperability
Digital-payment infrastructure	Strongly positive	Expands transaction capability
Consumer protection	Positive when proportionate	Increases trust
Proportional licensing	Positive	Reduces entry barriers
Excessive regulatory fragmentation	Negative	Raises compliance costs
Cybersecurity and privacy uncertainty	Negative	Reduces consumer and institutional confidence

The results indicate that regulation has a nonlinear relationship with adoption. Basic regulatory clarity supports adoption, while excessive complexity constrains it.

Regulatory Clarity

One of the biggest adoption-enabling mechanisms was regulatory clarity. To invest heavily in embedded financial products, firms need to have clear guidelines on issues of liability, payment processing, disclosure to consumers, data sharing, outsourcing, and licensing.

This is also reflected in the literature on emerging economies in which regulatory uncertainty and fragmented governance are also deemed as significant challenges to the adoption of embedded-finance (Al-Dasuqi, 2026).

The analysis suggests that there are three direct implications of regulatory uncertainty. The first is that it makes it more expensive to comply. Second, it slows down the product launch. Third, it deters investment in uncertainly regulated technology.

Thus, regulatory clarity and adoption are positively related.



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Open Data Access

There was a positive correlation between open data access and embedded-fintech adoption as well. Availability plays a crucial role in embedded financial services due to the need for real-time information in credit scoring, financial management, personalization, payment authorizations, and financial recommendations.

The CFPB's framework highlights the worth of consumer-sponsored monetary information transportability. The rule calls for specifying financial information to be made available to consumers and authorized third parties under certain conditions for covered data providers.

The European Commission has taken a similar approach, focusing on harmonised access to data, consumer control and safe technical interfaces.

The analysis therefore suggests that open data regulation is more than a issue on privacy. This is also a mechanism for market development.

Digital Payment Infrastructure

The embedded-fintech relationship had the highest positive association with digital-payment infrastructure.

Without a reliable payment rails, embedded finance cannot scale. Real-time payment infrastructure reduces transaction costs and enables platforms to incorporate payments directly into customer journeys.

The example of Pakistan's policy direction is one. The SECP's mandate on regulated entities to implement and display digital-payment solutions, such as Raast QR, illustrates how regulation plays a part in advancing the digital-payment landscape.

Payment infrastructure can be viewed as a lower layer of infrastructure to support embedded fintech. Even if consumers may be interested in paying with embedded payments, it's not going to become commonplace in a country with weak digital payment infrastructure.

Consumer Protection

The relationship between consumer protection and adoption was found to be positive but more complicated.

As a basic rule, improved consumer protection leads to more consumer trust. Embedded financial services are more likely to be embraced by users if there is transparency regarding fees, risk, data handling, dispute-resolution options and provider responsibilities.



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But poorly conceived regulation can make things more expensive and stifle innovation. For instance, consistent compliance rules for a large bank and a small technology intermediary may be disproportionate for smaller companies.

The financial-data rule illustrates the CFPB's efforts to strike a balance between access and consumer protection by restricting the purposes for which data can be used and providing requirements for security and privacy.

This finding is consistent with a proportional consumer-protection hypothesis: regulations that foster trust but don't impose undue transaction costs promote adoption.

Licensing Proportionality

The other important determinant was licensing.

Embedded fintech often is a multiplayer affair. The product can be marketed by a non-financial platform, the technology can be supplied by a fintech and the customer funds can be kept by a bank or the credit can be granted by a bank. Having to get the same regulatory authorization for everyone can be unnecessary.

A better way would be to divide and assign responsibility based on risk and activity.

This is in line with the regulatory scholarship that suggests proportionate regulation of embedded payments, embedded lending, BNPL, and financial intermediation (Kwon & Ko, 2023).

Cybersecurity and Data Privacy

Cybersecurity was determined to be both a regulatory requirement and a determinant of adoption.

Embedded finance is an increase of financial transaction participants. This makes it easier for there to be a number of weak points. Customers may be impacted by a security event occurring on a platform, even if the financial institution itself is not impacted.

CFPB's structure centers on the availability of secure and reliable data and third party obligations to access financial information.

Regulation that engenders trust, as seen in the analysis, facilitates adoption of cybersecurity. But the lack of clarity of compliance requirements can lower market entry and experimentation.

Comparative Regulatory Analysis

United States

The U.S. regulatory system is moving significantly toward consumer-controlled financial data. The CFPB Personal Financial Data Rights Rule of 2024 was a significant regulatory milestone on the path to open banking.



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But later remediation and litigations shows that the big changes in regulations can have an unstable effect. The CFPB said as of January 2026 compliance dates had been stayed and reconsideration of the rule was underway.

The U.S. situation is thus a case in point of the opportunity and the risk of regulatory change.

European Union

The EU has put in place a more extensive policy framework on payment modernization and financial-data access. It has a competitive, consumer protection, data rights, security and interoperability approach.

This generates a fairly complete institutional structure for the development of embedded finance.

Pakistan and Emerging Markets

In the case of emerging economies a different challenge emerges. If they are not a victim of too much fintech saturation, it is most likely low financial inclusion, cash reliance, infrastructure, and low digital trust.

Digital payments show how regulators can proactively nurture market infrastructure: the development of Raast and regulatory promotion of digital payments.

The recent research of emerging economies reveals that embedded finance adoption faces significant challenges, including regulatory fragmentation, data-protection regulations, cross-border compliance, weak infrastructure, financial literacy, and the coordination of the financial ecosystem (Al-Dasuqi, 2026).

So there must be a balance between the creation of a market and risk management in emerging-market regulation.

RESULTS

The research yielded six main findings.

Regulatory clarity is a prerequisite for the adoption of embedded-fintech. Result 1: Regulatory clarity enables the adoption of embedded-fintech.

The analysis showed that regulatory certainty has a positive association with market adoption. Licensing requirements, responsibilities, supervisory expectations and compliance levels are clear, strengthening investment predictability and reducing uncertainty.

Result 2: Open financial-data frameworks encourage innovation

Data-access regulation will allow for the embedded fintech development of services based on consumer-controlled financial data. The example of the U.S. and EU developments highlights the need for data portability and for standard interfaces.



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Result 3: Adoption Factor 1 is Digital-payment infrastructure

Interoperability of digital-payment systems opens up many more opportunities for embedded fintech. Therefore, the regulatory support for digital payment infrastructure has impacts beyond just adoption of digital payments.

Result 4: Proportionate regulation of consumer protection leads to greater trust.

Consumer protection increases consumer trust, transparency, security, and dispute resolution, which factors are identified as important to adoption in the analysis. But the disproportionate compliance requirements make the market-entry too high.

Result 5: Regulatory fragmentation limits cross-border expansion.

Platforms that are embedded in fintech often span multiple jurisdictions. Variations in licensing requirements, consumer protection requirements, data needs and payment requirements drive up compliance costs.

This issue is especially important for platforms looking to expand to emerging markets.

Result 6: Financial responsibility moves with embedded fintech

The analysis suggests a shift in responsibility from institutional towards ecosystem-based responsibility. There may be more than one organization involved in a financial transaction, and responsibilities must be assigned based on the operational control and risk of that transaction.

The result is significant as it contradicts the traditional assumption that the financial provider and the customer are directly linked.

DISCUSSION

The research results validate that embedded fintech is not just about technology. It is an institutional change in the financial intermediation process.

Traditional financial services are typically provider-based and provider oriented:

Financial Institution → Financial Product → Consumer.

The embedded fintech model is a new model that can be applied in the financial sector.

Platform → Technology Provider → Financial Institution → Embedded Product → Consumer

In reality, these interactions could simultaneously take place, creating a web of interdependent relationships.

The change has a number of implications.



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First of all, customer ownership is shifting from banking institutions to platforms. Platforms have transaction histories, behavior, buying trends, and customer relationships. Financial institutions can offer the regulated financial infrastructure but don't have as much direct influence over the customer experience.

Second, competition changes. Before selecting a financial product, a consumer can no longer compare banks. Rather, the monetary service is picked out automatically or shown at the point at which the consumer needs it.

Third, financial products become more and more invisible. This is referred to as "the death of fintech" by Langley and Leyshon (2025).

Fourth, the focus of regulation should be on the platform and not only the financial institution.

The findings also confirm the hypothesis that regulation can serve as an innovation infrastructure. The technical and institutional bedrock of embedded-fintech markets is provided by open banking principles, common APIs, payment systems, digital identity, and consumer-data rights. This is clearly illustrated in the European Commission's financial-data-access framework. The approach it proposes is consumer control, standardization, secure interfaces and competition. Meanwhile, the study reinforces the fact that regulation can have a ripple effect. Any unnecessary or excessive regulatory complexity could prove a disincentive for smaller fintech organizations, and help to consolidate market influence from large platforms and banks. It's important to note that embedded fintech already has significant network effects.

The best regulatory policy is, therefore, neither deregulation nor maximum regulation. However, the evidence corroborates proportionate ecosystem regulation, not proportionality.

Theoretical Implications

The research makes a contribution to the fintech literature in four ways.

Firstly, it builds on the Technology Acceptance Model by showing that perceived usefulness and ease of use exist in a wider institution. Regulation affects trust, security, availability and perceived risk.

Second, it builds on Diffusion of Innovation Theory by adding perceived complexity as an institutional factor.

Third, it builds on Institutional Theory by revealing that regulation can provide an enabling infrastructure as well as a constraint.

Fourth, it adds to platform theory by revealing that embedded finance elevates non-financial platforms to the financial system.

The results thus support the following integrated model:

The sequence of the following steps is what it looks like: Regulatory Environment, Institutional Trust, Platform Capability, Consumer Value, Embedded-Fintech Adoption.



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The relationship is supported by interoperability of payment systems and open data frameworks, and hindered by regulatory fragmentation and high compliance costs.

Managerial Implications

The findings have several implications for banks, fintech companies, tech platforms and regulators.

Banks

The banks to redefine themselves as financial infrastructure providers and customer facing institutions. Strategically important features include APIs, banking-as-a-service functionality, real-time payments, data integration, and partnership-management features.

Fintech Firms

From the onset, regulatory compliance must be embedded in the product design of fintech companies. Compliance has to be part of the business, because embedded-finance products run through a range of organizations.

Non-Financial Platforms

Platforms new to financial services should be aware of the growing linkage between customer experience and financial responsibility. The financial provider's identity, fees, risk and complaints procedures must be clearly disclosed.

Regulators

There is a need for risk and activity based frameworks. The responsibilities of regulation should match the financial role played not just the legal entity of the organisation.

Policy Recommendations

Recommendation 2: Implement new policies and procedures to lower the costs of installing retrofits

The classification of financial activities by the economic function of the activity should not only be based on the organizational classification.

Recommendation 3: Integrate data and information from multiple sources and ensure it is accessible for use.

Recommendation 4: Develop consistent API and data-access structures.

Standardized interfaces eliminate technological fragmentation and promote competition. A policy direction relevant to the EU is to standardise financial-data interfaces.

Proposal 3: Adopt proportional licensing.



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Small techs shouldn't be held to the same regulatory standards as systemically important financial institutions. Requirements should be commensurate with risk.

Recommendation 4 is to ensure that the platform is clearly defined for the responsibility.

Bank, FinTech, technology and platform responsibilities should be clearly defined by regulators.

Recommendation 5: Enhance consumer financial-data rights

Consumers need to have some control over their financial data. Data access should be voluntary, limited in scope, protected and revoked.

Recommendation 6: Create a national payment system that is interoperable.

There should be access to real-time payment infrastructure for banks and non-banks in a transparent manner.

Recommendation 7: Enhance supervision of cybersecurity.

Common security standards, incident reporting, third-party risk management and operational-resilience requirements are key elements of embedded-finance ecosystems.

Recommendation 8: Synchronise trans-border regulation

Digital platforms are borderless and there is a need for international coordination.

STUDY LIMITATIONS

There are some limitations of the study.

The first being that embedded finance is a dynamic space and regulatory rules are constantly evolving. The results are thus a snapshot of the regulatory context studied during the study period, and not a permanent state of regulatory equilibrium.

Second, the research is based on secondary regulatory and academic evidence, rather than a survey of consumers across the country.

Third, embedded-fintech is challenging to measure, since there are a lot of financial services that are not necessarily separately identified in official statistics.

In the fourth, the regulatory comparison is based on institutional difference, economic development, digital infrastructure, financial literacy, and consumer behavior. These variations make comparison of simple cross-country comparisons difficult.

Panel data for the firm or country level should be used to further investigate the causal relationship between regulatory reforms and embedded-fintech adoption in future empirical studies.

CONCLUSION



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Embedded fintech is a paradigm shift in the way financial services are structured and provided. Financial products are increasingly becoming a part of the day-to-day digital lives. Financial functions are increasingly coupled with e-commerce, mobility, social media, accounting, marketplace and enterprise applications, including payments, lending, insurance, banking/finance and investments.

The study confirmed that a key factor in this change is regulatory change. There is overall regulatory clarity and access to financial data, digital-payment infrastructure, proportional licensing, consumer protection, and interoperability in general that facilitate market adoption. On the other hand, inadequate regulation, unclear liability, onerous compliance demands, vulnerabilities to cyber attacks, and variable cross-border demands inhibit adoption.

The results prove the point that regulation is not solely an impediment to the development of fintech innovation. Sustainable adoption needs adequate regulation that sets the institutional framework. Consumer-data rights encourage trust and competition. The standardized interfaces enhance the interoperability. Digital-payment system enhances market possibilities. Proportional licensing reduces needless restrictions. Consumer-protection standards boost confidence.

Meanwhile, embedded fintech poses novel risks as well. Financial services increasingly are provided on platforms that are not traditionally understood as financial institutions. This poses problems of responsibility, consumer protection, data management, operational resilience, market concentration and systemic risk.

A 'whole-of-ecosystem' regulatory approach is thus the most appropriate. Regulators should monitor financial activity on a global basis; assign responsibilities based on operational control and risks; balance consumer protection with innovation without preventing it; and promote competitiveness and interoperability of financial-data and payment infrastructures.

The proper balance between innovation and institutional trust will go a long way toward determining the future of embedded fintech. Financial technology is introduced into markets when it offers a clear and consistent benefit, convenience, security and reliability to them. Those conditions are determined by regulation and whether they exist at scale. In sum, the idea of a sustainable growth of embedded fintech should not be interpreted as a dichotomy between innovation and regulation, but as a process where sustainable regulation is the pre-condition for market uptake.

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