



FINTECH

NOTES

The Impact of Central Bank Digital Currency on Payments Competition

Edona Reshidi, Marco Reuter, and Manisha Patel

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Prepared by Edona Reshidi, Marco Reuter, and Manisha Patel

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Acronyms/Glossary

Acquirer	Bank processing merchant card payments
AML	Anti Money Laundering
API	Application programming interface
BIS	Bank for International Settlements
CBDC	Central bank digital currency
CFT	Combatting the Financing of Terrorism
DCash	Eastern Caribbean Central Bank Digital Currency
e-CNY	China's Central Bank Digital Currency (pilot)
eNaira	Nigeria's Central Bank Digital Currency
FedNow	Federal Reserve's fast payment system
FPS	Fast payment system
Issuer	Bank issuing payment cards and authorizing transactions
KYC	Know Your Customer
MDR	Merchant Discount Rate
NAPAS FastFund 247	Vietnam's fast payment system
Pix	Brazil's fast payment system
QR	Quick Response
U.K.	United Kingdom
U.S.	United States
UPI	Unified Payment Interface (India's fast payment system)

Introduction

Central banks are actively exploring or piloting retail central bank digital currencies (CBDCs) and asking whether they could help improve competition in concentrated payment markets. Several jurisdictions have launched or piloted retail CBDCs.¹ This growing interest reflects a range of policy objectives, such as improving payment system efficiency, promoting financial inclusion, supporting monetary sovereignty, and adapting to declining cash use. Policymakers have increasingly been considering a relatively unexplored dimension: could CBDC help remedy the lack of competition when domestic payment markets are heavily concentrated? For instance, the European Central Bank, the Sveriges Riksbank, Bank of Canada, Bank of England, and Bank of Israel have expressed the desire to increase competition in payments by issuing a CBDC.² Even in cases where this is not the motivation, CBDC could have an impact on competition and payment market dynamics.

Payment markets are shaped by powerful network effects and platform dynamics that can naturally lead to concentration, sometimes inhibiting competition and contestability. Payments are a two-sided market connecting payers and payees and exhibit strong network effects.³ The value of a payment platform to any one user rises with the number of other users on the platform—a dynamic that tends to favor a few large platforms, such as card networks or e-money providers. These network externalities, combined with economies of scale and the accumulation of proprietary user data, can make payment systems prone to concentration. In some countries, a handful of providers have attained dominant market positions, resulting in significant market power. For instance, the U.K. Payment System Regulator has warned of an emerging long-term risk to competition in retail payments because of high market concentration and significant barriers for new entrants (U.K. Payment Systems Regulator 2022).⁴ This complex market structure means that introducing a CBDC could have significant competitive implications, positive or negative, depending on its adoption, design, and integration.

This Note provides an analytical framework and practical guidance to examine the potential impact of CBDC on competition. This Note does not opine on whether countries should issue CBDC—a jurisdiction-specific decision that requires careful examination of multiple factors. Instead, it provides a framework intended to help policymakers take stock of the existing payment landscape and analyze how CBDC could affect competition in the market for payments. Further questions are explored in other chapters of the [IMF's CBDC virtual handbook](#).

Although CBDC could affect competition in retail payments, other policies exist to improve efficiency in the payment market. Competition authorities and regulators in many countries have taken actions to mitigate anticompetitive behavior in payment markets. One of the most common interventions has focused on

¹ According to a recent Bank for International Settlements (BIS) survey, over 90 percent of surveyed central banks are engaged in some form of CBDC work, with more than half involved in experiments or pilot projects (Illes, Kosse and Wierds 2025).

² See, for instance, Cipollone (2024), Lane (2024), Bank of England (2025), and Usher and others (2020).

³ For more on two-sided markets, see Rochet and Tirole (2006), Armstrong (2006).

⁴ Furthermore, although Big Tech entry has the potential to deliver short-term consumer benefits, over the long term such gains risk being eroded if firms exploit entrenched market power to the detriment of competition. For more, see U.K. Financial Conduct Authority (2022).

capping fees.⁵ Further, some countries have introduced public fast payment systems (FPS) to provide a low-cost alternative to private payment platforms.⁶ Authorities weighing a CBDC against a public FPS may refer to comparative analyses elsewhere (see Patel, Kasiyanto, and Reslow 2024, for instance). In practice, CBDC and FPS could offer complementary benefits. This Note does not take a stand on which policies could or should be pursued. It supposes that authorities have chosen to pursue CBDC, for instance because other reforms have fallen short or market failures persist, and offers a framework to gauge the implications that CBDC could have on competition.⁷

The competitive impact of CBDC depends on the existing payments and regulatory landscape in a country, and on how CBDC is designed. This Note explores how CBDC could interact with existing private payment infrastructures, including card networks, and e-money platforms as well as public infrastructures such as public FPS. This framework addresses two core questions: (1) What is the expected competitive impact of CBDC on payment markets, depending on the existing payment landscape and regulatory context? (2) How can CBDC be designed to enhance competitive effects and mitigate related risks, and which design choices might undermine these goals?

The Note highlights that CBDC has the potential to enhance competition in retail payments, particularly in countries with unregulated payment markets that are dominated by few large payment platforms. By contrast, countries with well-functioning public FPS are unlikely to see significant improvements in competition because of CBDC.⁸ If introduced, CBDC can serve as both a new platform infrastructure and a payment method, with the potential to influence competition across the entire retail payment chain. It can do so through four key channels: pricing discipline, quality improvements, increased contestability, and broader financial access. CBDC has the potential to offer the greatest competitive benefits in markets where dominant private platforms have emerged, and regulatory oversight is limited or ineffective. In these settings, CBDC could reduce fees, improve access, and increase contestability. In more regulated markets or those with strong public infrastructure, the impact of CBDC might be more limited and should focus on addressing residual gaps such as broadening inclusion.

The competitive impact of CBDC will depend on the extent of its adoption, by both users and intermediaries. Adoption is driven by user trust, the relevance of features, and the incentives for intermediaries to participate (Koonprasert and others 2024). For CBDC to exert competitive pressure, it must be perceived as a viable alternative to existing payment options. This requires a careful understanding of why current methods are popular, for instance, credit card users may value bundled services such as credit and fraud protection, whereas cash users may prefer anonymity or informality. A CBDC that mirrors some of these features is more likely to gain adoption. However, full-scale adoption is not a prerequisite; just the possibility of users switching between payment methods has the potential to increase market competitiveness. Especially in markets with network effects dominated by private platforms, interoperability could play a key

⁵ For a recent stock take of public authority involvement in payment markets, especially in payment card markets, see Hayashi and others (2024).

⁶ Fast payment systems (FPS) that operate in the public interest is referred here, rather than engaging in profit-maximization, as public FPS. They do not necessarily have to be operated by the central bank, as different jurisdictions or other considerations may necessitate different legal constructs.

⁷ Although this Note focuses on retail CBDC, wholesale CBDC can also enhance efficiency and contestability across payment systems; its implications will be addressed in a separate forthcoming note.

⁸ Well-functioning public FPS offer efficient payments and a broad ecosystem offering attractive services.

role in reducing barriers to switching and coordination challenges, where new platforms struggle to attract users and merchants simultaneously.⁹ Interoperability can extend CBDC's effective reach, facilitate user choice, and pressure incumbents to compete on price and service quality.¹⁰

Finally, the Note outlines how the design of CBDC and its ecosystem directly shape its competitive impact and the associated trade-offs. Central banks should carefully define intermediary participation rules, fee structures, and interoperability standards to ensure that the CBDC ecosystem can foster competition. Without proper rules and design features, dominant incumbents may continue to exert market power or limit user switching, even within a CBDC framework. For example, if only existing incumbent intermediaries are permitted to operate in a CBDC system, or if they retain full control over CBDC's user pricing, they could continue to shape access and costs in ways that preserve their dominance—even within the new CBDC framework. Policymakers should also carefully balance the benefits of increased competitive pressure through CBDC with potential risks to the resilience and diversity of the payment market. Although CBDC can enhance competition, it may also crowd out private alternatives—particularly if it is priced too aggressively. For instance, if CBDC is made available for free to all users, private platforms may struggle to compete and exit the market.

This Note is structured as follows. Section I provides an overview of the structure of domestic retail payment markets, highlighting key participants, and market dynamics. Section II considers the role of CBDC in the payment market and introduces a conceptual framework to compare CBDC against existing systems. This section further identifies the main channels through which CBDC may affect competition. Section III presents a scenario-based analysis of how the impact of CBDC could vary across different payment infrastructures and regulatory settings. Section IV explores key CBDC design choices and assesses their competitive impact. Finally, Section V concludes this Note.

I. The Market for Domestic Retail Payments

Market Participants

The market for domestic retail payments is often highly complex and layered, but market participants can be divided into three groups: payment platforms, intermediaries, and end users. End users, such as consumers and merchants, are the ones that initiate and receive payments (Figure 1).¹¹ Intermediaries serve as the infrastructure layer between end users and payment platforms. These include consumer-facing

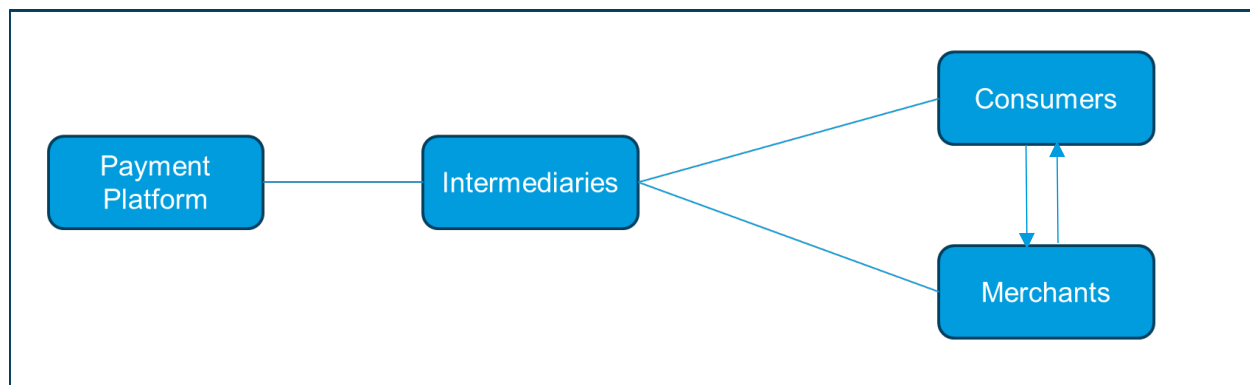
⁹ Ekmekci, White, and Wu (2025) show that in asymmetric platform markets, interoperability compels dominant firms to compete more aggressively by eroding their network advantage.

¹⁰ Interoperability between CBDC and existing payment platforms may be challenging because of technical or legal constraints as well as potentially high investment costs. In such cases, CBDC can still gain adoption through public sector use cases (for example, by paying salaries or government transfers using CBDC or enabling citizens to pay taxes with CBDC) that help create a critical mass of users.

¹¹ Consumers use payments to purchase goods and services from merchants, pay bills, or transfer money to other individuals (person-to-person payments); merchants use payments to receive customer transactions, manage payroll, or transact with other businesses; and government agencies participate as payers or recipients depending on the transaction.

institutions such as issuing banks, credit unions, and fintech firms (which provide payment methods such as cards or digital wallets, and services to complement payments), and merchant-facing institutions such as acquirers, which enable merchants to accept payments.¹² Payment platforms are at the top of the ecosystem. Established payment platforms such as Visa, Mastercard, and Big Tech firms, or public alternatives such as FPS, create networks that facilitate settlement across intermediaries, thereby shaping the competitive landscape.^{13,14}

Figure 1. Main Participants in the Payment Market



Source: Authors.

The defining characteristic of the payment market is that payment platforms connect two sides of end users, a structure that can foster concentration and market power. In these two-sided markets, platforms must attract both payers (typically consumers) and payees (typically merchants) to enable them to transact. The more users the platform can attract on each side of the market, the more attractive it becomes reinforcing network effects, as it can facilitate the transfer of funds and settlement of payments between an exponentially increasing number of parties. Decades of economic thought have outlined how this two-sidedness shapes competitive dynamics and can favor the emergence of dominant players with significant market power (see, for instance, Rochet and Tirole 2003, 2006; Armstrong 2006; Weyl 2010). Further, these insights have been reflected in competition law and enforcement, including antitrust cases involving major payment platforms, which resulted in significant settlements and fines, the largest of which exceeded U.S.\$ 5 billion.¹⁵

Payment platforms often operate under rules they set and enforce themselves, giving them significant control over access, pricing, and competitive behavior within their networks. These self-defined rules

¹² These intermediaries can be further segmented; for instance, in card networks, within the merchant payment space, acquirers, sub-acquirers, and independent sales operators each play distinct roles while managing significant fixed and variable costs.

¹³ These details may vary: some e-money networks (for example, Alipay, WeChat Pay) combine both platform and intermediary functions and are thus less layered, establishing a relatively direct relationship between the payment platform and end users. However, they often sell or facilitate the sale of other goods and services on their apps.

¹⁴ Other public platforms might include Automated Clearing Houses (ACH), Real-Time Gross Settlement (RTGS) services, and similar systems, which, depending on their design (for example, how long it takes to settle), could serve a subset of payments.

¹⁵ For details, see European Commission (2001, 2002, and 2007); and U.S. Supreme Court (2018) decisions, which resulted in significant settlements and fines, the largest of which exceeded U.S.\$ 5 billion.

typically extend across the entire payment chain, allowing platforms to determine the fees charged to intermediaries and to influence the fees intermediaries pay to each other—costs that are ultimately passed on to end users. For example, in card-based systems, payment platforms set interchange fees paid from acquirers to issuers, which form a major part of merchant costs. Platforms also frequently apply rules that limit how merchants respond to high costs, for instance by restricting surcharges; enforcing so-called “honor all cards rules”, which prevents merchants from only accepting cheaper cards, such as debit cards, while declining to accept credit cards; or disallowing payment method steering. Through this control over fee-setting and commercial terms, platforms shape market outcomes and create structural barriers to competition.

Although inefficiencies on the platform level tend to be most severe, inefficiencies along the payment chain could be further exacerbated by a concentrated intermediary sector that imposes multiple payment-related fees. In many countries, merchant-facing intermediaries—such as acquirers, who enable merchants to accept payments—tend to be more concentrated than consumer-facing intermediaries, such as issuers, who provide payment instruments like cards to consumers (Garcés and Lutes 2018). For instance, Canada’s acquiring market is highly concentrated: four acquirers process about 85 percent of card transactions (Welte and Molnar 2021). A similar structure exists in the United Kingdom. Recent findings by the U.K. Payment System Regulator show that small merchants often face opaque, bundled pricing and have not seen benefits from interchange fee caps as acquirers did not pass the savings on to the merchants (U.K. Payment Systems Regulator 2021). By contrast, competition on the consumer-facing side is typically stronger. In the United States and Australia, a diverse base of card issuers—including credit unions, regional banks, and fintech entrants—helps create competitive pressure. Yet, issuer competition may not always lead to reduced consumer fees, as there are often other market dynamics in play. Scheme fees fall largely on acquirers that often pass them on to merchants. Merchants, in turn, may pass these costs on to consumers, limiting the potential impact of issuer-side competition.

All in all, in payment markets, merchants typically face high fees, while consumers are not directly charged. However, market power can harm both sides as merchants may pass on fees to consumers. This pricing structure reflects the two-sided nature of payment platforms, where platforms subsidize the consumer side to attract usage and shift costs to the merchant side. As a result, although consumers do not pay fees upfront—and may even receive rewards for using certain payment methods—the true cost is often passed back to them indirectly. Merchants facing high payment fees commonly raise retail prices to maintain profit margins, meaning all consumers, including those who pay with cash, ultimately bear the cost (see, for instance, Rochet and Tirole 2006; Felt and others 2023).

Regulatory measures alone sometimes struggle to eliminate incumbent advantages or ensure competitive pricing, creating a role for CBDC as a complementary tool to enhance competition in the payment market. In many jurisdictions, regulators have been undertaking broader reforms and interventions—such as setting interchange fee caps, mandating open banking and even introducing FPS—to address structural issues in retail payment markets (see Box 1 for examples of existing interventions). Regulation can mitigate specific issues but leaves room for incumbents to engage in regulatory arbitrage. For example, capping interchange fees often prompts platforms to raise scheme fees or introduce new consumer charges. Moreover,

interchange fee caps cannot guarantee that intermediaries, in this case acquirers, will pass any cost reductions through to merchants.¹⁶

Box 1. Regulatory Interventions in Payment Markets

Regulatory approaches to improve competition in payments take several forms: Direct pricing regulation in the forms of caps, benchmark ranges could be applied; regulations or rules mandating participation to specific systems; and rules mandating interoperability with other systems and fee transparency. The last World Bank Global Payments Systems Survey (World Bank Group 2023) indicated that pricing regulation was an increasing consideration across central banks surveyed. This box considers examples of pricing regulation for different systems.

Card schemes face the most pricing regulation worldwide. A standard regulatory approach is to regulate the interchange fee or merchant discount rate (MDR) through caps or benchmark ranges. The cap/range may typically vary based on type of goods (such as grocery versus gas), mode (such as in person or e-commerce), and location (for instance, domestic or cross-border). Authorities enforcing the regulations could be the competition or antitrust regulator, a specific economic competition or payments competition regulator or the central bank itself. The Kansas City Federal Reserve's August 2024 update covers interventions in 43 countries and jurisdictions, of which 10 have imposed explicit caps on interchange fees—including Andorra, Argentina, Australia, Brazil, China, Costa Rica, Denmark, the European Union, the United States, and the United Kingdom—while the remaining 33 have employed other measures such as cost-based benchmarks, voluntary fee-reduction commitments, antitrust rulings, or enhanced transparency requirements (Hayashi and others 2024). The United Kingdom is an example of a highly regulated debit and card market with caps present on domestic interchange fees. Local regulators had been considering a further cap on the MDR—still under discussion. In Pakistan, the central bank capped interchange fee for domestic point of sale transactions at 0.2 percent for debit/prepaid cards and 0.7 percent for credit cards (State Bank of Pakistan 2023).

Many public FPS limit the fees charged to users or MDR. Brazil's Pix and India's Unified Payment Interface (UPI) are often showcased as classic examples raised for setting consumer fees at zero. However, both employ merchant fees in certain scenarios: in India, merchants accepting a prepaid instrument (for example, a digital wallet) face a 1.1 percent interface fee for transaction processing; in Brazil, merchants faced an average cost of 0.22 percent to use Pix (relative to 2.2 percent for credit cards, see for example, Duarte and others 2022).¹⁷ Such directions are given under the scheme rules and regulations, showcasing instances where central banks directly affect end user pricing. The Central Bank of Sri Lanka implemented new caps on transaction fees for users of the Common Exchange Funds Transfer System in March 2025, capping online digital transfer fees at 25 Sri Lankan Rupees per transaction (Central Bank of Sri Lanka, 2025). There is no regulation of fees for FPS in the United States. The Federal Reserve is unable to directly influence the costs incurred by end users engaging with FedNow.

E-money firms have faced looser pricing regulations to date but have come under recent scrutiny. During COVID-19, many African central banks such as the Central Bank of Kenya sought to temporarily waive consumer charges for low-value mobile money transfers (Njoroge 2022). This resulted in a boost to e-money use which has sustained even beyond the reintroduction of fees. The Central Bank of Nigeria implements some fee regulation on merchant payments (at 0.5 percent of the transactions value up to a maximum of 1,000 Nigerian Naira [U.S.\$ 0.65] (Central Bank of Nigeria 2019).

¹⁶ For instance, the interchange fee cap regulation in the European Union led to an increase in scheme fees and in acquirer margins. See European Commission (2020).

¹⁷ In recent years, the Reserve Bank of India and National Payments Corporation of India have reportedly considered a wider application of merchant fees to bigger merchants in general to ensure the long-term sustainability of UPI. See <https://www.reuters.com/world/india/indian-authorities-keen-charge-merchants-fees-bolster-homegrown-payments-network-2025-04-29/>.

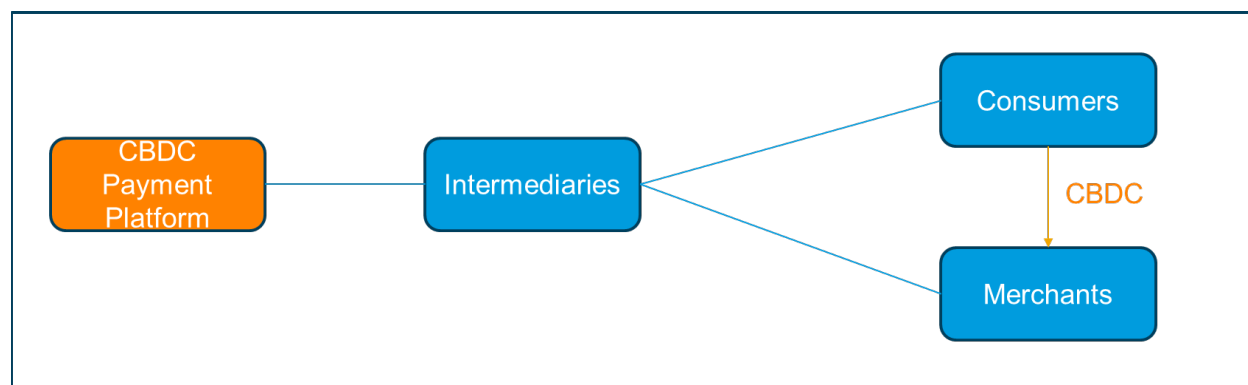
II. The Role and Competitive Impact of CBDC

This section first discusses the role of CBDC, then provides a framework for the analysis of the competitive impact of CBDC on the payment market.

The Role of CBDC in the Payment Market

CBDC fulfills a dual role in the payment market by providing both a new payment method and a new payment platform. Before assessing CBDC's competitive impact, its dual role in the payment market has to be considered (Figure 2). As a new payment method, CBDC represents an additional choice for end users when transacting. That is, it has to be compared against existing payment methods such as cards, cash, and e-money. As a payment platform, CBDC systems offer their own infrastructure through which payments are routed and ultimately settled. Thus, on the platform level, a CBDC system has to be compared against other payment platforms such as card networks and e-money platforms.

Figure 2. The Dual Role of CBDC in the Payment Market¹⁸



Source: Authors.

The role of CBDC as a payment platform is critical for competition, as its own set of rules dictate the different economic incentives along the value chain. CBDC platform rules, covering for instance the fees that will be charged, which intermediaries will be able to access the platform and under what conditions they will be able to do so, will influence existing pricing structures, business models, and the scope of participation in the CBDC ecosystem. By establishing transparent and nondiscriminatory rules, a CBDC platform can foster more competitive dynamics, directly or indirectly reduce prices charged by dominant players, and promote a more balanced distribution of value across the system. CBDC might address market failures across different layers of the payments chain. For instance, it could enhance competition at the platform layer by providing a competing payment platform or improve competition at the intermediary layer by creating a platform that fosters better competition among intermediaries by widening access, mandating

¹⁸ For considerations on the CBDC ecosystem, covering potential intermediaries and dynamics, see Koonprasert and others (2024).

interoperability, and establishing technological standards, such as standardized quick response (QR) codes for payments.

Enabling interoperability with existing closed-loop platforms could help achieve these outcomes by strengthening CBDC's competitive impact, particularly in markets where strong network effects give incumbents an advantage.¹⁹ If CBDC is seamlessly interoperable with existing payment platforms, CBDC users do not have to worry about the platform that the counterparty in the transaction is using and can rely on CBDC as a default possibility for payment. This helps overcome the coordination challenges that accompany strong network effects. These and other platform design levers and regulations—such as fee structures, bundling options, and legal-tender mandates—and their competitive implications are analyzed in more detail in section IV.

Framework

To assess CBDC's role in the payment market, a natural starting point is to compare the price and overall value it offers to end users relative to existing payment methods. When end users decide which payment method to use, they weigh the prices and overall value that the available choices offer (Figure 3). When CBDC is introduced, it not only adds a new option with a distinctive price and value, but also prompts incumbents to adjust or improve their offerings in response. In addition, new firms may enter the market and CBDC-based services may emerge, expanding the range of choices for end users.

The value that a payment method provides is driven by a wide range of characteristics encompassing acceptance, convenience, security, speed, and bundling, all of which drive demand. End users value many different characteristics, such as how widely the method is accepted for transactions, how convenient it is to use, how secure it is to use, how fast payment transactions are settled, and if it allows access to bundled products, such as credit. The value that CBDC provides depends on how it fares in all these categories, and many of them can be affected by different design choices made during the development of a CBDC.

- **Acceptance** reflects how widely a payment method is used and drives network effects: consumers prefer methods accepted by many merchants, while merchants adopt those used by many consumers. This creates a virtuous cycle that reinforces broad usage on both sides.
- **Convenience** includes aspects such as not having to carry cash and handle change, being able to pay contactless by tapping a phone or a card or scanning a QR code. More convenient payments also increase the speed of payments at checkouts, improving efficiency.
- **Security** includes prevention against fraud, unauthorized use, and loss of funds. For example, many cards and e-money solutions offer advanced systems that can detect fraud and unauthorized use to safeguard end users. By contrast, cash can easily be lost or stolen, while checks face issues with counterfeiting.
- **Speed** measures how fast funds are transferred and the transaction is settled. Cash offers instantaneous settlement, while the speed of other payment methods varies. Public FPS

¹⁹ Enabling interoperability between different platforms could pose challenges in ensuring anti-money laundering, combating the financing of terrorism, and "Know Your Customer" (KYC) standards. For example, it might be necessary to harmonize KYC procedures to ensure a common KYC perimeter between different, interoperable platforms.

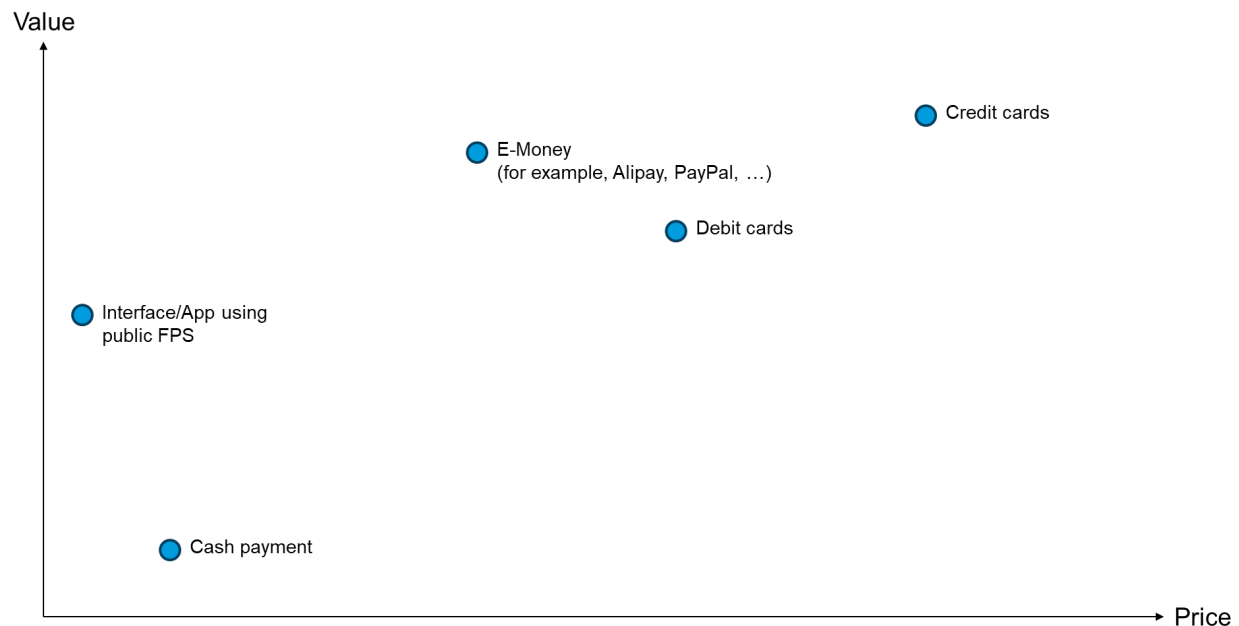
typically offer comparable speed to cash. With cards and e-money, consumers are often debited in real time, but there can be a delay until funds are available for the merchant.

- **Bundled products (for example, credit)** include the bundling of payments with other products. For example, credit cards offer payments that are bundled with credit, insurance, and other services in the same product. Similarly, e-money sometimes offers credit in the form of buy-now-pay-later products and leverages their apps to engage in cross-selling of other products such as insurance or investment products.
- **Data use and privacy** captures what information is collected during the payment process and how it can be used. For example, using cash offers most privacy, whereas other payment methods may collect and use information according to applicable laws and the product's specific terms of service. Data could be used to facilitate compliance with AML, CFT, and KYC regulations, or for commercial purposes.

Payment methods offered by private payment platforms tend to deliver high value but charge high fees, providing a dimension along which CBDC could compete. For example, payment by credit card tends to be free for consumers, while merchants are charged when accepting payments. Typically, the costs faced by merchants are relatively large, such that the total fees levied in a credit card transaction are high. In terms of value, credit cards are widely accepted, convenient, and typically offer security features such as charge-backs and fraud protection. In addition, credit cards bundle both credit and payments for consumers, such that they can pay for purchases at a later time or in installments. Although high fees offer a dimension along which CBDC could compete, policymakers must also ensure that CBDC provides high value comparable to existing solutions. For instance, policymakers could accompany CBDC with other public utilities—such as centralized fraud platforms—akin to the Reserve Bank of India's Central Payments Fraud Information Registry that consolidates real-time payment fraud reports (Reserve Bank of India 2022).

Figure 3. Price-Value Framework²⁰

Graphical representation of the payments landscape. All positions of payment methods vary country by country and are for illustrative purposes only. Value and price are aggregated to include both consumers and merchants, capturing the overall price-value proposition of each payment method.



Source: Authors.

Channels

The competitive impact of CBDC might be transmitted through different channels, encompassing its effect on prices and value, promoting market contestability for intermediaries, and financial access for end users. The framework leads to four channels through which CBDC affects competition in payments. The first two channels capture CBDC's effect on prices and value (the intensive margin of competition). The other two channels—labeled financial and contestability—capture changes in market participation (the extensive margin of competition). While the contestability channel captures entry and exit of intermediaries in the payment market, the financial access channel encapsulates participation by end users. Each of these channels encompasses a unique dimension of how CBDC could reshape market dynamics, from influencing cost structures and service standards to opening opportunities for new entrants and broadening financial inclusion.

- **The Pricing channel** focuses on the impact of CBDC on pricing within the payment market, addressing the fee dimension of the framework. There are three main types of transaction

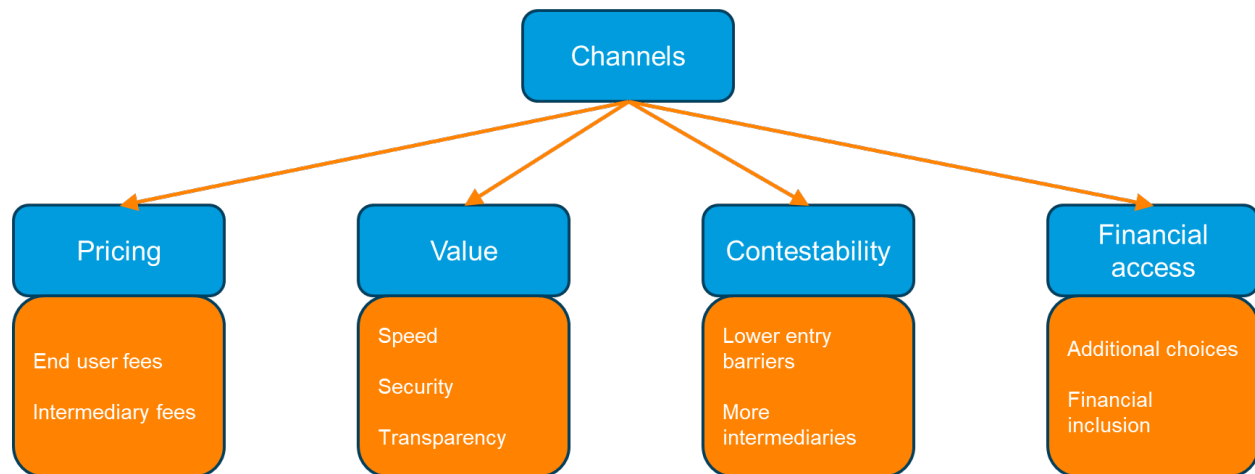
²⁰ The framework does not consider the cost of providing a CBDC or other forms of public money, if not through which these are transmitted to the end users, as end users' costs are important for determining the equilibrium in the payment market. Section IV provides further considerations on how cost recovery options for central banks on CBDC can alter the competitive landscape.

prices that can be affected in the payment market: network fees (paid by intermediaries to the payment platform), intra-intermediary or interchange fees (paid between intermediaries for routing and processing transactions), and end user fees (paid by consumers and merchants to intermediaries for accessing payment services). For instance, if CBDC is introduced with low or zero transaction fees, it could serve as a low-cost alternative for both end users and intermediaries. This may prompt incumbent platforms to re-examine and adjust their fee structures. These price adjustments may not always be efficient. Some could lead to unintended distortions or adverse effects on different sides of the market, risks that need to be carefully assessed.²¹

- **The Value channel** examines how CBDC entry and its design can affect the value dimension of the Price-Value framework. For instance, a CBDC that incorporates real-time transaction processing, stringent security measures, and transparent pricing and tracking can improve the speed, safety, and reliability of payments. Such features could compel incumbent platforms to elevate their own service quality in these dimensions in order to remain competitive.
- **The Contestability channel** examines how the design of CBDC can lower entry barriers and encourage new market participants in the payment market. By reducing reliance on legacy systems, simplifying integration, and designing inclusive participant schemes, a CBDC could enable fintech startups and nonbanks to enter the market more easily. This expanded contestability is likely to intensify competition, driving innovation as new entrants challenge incumbent providers. However, it is important to assess whether these competitive dynamics might also lead incumbents to adopt defensive strategies that could offset the potential benefits of CBDC or impact their engagement with the CBDC ecosystem. In some cases, incumbents unable to adapt may even exit the market. It is therefore essential that any intervention, including CBDC, is designed to preserve private sector innovation and ensure that consumer choice and competition are not inadvertently constrained.
- **The Financial Access channel** addresses the incentives of end users to adopt digital payments. CBDC can potentially redefine competitive dynamics by broadening the end user base. CBDC could offer a new, low-cost, digital payment option that reaches unbanked and underbanked segments of the population, which could compel traditional financial institutions to intensify competition through the development of more inclusive and innovative products—especially if CBDC provides attractive features, such as offline functionality, that may be lacking in private payment solutions.

Collectively, these channels provide a comprehensive basis for understanding how CBDC entry might affect market behavior, while also necessitating safeguards against unintended consequences.

²¹ For example, if CBDC increases competition for consumers and drives prices down, private platforms may try to offset lost revenue by raising fees for merchants, potentially shifting market distortions from one side to the other.

Figure 4. Main Channels of Competitive Impact

Source: Authors.

III. Scenario Analysis

The payment market differs across countries, but market outcomes have gravitated to three distinct scenarios, which are considered in this Note:

- (1) Countries where payments are dominated by private, profit-driven platforms, such as credit/debit card networks, e-money systems, or private FPS, covering different regulatory landscapes
- (2) Countries with established and well-adopted public, nonprofit FPS
- (3) Countries heavily reliant on cash with limited digital payment infrastructure

Within each of these scenarios, CBDC can have distinct competitive impacts through the four key channels: pricing, value, contestability, and financial access. Other factors may also affect results, such as how outcomes may differ depending on market conditions and regulatory context. The analysis presented considers CBDC as a potential tool with high impact in markets where persistent failures, such as high fees or limited contestability due to market power, have been identified and other interventions have proven insufficient. In jurisdictions where retail payment markets are already competitive and well functioning, the introduction of CBDC may offer limited additional benefits.

Baseline CBDC Design Assumptions

The competitive impact of CBDC will depend heavily on its design choices. Different design features, such as fee structures, access models, and restrictions on usage, can significantly influence how CBDC interacts with existing payment systems and market participants. To ensure a focused and structured analysis, a set of baseline assumptions is established, and deviations from these assumptions are explored in section IV.

CBDC is designed to promote a well-functioning market for payments, rather than operate as a profit-generating platform. Under this assumption, the central bank's primary objective is to promote a well-functioning payment market for all stakeholders, including end users, payment service providers, and other private payment platforms. Incorporating the interests of private participants is essential for a robust payment system, ensuring broad consumer access and a resilient financial ecosystem. Section IV discusses how the dynamics change if central banks were to shift their focus—either by emphasizing consumers or by putting more weight on their own profits—thus operating more similarly to private platforms.

CBDC is distributed to end users through intermediaries in a two-tier distribution model. In this case, intermediaries such as banks and payment service providers play a critical role in onboarding users, facilitating transactions, and ensuring accessibility. This assumption aligns with the practical considerations central banks have expressed in designing CBDC ecosystems that leverage existing financial infrastructures.

Central banks do not face constraints in setting fees for CBDC. The central bank can set CBDC fees without budgetary policy constraints, allowing for an optimal pricing strategy aimed purely at maximizing efficiency and ensuring a well-functioning market. Further considerations include practical constraints, such as cost-recovery mandates, political limitations on subsidization, or regulatory requirements, potentially restricting optimal fee-setting, such as requiring that fees must be zero, or disallowing subsidization of one side of the market. These types of constraints and their implications will be analyzed in section IV.

CBDC has no holding or transaction limits. No restrictions exist on CBDC holdings or transaction volumes. This assumption ensures that analysis of competitive effects captures the potential impacts of unrestricted CBDC usage across various market contexts. Further considerations on how changing this assumption will affect the competitive impact of CBDC are given in section IV.

This baseline serves to evaluate the impact of different CBDC design choices. These baseline assumptions provide a useful starting point to understand potential competitive impacts, however actual CBDC implementations may vary significantly. To evaluate the impact of different design choices, section IV addresses the competitive impact of these choices. Further, relative to the baseline, design levers considered in section IV change competitive impact relatively uniformly, such that they do not have to be considered separately in the scenarios.

Scenario I: CBDC in Payment Markets Dominated by Profit-Maximizing Platforms

The payment market in many countries is dominated by private, profit-maximizing payment platforms. In some countries, card networks have become predominant for payments, whereas in others, e-money providers dominate. This dominance has often resulted in a lack of competition, which is why it is particularly important to analyze the competitive effects of CBDC in that setting. However, some authorities have already introduced regulations to address this issue. Therefore, understanding how the impact of CBDC may vary under different regulatory regimes is critical.

Accordingly, this scenario is subdivided into two subscenarios:

- (1.a) An unregulated market environment
- (1.b) A regulated market environment

Scenario 1.a.: Unregulated Markets

Private platforms prioritize profit maximization, which sometimes results in anticompetitive practices that do not necessarily align with well-functioning markets. The influence of strong network effects and product differentiation further adds to the complexity of the competitive dynamics. Limited regulatory constraints have also enabled incumbent providers to maintain dominance through legacy systems and entrenched networks. In such markets with little or no regulation on private platform fees, CBDC could introduce significant competition in the payment market. CBDC's competitive impact could be strengthened by interoperability requirements, which can help counteract user lock-in and expand CBDC's reach. However, even without interoperability, CBDC might still promote competition through targeted adoption strategies, such as public sector payments, reaching underserved users, and enabling intermediaries to offer bundled services, while open access rules help the system grow its own network effects over time.²²

Pricing Channel:

CBDC can enhance price competition by offering a low-cost public option, directly challenging the fee structures of dominant private platforms. Dominant payment platforms are able to charge excessive fees, typically levied on the merchant side. A retail CBDC, offered at minimal or zero cost, can discipline the payment market by giving users and merchants a low-cost alternative. According to Liu, Reshidi, and Rivadeneyra (2025), introducing a CBDC can shift the pricing dynamics in two-sided markets. They find that introducing a CBDC can improve the functioning of payment markets compared to a market with only profit-driven platforms. According to their analysis, the welfare gains from a CBDC connect two channels: strategic shifts in pricing and increased financial access.

CBDC can alter platform pricing by intensifying competition on the consumer side, though this might sometimes lead to even higher merchant prices. When a CBDC enters as a public option, it forces private

²² For further discussion on deployment strategies and use cases that can support CBDC adoption, see Koonprasert and others (2024).

platforms to adjust their pricing strategies. Typically, consumers, who tend to choose a single platform, experience lower transaction costs because platforms compete more aggressively to attract and retain them. By contrast, platforms face less competitive pressure for merchants, who often engage with several platforms. To offset revenue shortfalls from lower consumer fees, platforms can increase fees charged to the merchant side. Although some merchants might stop engaging with the private platforms and transact exclusively in CBDC, the ones that remain might face even higher fees from private platforms after CBDC entry. This competitive bottleneck effect emerges naturally from the structure of two-sided markets. Even though similar outcomes might occur from heightened competition among private providers (Armstrong and Wright 2007; Edelman and Wright 2015; Wang 2025), the introduction of a CBDC guarantees that at least the CBDC platform consistently offers lower fees on one side of the market.²³

The pricing impact of CBDC also depends on market conditions and public policy constraints that may limit CBDC's competitive reach. Liu, Reshidi, and Rivadeneyra (2025), while abstracting from modeling the intermediary market explicitly, note that their results hold under the assumption that this market is perfectly competitive. The next section discusses deviations from this assumption and what measures central banks might adopt to ensure greater competitiveness in the intermediary market. Finally, it is important to also consider the effect of CBDC in environments where central banks might be constrained by other public policy objectives. For example, mandates to recover operational costs or restrict subsidies to certain user groups can constrain the public sector. This will be discussed in section, where the focus is on different design levers and potential restrictions that central banks might face with their CBDC projects.

Value Channel:

In unregulated markets, private providers already compete on service features and user experience to capture high-margin users, but a CBDC may still raise service standards at the margin. High margins incentivize private providers to invest in and offer high quality service, ensuring robust security and a reliable user experience (see, for instance, Klein and Leffler 1981; Shapiro 1983; Milgrom and Roberts 1986). A CBDC may contribute further modest enhancements, for example by increasing transparency in transaction processing and offering faster settlement speed. These incremental improvements, while valuable, are likely to be incremental rather than transformative. Consequently, in such markets, a successful public platform that is widely adopted is likely to have a more pronounced effect on pricing dynamics than on value, even though any enhancements in service add to the overall improvements in the market.

Contestability Channel:

A well-designed CBDC can improve contestability by lowering entry barriers in unregulated markets. CBDC could offer a transparent, low-cost alternative that intermediaries might use as a foundational infrastructure upon which to build new services. For instance, designing a central bank wallet as a foundational technological infrastructure, accessible through integration of application programming interfaces (APIs), can lower entry barriers by eliminating the need for costly proprietary wallet development, effectively lowering the fixed costs of market entry (Liu and others 2024). This is especially important in systems

²³ For more on welfare impacts of CBDC, see Liu, Reshidi, and Rivadeneyra (2025).

dominated by card schemes or Big Tech platforms, where participation typically requires negotiating access or paying high network fees. By eliminating those structural constraints, a CBDC may allow new providers to offer services at more competitive prices, challenging the high-fee models of existing incumbents. If CBDC provides low or even zero fees for transaction processing to intermediaries, it could further reduce operational costs for new entrants such as fintech startups and smaller service providers. However, the extent of this contestability effect will depend on specific design features of the CBDC.

CBDC may face an uphill battle in improving contestability given network effects, entrenched merchant relationships, and exclusive loyalty programs and could require regulatory intervention to be successful. Even if a CBDC technically enables new entrants to offer services, legacy platforms may limit its practical impact by restricting integration or access. For example, legacy platforms may decline to support CBDC payments within their proprietary ecosystems, impose contractual limitations on merchants or intermediaries, or design technical architectures that inhibit interoperability. A relevant example is the European Commission's antitrust case against Apple, which found the company restricted third-party access to near-field communication functionality—a standard technology for in-store “tap and go” contactless payments with iPhones—on iOS devices, hindering competition in mobile wallets. Apple later committed to opening near-field communication access on fair, nondiscriminatory terms to comply with European Union law (European Commission 2024). Without similar regulatory safeguards, dominant platforms elsewhere could adopt comparable tactics to limit CBDC adoption and weaken its competitive impact.

Financial Access Channel:

A CBDC can introduce competition in underserved market segments by offering a low-cost payment alternative. In unregulated payment markets, dominant private platforms often concentrate on high-income, high-volume users, sidelining lower-margin customers who are less profitable to serve. A retail CBDC—designed as a universally accessible, no-fee or low-fee payment option—can directly compete for users who are unbanked, underbanked, or priced out of existing services. Liu, Reshidi, and Rivadeneyra (2025) show that adding a public option like a CBDC can attract more end users than a market composed solely of private, profit-driven platforms. The inclusion effect implies that by providing a low-cost digital payment solution, a CBDC can reach a wider range of consumers—especially those currently underserved by traditional providers. This competitive effect is particularly meaningful in jurisdictions where private platforms or intermediaries face few regulatory requirements to serve financially excluded populations.

Still, in the absence of regulatory mandates, private intermediaries may lack the commercial incentives to distribute CBDC to excluded users, weakening its competitive impact. In unregulated environments, intermediaries are unlikely to invest in customer onboarding, merchant recruitment, or outreach efforts targeted at low-income or rural populations without regulatory compulsion or financial incentives. Without a policy framework to align commercial incentives with inclusion objectives—such as requiring wallet providers to offer basic CBDC services for free—CBDC's impact on financial access could be muted, and the market segmentation that limits access to digital finance may persist.

Scenario 1.b.: Regulated Markets

Some jurisdictions regulate payment markets to rein in market power by payment platforms, possibly limiting, but not eliminating the competitive impact of CBDC. The EU, for example, imposes interchange fee caps for credit cards under the Interchange Fee Regulation (European Commission 2015). Australia applies similar caps and supports merchant choice routing (Reserve Bank of Australia 2021); and the United States mandates debit routing options under the Durbin Amendment but leaves credit card fees largely uncapped (Federal Reserve 2021). These regulations have lowered prices, particularly for merchants. However, these interventions have often not been able to induce entry into the market, and regulatory arbitrage through the introduction of new fees has limited their effectiveness.

Pricing Channel:

Even in regulated markets, CBDC can strengthen price competition by addressing gaps and limitations in the existing regulatory framework. Although interchange fee caps reduce a key source of merchant costs, regulating payment markets is inherently complex because of their two-sided nature. Regulation typically targets the fees exchanged between intermediaries but does not always capture scheme fees, acquirer markups, or consumer-facing charges—areas where platforms and intermediaries can adjust pricing to maintain revenue. As a result, the total cost of payments can sometimes remain high despite regulatory controls. CBDC could place downward pressure on these and may also discourage the introduction of new or opaque charges, as private providers will need to stay competitive with a transparent, low-cost alternative.

Value Channel:

CBDC can improve service quality by raising the bar—offering a public benchmark that private platforms must match to stay competitive, especially where regulation alone has failed to lower switching costs or incentivize better user experience. Regulation in payment markets typically focuses on pricing, leaving value dimensions—such as speed, transparency, and user experience—untouched. Dominant players often have limited incentives to upgrade service quality when margins are low, consumer choice is restricted, and switching costs are high. Even efforts like data portability have had limited traction where the same few players dominate both sides of the market. A well-designed CBDC could address this gap by offering high-value baseline features—such as instant settlement, price transparency, and interoperability—which would pressure private platforms to improve their own offerings to retain users.

Contestability Channel:

CBDC can support greater competition if it enables wider intermediary access. Fee regulations do not necessarily reduce market concentration. In many regulated environments, dominant networks and banks retain control over customer interfaces, data, and merchant relationships. A retail CBDC, intermediated through a broader set of licensed providers, including fintechs, telecoms, or even public institutions, can help rebalance this structure. For this to happen, regulators should allow new types of entities to access CBDC rails and prohibit restrictive practices such as exclusive acceptance agreements or technical lock-ins. A precedent exists in the EU's Payment Services Directive 2 framework, which compels banks to open

their infrastructure to third-party providers. CBDC can play a similar role by fostering entry and making room for more diverse market participants.

Financial Access Channel:

CBDC can complement regulation by targeting structural barriers to access in markets where rules have improved fairness but not broadened reach. Even in regulated markets, deeper structural barriers, such as lack of ID, mobile phones or banking infrastructure, keep many people excluded. In these settings, private players might not find it profitable to serve low-income or remote users. A well-designed CBDC could overcome these gaps by enabling offline functionality, simplified onboarding processes and while being distributed by a broader set of intermediaries.

All in all, in Scenario I, CBDC has the potential to have a substantial impact on competition in the payment market, with downside risks stemming from entry into a market that is difficult to penetrate. Although CBDC has the potential to bring improvements, particularly regarding pricing and contestability, attracting users from successful incumbents is not guaranteed and requires CBDC to offer a compelling, high-value alternative. Further, CBDC and regulation can complement one another to achieve the desired outcomes.

Scenario II: CBDC in Markets with a Public Fast Payment System (FPS)

Many countries have already established public FPS that compete with private payment platforms. In this context, CBDC would have smaller effects on competition. The most prominent examples of public FPS include Brazil's Pix and India's UPI.²⁴ However, many more public FPS exist, for example, Singapore's Fast and Secure Transfers system (FAST), and NAPAS FastFund 247 in Vietnam. Given that these payment systems already provide a public alternative to private payment platforms, both the design of CBDC and its competitive impact have to be reconsidered. The role that CBDC can play in this context depends on the level of adoption and the cost of using the existing FPS. Where public FPS are widely used and low cost, the space for CBDC to exert additional competitive pressure may be limited. This analysis focuses on settings where public FPS have achieved meaningful adoption. By contrast, in jurisdictions where an FPS exists but adoption remains limited, CBDC may play a more prominent role, and those cases may resemble the dynamics described in the other scenarios.

Decision makers need to ensure interoperability between the CBDC and any existing public FPS to avoid fragmentation of public payment platforms. Users of CBDC should be able to seamlessly transact with others who might be using a public FPS. If there is a substantial friction in this type of transaction, fragmentation between the CBDC and the public FPS occurs, diminishing network effects and hurting the competitive position of both CBDC and the public FPS. Only when interoperability is ensured can CBDC potentially strengthen the competitive position of public FPS vis-à-vis a private payment network.

²⁴ Even between India and Brazil, the rate of adoption by the population has been drastically different. Pix is estimated to be used by 76 percent of the adult population in Brazil (Banco Central do Brasil 2025), whereas UPI is only actively used by an estimated 25 percent of the India's population (based on 350 million active users; [Shukla 2024](#)) after about 9 years of operation.

CBDC is unlikely to automatically drive uptake in under-used public FPS unless its design directly tackles adoption hurdles with targeted incentives. CBDC, if integrated and interoperable with the existing public FPS, can drive increased adoption of that public FPS. However, if adoption has been low, CBDC is unlikely to be a silver bullet unless it addresses the root causes that have initially stalled public FPS adoption. For example, CBDC could address incentive gaps for intermediaries by embedding measures such as offering reduced costs, allowing access to user data, or time-limited exclusivity arrangements. Furthermore, for developers, CBDC can be accompanied with open software development kits and APIs that simplify integration and allow external apps to interact directly with a CBDC ledger (for more detail, see a discussion of CBDC adoption by Koonprasert and others 2024, and on the positioning of CBDC and FPS by Patel, Kasiyanto, and Reslow 2024).

Pricing Channel:

The introduction of a CBDC will likely exert less competitive pressure on private payment platforms when a public FPS already exists. Public FPS and CBDC occupy similar roles in the payment market, both aiming to offer a low-cost, high-value public alternative to private payment platforms. Consequently, an existing public FPS already exerts much of the competitive pressure on private payment platforms that CBDC would, with CBDC likely applying only incremental additional pressure. Therefore, prices are unlikely to decrease significantly after the introduction of a CBDC.

Value Channel:

The expected impact of CBDC in improving competition in payments through the value channel is likely to be modest. Although CBDC does bring unique aspects, it largely overlaps with public FPS. That is, public FPS typically offer fast, secure, and convenient payments, which CBDC is also expected to offer. In terms of acceptance, CBDC might have advantages if it is declared legal tender and required to be accepted as a means of payment. Patel, Kasiyanto, and Reslow (2024) provide a comprehensive discussion around similarities and differences between CBDC and FPS.

Contestability Channel:

The effect of CBDC through the contestability channel when a public FPS already exists is likely limited, as public FPS and CBDC largely target the same set of intermediaries. Intermediaries in public FPS are typically banks, as the public FPS facilitates transactions between bank accounts. The same set of intermediaries is typically considered by central banks to support the two-tier implementation of CBDC. However, CBDC might be able to facilitate some increased level of contestability. Since CBDC is a liability of the central bank, it could attract new, nonbank intermediaries that simply provide an interface or services for end users, and might be subject to more lenient regulatory requirements.²⁵ That said, this channel

²⁵ As examples, the U.K. Digital Pound project considered the concept of 'Payment Interface Providers' and 'External Service Interface Providers, and Project Sela by the BIS Innovation Hub, Bank of Israel and Hong Kong Monetary Authority has explored how 'Access Enablers' could support competition whilst maintaining cyber resilience. For more details see: <https://www.bankofengland.co.uk/report/2025/intermediary-roles-and-scheme-rulebook-design-note> and <https://www.bis.org/about/bisih/topics/cbdc/sela.htm>.

depends on the implementation of the public FPS, as some public FPS, most notably India's UPI, already attract many nonbank intermediaries. Within UPI, nonbank intermediaries can facilitate payments for end users through a programming interface, without having to offer a bank account. Further data show that the inclusion of nonbank financial institutions into FPS is associated with more FPS usage more broadly (Frost and others 2024).

Financial Access Channel:

CBDC could enhance financial access by attracting new customers that have previously been excluded from traditional financial services and are unable to use the public FPS. Public FPS typically require users to have a bank account, excluding unbanked segments of the population. Since CBDC represents a liability of the central bank level, some central banks intend to make CBDC accessible to everyone, thereby enhancing financial inclusion for both consumers and merchants. In addition, CBDC could facilitate the transition of merchants from the informal sector to the formal sector. The exact impact, however, may depend on existing policies and CBDC design features. For example, the impact on competition might be dampened when legal residents have a right to a bank account, such as in the EU, but could be accentuated through policies that promote access to CBDC, such as a requirement for some financial intermediaries to offer CBDC to end users.

If interoperability is ensured, a CBDC could enhance and strengthen existing public FPS by offering another avenue of attracting customers and creating a virtuous circle. If a CBDC can attract new consumers, these customers may entice new merchants to accept payments through the public FPS. This, in turn, could attract even more consumers to use the public FPS, creating a cycle of growth and adoption. Similarly, CBDC might attract new merchants, further enhancing this cycle, as new merchants bring additional consumers who are interested in using CBDC for transactions.

All in all, in Scenario II, CBDC has the potential to complement existing public FPS and enhance public alternatives to private payment platforms, with downside risks stemming from fragmentation between CBDC and the public FPS. Even if CBDC manages to complement the existing public FPS, it is important to point out that the competitive impact of CBDC would likely be incremental. Further, offering CBDC in tandem with a public FPS would benefit from a cohesive public offering that avoids fragmentation and ensures interoperability between CBDC and the public FPS, strengthening the position of public alternatives to private payment platforms. Finally, risks for the adoption of CBDC could emerge, if it does not address possible existing shortcomings in public FPS.

Scenario III: CBDC in Cash-Reliant Countries

Countries that heavily rely on cash for payments face a distinct set of considerations. The rate and degree of competitive impact from CBDC will depend on whether the developed digital financial infrastructures exist and on users' habits, for example, because of a preference for informality or privacy in transactions. Some countries experience high levels of cash use even in the presence of highly digitalized infrastructure.

This Note, however, focuses on the case of countries where cash remains dominant and where relatively low levels of digital infrastructure exist.

Pricing Channel:

The potential for CBDC to enhance competition through pricing could be relatively limited in cash-reliant markets. However, it may bring efficiency gains by reducing costs relative to cash and preempt the emergence of dominant platforms in the future. The use of cash is associated with costs that largely do not stem from competitive issues (as cash is publicly provided by the government), but from inefficiencies, such as having to handle and transport cash, carrying change, and securing physical cash from theft or loss. Studies support this idea and show that cash can be more costly for payments than digital solutions, in particular for large payments (see, for instance, Hayashi 2021). Introducing digital payments through CBDC may reduce some of these costs. At the same time, the cost of providing and operating a CBDC has to be considered. Further, proactively introducing a CBDC could establish foundational infrastructure, preventing the emergence of a few dominant private payment platforms in the future. In these situations, even if CBDC does not immediately lower transaction fees, its early presence could reduce long-term market concentration risks and limit fees in the long term.

Value Channel:

CBDC can substantially improve payment value compared to cash by providing greater convenience, enhanced security, and enabling online payment capabilities. Key improvements include enabling online payments, which are a prerequisite for e-commerce; removing the inconvenience and security risks of carrying physical currency, and facilitating faster, more efficient checkout experiences through contactless payments, such as tapping phones or cards, or scanning QR codes. Moreover, CBDC can enhance financial recordkeeping and transaction transparency, further improving efficiency for merchants and consumers.

Contestability Channel:

By establishing foundational digital payment infrastructure, CBDC can significantly enhance market contestability by absorbing initial infrastructure costs that could otherwise be prohibitively high for individual intermediaries to bear alone. This foundational investment could enable a broad range of intermediaries, including nonbank entities, to develop innovative payment services, fostering competition and market diversity, and could be particularly important for smaller companies that may otherwise not have sufficient resources to enter the market. Such an outcome would likely depend on the level of engagement and promotion of CBDC by the central bank and relevant authorities, and central banks may also need to consider how to best encourage private participation in the long term.²⁶ A key question may be the ability of nonbank players to provide access to a CBDC to citizens. This has been shown, at least in the context of FPS establishment to support use for transactions (Frost and others 2024).

²⁶ To avoid a standalone public platform and secure active intermediary participation, central banks should consider deploying incentives to encourage intermediary participation. A summary of such incentives can be found in Koonprasert and others (2024).

Financial Access Channel:

The introduction of a carefully designed CBDC in a low-infrastructure environment could spur a wave of digitalization and inclusion. This is often considered one of the major benefits of the implementation of a public solution (where accompanied with appropriate public awareness and a communications campaign). UPI in India is a potential example a system that was brought in with accompanying central bank promotion and other policies to drive a gearshift change in financial inclusion. Overall, the impact of CBDC in cash-dominated environments hinges significantly on underlying motivations for cash usage. In markets where cash reliance stems from distrust in government or informality, CBDC adoption may remain subdued, minimizing competitive impacts. By contrast, markets characterized primarily by habitual cash usage present greater potential for CBDC adoption and its associated competitive benefits, especially when complemented by carefully designed features, for example privacy-preserving features.^{27, 28}

All in all, in Scenario III, CBDC has the chance to provide foundational infrastructure that could digitalize payments. The digitalization of payments could reduce costs that stem from transacting with cash and allow the emergence of business models for which cash is not suitable, such as e-commerce. However, downside risks could materialize if CBDC fails to encourage participation by the private sector to promote the development of a long-term sustainable ecosystem.

Summary: Assessing CBDC's Competitive Impact across Scenarios

Policymakers should first assess where their country's payment market best fits among the scenarios presented. This helps clarify the structural issues at play, whether related to pricing, entry barriers, or inclusion. Once the market scenario is understood, the next step is to define what issues CBDC needs to address and whether other measures—such as fee caps, interoperability mandates, or infrastructure investments—are underway or being considered.²⁹

The competitive potential of CBDC hinges on the underlying market structure and the degree of existing public intervention. In unregulated, privately dominated markets (Scenario I.a), CBDC could deliver broad welfare gains by potentially improving price dynamics, contestability, financial access, even if value improvements might be marginal. Where fee caps and other regulations already temper private market power (Scenario I.b), CBDC's impact is expected to be more moderate—strengthening remaining competition gaps in pricing, value, entry, and inclusion—but the introduction of CBDC would still requires careful implementation to avoid duplicating existing interventions. In markets with a well-established and widely adopted public FPS in place (Scenario II), CBDC stands to add only incremental benefits—primarily

²⁷ Lannquist and Tan (2023) discuss the channels in which CBDC generally can promote financial inclusion further.

²⁸ Features related to preserving privacy need to be carefully evaluated against other objectives, such as ensuring effective implementation of AML and CFT frameworks. See further discussion of financial integrity considerations in Schwarz and others (forthcoming).

²⁹ Infrastructure investments could include building a public FPS. Considerations around comparing FPS and CBDC are discussed further in Patel, Kasiyanto and Reslow (2024) and regional focuses can be found in for example, Ricci and others (2025). This paper instead focuses on the incremental effects of CBDC to each scenario.

by extending access to underserved populations—since the existing public FPS already offers an alternative to private platforms. Finally, in cash-reliant economies (Scenario III), CBDC's greatest strengths lie in boosting service value, lowering entry barriers, and widening financial access, even though immediate pricing effects may be limited.

Table 1 summarizes the comparative assessment. The rankings are relative and qualitative—high, medium, or low—indicating the expected magnitude of CBDC's impact on improving competition or outcomes in each respective channel under each market structure.

Table 1. Ranking of CBDC's Competitive Impact for Each Channel

“High” means a CBDC would significantly improve that aspect of the market (relative to the status quo), “medium” a moderate improvement, and “low” a minimal improvement.

Scenarios	Pricing	Value	Contestability	User Access
I.a—Private dominated—Unregulated	High	Low	High	High
I.b—Private dominated—Regulated	Medium	Medium	Medium	Medium
II—Public FPS dominated	Low	Low	Low	Medium
III—Cash dominated	Low	High	High	High

Source: Authors.

In the future, new scenarios may emerge. For example, stablecoins may gain traction as a form of payment and introduce different dynamics to other private payment platforms. Some preliminary considerations are outlined in Box 2.

Box 2. Stablecoins: A Preliminary View of Their Potential Competitive Impact

Even though stablecoins have been gaining traction, they are not (yet) established as a means of payment, in particular for domestic transactions. While stablecoins have increased their market capitalization significantly over the past years, they have not seen significant use in domestic retail payments. Instead, they currently seem to be largely used to facilitate international flows (see, for instance, Cardozo and others 2024; Auer, Lewrick, and Paulick 2025; Reuter 2025), or to purchase other crypto assets on digital exchanges.³⁰

Stablecoin payments are unlikely to gain significant market share until regulatory certainty has been achieved, as legal clarity, consumer protection, and user trust are critical. To use stablecoins for payments, end users need to be certain that such transactions are legal, that they are safe to use, and most importantly, that they maintain their peg to the underlying currency. While some jurisdictions have already passed stablecoin legislation (see, for example, the Markets in Crypto Assets regulation in the EU), regulation in many other jurisdictions is still being discussed. In some countries, the use of crypto assets for payments is outright banned, effectively prohibiting stablecoin use unless regulatory frameworks evolve. Even with comprehensive regulation in place, however, stablecoin adoption for payments is not guaranteed. It will ultimately depend on user preferences, cost considerations, and the quality of services provided by stablecoin issuers.

Stablecoins might exhibit different competitive dynamics compared to other private payment platforms. Stablecoins, even though issued by profit-maximizing entities, may exhibit different competitive dynamics because of two factors. First, payment fees do not currently seem to be the primary source of profits for stablecoin issuers. Instead, they earn the spread between the remuneration paid on the stablecoin, which is typically zero (and sometimes required to be zero by legislation), and the interest earned on the stablecoin reserves, which are usually invested in Treasury bills. Stablecoin issuers might forego charging fees for payments to promote more adoption of the stablecoin. However, if stablecoin issuers were to charge fees for payments, they would likely exhibit similar competitive dynamics to profit-maximizing payment platforms as discussed in Scenario I. Second, stablecoins are typically issued on decentralized blockchain networks over which the stablecoin issuers have no significant control. For example, stablecoin issuers cannot affect the fees that these networks charge to process a stablecoin transfer. Further, different stablecoins are often issued on the same networks, which allow for more seamless interoperability between stablecoins. Therefore, network effects may not necessarily accrue to specific stablecoins, but rather to the underlying network, which could be structured to facilitate competitive payments, even when there are network effects (see, for instance, Huberman, Leshno, and Moallemi 2021).

IV. Design Levers

Some of the design choices that decision makers face will affect the competitive impact of CBDC in the retail payment market (selected examples in practice can be found in Box 3). This section describes such choices and evaluates their competitive impact relative to the baseline assumptions that have guided the scenario analysis of the preceding section.

³⁰ Most stablecoins in circulation today are linked to the U.S. dollar. As such, they are not directly in competition with domestic payment systems or CBDCs in many jurisdictions. However, in the United States and in dollarized economies, U.S. dollar-linked stablecoins could still compete in the future with domestic payment systems or a potential CBDC.

Policy Constraints on CBDC Pricing

Central banks often face constraints on CBDC pricing—such as mandates to recover costs or to provide CBDC free of charge to consumers—that could hinder but not eliminate the competitive impact of CBDC. Implementing a CBDC can entail substantial costs for both the public and private sectors. Fiscal constraints, particularly in developing economies, may limit the feasibility and the competitive impact of CBDC. Many central banks, however, typically operate under policy frameworks that impose cost-recovery mandates that might help them offset some of these costs.³¹ Moreover, they may face obligations to provide CBDC free of charge, or limitations on market intervention.³² These mandates constrain the pricing aspect of CBDC. However, Liu, Reshidi, and Rivadeneyra (2025) find that even under cost-recovery or zero-fee constraints, offering a CBDC can still improve welfare, but the outcome may be suboptimal.³³ In these cases, strict zero-fee constraint would limit this flexibility and could reduce the effectiveness of CBDC in competing with other payment options.

Providing CBDC free of charge to end users might cause excessive competitive pressure, possibly crowding out private alternatives. If central banks are required to provide CBDC to end users at no charge, private payment platforms may be unable to compete in the market. As a result, they may ultimately be forced to exit the market, possibly leading to a less resilient payment market with a reduced number of choices for end users. This risk is highest if CBDC were made free not only for consumers, but also for merchants, as incumbents typically rely heavily on transaction fees levied on merchants and might lack alternative revenue streams. A temporary zero-fee CBDC phase, funded by seigniorage, for example, could swiftly erode margins and prompt market exits. Ultimately, a more flexible pricing framework—giving central banks greater freedom in setting fees—can significantly improve CBDC’s competitive impact and allow central banks to promote a healthy payment market that balances the interests of all participants.

Incentives in Two-Tier Implementation

A two-tier implementation of CBDC carries the risk of softening its competitive impact, making it critical for central banks to ensure a competitive market for CBDC intermediaries. When distributing CBDC in a two-tier model, the central bank typically does not directly fix end user fees—for instance, Nigeria’s eNaira was free to use initially, but after a 90-day grace period transactions would incur standard bank charges under existing fee guides.³⁴ Similarly, the Eastern Caribbean Central Bank’s DCash pilot charged no fees to consumers, leaving any charges to be levied by intermediaries at the merchant side. If central banks are unable, or choose not to regulate these end user prices directly, the competitive impact of CBDC will depend heavily on how intermediaries choose their prices. In such cases, it is critical that central banks ensure an efficient and competitive market for intermediaries.

³¹ For example, the U.S. FedNow operates under the Monetary Control Act of 1980, requiring the Federal Reserve to recover all associated costs for its payment services over time—a condition potentially applicable to other public platforms.

³² For instance, political considerations and accountability demands may prevent central banks from offering subsidies or rewards, further restricting CBDC’s competitive impact.

³³ For example, credit cards often reward customers with cash-back offers or bonus miles.

³⁴ For more details, see the charges and cost structure for the eNaira in the regulatory guidelines (Central Bank of Nigeria 2021).

Fostering intermediary competition by encouraging diverse intermediary participation and ensuring interoperability between intermediaries is crucial for enhancing CBDC competitiveness. Central banks can support a robust, competitive environment by opening the CBDC ecosystem to a wider range of intermediaries, increasing consumer choice, and incentivizing intermediaries to compete on price and quality. Expanding participation beyond traditional financial institutions could promote innovation and competitive pressure, benefiting end users through potentially lower CBDC costs and improved services (for further details, see, for instance, Koonprasert and others 2024). Further, clear regulatory standards for interoperability are critical to allow seamless transfers and transactions across providers. High switching costs or limited interoperability can undermine competitive dynamics by trapping consumers with individual intermediaries, allowing providers to maintain high fees or subpar services without market discipline (see, for instance, Copestake, Kirti, and Martinez Peria 2025).

Transaction or Holding Limits

Transaction or holding limits hinder CBDC's competitive impact in the payment market but can be important to achieve other policy objectives such as financial stability; it is critical that they are carefully calibrated to ensure an optimal trade-off. These potential limits on CBDC are widely considered as a tool to limit bank disintermediation and align CBDC with financial stability goals (see, for instance, Bidder, Jackson, and Rottner 2024; Verrier and others 2025). However, these tools can significantly shape the competitive dynamics in retail payments as well. A CBDC with no limits would likely exert the greatest competitive pressure, by contrast, stringent limits, particularly on transaction sizes, may constrain the use of CBDC for everyday payments, thereby softening its competitive impact. To ensure these limits are effective without unduly constraining CBDC's competitive impact, calibration should be informed by local data on payment behavior. For example, transaction limits could be set to accommodate the vast majority of retail purchases.

Remuneration

Offering remuneration on CBDC holdings could increase its competitive impact on payments but entails trade-offs with other policy objectives that should be carefully considered. If CBDC holdings are remunerated, the use of CBDC becomes more attractive, therefore increasing the competitive pressure it applies onto the payment market. However, remunerating CBDC could pose challenges for disintermediation and financial stability (see, for example, Andolfatto 2021; Chang and others 2023).³⁵ Thus, any potential increase in competitive pressure should be carefully weighed against possible downside risks for disintermediation and financial stability.

Legal Tender with Mandatory Merchant Acceptance

Designating CBDC as legal tender with mandatory merchant acceptance can significantly enhance competition in payment markets by addressing the typical coordination challenges inherent in two-sided markets. Successful adoption of CBDC for payments requires simultaneous participation from both consumers and merchants. Traditionally, introducing a new payment platform faces substantial hurdles

³⁵ CBDC could, however, also lead to an increase in bank deposits, depending on the interest rate of the economy (see, for instance, Chiu and others 2023).

because merchants are hesitant to accept a new payment method without sufficient consumer adoption, and consumers avoid adopting new methods that merchants do not widely accept. By legally requiring merchants to accept CBDC for transactions, the entry barrier on the merchant side is eliminated, enabling consumers to confidently adopt CBDC knowing it will be universally accepted.

Interoperability with Existing Payment Platforms

Enforcing interoperability between CBDC and existing payment platforms can enhance CBDC's competitive impact but requires regulatory intervention. Mandating interoperability between CBDC and existing payment platforms, such as e-money platforms, could also help overcome coordination challenges by leveraging the network effects of existing payment platforms. However, regulators must ensure that such interoperability is well designed, for example, by introducing a QR code standard for payments, as in the India's UPI or Singapore's Fast and Secure Transfers system. Further, on the backend, regulators have to ensure seamless settlement between CBDC and commercial bank money. Although interoperability holds potential to amplify the competitive impact of CBDC, it may not always be technically or legally feasible. In such cases, CBDC can still gain adoption and exert competitive pressure by targeting underserved users, enabling public sector use cases, and fostering open participation that builds new network effects over time.

Bundled Products and Services

Permitting CBDC to be offered as part of bundled financial services could enhance its value to users and increase intermediary participation; however, it may also introduce policy trade-offs that affect competition, particularly through reduced pricing transparency. Competition in retail payments is shaped not only by who can enter the market but also by which products are offered to end users. Many end users value bundled products and services, such as credit, fraud protection, or integrated insurance. For intermediaries, bundling creates additional revenue streams, such as interest, fees, or cross-selling, which helps make CBDC distribution viable especially when basic payments are low margin or free. If decision makers allow intermediaries to integrate CBDC into their offerings, the perceived value of CBDC to both end users and intermediaries could increase. It is important to note that, while allowing CBDC to be bundled with other intermediary products, central banks should consider the importance of ensuring that CBDC is also offered as a stand-alone product, as exclusively bundling it with other intermediary products could obscure its true price, even if CBDC itself is low-cost or free.

Platform for Innovation

If CBDC can create a platform that drives financial innovation, for example, through tokenization or programmability, its competitive pressure in the payment market will increase. If financial assets become increasingly tokenized and CBDC serves as the settlement asset in that market, users will hold CBDC, which will subsequently incentivize them to use it for payments. Similarly, if programmability becomes a valued attribute of CBDC, it will create demand for CBDC, prompting users to possibly also employ it for payments. This dynamic could drive network effects between CBDC for financial innovation and payments, benefiting both domains (for further details on tokenization, see Agur and others 2025). These platform

features could also enable the development of complementary services that would further enhance CBDC's value proposition. Whether such services emerge depends on key design and ecosystem choices. An open CBDC platform, with APIs or programmable interfaces, could allow intermediaries to offer differentiated, value-added services. Public infrastructure may also support this dynamic. For instance, India's Central Payments Fraud Information Registry provides real-time fraud detection as a shared utility. By enabling both public and private complementary services, CBDC can raise service quality standards and increase competitive pressure on incumbent platforms across the payments ecosystem.

Box 3. Examples of Competition-Enabling Design Features

Integration with existing public FPS: India's retail digital-rupee pilot requires every participating CBDC wallet to accept the national UPI QR code standard. Users that hold the digital rupee in digital wallets issued by the Reserve Bank of India can pay merchants by scanning existing UPI QR codes, meaning the CBDC plugs directly into India's instant payment infrastructure. With over 50 million UPI-enabled merchant points covering both urban and rural areas, this integration instantly broadens CBDC acceptance without extra development effort and reduces end user lock-in.³⁶

Interoperability with private platforms and intermediaries: The People's Bank of China's CBDC (e-CNY) pilot design features a proprietary wallet that integrates seamlessly into existing payment ecosystems. End users can transact in e-CNY within Alipay, WeChat Pay, and major commercial banking apps. At the infrastructure level, e-CNY wallets interoperate with different operators' digital wallets and link directly to bank accounts. By minimizing technical, contractual and behavioral frictions, this interoperable approach lowers end users' switching costs and holds potential to aid with competitive effects.³⁷

Charging zero or low end user fees: Across live, pilot, and planned CBDC projects, central banks are adopting zero- or low-fee policies for their end users to position their CBDC as the low-cost alternative to incumbent payment networks. The Central Bank of Nigeria waives person-to-person eNaira charges and keeps wallet-funding costs "minimal" to nudge uptake. The Sand Dollar platform advertises zero transaction fees for individuals while explicitly offering merchants lower acceptance fees than card networks.³⁸ The People's Bank of China forbids fees on individual e-CNY conversions, passing its own zero-fee policy on to commercial operators.³⁹ The legislative proposal of the digital euro states that individuals will incur no charges for basic services, while merchants may be charged.

Allowing fees between intermediaries: Within the Digital euro ecosystem, inter-intermediary fees, similar to interchange fees in existing card schemes, are envisaged to enable intermediaries (for example, those serving consumers) to recover their costs. To mitigate potential distortions, both inter-intermediary and merchant-service fees plan to be capped. To ensure these fees remain fair and uniform across the euro area, the European Central Bank plans to regularly monitor, adjust, and publish fee caps, and collaborate closely with competition authorities (see European Commission 2023). This pricing and regulatory approach could support end user uptake and encourage intermediary participation and contestability.

³⁶ See Reserve Bank of India, "Frequently Asked Questions on Digital Rupee," <https://www.rbi.org.in/commonman/English/scripts/FAQs.aspx?Id=3686>; and National Payments Corporation of India, "RBI's Digital Rupee (CBDC) and UPI Interoperability," Circular No. UPI/OC/170, 2023, https://www.npci.org.in/uploads/UPI_OC_170_RBI_s_Digital_Rupee_CBDC_and_UPI_Interoperability_c61688c62c.pdf

³⁷ For further discussion on e-CNY, see for example People's Bank of China (2022) and Bidder and Lu (2025).

³⁸ For more information on using the Sand Dollar, see: <https://www.sanddollar.bs/individual>.

³⁹ See People's Bank of China (2022).

V. Conclusion

This Note provides a framework for policymakers to assess the potential competitive impacts of CBDC in retail payment markets. CBDC could function as both a digital payment method and a foundational infrastructure, with the potential to influence competition across the entire retail payment ecosystem. As this Note has argued, CBDC can have a competitive impact through four channels. First, it may affect the price dynamics and help reduce high fees in the payment market. Second, CBDC may enhance the value proposition for end users by offering a competitive alternative to existing private platforms. Third, CBDC could help increase contestability in the payment market, for example, by making it easier for nonbank financial institutions to enter the payment market if they are allowed to become CBDC intermediaries. Finally, CBDC could improve financial access to end users that are underserved by existing private payments providers, by offering low-cost services and attractive features—such as offline functionality—that might be lacking in private payment solutions.

CBDC's impact on competition will depend on the market structure and the regulatory framework. CBDC could have the highest competitive impact in markets led by unregulated private platforms, where they can reduce fees, boost access, and enhance service standards. In regulated payment markets with fee caps, CBDCs have a more moderate effect, reinforcing existing controls, and addressing gaps in inclusion or price transparency. Where FPS are well established, CBDC may play a complementary role, supporting wider access for underserved groups. In cash-heavy markets with limited digital infrastructure, CBDC could encourage digital payments and financial inclusion while curbing potential future market concentration.

CBDC design choices will shape its competitive impact and should be carefully considered. As highlighted in section IV, there are many design levers that policymakers can employ to shape the competitive impact of CBDC. For example, rules regarding the pricing of CBDC, particularly when implemented in a two-tier system; holding limits for CBDC, which could present a trade-off between financial stability and CBDC's usefulness for payments; a requirement or mandate to accept CBDC or make CBDC interoperable with existing payment platforms; the ability to bundle other services, such as credit, with CBDC; and the development of a larger CBDC ecosystem, for example, in the context of tokenized assets.

Policymakers should carefully balance increased competitive pressure through CBDC with the potential associated risks, especially related to the resilience of the payment market. While CBDC has the potential to increase competition in the payment market, policymakers should also consider the risks and how CBDC might affect private alternatives in the market. For instance, if CBDC is priced too aggressively, possibly being made available for free to all market participants, it might crowd out private payment platforms. If private alternatives were to exit the market as a result of CBDC entry, a possible trade-off between resilience and variety of choice, and an increase in competition might present itself, which should be carefully considered by policymakers. A further dimension to consider is the possible interaction of CBDC with existing domestic competition policy and guidance.

Evaluating whether a CBDC is fostering effective competition in retail payments requires a broad set of indicators rather than reliance on a single metric. In two-sided payment markets, competition often plays out unevenly across end user groups, making narrow price measures potentially misleading. For example, merchant fees may rise even as consumer costs fall or vice versa, while overall welfare improves through broader access or greater efficiency. To reflect this multidimensional nature, several categories of indicators can be tracked. First, *price-based outcomes*, such as changes in merchant discount rates or interchange fees, can signal pricing pressure on incumbents. Second, *market concentration measures*, including the Herfindahl–Hirschman Index and shifts in provider market shares, can capture changes in market power. Third, *contestability indicators*, such as new market entry, user switching, or multihoming, may reveal whether barriers to entry are falling. Finally, *financial inclusion metrics*, such as increased digital payment use among underserved populations, can show whether CBDC is expanding access and fostering competition in segments underserved by private providers.

Annex I. Payment Fees across Markets

Fee structures for different payment types vary across jurisdictions. Fees across different systems generally exist to cover acceptance, processing, and security of the transaction, as well as investment in innovation/efficiencies. In layered systems, they further reflect the need to compensate different intermediaries for the services they provide. In most payment schemes, the merchants face the majority of direct costs, enabling acceptance of any payment type typically known as a “merchant discount rate” (MDR). That said, consumers do face some form of fees in many FPS and e-money networks, for example during cash in/out transactions, transfers within, and outside their network, and at point of sale including government-mandated levies.

Card systems display the most global consistency—primarily because of the existence of a few global card networks. E-money networks and FPS display many inconsistencies in fee structures because of their distinct geographic developments and bundling with several other services.

- **The majority of card-based systems globally are structured around two direct fees to end users:** the merchant faces a participation/acceptance fee (MDR) paid to an intermediary providing access to a card network/card payments; the consumer may face (credit) card charges for their access to credit. Within the merchants’ fees, layers of other fees to intermediaries for various services are included—most notably acquiring fees, interchange fees, and scheme/processing fees. Card schemes receive the scheme fee, but acquiring and interchange fees are received by the sending/receiving intermediaries of the payment (usually acquiring and issuing banks). Fees will further differ by industry sector and transaction size. As an example, Mastercard’s publication of their U.S. interchange fees highlights the variance of interchange fees by sector.⁴⁰
- **Through developing FPS, many countries have tried to minimize fees to end users to help adoption.** FPS have been developed with a mix of public and private investment over the past two decades. Although some payment types are subject to fees, many low-value person-to-person transfers are offered free of charge to consumers. However, all intermediaries facilitating a payment may experience a direct or indirect participation fee to a fast payment infrastructure or scheme—these could comprise a fixed or periodic component and a variable/volume-based cost. Some countries (such as Sri Lanka and Australia) further require FPS participants to become a shareholder of the fast payment scheme itself. Depending on the most prominent use cases, a fast payment may or may not have direct costs to consumers and merchants. For example, in India, UPI transactions are generally free for consumers undertaking person-to-person and person-to-merchant transactions. However, a third-party study in India indicates that over 40 percent of UPI users surveyed had still experienced some sort of fee to undertake a UPI transaction in the past

⁴⁰ Mastercard. “U.S. Interchange Rates and Fees.” Updated semiannually.

<https://www.mastercard.com/content/dam/mccom/us/business/documents/merchant-rates-2025-2026.pdf>.

year.⁴¹ Merchants may or may not face direct charges to accept a fast payment in store or online, depending on the nature of the fast payment transaction. In the case of India, person-to-merchant UPI transactions undertaken through a digital/prepaid wallet costs merchants an “interchange fee” of up to 1.1 percent.

- **E-money payment networks show the most heterogeneity in fee structures between regions.** In Europe, e-money payments commonly integrate with cards schemes and sometimes FPS, acting effectively as intermediaries to other systems. PayPal and Revolut are two examples of e-money issuers who charge little-no fees to consumers for e-money transactions, but may charge merchants to accept an e-money payment. Similarly in Asia, e-money schemes are free for most individual users but charge merchants an MDR or equal fee; for example, payment service providers in Indonesia are estimated to charge merchants anywhere between 0 and 2 percent fees on transactions to cover processing (Sun and Rizaldy 2023). Merchant charges and income through cross-subsidies with other business lines are considered a strong reason why e-money networks in Asia have gained such scale. By contrast, throughout Africa both consumers and merchants can face fees relative to a percentage value of the transaction, both within their e-money network and when transferring between. The amounts can vary and may only apply after a threshold amount. In recent years, government-initiated mobile money levies have become more common (Ghana, Nigeria), raising the costs to consumers (Niesten, Kobina Amoako, and Abdullahi 2024).

⁴¹ Study undertaken by Local Circles involving 32,000 participants. See Local Circles “73% UPI users surveyed say they will stop using it if transaction fee is regularized by the Government”: <https://www.localcircles.com/a/press/page/upi-transaction-fee-survey>.

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