

Instant Payments in Czechia: Adoption and Future Trends

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Instant Payments in Czechia: Adoption and Future Trends

Ivan Trubelík, Tomáš Karhánek, Simona Malovaná, and Aleš Michl *

Abstract

This paper analyzes the adoption and evolution of the instant payment system (IPS) in Czechia, focusing on its integration into the Czech Express Real Time Interbank Gross Settlement (CERTIS) system. Since 2018, CERTIS has enabled 24/7 CZK fund transfers, boosting transaction efficiency. Voluntary bank participation led to rapid uptake, and by 2024, IPS-participating banks handled over 90% of CERTIS client transactions, with 50% of interbank retail payments processed instantly. Czechia's IPS stands out for its seamless bank integration, high reliability, and flexible limits. It also outperforms priority payments for lower-value transactions. The paper explores future developments, including cross-border payments and links to central bank digital currencies.

JEL Codes: E42, E58, G21, O33.

Keywords: CERTIS, instant payment system, real-time settlement, transaction efficiency.

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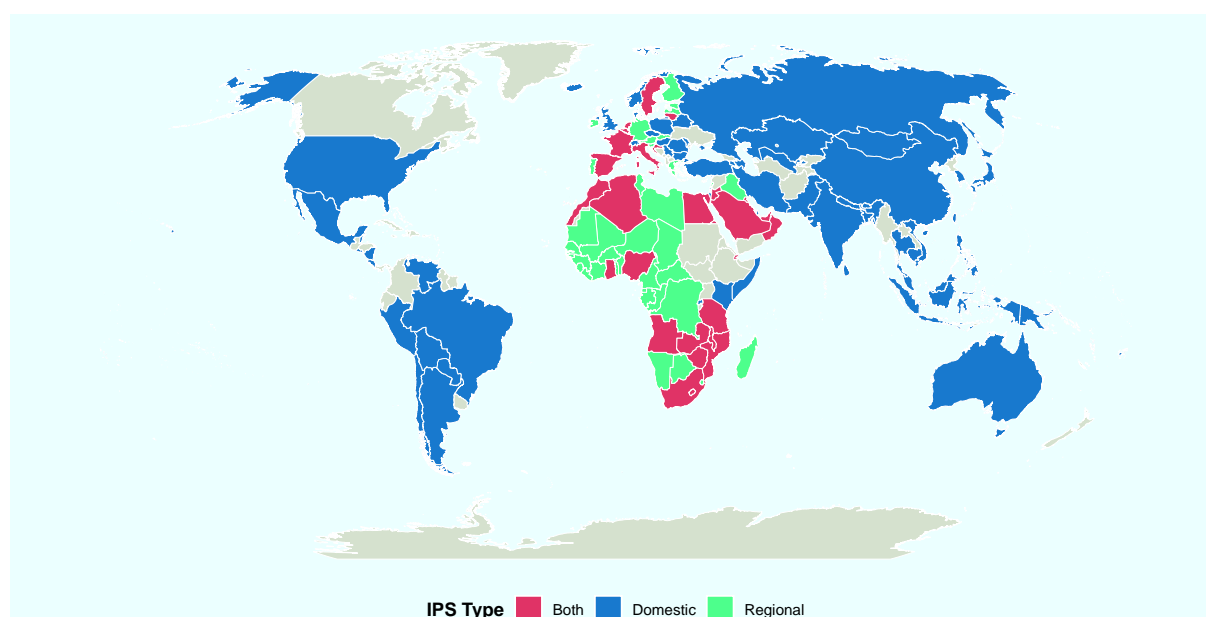
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1. Introduction

Instant payments – also known as fast or real-time payments – are electronic fund transfers characterized by near-instantaneous settlement and round-the-clock availability. They represent a significant evolution from traditional payment methods, which may take hours or days to process. In recent years, the worldwide adoption of instant payment systems¹ (IPS) has grown dramatically, driven by increasing consumer and business demands for rapid, reliable financial transactions. Figure 1 illustrates how these systems have gained traction across diverse regions, supporting both domestic and regional payment needs. Figure A3 presents the timing of the IPS adoption across countries relative to that of the Czech Republic.

This global expansion includes robust adoption in Europe and Asia-Pacific, leading to a pronounced spike in the number of countries implementing IPS around 2018 (Figure 2, Panel A). During this period, the Eurozone launched TARGET Instant Payment Settlement (TIPS), while Czechia introduced an advanced iteration of its Czech Express Real Time Interbank Gross Settlement System (CERTIS). Leveraging CERTIS allowed the Czech Republic to establish 24/7 real-time transfers in Czech koruna, placing Czechia among Europe's early adopters of faster, more efficient payment mechanisms.

Figure 1: A Map of Countries with Instant Payments Systems



Note: The information on instant payments systems were obtained from the websites of the operators (central banks or private organizations), public announcements of their representatives, reports of regional financial inclusion promoting organization (Africa Nenda) and news articles.

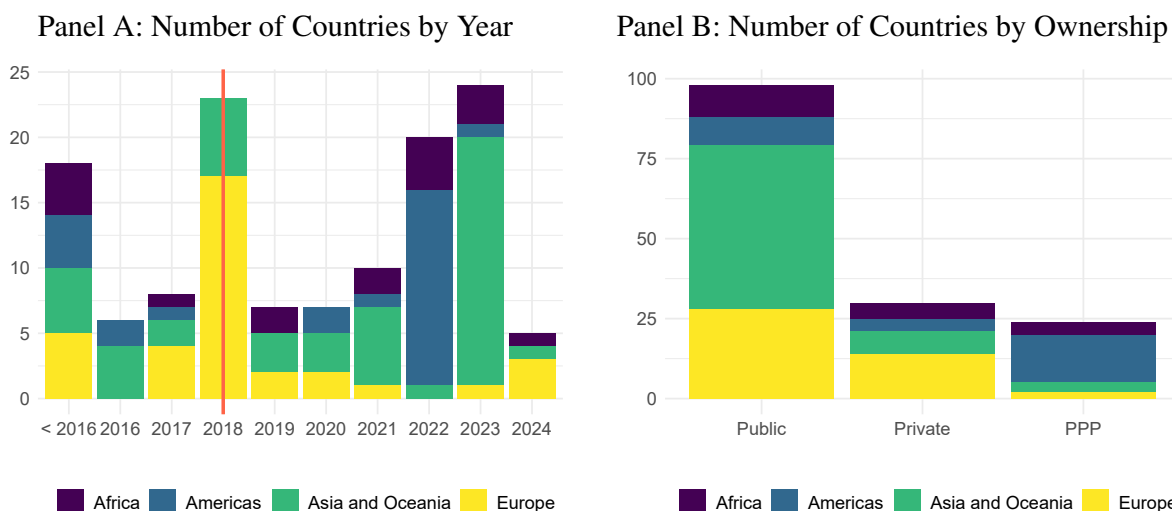
A key driver behind such initiatives has been the proactive role of central banks and regulators. Research indicates that jurisdictions with strong public-sector leadership – as seen in Brazil and India – often achieve a faster, broader uptake of IPS (Frost et al., 2024; IBRD, 2021). Ownership structures also vary: some systems are fully public, while others emerge from public-private partnerships or private bank consortia (Figure 2, Panel B). These governance models influence both the design of instant payment platforms and the pace of their adoption.

¹ In the literature, instant payment systems are also referred to as fast payment systems (FPS) or real-time payments systems

The advantages of instant payments extend from individuals and businesses to the broader economy. Users benefit from immediate access to funds, increased liquidity, and reduced settlement risk, while businesses gain efficiency in cash flow management. Additionally, digital payments generate transaction data that can improve access to financial services such as credit, reinforcing financial inclusion and economic growth in various regions (Aguilar et al., 2024; Bech and Hancock, 2020; IBRD, 2021; Frost et al., 2024). Furthermore, instant payments help replace slower, traditional payment methods (Khiaonarong and Humphrey, 2022),² especially when integrated with mobile payment platforms in emerging markets like India, Brazil, and Thailand (Aguilar et al., 2024; Frost et al., 2024).

Against this backdrop, Czechia's own journey toward instant payments stands out as a pivotal case in Europe. By enhancing CERTIS, originally established in 1992, the Czech National Bank (CNB) enabled near-instant domestic transactions with high reliability and scalability. Unlike mobile-first systems such as India's Unified Payments Interface (UPI) or Brazil's Pix, the Czech model emphasizes seamless integration into existing banking infrastructure, prioritizing security, interoperability, and standardization. Although CERTIS currently handles only domestic transfers, this modernization effort underscores Czechia's commitment to efficient, real-time financial services and offers insights into effective payment infrastructure development.

Figure 2: Adoption of Instant Payments by Year and Ownership Across Regions



Note: Panel A illustrates the number of countries that adopted instant payments each year, grouped by region. The vertical red line marks the year 2018, when TIPS (TARGET Instant Payment Settlement), a pan-European instant payment system, was introduced, and Czechia launched its national instant payment system. Panel B shows the number of countries adopting instant payments based on ownership structures (public, private, or PPP) across regions. PPP stands for the Public-Private Partnerships. Detailed information on individual countries is available in Table A5 in Section 3.

The progress Czechia has made in adopting instant payments is summarized in Table 1. The share of banks that adopted instant payments on the total number of client³ the transaction in the CERTIS system rose from 16% in 2018 to around 90% in only two years. When considering the

² In Brazil and India, central banks spearheaded Pix and UPI, respectively, ensuring swift adoption (Committee on Payments and Market Infrastructures, 2021; Aguilar et al., 2024; Frost et al., 2024; Di Iorio et al., 2024). By late 2024, Pix reached over 80% of Brazil's population, while UPI surpassed 15 billion monthly transactions by November 2024. Meanwhile, Sweden's Swish has helped make that country one of the most cashless societies worldwide.

³ We define client transactions (also referred to as non-bank transactions) as transactions between clients of the banks, excluding central bank operations and interbank transfers.

share of instant payments on retail payments⁴, the data for 2024 reveal that 50% of retail payments are instant payments, with even higher shares when excluding batch and scheduled payments that currently cannot be handled instantly (and even higher when considering only payments between banks participating in the instant payments system).

Table 1: Progress in Instant Payment Usage in Czechia

Indicator	2018	2019	2020	2021	2022	2023	2024
Market share (banks in the IPS; client transactions)	16%	41%	87%	90%	91%	90%	90%
% share of instant retail payments in:							
All retail payments	-	-	-	-	24%	42%	50%
Retail payments w/o batch and scheduled payments	-	-	-	-	51%	73%	81%
Retail payments w/o batch and scheduled payments; only banks in IPS	-	-	-	-	63%	83%	89%
% share of instant non-bank transactions in:							
< 10k CZK payments	0%	2%	13%	18%	22%	29%	35%
10k - 50k CZK payments	0%	1%	7%	10%	13%	18%	21%
50k - 400k CZK payments	0%	1%	7%	10%	12%	16%	18%
limit-weighted payments	0%	4%	15%	20%	24%	32%	38%

Note: IPS = Instant Payments System. Non-bank transactions via IPS are calculated as the share of instant payments in client credit transfers (client interbank transactions via CERTIS). These calculations are based on data for banks and branches of foreign banks (on a consolidated basis with their subsidiaries). The share of instant payments in IPS bank limit weighted transactions is calculated in a restricted set of transactions that are lower or equal to in value to the limit for instant payments for each individual bank at a specific day. The data source is CERTIS and survey that the Czech National Bank conducts among banks.

The remainder of this paper explores these themes in greater detail. In Section 2, we examine the design, governance, and performance of Czechia's instant payment system, focusing on CERTIS and its role in near-instant settlements. Section 3 provides a broader international comparison, highlighting global trends, diverse ownership structures, and varied adoption patterns. Lastly, Section 4 examines forthcoming innovations, including cross-border real-time payment links and the potential role of central bank digital currencies, which promise to further shape the instant payments landscape in the coming years.

2. Instant Payments in Czechia

Instant payments in the Czech Republic build on the robust foundation of CERTIS, operated by the CNB. As the central platform for interbank transactions in Czech koruna, CERTIS provides the core infrastructure for near-instant settlements, aligning the Czech financial system with international moves toward faster and more efficient payments. This chapter first outlines the design and operational framework of CERTIS, then explains the incorporation of instant payments in 2018, concluding with an overview of adoption trends, transaction limits, and competition with existing payment services.

2.1 CERTIS: The Backbone of Czech Electronic Payments

CERTIS is the only interbank payment system in the Czech Republic handling transactions in Czech crowns. It began operations on March 8, 1992, under the State Bank of Czechoslovakia. Following the split of Czechoslovakia, the system remained with the CNB, while Slovakia established its own clearing center. As of 2024, CERTIS has 47 registered participants. Direct participants include banks with a Czech banking license, encompassing domestic banks, savings and credit cooperatives,

⁴ We define retail payments as transactions from personal accounts.

and branches of foreign banks operating in the Czech Republic. In addition to direct participants, certain financial institutions participate in CERTIS through bilateral agreements with the CNB. These “third parties” are non-bank entities, such as card payment clearing houses and securities settlement institutions.^{5,6}

CERTIS operates on a real-time gross settlement (RTGS) basis, enabling immediate, individual transaction settlement and minimizing settlement risks.⁷ Payments are settled using interbank accounts maintained by the CNB for direct participants, with transactions becoming irrevocable once processed by CERTIS. Funds in these accounts contribute to participants’ reserve requirements, which are set at 4.0% of total deposits as of January 2025, an increase from the previous 2.0%. To accommodate increasing demand for cashless transactions, CERTIS has been upgraded to handle up to 1.5 million transactions per hour, allowing a daily maximum of 34.5 million transactions.⁸

CERTIS processes all interbank transactions in Czech koruna, regardless of their value.⁹ However, it does not support multi-currency transactions, which are processed through other systems like TIPS in the Eurozone.

Over the years, the CERTIS system has experienced significant growth in the volume of transactions processed. In 1992, when the system became operational, the average daily volume of transactions was about 300 thousand, totaling nearly 75 million transactions for the year. By 2023, the average daily volume had increased to 3.6 million, amounting to approximately 910 million transactions annually. Figure 3 illustrates the evolution of the volume and value of transactions processed by CERTIS, highlighting seasonal patterns and notable shifts during specific periods. Transactions are grouped into seven value intervals: below 10k CZK (400 EUR), 10k–100k CZK (400–4k EUR), 100k–1m CZK (4k–40k EUR), 1m–10m CZK (40k–400k EUR), 10m–100m CZK (400k–4m EUR), 100m–1b CZK (4m–40m EUR), and above 1b CZK (40m EUR).¹⁰

⁵ Interbank transactions are settled using accounts that direct participants hold at the CNB. Although “third parties” do not have interbank payment accounts at the CNB, they can submit payment orders to transfer funds between direct participants on their behalf, facilitating processes such as settling card payment clearings or stock exchange transactions.

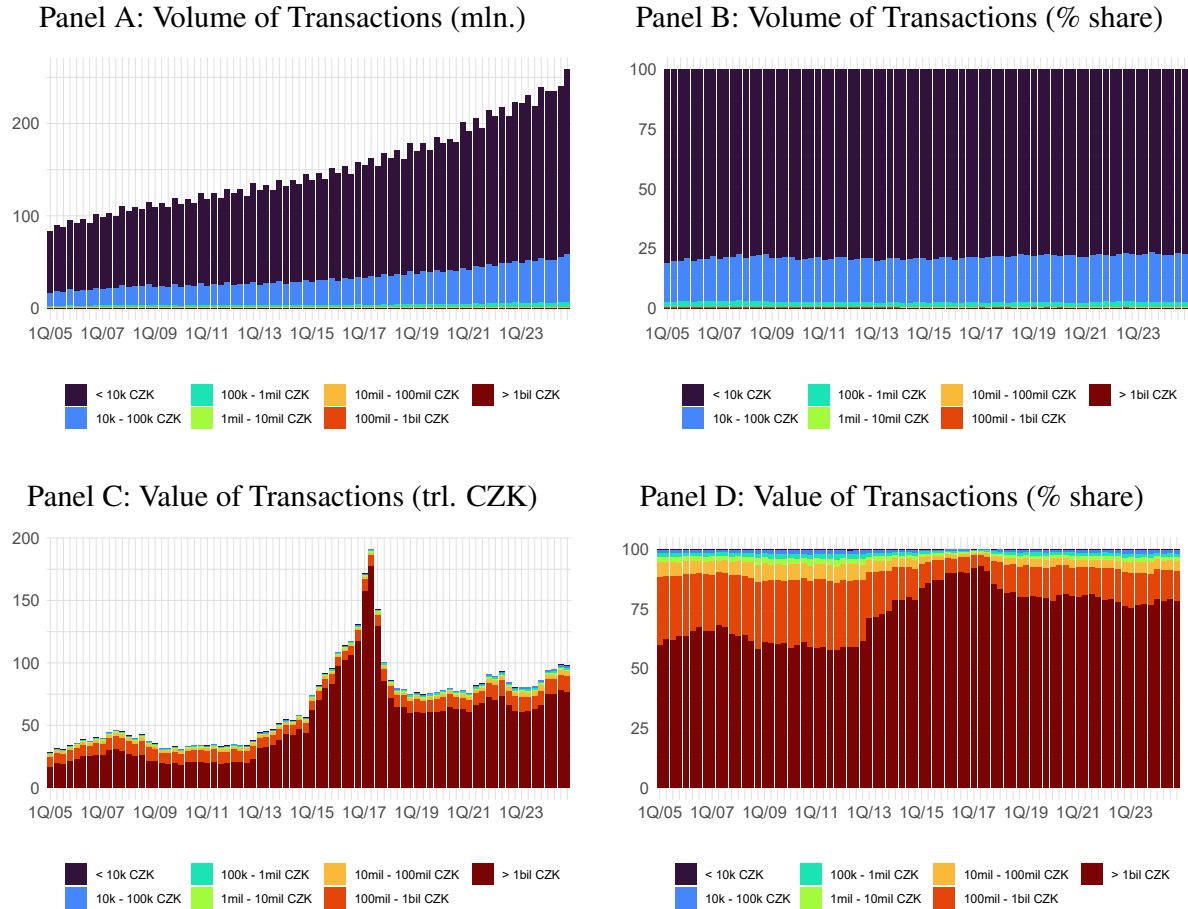
⁶ From the 47 CERTIS participants, there are domestic 23 banks, from which 4 are building associations, 4 savings and credit cooperatives, 16 branches of foreign banks, and 4 third party institutions.

⁷ There are two main payment system designs: deferred-time net settlement (DTNS) and real-time gross settlement (RTGS). DTNS processes payments in batches after set intervals, which can introduce settlement risks if one participant defaults. In contrast, RTGS settles transactions individually and immediately, nearly eliminating such risks. Modern technology and intraday collateralized credit by central banks, as in CERTIS, mitigate the higher liquidity demands of RTGS.

⁸ From a technical point of view, CERTIS operates on a structured accounting day: it begins at 5:00 p.m. on the previous working day (D-1) and ends at 4:00 p.m. on the current day (D), with settlement starting at midnight. Participants electronically submit payment orders via a secure telecommunications network, adhering to CNB-defined rules. Once validated, payments are processed by checking the sender’s account for sufficient funds, followed by immediate settlement—debiting the sender’s account and crediting the recipient’s. The processed transactions are then electronically communicated back to the participants. Additional technical information on CERTIS can be found at <https://www.cnb.cz/en/payments/certis/>.

⁹ The types of transactions it handles include credit transfers, direct debits, corrective settlements, ancillary system transactions, and instant payments. Credit transfers are further categorized into low-priority client transfers, high-priority client transfers, and high-priority bank-to-bank transfers. Priority transfers receive settlement preference, while instant payments are settled continuously on a 24/7/365 basis.

¹⁰ We do not have specific data on which transactions are retail versus corporate. Generally, low-value transactions tend to be retail, while larger ones often represent bank-to-bank or corporate payments.

Figure 3: Volume and Value of All Transactions Processed by CERTIS: Breakdown by Value Category

Note: The transactions are divided into 7 non-overlapping categories by their value. The data source are quarterly CERTIS reports.

During the COVID-19 pandemic, a noticeable drop occurred in transactions below 10k CZK (about 400 EUR), though the relative share of transaction categories remained stable. Seasonal patterns are evident, particularly for transactions between 10k and 100k CZK (about 400–4,000 EUR), with dips in the first quarters of each year. Interestingly, the value of transactions processed by CERTIS experienced a significant increase during 2013–2017, driven by changes in liquidity management and monetary policy. This surge was influenced by equalizing the overnight deposit rate and the two-week repo rate (November 2012–August 2017), prompting banks to replace repo operations with overnight deposits. Additionally, the CNB conducted exchange rate interventions from November 2013 to April 2017, which increased the excess liquidity of the Czech koruna. The combination of this excess liquidity and banks increasing frequency of their large transactions, due to switching from two-week repo operations to overnight deposits, led to a spike in transaction values being processed by CERTIS.

Risk management and business continuity. CERTIS does not allow overdrafts, so transactions lacking sufficient funds are queued until the account balance is adequate. Banks can secure funds through incoming transfers, borrowing from the money market, or obtaining collateralized intraday

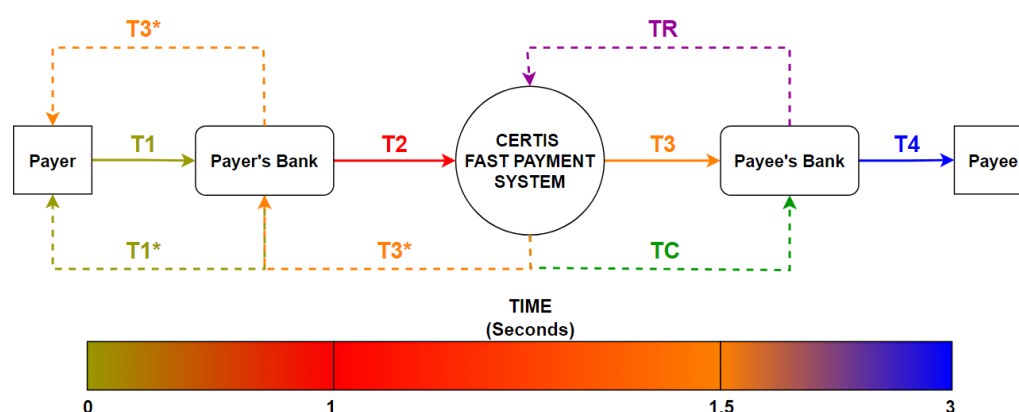
or overnight credit from the Czech National Bank.¹¹ The CNB ensures the system's reliability, maintaining operational continuity during emergencies. CERTIS complies with the European Central Bank's standards for systemically important payment systems (SIPS), with contingency plans regularly tested and updated.

Pricing and fees. CERTIS fees are set by the Czech National Bank to cover operational costs. Initially, fees were based on six time brackets during the accounting day, reduced to three in 2017, and abolished entirely in 2018 to simplify operations and reduce overload risks. Fees now vary by instrument type and priority level, with unified pricing for some services. Discounts are applied based on transaction volume, with thresholds granting larger reductions for higher volumes. The current fee structure, along with discount details, is shown in Table A1 in the appendix.

2.2 Instant Payments: Overview and Adoption

Instant payments were introduced in the Czech Republic in November 2018 as a new type of credit transfer settled in near real-time, allowing funds to be transferred between banks within seconds. These transactions take place in Czech koruna and operate as a dedicated scheme integrated into CERTIS.

Figure 4: CERTIS Instant Payment System Operation Diagram



Note: The sequence of operations is in the following order: T1, T2, TC, TR, T3, T4. Dashed lines represent delivery of information or information requests, the bold line represents the flow of the money in the instant payment transaction. The * operator represents a communication operation which is parallel to the respective transaction operation. More detailed description of each step is available on the CNB's website.

To ensure transactions are completed within seconds, the system and participating banks follow clearly defined steps, as shown in Figure 4. When a payer initiates a instant payment, their bank performs internal checks to verify sufficient funds and ensure limits are not exceeded before sending the instruction to CERTIS. CERTIS then validates the payment's authenticity, checks the payer bank's balance, and confirms that the payee's bank can process instant payments. If these checks succeed, CERTIS reserves the payment amount and requests confirmation from the payee's bank. Upon confirmation, the funds are immediately transferred. If no confirmation is received within six seconds, the payment is rejected. Under normal circumstances, the entire process, from initiation to crediting the payee's account, is completed within three seconds.

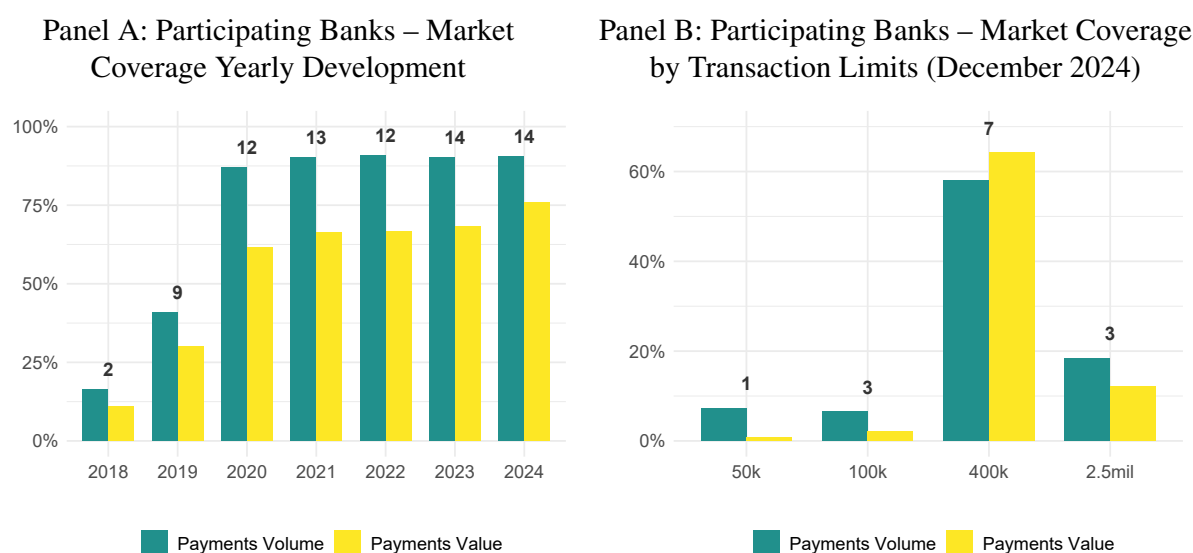
¹¹ Collateral includes securities registered in the Short-Term Bond System (SKD), a CNB-operated registry for short-term bonds issued by the Czech Republic.

The system is operational 24/7, with planned maintenance scheduled outside regular working hours to minimize disruptions. Since its launch, the CERTIS IPS has maintained exceptional reliability, with minimal delays or rejections occurring in only 0.1–0.2% of cases due to minor communication issues. The Table A3 displays the quarterly downtime of the IPS system, distinguishing CERTIS IPS maintenance, maintenance of commercial banks' internal payment systems, and outage of the commercial banks' internal payment systems.

Although participation is voluntary, the instant payment service has steadily gained traction, with 14 banks offering the service as of 2024. Initially, only two banks joined at the scheme's launch, but coverage expanded significantly by late 2019, as several major Czech banks adopted the service, as shown in Figure 5, Panel A. Within two years, the majority of banks adopted the IPS. In terms of inter-bank payments processed in CERTIS, these banks cover about 90% of the volume of payments, and in terms of payments value, about 68% (suggesting that banks that did not adopt the IPS are rather non-retail banks with high valued payments).

The CNB, as the scheme administrator, sets an overall maximum transaction limit that all instant payment participants must adhere to. Initially set at 400,000 CZK (about 16,000 EUR), this limit was increased to 2,500,000 CZK (about 100,000 EUR) in June 2021, aligning with the SEPA Instant Credit Transfer standards. However, individual banks are free to impose their own, often more restrictive, outgoing transaction limits, and may also set daily ceilings for the total amount sent via instant payments. This flexibility results in varying practices across institutions, as illustrated in Figure 5, Panel B.

Figure 5: Instant Payments Adoption and Transaction Limits in Czechia



Note: The data for CERTIS payments are consolidated at the bank group level and represent the annual average. **Panel A:** The numbers above the bars indicate the number of banks that adopted instant payments by the end of each year. The decline in the number of banks in 2022 compared to 2021 reflects the acquisition of Equa bank by Raiffeisenbank in November 2022. The chronological order of banks joining the system is available in Table A2. **Panel B:** Horizontal axis represents transaction limits set by banks for instant payments. The numbers above the bars indicate the number of banks that with certain limits.

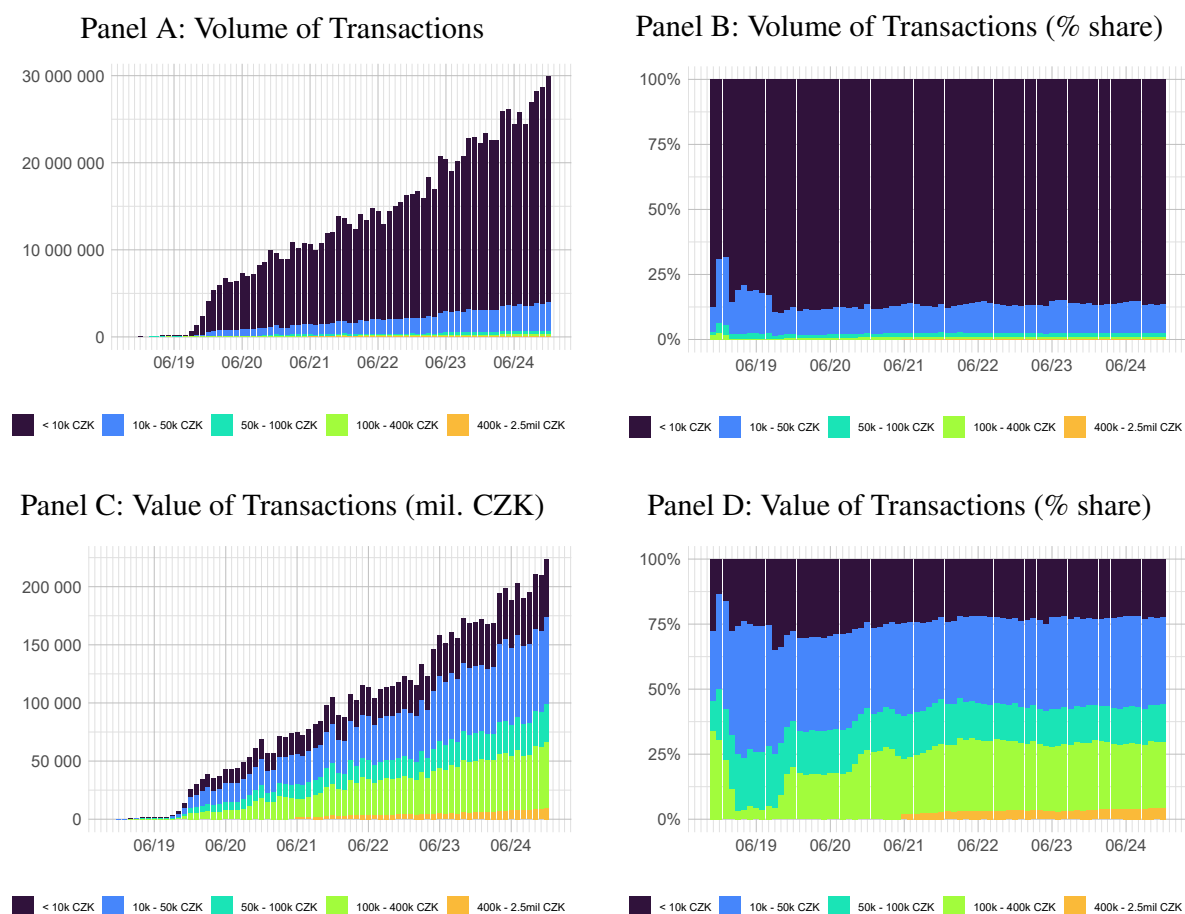
2.3 Instant Payments: Main Trends

Having covered the design and operational framework, we now examine how instant payments (interbank payments processed by CERTIS) have evolved over time. Given current transaction limits, this analysis focuses on the four lowest value intervals (below 10k CZK, 10k–100k CZK,

100k–1m CZK and 1m–2.5m CZK). The data show a steady increase in both volume and value, accompanied by distinct patterns tied to transaction size, bank participation, and client composition.

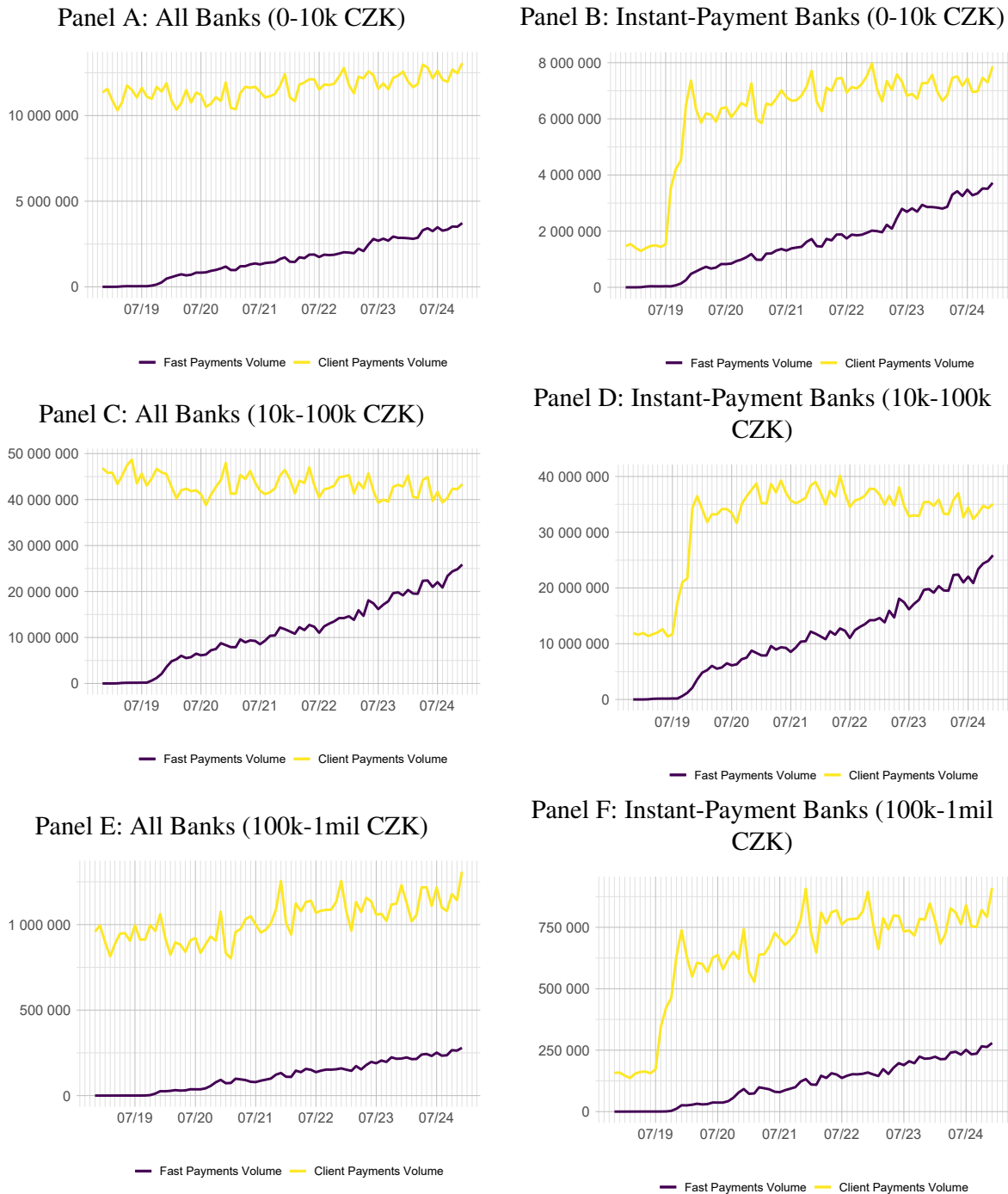
Figure 6 illustrates the continuous rise in instant payment volumes. By late 2019, the distribution of transactions by size had stabilized: those under 10,000 CZK accounted for around 80–90% of the total volume of payments, while transactions in the 10,000–100,000 CZK bracket consistently comprised 10–15%. Turning to aggregate value, smaller transactions dominate by count yet represent only 20–30% of the total value, with mid-sized transactions (10,000–100,000 CZK) maintaining a steady share of 45–55%. Since mid-2021, payments in the 100,000–1,000,000 CZK range have grown notably, surpassing 30% of total value by the end of the sample period. Although payments exceeding 1,000,000 CZK remain a smaller segment, their share has gradually risen as more banks adopt higher instant payment limits.

Figure 6: Volume and Value of Instant Payments: Monthly Breakdown by Value Category



Note: The highest depicted transaction category is 2.5 million CZK (100k EUR) because of the limit of 2.5 million CZK (100k EUR) on instant payments. The data are obtained from the CERTIS payment system.

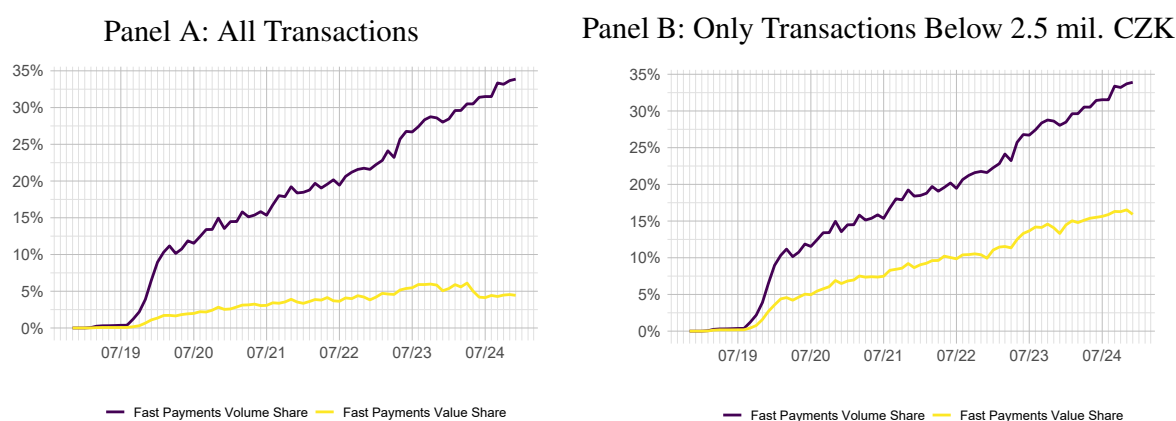
Figure 7: Volume of Instant Payments vs. All Inter-Bank Client Payments: Breakdown by Value of Transactions



Instant payments have rapidly gained traction, particularly for smaller-value transactions. Figure 7 benchmarks instant payments against all inter-bank payments across several value bands. By the end of 2023, instant payments constituted roughly 30–35% of all transactions under 10,000 CZK, with slightly lower penetration in higher brackets. These shares vary depending on whether we include all CERTIS participants or focus solely on those that offer instant payments (the latter showing higher shares overall).

More specifically, Figure 8 reveals that instant payments represented around 34% of all CERTIS “client transactions” (i.e., interbank transactions) by volume in 2024. Although their value share was just 5% overall – partly limited by the 2.5 million CZK (100k EUR) transaction cap – instant payments exceeded a 15% share among lower-value transactions (under 2.5 million CZK). This progression indicates that instant payments have moved from a niche service to a mainstream payment method within certain transaction bands.

Figure 8: Share of Instant Payments on Inter-Bank Client Transactions



Note: The transactions forming the basis for the share of the instant payments are CERTIS transactions (that is only inter-bank transactions) comprising of regular credit transfers, priority credit transfers, three-party credit transfers, instant payments credit transfers and direct debits. This group is referred to as client transactions in contrast to bank transactions that are not associated to any particular client of the bank.

2.3.1 Variation Among Banks

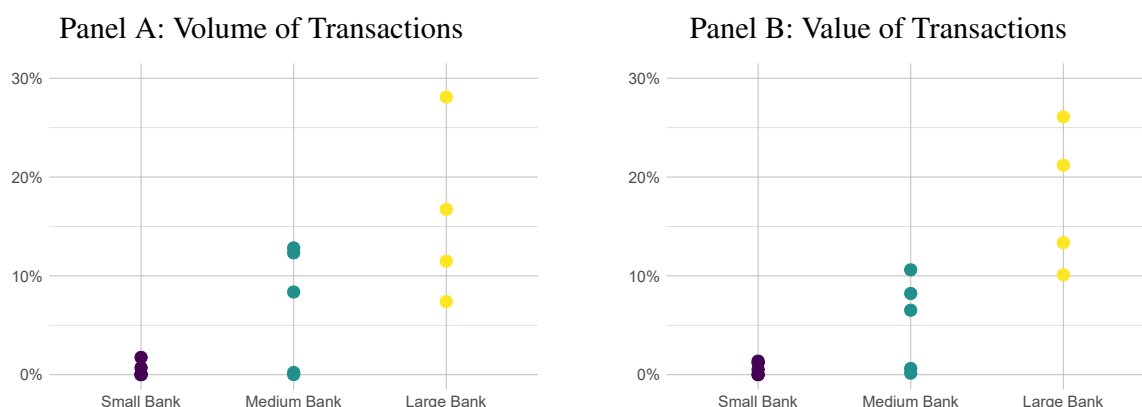
The data reveal notable diversity in how different financial institutions have adopted instant payments. Figure 9 shows that large banks account for the bulk of instant payments by overall volume and value, yet some smaller institutions exceed expectations by holding disproportionately large shares relative to their size. Meanwhile, average transaction values (Figure 10) vary considerably across banks, often reflecting the outgoing transaction limits each bank sets and the nature of its clientele.

Further evidence in Figure 11 highlights a strong correlation between a bank’s focus on retail depositors and its share of instant payments. Retail-oriented banks tend to exhibit higher adoption rates – though typically with fewer high-value transactions – whereas larger, more diversified institutions have introduced instant payments more gradually.

Figure 12 compares each bank’s share of instant payments over time, revealing distinct growth trajectories. While some banks’ instant payment shares rose steadily, others experienced sharp increases after modifying their service offerings or promotion strategies. A detailed timeline for the four largest Czech banks is presented in Figures A1 and A2. By late 2023, several banks had

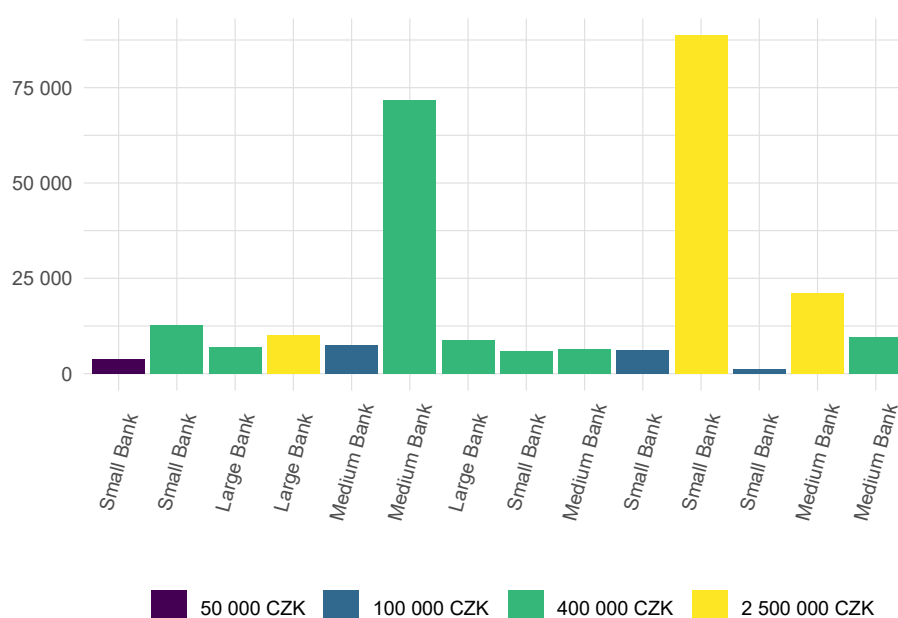
exceeded 90% instant-payment usage among eligible transactions, underscoring the potential for swift, transformative changes in payment behavior. This rise is also evident in other statistical measures (minimum, mean, median, quartiles) of the banks' shares of instant payments, all of which show a pronounced upward trend – indicating that instant payments are becoming firmly integrated in each adopting institution.

Figure 9: Share of Banks in Instant Payments Transactions



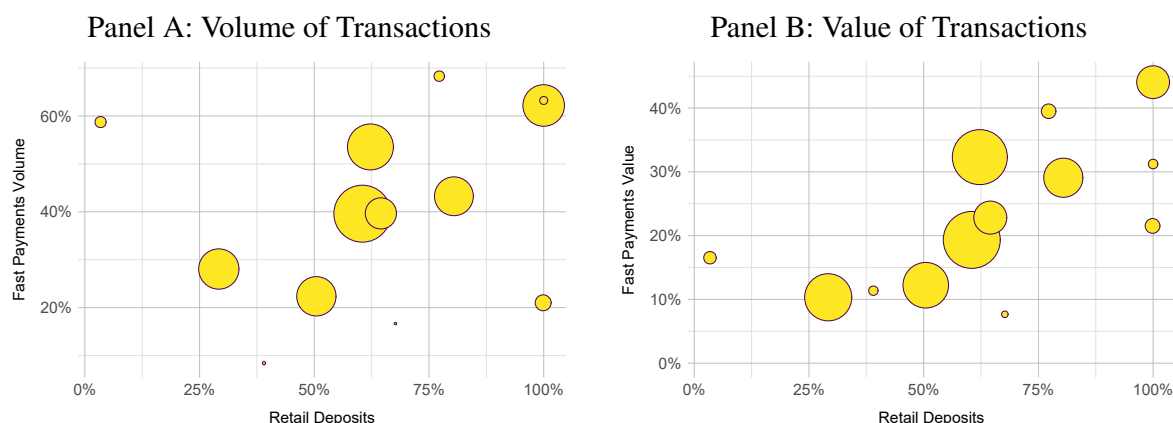
Note: The data refer to 2023, which is the most recent complete year of data. The classification of banks into small, medium and large banks is based on the methodological document of the Czech National Bank associated to the ARAD database with a dedicated section to bank groups breakdown - specifying small banks as below 2%, medium banks between 2-10% and large banks over 10% of the total banking sector's assets. The data are obtained from the CERTIS payment system.

Figure 10: Average Value of Instant Payments by Bank Size and Transaction Limit



Note: The data refer to 2023, which is the most recent complete year of data. The classification of banks into small, medium and large banks is based on the methodological document of the Czech National Bank associated to the ARAD database with a dedicated section to bank groups breakdown - specifying small banks as below 2%, medium banks between 2-10% and large banks over 10% of the total banking sector's assets. The colors represent the instant payments limit on single transactions that is fully in discretion of individual banks. The data are obtained from the CERTIS payment system.

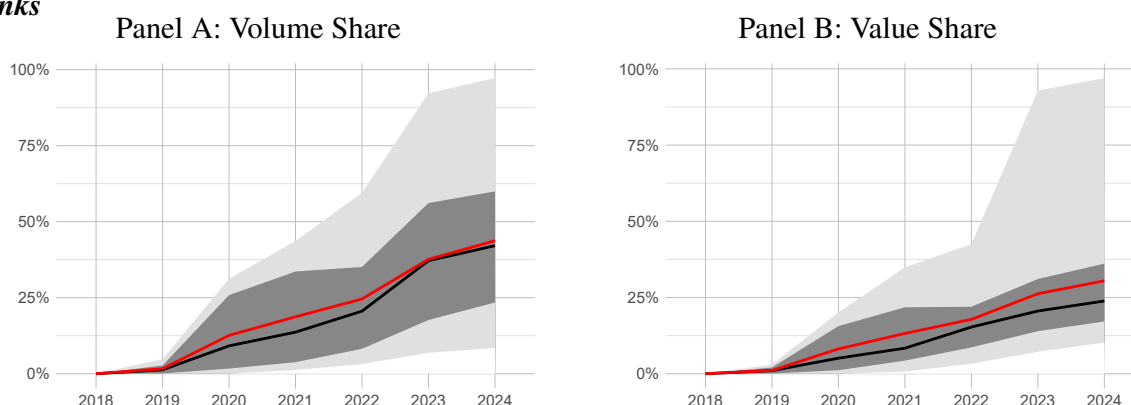
Figure 11: Share of Instant Payments against Bank Retail Specialization



Note: The share of instant payments volume and value refers to the group of all non-intrabank credit transfers and direct debits in CERTIS under 10 million CZK for each individual bank. The retail deposits share represents the portion of the bank's deposit portfolio related to households and natural person entrepreneurs. Both the indicators use data from August 2024. The size of the circles is proportional to the absolute volume/value of instant payments sent from individual banks. The data on the share of instant payments are obtained from the CERTIS payment system and the retail deposits shares were calculated based on the data from the SDAT database.

Finally, in terms of transaction value, Figure 12 confirms a similarly growing share of instant payments, although the pattern can differ from volume-based measures due to a heavier concentration in certain value ranges. Even so, some banks report maximum value shares close to 90%, mirroring the volume distribution. Overall, the slightly lower value-based share compared to volume-based share reflects that many instant payments occur at lower-to-mid transaction levels – a trend consistent with the current limit of 2.5 million CZK and broader usage patterns across the sector.

Figure 12: Distribution of the Share of Instant Payments on Client Payments among Individual Banks



Note: The share of instant payments is calculated among non-intrabank credit transfers and direct debits up to 2.5 million CZK (excluding bank transactions that are not associated to any particular client of the bank) and only banks that have adopted instant payments are included for a clearer comparison. The light gray range represents the minimum and maximum share of instant payments among the banks in a given year. The dark gray range represents the first and third quartiles, the black line represents mean of the sample and the red line the sample median. The data are obtained from the CERTIS payment system.

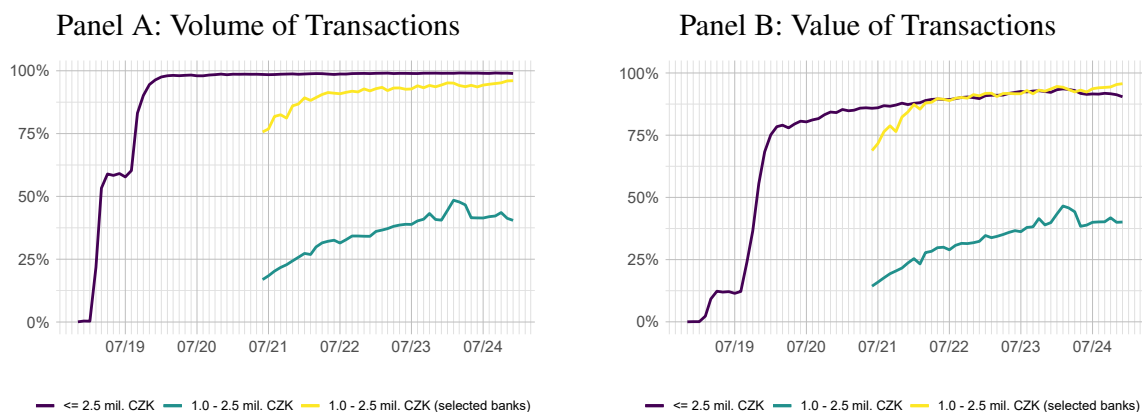
2.3.2 Competition with Priority Payments

Priority payments are a premium service designed to settle transactions faster than standard credit transfers. Banks typically charge additional fees for this service, with both speed and cost varying across institutions. Because the primary advantage of priority payments over regular, often free, transfers is rapid crediting of funds, instant payments naturally compete with them. It is thus informative to see whether users have shifted away from priority transfers in favor of instant payments.

Figure 13 shows that since mid- to late 2019, instant payments have largely displaced priority transfers in the small-to-medium transaction segments. Even in high-value ranges (1–2.5 million CZK), where instant payments remain less available at certain banks, those with higher instant payment limits have already recorded a notable migration away from priority transfers. As more banks expand their limits and improve the user experience for instant payments, priority payments may continue to lose ground – ultimately benefiting end users with faster, more cost-effective transactions.

It is worth highlighting that the majority of priority payments traditionally fall under 10,000 CZK. Consequently, once instant payments were introduced, many customers saw a notable reduction in fees, given that priority services typically apply a fixed charge – often a considerable percentage of smaller-value transfers.

Figure 13: Instant Payments vs. Priority Payments



Note: The plots depict the share of instant payments among the sum of instant and priority payments in respective categories. The blue lines portrays the instant payments share among all the Czech banks, whereas the yellow line represents the share of instant payments only for banks that enable their client to make instant payments up to 2.5 million CZK (the second highest offered limit in other banks is 400 thousand CZK). The data are obtained from the CERTIS payment system.

2.3.3 Newly Attainable Payments Outside of CERTIS Business Hours

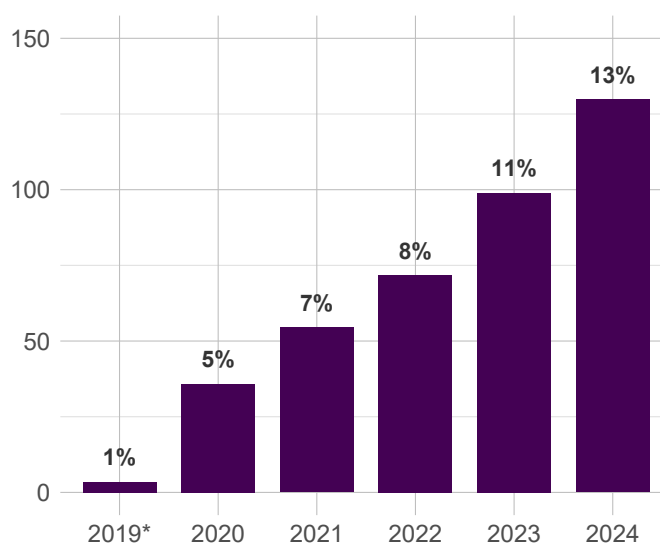
As was mentioned in Section 2.1, the CERTIS system for regular (non-instant) payments has operating hours (time when settlement of transactions is being conducted) that span across working days from 0am to 5pm. Therefore, non-instant payments are not settled from 5pm to 12pm on workdays and on weekends and bank holidays.

It is thus of interest to analyze the volume of payments that were settled in the aforementioned time as instant payments (that are the only type of payment in CERTIS that have a 24/7/365 operability) when regular payments are not possible to be settled. Settling payments in these new time zones enables a faster flow of funds between the transactions participants - improving business liquidity,

increasing convenience of transaction settlement for individuals and last but not least creates an opportunity for new means of payments for products and services.

Figure 14 highlights the increasing volume of transactions in CERTIS that are settled outside the regular CERTIS business hours. It peaks at almost 130 million transactions in 2024, underpinning the actual substantial demand for payment initiation (and possibly settlement) even in the evenings and weekends/holidays. The increasing share of these transactions among all the CERTIS transactions reflects the increasing share of instant payments in CERTIS and also that around one third of instant payments is settled in regular CERTIS non-business hours.

Figure 14: Payments Settled in Time Regular CERTIS is Out-of-Business (mln.)



Note: 2019* data begin in 08/2019. The percentages represent the share of payments settled after 5pm, on weekends and bank holidays among all client transactions. The data are obtained from the CERTIS payment system.

2.4 Instant Payments: Cyber-Enabled Financial Frauds

The advancement of financial system technology does not unfortunately come without its drawbacks, as there are always those that seek to exploit and illegally benefit from the system and its users.

Cybercrime in the Czech Republic has been on the steady year-to-year rise of 10% - 25% during 2014-2021, however it experienced a sharp hike in 2022, almost doubling the number of cyber-related criminal acts reported to the police in the previous year.¹² The Czech Republic has also seen the shift of crime into the cyberspace, as the cybercrimes in 2014 comprised only 2% of all crimes, while in 2024 the share has increased to over 11%. However, based on the recent literature dealing with cybercriminality (Curtis and Oxburgh, 2023), the number of reported cybercrimes is only a fraction of the reality. The actual figure may be up to seven times higher.

We were able to filter the cyber-enabled financial frauds from the whole population of cybercrimes based on the official categorization of criminal acts. The share of cyber-enabled financial frauds¹³ on total cybercriminality has also evolved from 71% in 2014 to 87% in 2024. Table A4 depicts the

¹² We utilize data from the official statistics of the police of the Czech Republic

¹³ Such as: unauthorized acquisition, forgery, or modification of a payment instruments

yearly dynamics in the volume and relative share of the financial cybercrimes reported in the Czech Republic.

Czech banks reported that in 2024, a staggering 87,407¹⁴ of their customers suffered from a cyber-enabled financial fraud, leading to a total damage of 1.39 billion CZK (approximately 56 million EUR) (Czech Banking Association, 2024). The increased number of cybercrimes aimed at the financial sector is one of the reasons of the heterogeneity in the limit setting for outgoing instant payments in the Czech banking system, as some commercial banks argue that the security risks currently outweigh possible benefits of increasing the limits.

Besides the regularly used fraud methods such as phishing¹⁵, the instant payment systems and their users are more susceptible to authorized pushed payment (APP) scams.¹⁶ Due to instant transfer of the funds, it is virtually impossible to stop or revert such operation, as the fraudster proceeds to immediately launder the money through various accounts.

The paper by Toh (2024) describes in detail how fraudsters utilize the instant payment schemes, but also proposes countermeasures that banks and IPS operators can take in order to reinforce the safety for their clients. Among several possible safety measures, the author suggests to utilize the power of AI and machine learning in an automated transaction scam risk assessment that would detect anomalies in customers' behavior and hold the transaction until further confirmation from the customer. Pay.UK already conducted a successful pilot of such APP scam detection system with a 56% success rate (Featurespace, 2024).

Another notable countermeasure against fraud is the confirmation of payee (CoP) feature. This method has been already incorporated in some IPS, nevertheless the new regulation by the EU¹⁷ obliges all IPS providers in the Eurosystem to incorporate this service by the October 2025.

Finally, possibly the simplest – yet maybe the most effective – of the countermeasures is the customers' education on the matter. Urging them to not share their sensitive information with anyone, not to get manipulated by a false sense of pressure and to always remain vigilant – as fraudsters can resort even to a “primitive” way of performing the fraud, such as placing their custom QR sticker over the regular one on the parking meter. The Czech Banking Association in cooperation with the police and other state institutions have launched an initiative that in 2024 held over 5,500 seminars and educated almost 195,000 people on the risks and prevention of cybercrime (Czech Banking Association, 2024).

3. Czech Instant Payment System in the International Context

In an era of growing demand for rapid and seamless financial transactions, many countries have modernized their payment ecosystems by introducing instant (real-time) payment systems. The global uptake of these systems has been striking, driven by both public and private initiatives, and

¹⁴ Data published by the Czech Banking Association, which shows the number is 5.4 times higher than figure reported to the police.

¹⁵ Fraudsters steal personal information, like bank account or credit card details, from victims by pretending to be legitimate entities.

¹⁶ Scams in which fraudsters manipulate the victims to authorize the transaction themselves, often leveraging a feeling of urgency and fear.

¹⁷ EU Instant Payments Regulation (Regulation 2024/886)

facilitated by advancing digital and mobile technologies. This section explores key international examples, highlights emerging trends, and situates the Czech IPS within the global landscape.

3.1 Global Overview of Instant Payment Systems

Instant payment systems have proliferated worldwide, with the majority of countries in Europe, the Americas, Asia, and Africa now offering at least one real-time settlement platform. Table A5 provides a detailed overview of system launch dates and ownership, complementing Figure 1 in the introduction. Generally, these solutions can be classified either as domestic or regional/cross-border. Domestic systems are developed and operated within a single jurisdiction – often by a central bank or a private bank consortium – and include the U.S. Real-Time Payments (RTP) and FedNow, India’s Unified Payments Interface (UPI), Brazil’s Brazilian Instant Payments (PIX) or Czechia’s CERTIS system. Additional examples of national IPS include Poland’s Express Elixir, Australia’s New Payments Platform (NPP), and Korea’s Electronic Banking System (EBS). Regional or cross-border systems, on the other hand, operate collaboratively across multiple countries under a regional economic organization or central financial authority. Numerous African nations, for instance, rely on supra-national instant payment structures enabled through membership in economic and monetary unions.

While the presence of at least one instant payment system is now common, significant variations remain in how these systems are implemented, governed, and adopted by end-users. Adoption rates often hinge on the number and type of participating banks, the availability of diverse initiation channels (e.g., mobile apps), and the system’s resilience and uptime. As a result, even if two countries each operate an instant payment system, their real-world effectiveness can differ markedly.

Some jurisdictions host more than one instant payment system to accommodate different stakeholders, ownership structures, or transaction use cases. The co-existence of public and private platforms serves various needs. Public systems – such as the European Central Bank’s TIPS – display central bank leadership, while privately operated ones – like EBA Clearing’s RT1 – may compete on features or provide alternative routes for institutions. In terms of transaction types and volumes, certain platforms handle high-volume, large-value institutional flows, whereas others focus on smaller consumer payments or mobile-based services. Running multiple systems also increases resilience, ensuring that if one platform goes down, another can maintain continuity. Prominent examples include the Euro Area, where RT1 (private) operates alongside TIPS (public) or the United States, which has RTP (The Clearing House) alongside FedNow (Federal Reserve).

Despite the global traction of instant payments, some developed economies have lagged in rolling out effective real-time systems. Switzerland, for instance, launched its instant payments functionality only in August 2024 (SNB, 2024), while Ireland has had limited success in developing its own solution despite various initiatives in the past and presently relies on Euro Area TIPS (Irish Times, 2024), with a relatively low rate of instant payments usage. Nevertheless, upcoming EU regulations will mandate instant payments by late 2025,¹⁸ likely expediting Ireland’s adoption. In Canada, real-time rail infrastructure remains in question, with the launch pushed back until at least 2026 (Payments Canada, 2024). Finally, New Zealand does not yet have a concrete plan for instant payments system development and implementation. These examples underscore that advanced banking markets do not automatically guarantee rapid or seamless instant-payment

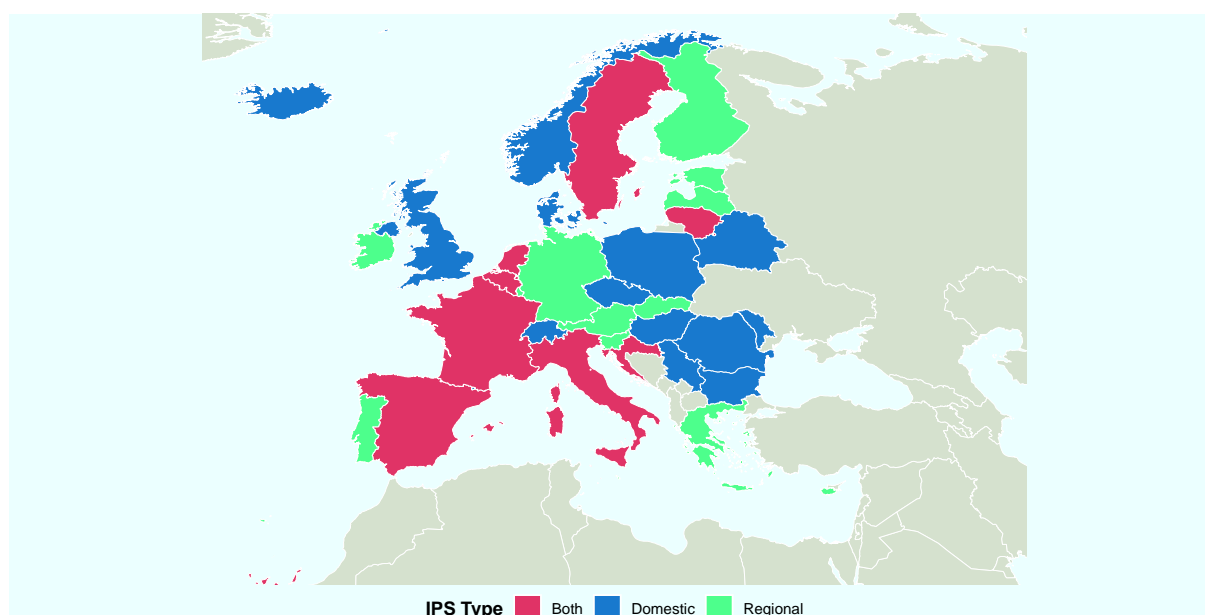
¹⁸ REGULATION (EU) 2024/886 of the European Parliament and of the Council of 12 April 2024 on facilitating instant payments within the Single Euro Payments Area. Published in the Official Journal of the European Union on 15 April 2024.

rollouts, as domestic regulatory environments, legacy infrastructures, and stakeholder coordination can significantly affect timelines.

3.2 European Context and Czechia's CERTIS

A more granular look at Europe reveals considerable variety in how instant payments are offered (see Figure 15). Generally, countries fall into four categories. First, some nations maintain national systems outside TIPS – for instance, Denmark¹⁹, Poland, and Czechia – because they have their own currency and do not rely on Eurozone infrastructure. Second, national systems connected to TIPS exist in larger Eurozone countries and newer members, enabling a pan-European reach, as well as in Sweden that uses connection to TIPS for SEK transactions. Third, several countries, including Germany, Austria, Italy, Portugal, and Finland, have no domestic system and rely exclusively on TIPS and RT1. Lastly, certain Western Balkan nations and Ukraine currently lack any form of instant payments.

Figure 15: Map of European Countries with Instant Payments Systems



Note: The information on instant payments systems were obtained from the websites of the operators (central banks or private organizations), public announcements of their representatives, reports of regional financial inclusion promoting organization (Africa Nenda) and news articles.

Czechia introduced its real-time payments in 2018, around the same time the Eurosystem rolled out TIPS, demonstrating its ability to keep up with payment innovations in Eurozone countries. While Czech banks do not currently connect to TIPS for cross-border Euro transactions, the CERTIS system provides a robust and scalable platform for domestic settlement in Czech koruna. This demonstrates how even smaller economies, with effective infrastructure and strong central bank leadership, can lead in real-time payment innovation.

Although many countries worldwide now operate some form of instant payment system, simply having a platform does not guarantee success. Interoperability, broad bank participation, and user-friendly interfaces remain key to widespread adoption. In Czechia, instant payments under

¹⁹ As stated in the press release by NPC (Nordic Payment Council), Danmarks Nationalbank plans to fully switch from the national instant payment scheme to TIPS by Easter of 2025.

CERTIS achieve near-continuous availability – comparable to Sweden’s RIX Inst or India’s UPI overlay system – while underscoring the pivotal role of the public sector. In contrast to the mobile-centric architectures found in India’s UPI or Brazil’s Pix, Czech banks have integrated instant payments into existing systems, offering users a seamless upgrade underpinned by strict security standards. The current transaction ceiling of 2.5 million CZK accommodates relatively high-value transfers; however, the country has yet to support multi-currency or cross-border instant transactions. Participation in the instant payments scheme remains voluntary, and although adoption has risen steadily, Czechia’s experience differs from jurisdictions like Brazil and Hungary – where adoption was mandated²⁰ – or the UK, which used strong market incentives to make instant payments widespread.

From an international perspective, Czechia’s approach can be considered a hybrid model, coupling a central bank–run RTGS backbone with individual banks’ autonomy over transaction limits and user-facing services. This model has established Czechia as a pioneering European adopter outside the Euro Area and shows that public-driven upgrades can effectively modernize domestic payment infrastructures. Future enhancements could include tighter mobile integration – an area where India’s UPI and Thailand’s PromptPay excel – and connections to regional and multi-currency systems like TIPS. Such measures would further boost Czechia’s use of real-time payments, broadening the system’s reach and elevating the speed and efficiency of everyday transactions.

4. Future Developments

This chapter examines the latest advances in instant payment systems and showcases how various countries have modernized their infrastructures and services. In particular, it explores recent initiatives aimed at improving system interoperability, enhancing security measures, and adopting next-generation messaging standards to keep pace with evolving global requirements.

4.1 Migration to TIPS

To stay aligned with core developments in payment systems – such as the ISO 20022 messaging standards and stronger security protocols – several non-euro countries have decided to migrate their domestic infrastructures to the European TARGET services. These services comprise T2 (mainly large interbank payments), T2S (securities settlements), and TIPS (instant payments). All three platforms can operate in multiple currencies, thereby facilitating the onboarding of non-euro jurisdictions.

Sweden became the first country to discontinue its national instant payment system, replacing it with TIPS in February 2024 (ECB, 2024b). Denmark plans a similar move in April 2025, retiring its Kronos2 and Straksclearing platforms and transitioning fully to TARGET services (DN, 2024a). Meanwhile, the Danish central bank will retain its own system for monetary policy operations and collateralized intraday credit. Danish payment service providers will operate under the NCT Inst payment scheme governed by the Nordic Payments Council (DN, 2024b), a distinct setup compared to the euro-oriented SCT Inst and OCT Inst schemes.

Norway became the last of the Scandinavian countries to formally confirm its participation in TIPS, signing an accession agreement in November 2024 (ECB, 2024a) with plans to join by the first half of 2028. In all these cases, discussions involving financial-sector stakeholders preceded the

²⁰ All Hungarian payment services providers are required to participate in the Hungarian IPS, while in Brazil only institutions with more than 500,000 active customer accounts are obliged to join Pix.

decision to adopt TIPS, followed by extensive testing programs carried out by both the central bank and payment service providers, as thoroughly described by Danmarks Nationalbank (DN, 2024b).

For other non-euro countries, migrating to TIPS brings three main benefits. First, it provides a pathway to adopting the ISO 20022 messaging format, which supports rich data transmission and enables the creation or adaptation of value-added payment services. Second, the Eurosystem's role as TIPS operator can significantly strengthen IT security. Third, connection to TIPS might be less costly than development and maintenance of new payment system features, such as instant multi-currency payments. Whether a given non-euro country's instant payment infrastructure should migrate largely depends on whether its existing platform is unsatisfactory in these key areas.

4.2 Cross-Border Payments

The review of countries adopting instant payments in Section 3 underscores that real-time settlement can extend well beyond individual national systems. Indeed, cross-border integration of instant payments has become an increasingly feasible and attractive option.

One way to achieve this integration is by directly linking two instant payment infrastructures. The first of this kind was the connection between Singapore's PayNow and Thailand's PromptPay in April 2021. India's UPI, a retail instant payment platform, also endeavors establishing this approach by forging bilateral connections with other systems (Times of India, 2024; The Economic Times, 2024). Its first cross-border link was established with Singapore's PayNow in February 2023, followed by agreements on payments acceptations with Sri Lanka, Mauritius, France, and additional countries. Each new connection strengthens UPI's aim of becoming a global payment solution.

A second strategy – offered by the BIS Innovation Hub's *Nexus* project – enables a hub-and-spoke architecture to interconnect multiple national instant payment systems simultaneously (BIS, 2024). Under this model, each participating country only needs a single interface to the BIS Nexus hub (operated by the Nexus Scheme Organization in Singapore), which then routes transactions among all other member systems and manages foreign exchange conversion via competition of FX providers. India, Malaysia, the Philippines, Singapore, and Thailand are set to launch this multilateral solution, with Indonesia participating as a special observer.

The advantages of enabling cross-border instant payments are manifold. Most notably, they improve liquidity management for international B2B operations (the G20 roadmap aims at developing cheaper, faster and more transparent cross-border payments, FSB 2025), stimulate trade, and reinforce the global prominence of countries equipped with secure, instant cross-border solutions. They also streamline overseas transactions for tourists, who can rely on their home banking apps or payment providers for seamless payments abroad.

4.3 Financial Innovation and Central Bank Digital Currency

Various innovative services are emerging to enhance or simplify instant payment transactions for both payers and payees. In some jurisdictions, users can already send instant payments using alternative identifiers – such as mobile phone numbers, email addresses, national IDs, or passport codes – instead of traditional account numbers. This practice has been implemented in Czechia through CERTIS and is also used in many countries like Hungary, Latvia, Australia, China, the United Arab Emirates, Malaysia and others, including several African regional instant payment systems.

A particularly valuable feature within certain instant payment platforms is “confirmation of the payee”, as seen in the United Kingdom’s Faster Payment System. Before finalizing a transaction to a new or unfamiliar account, users can verify the account owner, thereby minimizing the risk of misdirected payments or fraud. In Czechia, this feature is connected to payments sent to a phone number (after entering the number, the payer directly sees the name of the recipient). Nevertheless, while alias-based methods (phone numbers, email addresses) simplify data entry, they remain less convenient than quick response (QR) code-based payments, which automatically populate the payer’s interface with the necessary transaction details and reduce the risk of input errors.

Irrespective of how instant payments are initiated, a core concern is data security. Simply substituting the account number with an alias does not, on its own, address potential data leaks. One solution – already adopted in the U.S. ACH RTP²¹ network – is tokenizing the account number. In this process, the real account number is replaced by a randomly generated token, decryptable only by a trusted counterparty, thereby lowering the potential for cybercriminals to exploit sensitive payment details.

Many instant payment systems also offer additional services. For example, the Eurosystem’s TIPS is compatible with a “request to pay” option, allowing a prospective payee to merge the act of sending payment details with the actual transaction (a feature present also in the UK, USA, India or Hungary). Similarly, the United Kingdom’s Faster Payments System supports forward-dated payments, so users can schedule transactions that will be instantly settled at a future date, ensuring the same real-time benefits as an immediate instant payment.

Lastly, growing attention is given to the interplay between instant payments and central bank digital currencies (CBDCs), given that both enable real-time settlements. According to a survey by Aurazo et al. (2024), whether CBDCs are viewed as substitutes or complements to instant payments depends on their intended role – some central banks envision CBDCs as a potential replacement for cash and bank deposits, while others see them merely as a secure, risk-free supplement to conventional payment options. Evidence from early adopters (e.g. Nigeria, Jamaica, and the Bahamas) suggests that its adoption has so far been limited, implying that a CBDC’s usefulness hinges on the sophistication of each country’s financial landscape.

To combine CBDCs with instant payments effectively, an interoperability channel must be established so that funds can move seamlessly between central bank and private bank money – potentially via digital wallets. For central-bank-operated instant payment systems, the most straightforward solution might be integrating CBDC transactions into the existing infrastructure, allowing both forms of money to be settled along the same rail and thereby enhancing the versatility of real-time payments.

5. Conclusions

Instant payment systems have experienced swift global advancement, and Czechia has positioned itself among the front-runners in this field. By integrating real-time transfers into the existing CERTIS infrastructure, the Czech National Bank demonstrates how central banks can modernize financial markets while ensuring operational efficiency, transparency, and security. Today’s setup accommodates rapid, near-seamless settlements and shows ample capacity to handle further increases in transaction volumes.

²¹ Automated Clearing House Real Time Payments

A core element of this success is a voluntary bank participation. Instant payments are now offered by banks covering over 90% of all CZK denominated client transactions in the banking system. The high bank participation rate in the IPS is one of the fundamentals allowing for around 50% of all interbank retail transaction to be processed as instant payments. This number is even higher in lower-value brackets where real-time transfers provide a significantly faster and often cheaper alternative to priority payments. Moreover, banks serving predominantly retail customers have seen markedly higher instant payment usage, reflecting varying adoption patterns linked to customer needs and service offerings.

From an international perspective, the Czech approach – grounded in a robust payments platform and enhanced by collaborative efforts with commercial banks – stands out as both innovative and efficient. While some European countries plan to retire their domestic systems in favor of common infrastructures like TARGET services, Czechia’s strategy highlights the value of a domestically managed but evolving real-time settlement framework. Ongoing considerations for cross-border links, alternative account identifiers, and potential interactions with CBDCs suggest that Czechia, like many other jurisdictions, will continue exploring ways to refine and expand its instant payment capabilities. Taken together, these developments underscore the broader role of instant payments in supporting financial innovation, inclusion, and overall economic vitality.

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Appendix A: Additional Information

Table A1: Current CERTIS Price List

Transaction type	Baseline Fee
Client low priority transaction	0.1 CZK (0.004 EUR)
Client high priority transaction	1.0 CZK (0.04 EUR)
Bank high priority transaction	5.0 CZK (0.2 EUR)
Instant payment	0.11 CZK (0.0044 EUR)
Discount Threshold	Discount
From 250,000 to 2,499,999 transactions per month	0.04 CZK (0.0016 EUR)
From 2,500,000 to 4,999,999 transactions per month	0.06 CZK (0.0024 EUR)
Above 5,000,000 transactions per month	0.08 CZK (0.0032 EUR)

Table A2: History of Changes in Instant Payments Participants

Date of Change	Type of Change	Identity Code	Participant's Name
8 November 2023	New Code	6363	Partners Banka, a.s.
15 February 2023	New Code	8500	Multitude Bank, p.l.c.
16 November 2022	Deleted Code	6100	Raiffeisenbank a.s. (previously Equa bank a.s.)
1 January 2022	Change of Name	6100	Raiffeisenbank a.s. (previously Equa bank a.s.)
10 June 2021	New Code	5800	J&T BANKA, a.s.
16 November 2020	New Code	8040	Oberbank AG pobočka Česká republika
2 September 2020	New Code	6210	mBank S.A., organizační složka
7 May 2020	New Code	6100	Equa bank a.s.
18 December 2019	New Code	2010	Fio banka, a.s.
20 November 2019	New Code	0600	MONETA Money Bank, a.s.
11 November 2019	New Code	0300	Československá obchodní banka, a. s.
4 October 2019	New Code	6000	PPF banka a.s.
19 September 2019	New Code	5500	Raiffeisenbank a.s.
15 August 2019	New Code	0100	Komerční banka, a.s.
1 March 2019	New Code	2250	Banka CREDITAS a.s.
23 November 2018	New Code	3030	Air Bank a.s.
19 November 2018	New Code	0800	Česká spořitelna, a.s.

Table A3: Instant Payment System Downtime (% of total time in the quarter)

Quarter	CERTIS maintenance	Commercial bank IP maintenance	Commercial bank IP outage
4Q 2018	0.00%	2.82%	2.51%
1Q 2019	0.01%	1.20%	1.17%
2Q 2019	0.02%	1.72%	0.28%
3Q 2019	0.02%	7.08%	0.16%
4Q 2019	0.01%	4.22%	0.11%
1Q 2020	0.00%	1.27%	0.11%
2Q 2020	0.02%	3.71%	0.25%
3Q 2020	0.24%	2.14%	0.36%
4Q 2020	0.00%	1.77%	0.10%
1Q 2021	0.07%	1.30%	0.17%
2Q 2021	0.18%	1.70%	0.08%
3Q 2021	0.00%	1.28%	0.06%
4Q 2021	0.04%	1.26%	0.05%
1Q 2022	0.00%	1.29%	0.03%
2Q 2022	0.02%	1.15%	0.05%
3Q 2022	0.00%	1.04%	0.15%
4Q 2022	0.00%	1.83%	0.12%
1Q 2023	0.00%	1.05%	0.06%
2Q 2023	0.09%	1.25%	0.05%
3Q 2023	0.00%	0.82%	0.24%
4Q 2023	0.01%	1.06%	0.09%

Table A4: Cyber-Enabled Financial Frauds Share on Total Cybercriminality and Overall Criminality

Year	Cyber-enabled financial frauds	Share on all cyberspace crimes	Share on all crimes
2014	3,078	70.8%	1.1%
2015	3,496	69.6%	1.4%
2016	3,513	70.4%	1.6%
2017	3,852	68.4%	1.9%
2018	4,241	62.2%	2.2%
2019	5,885	69.9%	3.0%
2020	5,837	72.3%	3.5%
2021	7,126	74.9%	4.7%
2022	15,789	85.1%	8.7%
2023	16,981	86.7%	9.4%
2024	16,090	87.0%	9.3%

Notes: The data are obtained from the official statistics published by the police of the Czech Republic, thus representing only the reported cybercrimes. The real number of all cybercrimes, based on the latest studies, could potentially be up to 7 times larger.

Table A5: Instant Payment Systems: International Comparison

Jurisdiction	System name	Operator	Year of introduction	Cross-border capabilities	Multi-currency	Participation of NBFIs	Ownership
Europe							
Euro Area	RT1	EBA Clearing	2017	No	No	No	Private
Euro Area	TIPS	Eurosystem	2018	Yes	Yes	Yes	Public
Andorra	SNCE	IberPay	2017	Yes	No	Yes	Private
Belarus	IPS	NBRB	-	Yes	Yes	No	Public
Belgium	IP-BE	STET/CEC*	2019	Yes	No	-	Private
Bulgaria	BLINK	BORICA AD	2021	No	No	Yes	Private
Croatia	EuroNKSInst	Fina	2023	Yes	No	-	Public
Czechia	CERTIS	CNB	2018	No	No	No	Public
Denmark	Straksclearing	Mastercard	2014	No	No	Yes	Private
France	SEPA(EU)	STET	2017	Yes	No	-	Private
Hungary	GIROInstant	MNB	2020	No	No	No	Public
Iceland	EXP	CBI	2020	No	No	No	Public
Italy	Jiffy	Sia	2014	No	No	Yes	Private
Liechtenstein	SIC	SIX	2024	Yes	No	No	PPP
Lithuania	CENTROlink	Lietuvos Bankas	2017	Yes	No	Yes	Public
Moldova	MIA	NBM	2024	No	No	Yes	Public
Netherlands	eW IP CSM	eW	2019	No	No	No	Private
Norway	Straks 2.0	Mastercard	2013	No	No	No	Public
Poland	Express Elixir	KIR	2012	No	No	-	Private
Poland	BLIK	PPS	2015	No	No	-	Private
Poland	BlueCash	Blue Media	2012	No	No	-	Private
Romania	Plati Instant	TRANSFOND	2019	No	No	No	Private
Serbia	NBS IPS system	NBS	2018	No	No	Yes	Public
Spain	SNCE	IberPay	2017	Yes	No	Yes	Private
Sweden	BiR	Bankgirot	2012	No	No	No	Private
Sweden	RIX-INST	Riksbank	2022	No	No	No	Public
Switzerland	SIC	SIX	2024	Yes	No	No	PPP
United Kingdom	FPS	Pay.UK	2008	No	No	Yes	Private
Americas							
CARICOM	PAPSS	Afrexim and CB's	2022	Yes	Yes	No	PPP
Argentina	Transferencias 3.0	BCRA	2011	No	No	Yes	Public
Belize	APSSS	CBB	2016	No	No	No	Public
Bolivia	QR BCB	BCB	2023	No	No	No	Public
Brazil	Pix	Banco Central do Brasil	2020	No	No	Yes	Public
Costa Rica	SINPE	BCCR	2015	No	No	-	Public
El Salvador	Transfer365	CRBES	2021	No	No	Yes	Public
Chile	TEF	CCA	2008	No	No	No	Private
Mexico	SPEI	Bank of Mexico	2004	No	No	Yes	Public
Nicaragua	PayExpedite	PaySett	2016	No	No	No	Private
Paraguay	SPI	BCE	2022	No	No	Yes	Public
Peru	CCE	CRBP	2020	No	No	No	Private
United States of America	TCH RTP	The Clearing House	2017	No	No	No	Private
United States of America	FedNow	Fed	2023	No	No	No	Public
Venezuela	Pago Móvil	-	-	-	-	-	-
Venezuela	PayAll	-	-	-	-	-	-

Table continue on the next page.

Jurisdiction	System name	Operator	Year of introduction	Cross-border capabilities	Multi-currency	Participation of NBFIs	Ownership
Asia and Oceania							
Arab Monetary Fund	BUNA	ARPCSO	2023	Yes	Yes	Yes	Public
Armenia	ArCa Pay	Armenian Card	2024	No	No	Yes	Private
Australia	NPP	NPPA	2018	No	No	Yes	PPP
Azerbaijan	IPS	CBRA	2020	No	No	No	Public
Bahrain	EFTS Fawri+	CBB	-	No	No	No	Public
Bangladesh	NPSB	Bangladesh Bank	2012	No	No	No	Public
Bangladesh	RTGS	Bangladesh Bank	2015	No	No	No	Public
Bangladesh	Binimoy	Bangladesh Bank	2022	No	No	Yes	Public
Bhutan	BIPS	RMA of Bhutan	2017	No	No	No	Public
Cambodia	Fast Payment	NBC	2016	No	No	Yes	Public
Fiji	NPS ACH	RBF	2023	No	No	No	Public
Hong Kong	FPS	HKICL	2018	No	Yes	Yes	PPP
China	IBPS	CNCC	2010	No	No	No	Public
India	UPI (IMPS)	NPCI	2016	Yes	Yes	Yes	PPP
Indonesia	BI-FAST	Bank of Indonesia	2021	No	No	Yes	Public
Iran	IPS	CBI	2021	No	No	No	Public
Israel	Masav	Bank of Israel	2007	No	No	No	Public
Japan	Zengin	Zengin-Net (JBA)	2018	No	No	Yes	Private
Jordan	ChQ	JoPACC	2020	No	No	Yes	Private
Kazakhstan	IPS	NPCK	2022	No	No	No	Public
Kuwait	WAMD	K-Net	2024	No	No	No	Private
Malaysia	DuitNow	PayNet	2018	No	No	Yes	Private
Maldives	Favara	MMA	2023	No	No	No	Public
Mongolia	ACH+	The Bank of Mongolia	2019	No	No	-	Public
Nepal	connectIPS	NCHL	2018	No	No	Yes	Public
Oman	RTGS	CBO	2023	No	No	No	Public
Pakistan	Raast	SBP	2021	No	No	Yes	Public
Papua New Guinea	REPS †	BPNG	2021	No	No	Yes	Public
Philippines	Instapay	BancNet	2018	No	No	Yes	Public
Qatar	FAWRAN	QCB	2024	No	No	No	Public
Russia	SBP	Bank of Russia	2019	No	No	No	Public
Saudi Arabia	SARIE	SCB	2021	No	No	No	Public
Singapore	PayNow	BCSPL	2017	Yes	No	Yes	Private
South Korea	EBS	KFTC	2001	No	No	No	Public
Sri Lanka	CEFTS	Lanka Clear	2016	No	No	-	Public
Taiwan	IRS	FISC	1987	No	No	No	Public
Taiwan	FXML	FISC	-	No	No	No	PPP
Thailand	PromptPay	NITMX	2016	Yes	No	Yes	Private
Turkey	FAST	CBRT	2021	No	No	No	Public
United Arab Emirates	IPI	CBUAE	2019	No	No	No	Public
Uzbekistan	IPS	CBRU	2020	No	No	No	Public
Vanuatu	VANKLIA	RBV	2023	No	No	No	Public
Vietnam	IBPS	SBV	-	No	No	No	Public

Table continue on the next page.

Jurisdiction	System name	Operator	Year of introduction	Cross-border capabilities	Multi-currency	Participation of NBFIs	Ownership
Africa							
Arab Monetary Fund	BUNA	ARPCSO	2023	Yes	Yes	Yes	Public
SADC	TCIB	BankservAfrica	2021	Yes	No	Yes	PPP
WAMU	BCEAO IPS †	BCEAO	2024	Yes	No	Yes	Public
CEMAC	GIMACPAY	GIMAC	2020	Yes	No	Yes	PPP
PAPSS	PAPSS	Afrexim and CB's	2022	Yes	Yes	No	PPP
Algeria	Switch Mobile	GIE Monétique	2024	No	No	No	Public
Angola	KWiK-Kwanza Instantâneo	BNA	2023	No	No	Yes	Public
Djibouti	SYRAD	CBD	2021	No	No	No	Public
Egypt	InstaPay	Egyptian Banks Company	2022	No	No	No	PPP
Ghana	GIP	GhIPSS	2015	No	No	Yes	Public
Ghana	Ghana MMI	GhIPSS	2016	No	No	Yes	Public
Kenya	PesaLink	IPSL	2017	No	No	Yes	Private
Lesotho	LeSwitch	CBL	2024	No	No	Yes	Public
Malawi	NatSwitch	BPC	2022	No	No	Yes	Private
Mauritius	MauCAS	Bank of Mauritius	2019	No	No	Yes	Public
Morocco	Virement Instantané	GSIMT	2023	No	No	No	Public
Mozambique	SIMO	SIMO	2012	No	No	Yes	PPP
Nigeria	NIP	NIBSS	2011	No	No	Yes	PPP
Rwanda	eKash	RSwitch	2022	No	No	Yes	Private
Somalia	NPS	CBS	2021	No	No	No	Public
South Africa	PayShap	BankservAfrica	2023	No	No	No	Private
Tanzania	Tanzania IPS	Bank of Tanzania	2022	No	No	Yes	Public
Zambia	NFS	ZECHL	2019	No	No	Yes	PPP
Zimbabwe	ZIPIT	Zimswitch	2011	No	No	Yes	Private

Notes:

* STET is the technical operator, while CEC is the legal operator.

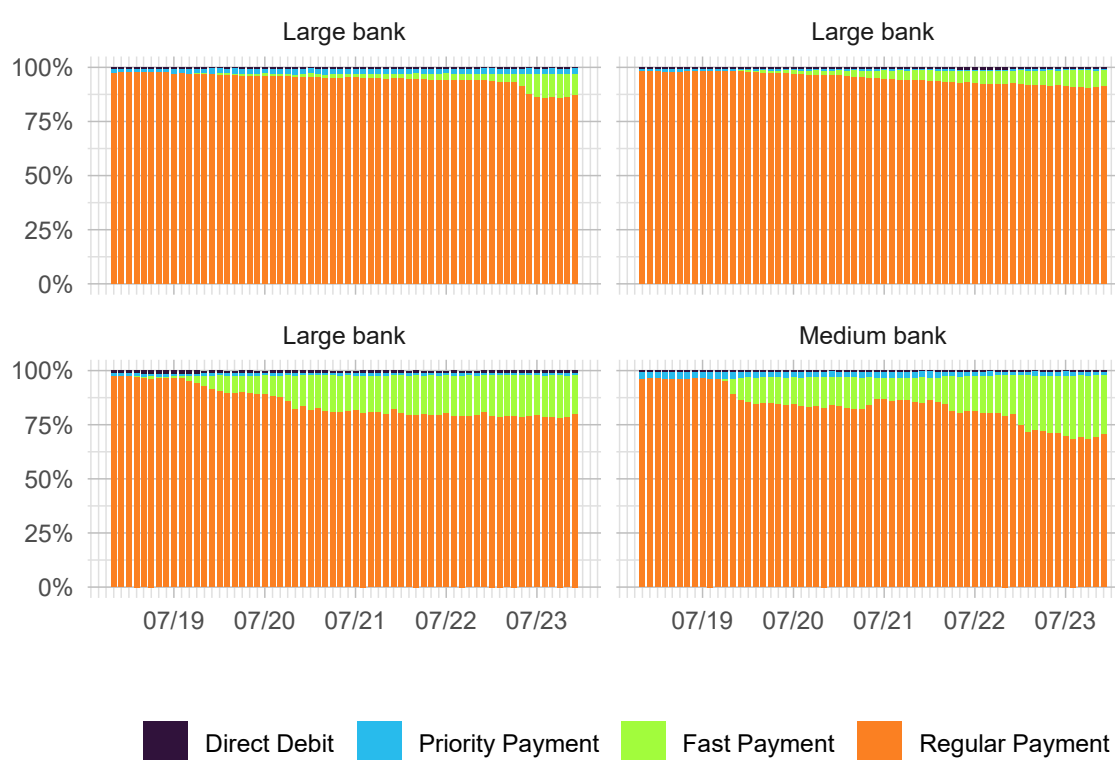
† Pilot project.

Operator names: National Bank of the Republic of Belarus (NBRB), Czech National Bank (CNB), Magyar Nemzeti Bank (MNB), Central Bank of Island (CBI), National Bank of Moldova (NBM), National Bank of Serbia (NBS), Banco Central de la República Argentina (BCRA), Central Bank of Belize (CBB), Banco Central de Bolivia (BCB), Banco Central de Costa Rica (BCCR), Central Reserve Bank of El Salvador (CRBES), Banco Central de Paraguay (BCP), Central Reserve Bank of Peru (CRBP), Federal Reserve (Fed), Arab Regional Payments Clearing and Settlement Organization (ARPCSO), New Payments Platform Australia (NPPA), Central Bank of the Republic of Azerbaijan (CBRA), Central Bank of Bahrain (CBB), Royal Monetary Authority of Bhutan (RMA of Bhutan), National Bank of Cambodia (NBC), Reserve Bank of Fiji (RBF), Hong Kong Interbank Clearing Limited (HKICL), China National Clearing Center (CNCC), National Payments Corporation of India (NPCI), Central Bank of Iran (CBI), Japanese Bankers Association (JBA), Jordan Payments & Clearing Company (JoPACC), National Payment Corporation of Kazakhstan (NPCK), Maldives Monetary Authority (MMA), Nepal Clearing House Limited (NCHL), Central Bank of Oman (CBO), State Bank of Pakistan (SBP), Bank of Papua New Guinea (BPNG), Qatar Central Bank (QCB), Saudi Central Bank (SCB), Banking Computer Services Private Limited (BCSPL), Korea Financial Telecommunications and Clearing Institute (KFTC), Financial Information Service Company (FISC), Central Bank of the Republic of Turkey (CBRT), Central Bank of the United Arab Emirates (CBUAE), Central Bank of the Republic of Uzbekistan (CBRU), Reserve Bank of Vanuatu (RBV), State Bank of Vietnam (SBV), Banque Centrale des Etats de l'Afrique de l'Ouest (BCEAO), Le Groupement Interbancaire Monétique de l'Afrique Centrale (GIMAC), Banco Nacional de Angola (BNA), Central Bank of Djibouti (CBD), The Ghana Interbank Payment and Settlement Systems Limited (GhIPSS), Integrated Payment Systems Ltd (IPSL), Central Bank of Lesotho (CBL), Banking Payments Context (BPC), Groupement pour un Système Interbancaire Marocain de Télécompensation (GSIMT), Sociedade Interbancaria De Mocambique (SIMO), Nigeria Inter-Bank Settlement System Plc (NIBSS), Central Bank of Nigeria (CBN), Central Bank of Somalia (CBS), Zambia Electronic Clearing House Limited (ZECHL).

Figure A1: Volume Share of Payment Types in 4 Largest Instant Payment Banks

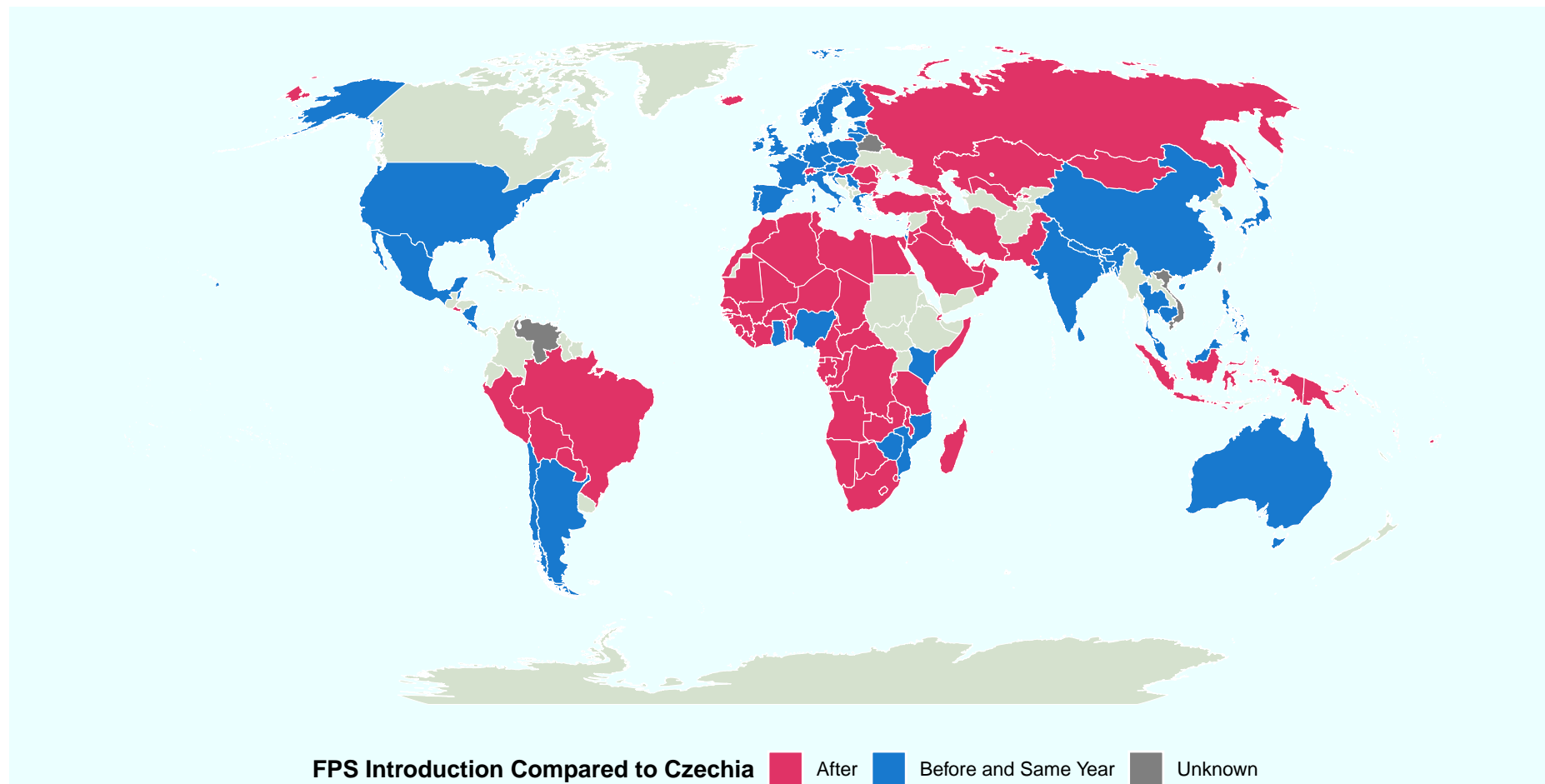
Note: The 4 largest banks are banks with the highest value of assets at the end 2023 in Czechia among those banks that have adopted instant payments. The shares are reported only for client payments in the CERTIS system (i.e. those excluding intra-bank payments without a client account) with a value of the transaction below 10 million CZK. The data are obtained from the CERTIS payment system.

Figure A2: Value Share of Payment Types in 4 Largest Instant Payment Banks



Note: The 4 largest banks are banks with the highest value of assets at the end 2023 in Czechia among those banks that have adopted instant payments. The shares are reported only for client payments in the CERTIS system (i.e. those excluding intra-bank payments without a client account) with a value of the transaction below 10 million CZK. The data are obtained from the CERTIS payment system.

Figure A3: Map of Countries by Introduction of Instant Payment System



Note: The information on instant payments systems were obtained from the websites of the operators (central banks or private organizations), public announcements of their representatives, reports of regional financial inclusion promoting organization (Africa Nenda) and news articles.

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