

INSTANT PAYMENTS IN HUNGARY – CENTRAL BANK’S ROLE IN THE DEVELOPMENT

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As the introduction of instant payments became a global trend recently, the role of central banks as a catalyst of developments is increasingly in the centre of attention. The aim of this paper is to identify those fields, where central banks can intervene to facilitate the widespread use of the new service. We introduce the questions and challenges that emerged during the implementation of instant payments in Hungary and the responses of the Central Bank of Hungary (MNB) to them. On the basis of this, we intend to draw general conclusions in order to support the utilization of Hungarian experiences in other countries as well. A unique feature of the Hungarian instant payment service is that it is mandatory by legal regulation for payment service providers to provide instant credit transfers as a “new normal” on a continuous basis, i.e. 24/7/365. The interoperability of payment solutions and data-entry methods is also ensured by legal requirements, in order to avoid closed-loop services. MNB also facilitates innovation in the market by preparing a domestic QR-code standard and a central brand for the basic service level. As for liquidity management concerns, MNB provides instant collateralized credit for payment service providers when the RTGS system is closed, thus minimizing financial stability risks in relation to the prefunded operational model.

1. INTRODUCTION

The development of instant payment systems is a global tendency and reached almost all countries for now. From Australia through the majority of Asian and European countries to the United States, this new payment service is introduced or currently under implementation. The reasons for the accelerating pace of the implementation of these systems are various. On one hand the demand for electronic payment methods with real-time processing – similar to cash payments – has been ubiquitous among both consumer and business clients of banks for a long time. These expectations were amplified by the real-time user experience of several current digital services like the myriads of new communication channels.

Even though the demand has been constantly growing for instant payments during the last decade, on the supply side traditional payment infrastructures were unable to meet these requirements. Until a few years ago, credit transfers were generally cleared and settled within one workday (t+1), thus even the introduction of intraday clearing meant a big step forward. This was the case in Hungary as well, where intraday clearing was implemented in 2012 with five clearing cycles, which were doubled to ten in 2015. However, due to the operating hours from 7.30 a.m. to 5 p.m. on weekdays and an average 1.5 hour processing time of individual transactions, credit transfers were unable to become a panacea against widely prevalent cash usage.

Card systems represent one way of solutions, offering instant purchasing experience, however with the use of a rather complex infrastructure, collateral system and scheme rules. Card-based mobile payment solutions meant innovation on the service level e.g. with the widespread use of tokenization of card data, nevertheless the underlying infrastructure basically remained intact. Besides – although there are initiatives towards this way as well – due to its complexity, card systems proved to be inappropriate in most of the person-to-person (P2P) payment situations. Another way of the satisfaction of the user need for real-time experience was the establishment of electronic money (e-money) systems. These systems were able

to overcome the problem of outdated traditional payment infrastructures, however for a certain price i.e. the further fragmentation of the payment market. E-money systems created closed, parallel universes, which only convenient from a user's perspective, if e-money issuers reached a significant level of user and acquiring coverage. Otherwise the constant need to divide liquidity between different e-money accounts and the simultaneous use of several mobile wallet applications and online user interfaces make the daily use of these solutions cumbersome indeed. Thus e-money solutions became successful mainly in those cases, where the client-basis was already at the disposal due to an other service. This was the case e.g. in China, where Alibaba and WeChat offered payments as a complimentary service built on core business. E-money systems were also managed to break through in the field of cross-border payments (either P2P or P2B), where the extremely complex chain of correspondent banks offered a much slower and more expensive way to transfer money. E-money payments also raise issues concerning innovation: while they can facilitate innovation in short-term, since PSPs are not forced to wait for the developments of the central infrastructure or other PSPs, in the long run successful solutions may pursue less development activity due to large number of users within their own closed-loop systems.

After the period of bypassing the hinderances of traditional payment infrastructures with the above mentioned solutions, innovation reached to the point where not only the service level, but also the underlying infrastructures could have been reformed. On one hand after the millennium the performance of IT systems grew exponentially in parallel with the decrease of IT prices, on the other hand the widespread availability of broad-band mobile internet offered large customer base and a variety of payment situations previously unable to reach. This yielded the possibility for credit transfers too with the introduction of instant payments to become a core retail payment method after decades of serious constraints in use (see e.g. Mai, H. 2015).

Fresh technological advancements also meant new business opportunities and more competition on the payments market. Until recently, due to the economies of scale feature and the market failures in the payments field i.e. high market-entry barriers, high market concentration, competition was rather moderate. Since changing payment service provider (PSP) was – and to a large extent still it is – extremely cumbersome, banks as incumbent market participants were not forced to execute deep-rooted payment innovations. This was also amplified by the network characteristics of the market, which revealed the importance of the role of central banks as initiators, coordinators and catalysts of comprehensive innovations covering all stakeholders. Recognizing the significant demand for faster and more convenient payment solutions, combined with the moderate interest for change from incumbent market participants, a legion of emerging Fintech companies appeared making payments as one of the most threatened banking service from disruption. This process entailed different central bank approaches: while in China for instance regulators followed a “wait and see” approach, gradually tighten legal requirements towards fintechs after they started to flourish (Kajdi, 2017), Europe followed the opposite way. With the requirements of the new PSD2¹ the European approach intends to facilitate the market-entry of Fintechs, nevertheless in a rigorously regulated way. However there is no doubt, that the appearance of new third-party – payment initiation and account information – PSPs will largely contribute to the popularity of instant payments.

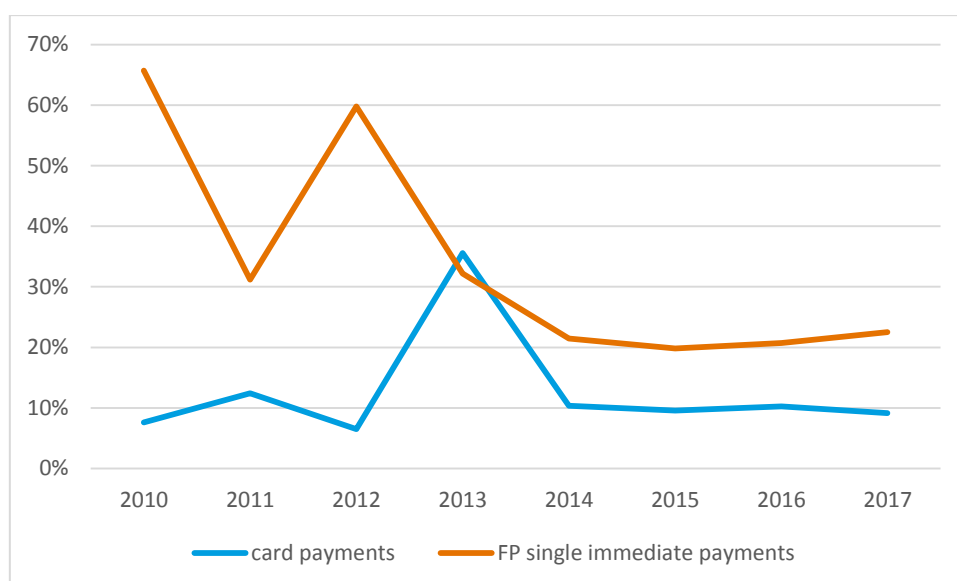
¹ Directive (EU) 2015/2366 of the European Parliament and of the Council on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC

Within these circumstances it was clear, that if Hungary would like to sustain competitiveness on the international level, the implementation of instant payments is a fundamental step. However, the degree of the involvement and the role of the Central Bank of Hungary (MNB) had to be analysed profoundly. The aim of this study is to introduce the points where MNB decided to step up as a regulator or coordinator in order to facilitate the exploitation of advantages of instant payments to the largest extent. In the second chapter we provide a brief overview on international practices regarding central banks' roles, then we introduce the unique features of central bank intervention in Hungary during instant payments' implementation. We describe those points where decision was made to coordinate or regulate in order to show the reasons behind the acts of the Central Bank of Hungary. Finally, we draw those general conclusions which can be applied in other countries with similar payment market features.

2. INTERNATIONAL EXPERIENCES

Instant payments gradually gained ground globally after the millennium and appeared in Europe in the United Kingdom in 2008. This was soon followed by the Swedish (2012), the Polish (2012) and the Danish (2014) instant payment systems, nevertheless with somewhat different approaches. As Bech et al. (2017) showed, the diffusion of instant payments is rather similar to that of RTGSs', nonetheless it is expected to increase more. Within the Faster Payments scheme of UK, transaction value limits were gradually raised up to GBP 250,000 (HSBC, 2019), which contributed to the above average, accelerated adoption path (SWIFT, 2015). It is also important that the growth of card turnover remained basically intact after the introduction of instant payments in the UK, which shows that mainly cash transactions were channelled to electronic payments and highlights the fundamental role of this new service on the way towards cashless payments. The increase of the card business continued to be around 10 per cent annually in terms of transaction numbers, while a decade after the launching of Faster Payments the year-on-year growth is still above 20 per cent.

1. Figure: Year-on-year growth of card and instant payment* transaction numbers in the United Kingdom, 2010-2017



Source: own calculation based on ECB and Faster Payments UK data

*Among instant payment transactions only the single immediate payments were considered

This is the case in other countries too (i.e. Denmark, Poland, Sweden) where instant payments were introduced the earliest, and where PSPs still run a thriving card business besides the new instant service. It reflects to the solution of a key concern of PSPs, which can make traditional market participants reluctant to invest considerable development cost in an instant payment project: the new service is not a threat to lucrative card business, instead it can be considered an effective mean to migrate cash transactions into electronic systems. As the study of CPMI (2016) emphasizes PSPs attention should be raised in order to include long-term benefits of expensive instant payments projects when assessing these decisions.

An other key message of the CPMI study is that coordinated efforts are needed, when introducing instant payments to reach wide coverage among PSP clients. The availability of the majority of consumers and companies is crucial to build a successful and profitable business case, however due to the network effects of the payments market it is hard to reach without central coordination. National central banks can play an important role in this field, nonetheless to a different level. While in Mexico for instance all PSPs participate in the new service which was greatly supported by the central bank (Negrin et al., 2008), in other countries like Sweden for instance the implementation of the new service was rather a market initiative (Duston, 2015).

Concerning the importance of central coordination, the adherence to the European instant payment scheme can also serve as a good example. The European Payments Council (EPC) prepared the harmonised rulebook for SEPA instant payment process flows and data contents in 2016, revised in 2017 and 2018 (EPC, 2018a) in order to create a common basis for the future of new market services. Besides these common basic rules, a new infrastructure was established by the ECB² to create cheap options for PSPs which intend to join the scheme. This initiative is completed with the first steps towards European SEPA Proxy Look (SPL) service with a scheme rulebook (EPC, 2018b). In addition to joint European efforts, national central banks also started important work to raise the level of instant payment reachability. As the reports of the Finnish Payments Council Working Group (Finlands Bank, 2019) or the Estonian Retail Payments Forum (2019) highlights, central coordination is essential when promoting the use of instant payments. Although the joining of PSPs to new SCT Inst scheme – thus the ratio of reachable consumers and businesses – shows a growing pace, there are still some countries where the adherence level is rather low. Due to the above mentioned reasons, this can be a severe obstacle to exploit the advantages of instant payments. Users are forced to use alternative solutions if they would like to experience electronic real-time payments, while those PSPs which intend to develop innovative solutions are also constrained due to the low coverage of users, thus the lack of viable business cases. With our study, we would like to contribute to the efforts aiming to overcome these challenges by the introduction of recent years' experience in Hungary.

3. THE HUNGARIAN MODEL

As described above, the idea of the implementation of an instant payment system can come from various stakeholders in the payments market. Nevertheless, it can be said, that in several countries the banking sector decided to actively participate in the comprehensive reform of credit transfers, thus from a central bank's point of view, the tasks rather concerned the central coordination of ongoing initiatives instead of

² I.e. TARGET Instant Payment Settlement (TIPS): <https://www.ecb.europa.eu/paym/target/tips/html/index.en.html>

stepping up as regulators. In Hungary the previous major developments in the payments field – like the introduction of intraday clearing – were originated from the MNB. To further facilitate this coordinator and initiator role, MNB acquired the Hungarian ACH GIRO in 2014, as a central player in the domestic payment network. After discussions with the banking sector it was clear that no comprehensive development project will be launched in the near future from the market participants' side to implement instant payments. In addition to this, the cash in circulation has been constantly growing, and the cash to GDP ratio was high in international comparison as well. Although it is obvious, that the drivers of cash demand cannot be limited only to transaction purposes, other surveys (Ilyés – Varga, 2015, 2018) proved the large prevalence of cash usage in Hungarian payments market.

MNB investigated the level of central intervention which is needed to introduce instant payments in Hungary for more than a year, consulting with several major market stakeholders too and in December 2016 published the Operational model of the instant payment service in Hungary (MNB, 2016). Previous analysis (Ilyés – Varga, 2016) showed, that no matter how favourable would be the new system in the long run, due to the significant development costs, the short-term interest of market stakeholders would restrain them to invest in it. The high number of cash transactions makes this payment method competitive to electronic alternatives, therefore the turnover of electronic payment methods must reach a critical level, where the unit costs are low enough to provide real option. This is especially the case in a small market like the Hungarian, where transaction numbers will always be lower than in the euro-zone for instance.

Considering the above mentioned aspects, MNB decided to follow a unique way and regulate the implementation of instant payments in Hungary in order to move the whole domestic payments market into a more optimal point from a social point of view. Nevertheless, this fundamental change will not only be advantageous for consumers and enterprises as the users of new payments solutions, but can also incite incumbent PSPs to increase their competitiveness against new fintech challengers. In the following chapters we provide further details on central bank's role in the different fields of development.

3.1. Regulation

When the decision was made on the introduction of instant payments in Hungary at the MNB, it was declared as a main goal to provide this service as a “new normal” i.e. it should be available as a basic service to the majority of consumers. In case of a premium service (with premium pricing) transaction numbers would be low, taking into account the cost-conscious attitude of Hungarian consumers, and due to the economies of scale feature of the payments market it would result expensive processing as well. This means that low usage of the new, more modern instant payments instead of cash could be expected in the long run. To avoid this trap MNB decided to regulate the field of credit transfers, making mandatory for banks to migrate the majority of these transactions to the new instant payment infrastructure. According to the legal requirements those transactions which meet the following demand must be processed instantly:

- a) it is given to the debit of the payer's forint payment account;
- b) its amount does not exceed 10 million forints (appr. 31,000 EUR);
- c) it does not specify a debit date following the date of receipt by the payment service provider;
- d) it is submitted by the payer by means of information technology, telecommunication or by other means as specified in the framework contract with the payment service provider, and is processed by the payment service provider in a way that does not require any human intervention; and
- e) it is not submitted in batches, except those transactions where the payer is a consumer.

This means that the vast majority (i.e. estimated to be more than 90 per cent) of consumer transactions and individual business transactions are considered as an instant credit transfer being the new normal service after the launching of the system. Condition a) refers to the fact, that only Hungarian forint (HUF) payment accounts can be debited, however on the beneficiary side accounts denominated in other currencies can also be addressed. In the case of extra-European Economic Area (EEA) currencies this means a longer (t+2) time limit for crediting the account, in these cases the payer side is informed through specific reason-codes in the response messages. Concerning condition b) c) and e) it is important to stress that transactions above the set value limit, or with different value date or batched transactions split by PSPs to individual credit transfers can also be submitted to the instant payment system, but the beneficiary PSP has the option to reject them. The value limit is planned to be raised during the upcoming years on the basis of practical experience.

The continuous availability of the new service is also considered to be an important legal requirement. Hungarian PSPs have to ensure the operation of their system 24/7/365 with only 24 hours of annual planned downtime to execute system maintenance tasks. This central bank requirement is a huge step forward from the operation of the current intraday clearing systems i.e. usually only on weekdays and for a certain period of the day, and it is essential to meet if electronic payment methods intend to compete with cash. Nevertheless, on the basis of responses from PSPs, the biggest challenge when introducing instant payments - even greater than real-time processing – is just this criterion, i.e. to transform the operation of the PSPs.

Although the “big bang”-type introduction of instant payments with the mandatory participation of PSPs supports the spread of the new service through total reachability, this approach also has its specific challenges. MNB originally planned to launch instant payments in Hungary on 1 July 2019, however some market participants reported serious delays in their developments. As a consequence, the Financial Stability Board of MNB decided to postpone the launch of instant payment service to 2 March 2020, while the central infrastructure of GIRO and MNB (i.e. all central functions like settlement, liquidity management, request-to-pay messages, proxies etc.) went live on 1 July 2019. The decision was made with attention to maintain the trust towards electronic payment methods. Due to the above described network effects, if certain PSPs were unable to join the new instant payment platform, their clients would not be reachable and it would have caused an extremely difficult communication task to educate consumers on which PSPs are available. This type of gradual joining of PSPs also could hinder the provision of instant payment-based services, e.g. acquiring at physical point-of-sales. Thus MNB decided to oblige PSPs to execute complex tests on the already operating central infrastructure during the 8 months between 1 July 2019 and 2 March 2020.

3.2. Liquidity-management

An other key criteria was to ensure the sound and reliable liquidity management of instant credit transfers. The Hungarian system is based on a prefunded liquidity management, instead of the gross settlement of individual transactions like e.g. in the TIPS³. Banks transfer the cash which they intend to use to prefund instant payments to a single account held at MNB, handled by GIRO ACH. The prefunded cash amount still remains the asset of banks from a legal point of view, however PSPs delegate the task of transferring money in and out from the common account to GIRO. This is necessary since GIRO is the key

³ TARGET Instant Payment Settlement

player in the system, which calculates the individual balance of system participants in every moment, therefore all liquidity-management transactions of banks have to be executed through GIRO.

Although preliminary analysis (Balla – Ilyés, 2016) in this field showed that currently only a small fraction of payment service providers' liquidity is needed, MNB introduced additional measures to minimize the liquidity risk. In case of a prefunded system one of the options to minimize liquidity risks is to extend the operational hours of the RTGS to a continuous (24/7) operation, which enable banks to raise the prefunded liquidity at any time. However, during the planning phase it was estimated that this solution would have a significantly high cost due to the entire renewal of central bank's system. Therefore, in the Hungarian system banks can raise the prefunded liquidity from their RTGS account only during RTGS operation time (i.e. from 7 am to 5 pm at weekdays) and for nights and weekends the liquidity need of instant payment transactions must be estimated in advance. This also implies that if a bank miscalculates the liquidity demand for the periods when the RTGS is closed, it might run out of liquidity and its clients will not be able to execute credit transfers although they possess enough money on their personal accounts. Needless to say, this can cause severe stability and reputational risk not only for the given bank, but for the whole payments market as well. In the Hungarian system, where most of the credit transfer turnover will be processed within the instant payment system due to regulatory requirements this risk is even higher. To handle this, MNB initiated the implementation of additional solutions for banks.

During nights and weekends, when the RTGS is closed, instant payment credit will be available to Hungarian banks in case of emergency due to miscalculation of liquidity. This means that banks can have a credit which is collateralized with securities for MNB. This option is not available during RTGS operational time and for those clearing members which are outside monetary policy partners (e.g. State Treasury).

The interest rates applied in the field of liquidity management were set in line with MNB's monetary policy. All credit institutions have to provide a declaration to MNB regarding the ratio of their prefunded liquidity they would like to be counted in the calculation of minimum reserve requirement. For the liquidity which is not part of the minimum reserve MNB pays the overnight deposit interest rate. Since MNB planned the introduction of instant payment credit in order to avoid emergency cases, not as a standard method for daily liquidity management, the interest rate for this credit was set at a relatively high level i.e. overnight credit plus 200 base points.

3.3. MNB's support for the development of innovative payment solutions

In order to have a widespread usage of instant payments, the establishment of a new modern infrastructure is only a starting point. The development of convenient and innovative payment solutions by market stakeholders is also a key element to reach strategic goals. Therefore, MNB declared as a fundamental task to support the elaboration of new payment solutions on the basis of the new instant payment system. To facilitate developments, a detailed MNB guideline was prepared on the payment and data entry processes applicable in the instant payment system and on the standardisation of the basics of certain related business services (MNB 2019a) in cooperation with the experts of GIRO and discussed with the representatives of the Hungarian banking community. The aim of this document is to help market stakeholders, especially non-bank fintech service providers to understand the business processes of instant payments and to provide examples for payment process steps in major payment situations.

The central infrastructure also has special functions to promote market innovation. One key element of this is the establishment of a central database for proxies i.e. secondary account IDs. At the beginning of

the new service mobile phone numbers, email-addresses and tax IDs can be registered in the database, but it was created in a way that the inclusion of new proxies requires only moderate development. It is also important that according to the MNB regulation it is mandatory to banks to provide the opportunity for their clients to submit their credit transfers with the use of the payee's proxy (instead of the payee's IBAN and name). On one hand this feature is expected to make the initiation of transactions much easier in the traditional credit transfer payment situations like P2P payments. On the other hand, this also supports the extension of the usage of credit transfers to other, currently not typical payment situations like purchases at physical retailers.

An other additional feature of the central infrastructure is the handling of request-to-pay (RTP) messages. RTP service means that a non-clearing message is sent to the payer from the beneficiary with all the necessary information to initiate a credit transfer as a response. This facilitates the easier initiation of instant payments and can be extremely useful – besides P2P situations – in case of bill payments for instance, since unlike current direct debit schemes the payee has the right to decide on the initiation of the payment and its timing, while maintaining much of the convenience of the process. From the perspective of the payments market it is also fundamental, that the initiation of RTP messages is allowed to those non-payment service providers (basically merchants, utility service providers, telco companies) as well, which are able to connect directly (or indirectly through a technical service provider) to GIRO's core infrastructure. This means that these – previously screened, thus reliable – companies can send RTP messages without the use of PSPs. It is important to stress that this kind of message sending is restricted to non-clearing RTP messages, while the credit transfers (instant payments) can only be initiated through PSPs, therefore system-security risks are mitigated. This wider circle of RTP-senders might result in cheaper acquiring of retail payments in the long run. The provision of RTP service is not mandatory for Hungarian payment service providers, since the emergence of new non-bank market participants might cause enough competition and thus incentive to innovate in itself.

It is also to highlight that RTP messages can also be sent with the use of the payer's proxy (e.g. phone number), but non-PSPs cannot query data from GIRO's central proxy database in order to protect sensitive data. Thus if their payment process is constructed in a way which includes the use of proxies when sending RTPs, these actors (merchants, telcos etc.) have to contract with PSPs, and they will never have access to these personal data.

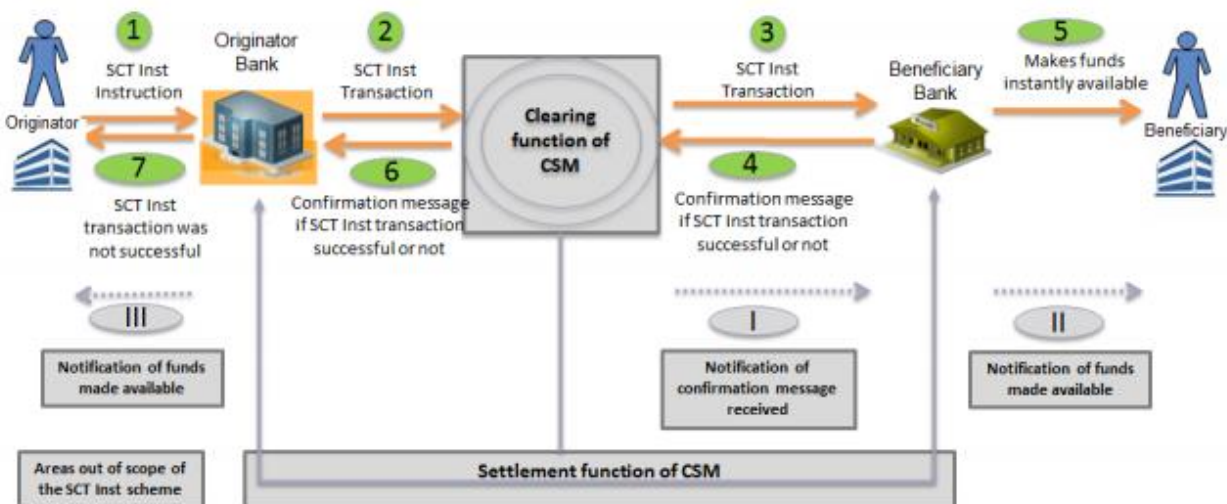
3.3.1. Differences from the SCTInst scheme

Although Hungary is not part of the euro-zone, the domestic instant payment system was intended to implement in a way, which ensures the use of harmonized European standards to the largest extent. This was also considered to be important to reduce development costs of payment service providers, since several Hungarian banks ran their instant payment projects on the basis of their foreign parent banks' developments and IT developers were also more familiar with European scheme. Therefore, the main process flows, business and operational rules, datasets and attributes in the Hungarian scheme are consistent with the Europeans, and GIRO ACH was responsible for the preparation of the Hungarian rulebook (GIRO 2018).

Besides obvious differences like the applied currencies, the most important deviation occurs at the time limit of the payment process. While the SCT Inst scheme originates from the voluntary participation in instant payments, since in Hungary it is obligatory by law stricter time-limits were applied. The reason for this is that in several payment situations e.g. acquiring at a physical point of sale, the time needed for the

transaction-processing can be fundamental. To ensure that instant payments can be used in all payment situations, including these time-critical ones, stricter rules had to be set, and required more precisely. Graph 1. shows the business process flow of the European and the Hungarian schemes.

Graph 1.: Overview of the Business Process of Instant Payments



Source: EPC 2018a

While within the SCT Inst scheme a 10 second time-limit was set for the whole process (i.e. from step 2 to step 6), in the Hungarian system this process was broken down to two partly overlapping sub-processes, each with a 5 second time limit. The first 5 seconds starts at step 2 and finishes at step I, when the beneficiary payment service provider receives the response of the ACH (GIRO) on the interbank settlement and immediately credits the beneficiary's account. The second 5 seconds starts at step 4, when the beneficiary's bank sends an immediate response to the ACH on the receiving of the transaction and finishes at step 6, when the payer's payment service provider receives the notification on the successful finalization of the transaction from the GIRO ACH. Since the first and the second 5 seconds are partly overlapping in the Hungarian system, the payment service providers have slightly less time to finalize an instant payment transaction, compared to European rules.

The starting point of the time limit i.e. the time stamp also been put differently in the two schemes. While within the SCT Inst scheme the payer's PSP first check the credit transfer instruction (e.g. fraud checks), then makes a reservation of the amount on the originator's payment account and finally puts the time stamp on the transaction, the legal and scheme rules are different in the Hungarian model. In the HCT Inst scheme two conditions have to be met to put a time stamp i.e. the first Hungarian PSP received the credit transfer instruction (thus in case of payment initiation service providers (PISP) this refers to the domestic PISP), and the payer is authenticated (if it is required by legislation it is a strong customer authentication (SCA)). Therefore, Hungarian rules are stricter in a sense that the necessary checks to finalize an instant credit transfer can be part of the first 5 seconds time-limit, depending of the applied process flow. The change of the payee's proxy (e.g. mobile phone number) to IBAN and name can also be a part of the first 5 seconds, if the payment process is set this way. However, it is also possible that the moment the payer filled the proxy data field on the user interface (front-end), the PSP immediately starts to look for the IBAN and name belonging to the given proxy regardless the time stamp has been put or not.

It is important to highlight that the operational differences described above do not restrain HCT Inst payment service providers to participate in the SCT Inst scheme, since Hungarian rules are stricter. Thus, in case a payment service provider is able to meet the requirements of the Hungarian system, it will automatically mean the fulfilment of major European business rules as well.

3.3.2. Definition of additional data content

As described above, one of the main MNB goals of the introduction of instant payments in Hungary is to provide alternative to cash in basically all payment situations. However, different payment situations imply different data content in the messages, which is needed for the involved participants when processing the transactions. This covers the data demand not only from payment service providers, but also other stakeholders like merchants at physical or online point of sales, utility service providers or state institutions. In case each participant uses their own identification numbers and ID formats, this might end in closed-loop, non-interoperable services, where the affected stakeholders (e.g. merchants) have to contract with PSPs individually. To avoid this situation and ensure the interoperability of instant payment services to the largest extent, MNB and GIRO coordinated the elaboration of additional optional data fields, their content and format, which can be used to develop additional services on the basis of the central infrastructure. The following additional optional data fields were identified as essential for the development of payment solutions:

- Payment situation ID: based on standard ISO purpose codes this fulfils similar functions to MCC codes in card schemes, facilitating fraud monitoring, as well as the analysis of instant payment turnover. Due to the very nature of instant payments and their flexible usage, these codes cannot be applied in a large ratio of transactions, since in certain cases even PSPs cannot decide unequivocally that the given transaction was a “traditional” P2P payment or it was the result of a previous economic transaction. Nevertheless e.g. in the case of instant payments as a response to RTP messages it can be useful for market participants and the central bank as well to apply these codes in messages.
- Retail unit, shop ID: this is to ensure the smooth processing of payments in case of physical acquiring.
- Merchant device (POS-terminal, cash register) ID: like shop ID, this data field can be crucial in case of physical point of sales, especially when more terminals or cash registers are operated within one shop.
- Invoice or receipt ID: the identification of bills can be fundamental especially for utility service providers or telco companies, which have to handle millions of incoming payments.
- Customer identifier (for bill payments): the identification of the payer can also be important at (utility) bill payments for instance, when the incoming transaction must be assigned to the appropriate clients.
- Payee’s internal transaction identifier: beneficiaries use their own payment transaction IDs in certain cases, thus the inclusion of this number can facilitate the smooth processing of payments.
- Loyalty or discount scheme identifier: merchants can include the ID numbers of the payer in their own loyalty systems, with which they can obtain additional information on their clients and provide personalized discount offers to customers.
- National Tax and Customs Administration (NAV) verification code: in Hungary the verification code of the Tax Administration Office is a mandatory element of payment receipts, therefore this number can be useful for the processing of payments.

3.3.3. Issues related to PSD2 API

The afore mentioned new PSD2 European payment directive intends to lower market-entry barriers by opening incumbent payment service providers' systems to third-party payment service providers (TPP) like PISPs. As it is well known in the payments market, this is executed through APIs, provided by Account Servicing Payment Service Providers (ASPSPs, mainly banks) to these new market participants. From a public policy perspective, the increasing competition and the growing number of market players is advantageous, especially for consumers and business clients of PSPs. However, the favourable consequences of the new regulatory background can only be utilized if the service level is the same in the case of TPPs as well.

Recently there has been intense discussion on the European market too, whether an API standard should be defined and to what extent is it mandatory for banks to support the operation of new market stakeholders. While no domestic API standard has been prepared in Hungary so far, MNB considered fundamental to facilitate the service provision of TPPs. Concerning instant payments one crucial point was identified i.e. the data content of payment messages. As introduced above, some optional additional data fields were defined to promote the innovation of new payment solutions. However, if PISPs are not able to transmit these data (e.g. POS ID) to banks through the APIs they might be able to provide services only in a limited scope of payment situations, while incumbent players are able to exclude these players from physical point of sale payments for instance. To prevent this, it is mandatory for domestic ASPSPs by MNB regulation to facilitate the transmission of all data content of payment messages through their APIs including the additional optional data fields. In the future this measure can help to boost market competition.

3.3.4. Data-entry and QR-code standard

While in card payments the entry of the necessary data to execute a payment is relatively easy with the one-time registration of card number, CVC/CVV code, cardholder's name and expiry date, the initiation of credit transfers is slightly complicated. In order to submit a credit transfer to the payment service provider, the payer must add at least the beneficiary's name and IBAN, as well as the amount of the transaction. This can happen by manually filling the requested data fields, however such inconvenient methods cannot be expected to prevail widely. Thus, automated methods must be applied either to provide the beneficiary's data to initiate a credit transfer or the payer's data to send an RTP message.

These automated data entry methods include the use of e.g. NFC, QR-code or BLE technologies, but it is common in all of them that they can be used to exclude the clients of competitor PSPs and to create closed-loop payment solutions. In case of physical acquiring it can happen for instance, that the merchant's acquirer PSP defines its own QR-code, which cannot be read with other PSPs' mobile payment applications. To overcome this issue, MNB regulation requires from PSPs to use open data-entry methods, which are interpretable to any other market stakeholder due to the openly published technical documentations. This results in a situation where no competitive advantage can be gained with any automated data-entry methods, since technically any PSPs will have the opportunity to develop an interface (e.g. mobile app) which can use any data-entry methods available on the market.

The regulatory requirement solves the issue of interoperability concerning payment solutions on one hand, but cannot be considered optimal from a market perspective on the other hand, since the develop-

ers of mobile payment applications have to ensure the reading of several different QR-codes for instance if they want to reach a wide coverage. A solution for this issue can be to create a standard for QR-codes at least on a national level, but aiming international interoperability to the largest extent. MNB in its catalyst role elaborated - in cooperation with market stakeholders – and published such a domestic QR-code standard (MNB 2019b) using the already published EPC guidelines⁴. Besides setting technical parameters like the error level or size, it is important that all previously defined optional additional data (like POS ID etc.) can be included in the code, therefore it can be used in basically all payment situations from transactions at physical point of sales to online purchases.

3.4. Branding

In case of the Hungarian instant payment system the level of MNB communication towards final users of the new service (i.e. consumers and businesses) also had to be considered. Basically, three different approaches could have been identified:

1. Systems like e-money solutions, where the entire branding is in the hand of the e-money issuer.
2. Those solutions where the branding is set on the service level (e.g. MobilePay in Denmark, which refers to an application of Danish banks, not the underlying Straxclearing infrastructure).
3. Those solutions where the branding is set on the basic service level (e.g. Faster Payments in the U.K., which refers to instant payment service of any payment service providers).

MNB chose the third approach defining branding criteria only on for the base service, i.e. credit transfers within 5 seconds. The reason behind this is that MNB intends to provide ample room for market innovations and competition, so that any PSP can develop its own instant payment-based solution with own branding. This approach is rather similar to those card-based wallet solutions, where besides the brands of the underlying card schemes the payment solution itself (i.e. the mobile app) also has its own brand (e.g. ApplePay). In the future, this is expected to facilitate multiple choices for end-users and incite service providers to apply the latest technology in order to maintain their clients. A common basic-service level brand can be useful e.g. customers can easily identify those physical point-of-sales, where they can pay with instant payments using any solution of market players similar to card-based solutions, where merchants only show the brands of the accepted card schemes to customers instead of the logos of the specific wallet solutions.

3.5. Pricing

As Hartmann et al. (2017) draw the attention, the appropriate pricing is crucial in the case of inciting the widespread use of instant payments. To understand this issue more profoundly, MNB conducted an analysis (Kajdi et al. 2018) comparing the pricing of Hungarian banks with pricing data of 60 accounts from 11 European countries⁵. Concerning the Hungarian situation MNB has comprehensive data, thus conditions of 57 domestic payment accounts was involved in the examination, which cover approximately 75 per cent of consumer clients. Three consumer profiles were set for the sake of comparing the different countries. Although the survey cannot be considered representative on the international level, since it would obviously consume extremely large resources and more data (e.g. consumer transaction habits of the

⁴ <https://www.europeanpaymentscouncil.eu/document-library/guidance-documents/quick-response-code-guidelines-enable-data-capture-initiation>

⁵ The involved countries were: Bulgaria, Denmark, France, Germany, Italy, Poland, Portugal, Romania, Spain, UK

different payment accounts), using the account conditions of the largest banks in the chosen countries provide useful information to have a deeper insight in pricing of payment services.

The analysis verified on one hand that the pricing of Hungarian payment services is higher – in relative, but in some cases also in absolute terms – compared to the European level, which clearly hinders the increasing use of electronic payments. But what is perhaps even more important is that issues in the pricing structure was also revealed: as Table 1. shows, in most European countries the initiation of credit transfers is included in the monthly account management fee, thus no additional fees must be paid for a transaction (“package pricing”⁶); in seven of the foreign countries all examined account packages applied “package pricing”. However, in Hungary it is typical to charge fees for each credit transfer transaction, which is evidently not competitive compared to cash and card payments, which consumers perceive as free of charge.

Table 1.: Pricing of credit transfers in different European countries

Country	Number of examined accounts' conditions	From this: number of accounts with package pricing	Ratio of accounts with package pricing
Hungary	57	11	19%
Foreign countries:	60	48	80%

Source: MNB

In order to ensure the widespread use of instant payments, the fees related to credit transfers have to be abolished or included in monthly account management fees. MNB started intense discussion with the banking sector and drew up recommendations both for market stakeholders and government regulators to change the current pricing structure. One of the key messages is that if banks intend to achieve higher transaction turnover (i.e. intense use of instant payments instead of cash), it is unconceivable without a radically new attitude in pricing and the introduction of “package pricing”.

4. CONCLUSIONS

This analysis intended to provide an overview of the possible points where a central bank can step up either as regulator or as a catalyst of comprehensive payment system developments. The case study of the upcoming Hungarian instant payment system can serve as food for thought to those countries which also plan to introduce this new service, but it might provide new perspectives for those as well, which already have an instant payment system in operation. MNB followed a holistic approach when identifying the points where central measures were needed, and these central bank steps influenced more or less the entire operation of instant payments. As key take-away messages the followings can be highlighted:

⁶ Package pricing: according to our applied definition, package pricing is used if no additional fee is charged for the initiation of a credit transfer without any limits in the number of transactions

- **Regulation:** A unique feature of the Hungarian model is that it is mandatory for PSPs to provide instant payments as the “new normal”. While this central bank intervention might not be necessary in those countries, where market stakeholders initiated comprehensive developments voluntarily, the stricter regulatory approach can be advantageous for those, where no market-led innovation is expected.
- **Liquidity-management:** In those systems, which operate with prefunded liquidity management and intend to introduce instant payments as the new normal, the possibility of instant credits out of RTGS operation hours is an essential additional safety net to prevent operational and stability risks. It is also worth to consider, that the development costs of such function are much less than the transformation of RTGS operation to continuous (24/7/365).
- **Catalyst and coordinator role for services:** Concerning the development of innovative payment solutions, MNB played mainly coordinative role. The elaboration of MNB guidelines for instant payment process flows and QR-code standards or the definition of additional optional data fields all aimed to facilitate service level developments, since in the end these are the means that support the wide prevalence of the new payment method. If consumers have negative initial experience e.g. they intend to use their mobile payment apps, however their payment applications are unable to read QR-codes it can deter large groups of the population from switching to cashless solutions.
- **The role of TPPs:** Due to PSD2 regulations market competition is expected to become more intense in the near future. MNB facilitated this transformation by applying specific regulation to APIs (banks’ APIs must support the transmission of the content of additional optional data fields e.g. POS-terminal ID number), which will enable TPPs to provide instant payment-based service to the largest possible extent.
- **Inclusion of non-PSP actors in the RTP service:** Within the Hungarian system non-PSP market stakeholders like merchants, utility service providers or telco companies will be able to send RTP messages without the support of PSPs, which is also expected to increase market competition.
- **Big-bang type launching of instant payments:** As the delay of the introduction of the Hungarian instant payments clearly shows, when all PSPs are obliged by regulation to participate, it poses certain risks. Coordinators like national central banks or banking associations can reduce such risks by strict monitoring of market stakeholders development projects – as MNB did – nevertheless the probability of delays in PSP developments cannot be excluded entirely.

The profound evaluation of the Hungarian strategy regarding the introduction of instant payments can be executed when the initial data and experiences are available. However further coordinative tasks are already envisaged like the implementation of payment infrastructure strategy, which aims to consolidate current retail payment clearing platforms (overnight, intraday and instant payment). Within this task e.g. the migration of batched credit transfers to the instant payment infrastructure will pose new challenges for the central bank, since otherwise this change might result in the overload of certain beneficiaries without centrally coordinated discussions.

The above introduced interventions of MNB showed how central banks can support the uptake of instant payments. To reach this goal one of the most important factor is to ensure high coverage (“reachability”) of PSPs and their clients, since this can facilitate the building of viable business cases on the market participants side. We believe, MNB solved this problem in an effective and unique manner mainly by making the provision of instant payments mandatory by regulation. This approach completed with the mitigation of

liquidity risks and the facilitation of the development of supplementary services can serve as practical experience for other countries as well.

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