

■ Innovations in payment systems

The dynamic advances in information and communication technology have ushered in a raft of new products in the field of payment systems. While online banking is now firmly established in Germany, contactless payment facilities in the retail trade, new payment procedures for internet purchases, the use of mobile phones and technology enabling the transfer of funds from one account to another in a matter of seconds are at the centre of interest today.

Even though many payment innovations are still in the process of being phased in and gradually extended, these developments are regarded as having high growth potential. Innovations in this area may bring about major changes in the payment services market and could, for example, weaken the role of banks in this traditional area of their activities. There are already signs that competition in the payments sector is likely to increase owing to the technological know-how and broad customer bases of non-bank service providers such as web merchants or mobile phone companies. These tendencies can also be observed at an international level, as reported in a recently published study by the Basel Committee on Payment and Settlement Systems (CPSS) entitled "Innovations in Retail Payments".

Central banks have a vested interest in facilitating the efficient and secure settlement of payments because of their statutory mandate. It is for this reason that they keep a close eye on current payment trends and developments and assess whether additional action needs to be taken. Such action might include expanding their oversight activities and stepping up cooperation with other national or international authorities. But central banks also need to consider the implications of innovation for their own provision of services and for monetary policy.

Besides technological advances and changes in user habits, the main drivers of innovation have been the regulatory framework, the degree of standardisation and cooperation, the price structure and security. These factors have simultaneously caused the payment services market to feature more prominently in the political debate in Europe and the world as a whole, as evidenced by the emergence of payment system forums involving service providers, users and regulators and by the increasing activity of competition authorities, for example in connection with determining the admissibility of interbank fees. In particular, the establishment of the Single Euro Payments Area (SEPA) is expected to generate innovative impetus across Europe.

Dynamic developments in cashless payments

Payment system developments in Germany ...

In the course of the last fifty years, cashless payment systems in Germany have developed at a rapid pace.¹ Currently, almost 18 billion payments worth around €68 trillion are effected in Germany every year, which is equivalent to 212 payments totalling about €31,000 *per capita*. Among the major developments in recent years are the increasing importance of card payments and the rapid growth of online banking. Over the past decade, use of online banking facilities has more than doubled; just over 45% of Germans above the age of 16 now use the internet to access their giro account.² This increasing availability of the internet has also led to significant changes in consumers' purchasing habits. At present, just over 5% of all retail sales in Germany are already generated by e-commerce.³ This has also left its mark in the world of payments, for example in the form of new or enhanced conventional payment schemes.

... and the world at large

Advances in information and communication technology have also paved the way for progress in payment operations and systems elsewhere in the world. Over the past ten years, the number of internet users has more than quadrupled globally to around 2.2 billion. With almost six billion users to date, the mobile phone sector has expanded even more rapidly. The same applies to developing countries, where, statistically, as many as eight out of ten people possess a mobile phone.⁴ This notably fosters hopes of providing financial services through this channel to the more than 2.5 billion individuals around the world who have hitherto had no access to bank accounts.

Emerging market economies such as Brazil, China, India, Korea, Russia and Saudi Arabia have used the past few years to systematically modernise their payment infrastructures. These countries have flourishing economies with high double-digit growth rates in payment transactions, whereas in Europe and the United States

growth in payments is in the low single-digit range. This is largely the result of the different degrees of development within the payments segment, as reflected, for example, in the wide international divergence in the annual number of *per capita* payment transactions. Almost every country has witnessed major growth in card payments in recent years; in the countries represented on the Committee on Payment and Settlement Systems (CPSS),⁵ credit and debit cards account for over 50% of payment transactions and are now the predominant instrument for cashless payments.

Central banks attach great importance to payment-related innovations because such developments generally have an impact on both efficiency and security. Efficient and secure payment systems are essential to a smoothly functioning real economy and a key factor in maintaining confidence in a country's financial infrastructure. They are therefore ultimately indispensable as a means of ensuring confidence in the national currency itself. Mindful of this fact, the central banks represented on the CPSS tasked a working group with examining the latest trends in the field of payments. The report, which was recently published,⁶ gives an overview of significant innovations observed in this field and analyses similarities detected among these trends as well as positive and negative determinants. The group was also tasked with assessing the consequences and challenges for

Significance of innovation for central banks

¹ See Deutsche Bundesbank, Cashless payments in Germany and the role of the Deutsche Bundesbank, Monthly Report, March 2009, pp 49-64.

² Source: EUROSTAT and banking associations.

³ Source: German E-Commerce and Distance Selling Trade Association (Bundesverband des Deutschen Versandhandels – bvhl).

⁴ Source of information and definitions: International Telecommunication Union (ITU).

⁵ In addition to the G10 countries plus Switzerland, Singapore and Hong Kong, Australia, Brazil, China, India, Mexico, Saudi Arabia, South Africa and Turkey have joined the countries represented on the CPSS since 2009. Its members are each country's central banks (plus the ECB).

⁶ Bank for International Settlements, Committee on Payment and Settlement Systems, Innovation in retail payments, Report of the Working Group on Innovations in Retail Payments, May 2012.

Total number of transactions based on cashless payments						
2010						
	Number per capita	% of total number of transactions				
		Credit transfer	Direct debit	Credit and debit cards	Electronic money	Cheque
Australia	295	¹ 27.1	10.3	58.3	.	4.4
Belgium	219	42.1	10.3	44.7	2.5	0.3
Brazil	104	38.5	21.4	31.6	0.2	8.4
Canada	276	10.6	6.9	72.7	.	9.7
China	5	15.1	.	71.7	.	13.2
France	264	17.6	20.1	43.6	0.2	18.4
Germany	212	33.9	50.2	15.5	0.2	0.3
Hong Kong SAR ²	.	0.6	0.8	10.0	86.1	2.5
India	6	4.6	2.4	71.9	.	21.2
Italy	67	32.7	15.8	40.0	3.1	8.4
Japan ³	88	12.7	.	73.0	⁴ 13.5	0.9
Korea	247	22.0	11.8	58.7	1.3	6.2
Mexico	21	36.1	2.0	43.5	.	18.5
Netherlands	322	29.6	24.4	42.7	3.3	.
Russia	34	68.1	3.5	26.3	2.0	0.0
Saudi Arabia	50	0.3	0.1	99.0	.	0.6
Singapore	506	1.3	2.2	7.9	85.5	3.0
South Africa	44	24.2	25.8	46.5	.	3.5
Sweden	330	31.9	8.7	59.3	.	0.0
Switzerland	173	54.2	3.3	41.3	1.1	0.0
Turkey	30
United Kingdom	.	20.5	19.5	53.2	.	6.7
United States	347	7.1	10.8	60.8	.	21.3
CPSS ⁵	66	17.5	15.0	52.8	1.2	13.6

Source: CPSS, Statistics on payment, clearing and settlement systems – figures for 2010. ¹ Includes BPAY transactions. ² Indicative figures provided by the Hong Kong Monetary Authority. ³ Figures for 2009 provided by the Bank of Japan. ⁴ Payments for public transportation are excluded. ⁵ Sum excluding those countries for which data are not available and Hong Kong SAR and Japan.
 Deutsche Bundesbank

central banks that are likely to arise from these developments.

An overview of innovative payment schemes

Basis for analysis

The analysis was based on a fact-finding survey conducted among CPSS central banks regarding innovations in retail payments in their respective countries over the past decade. In addition, the report focuses on selected developments in a number of other countries. A total of 122 innovations from 30 countries were catalogued, with attention paid to both product innovations, for example in the form of new or materially enhanced payment instruments or solutions, and to process innovations. Since the attributes “new” and “materially enhanced” are both relative criteria which depend on the situation in the individual country, a broad range of relevant trends was covered.

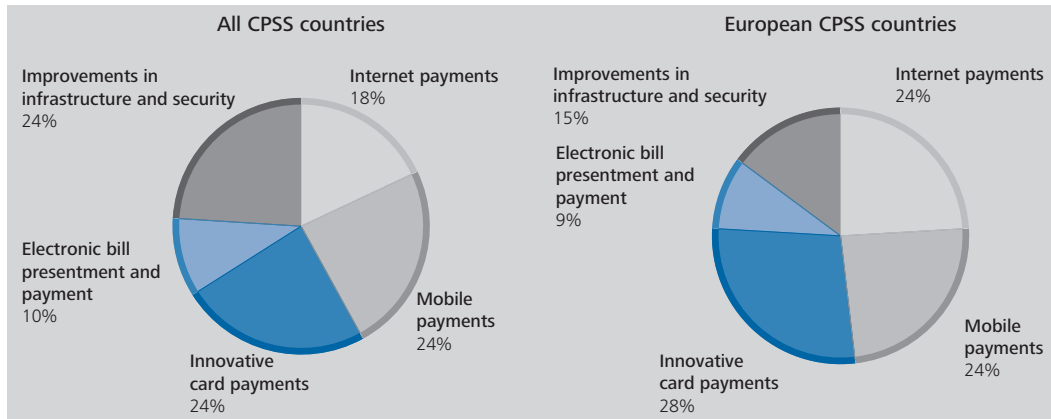
Recent developments in international, European and national payment systems can generally be assigned to one of the following five categories:

- innovative card payments,
- internet payments,
- mobile payments,
- electronic bill presentment and payment (EBPP)⁷ and
- improvements in infrastructure and security.

In Germany, as in the rest of Europe, the first three listed categories are of particular importance.

⁷ As a general rule, this encompasses any schemes which entail the digital submission of bills and simultaneously allow the payee to initiate a payment automatically.

Innovations by product category



Source: Bank for International Settlements, Innovations in retail payments, Committee on Payment and Settlement Systems, Report of the Working Group on Innovations in Retail Payments, May 2012.
 Deutsche Bundesbank

Innovative card payments

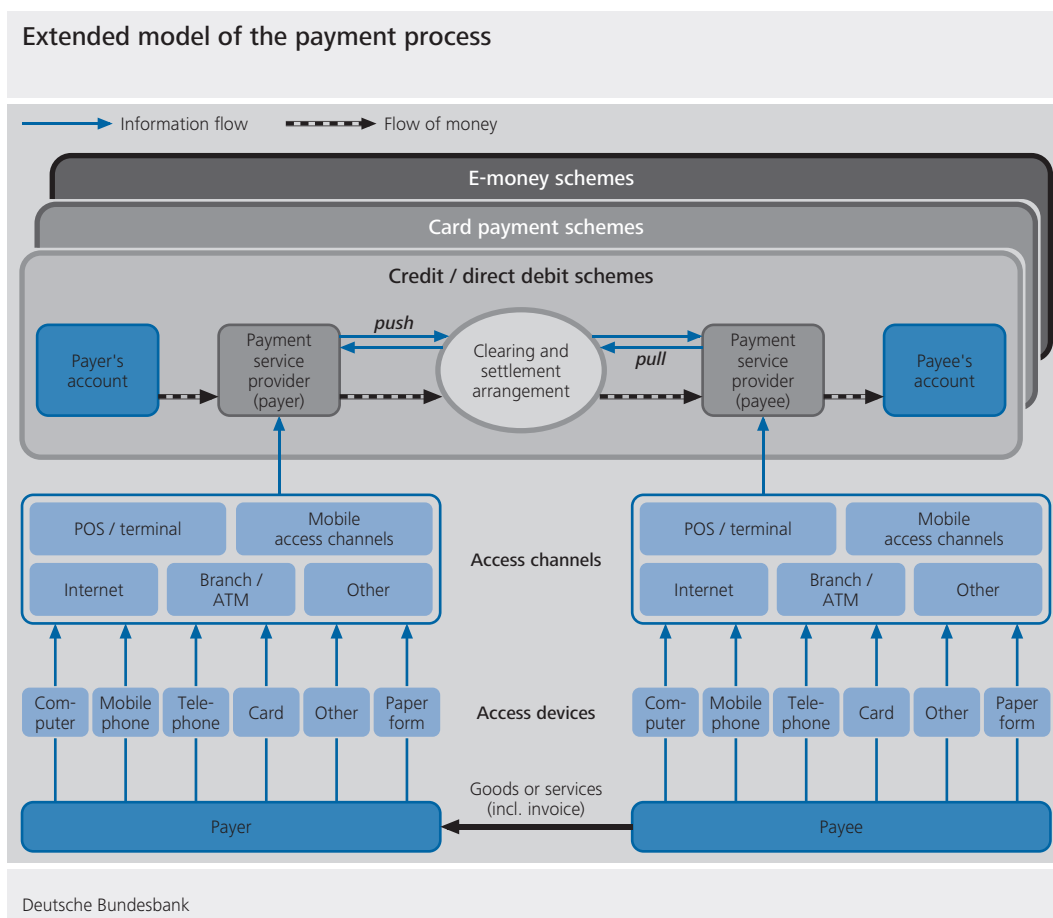
In Germany, very high expectations are attached to the deployment of contactless technology (near field communication, NFC) for card payments as it enables payments at point-of-sale (POS) terminals to be processed more speedily. At present, a large-scale pilot project known as "girogo" and based on the e-money system GeldKarte is being run by the German banking sector in Lower Saxony. The GeldKarte constitutes a prepaid electronic wallet (also referred to as a prepaid card) which has thus far been primarily used for effecting payment at parking meters and public transport ticket dispensers. In addition to being used for the contactless payment of purchases up to a value of €20, another new feature will in future enable the holder to automatically top up his/her GeldKarte balance at the POS, thus preventing the cancellation of a transaction due to insufficient funds. The savings bank sector has already announced its intention to equip the more than 40 million cards for which it is responsible with an NFC capability in the coming years. Parallel to this, the international credit card companies MasterCard and Visa are endeavouring to establish their contactless card products in the German market. At the international level, too, contactless payment schemes and prepaid solutions are the predominant lines of development within the innovative card payments category. Prepaid cards

have a particularly important role to play in allowing individuals without any access to bank accounts to settle payments on a cashless basis or, for example, enabling government transfer payments to be made without any need for cash.

However, in the next few years, innovations are also likely to raise the level of acceptance of payment cards. With 700,000 acceptance terminals now in place, the level of market penetration in Germany is very high, not least in the case of large and medium-sized trading companies. However, for small-scale merchants, hotel and restaurant proprietors who are averse to investing in the requisite infrastructure there is still much untapped growth potential which could be exploited, for example, by using mobile phones as a card terminal.

Thanks to the growth of online shopping in Germany, specialised online payment schemes are gaining in popularity. Internet payments refer to all e-commerce payments transmitted by customers to their payment service provider using the internet as an access channel; it is immaterial whether the access device used is a conventional PC, a tablet computer or a smartphone.

Internet payments



In Germany, two variants of payments via internet play a leading role. First, over the past few years, a number of schemes have been launched on the market which are based on payment by credit transfer using the purchaser's online banking application. The main players here are "Giropay", a system operated collectively by German banks which forwards customers directly from the e-merchant's website to their online banking application for the purpose of payment, and "sfortüberweisung.de" under which a technical service provider (non-bank) triggers a credit transfer for the customer in his/her online banking application. Second, special internet-based electronic payment schemes are available that enable transfers of electronic money (e-money)⁸ between accounts held within the network. The most frequently used provider of this service in Germany is PayPal,⁹ whose platform not only enables the user to transfer prepaid e-money balances but also accepts payments by credit card

and credit transfer or, in the case of Germany, by direct debit from a bank account.

In Germany, there is also a growing awareness of the option of payment by mobile phone. In many pilot projects, however, mobile phones or devices are merely a substitute for a credit or debit card inasmuch as they can be fitted, for example, with a sticker which assumes the function of the card or incorporate a SIM card with a payment card function. In other instances, mobile phones are used solely to gain authorisation. This is achieved by sending a transaction authentication number (TAN) which is needed in order to conclude the payment process. By contrast, genuine mobile (phone) payments are characterised by the fact that

Mobile payments

⁸ This refers to prepaid balances in the prevailing currency which are stored on cards or computer servers and which can be used to effect payment not just on the part of the issuer but also for third parties.

⁹ See, for example: EHI Retail Institute, Online Payment Studie 2012.

they are initiated and transmitted using mobile communication networks or technologies. For instance, in some locations in Germany mobile phone parking is available, in other words parking fees can be paid by means of a text message which is charged to the participant's mobile phone bill. In addition to the various existing local SMS-based payment solutions for the purchase of local public transport tickets, it is possible that in the next few years the market will see an influx of products offering mobile payment applications (apps) involving a direct debit (collection of funds from the user's bank account).

Electronic bill presentment and payment

While in some countries, specialised procedures or technical platforms have been developed for the purpose of electronic bill presentment and payment (EBPP) or purely for paying bills, such tools play only a minor role in Germany, at least in business-to-person dealings. This is attributable, first, to the still high proportion of paper-based bills in use. A second factor is that electronic invoicing mostly involves bills being transmitted as an e-mail attachment.¹⁰ Furthermore, the German collection authorisation direct debit scheme is a procedure that offers consumers a convenient, easy-to-use and secure payment instrument, especially for ongoing payment obligations.

Improvements in infrastructure and security

Innovations designed to accelerate payment processing or to make it significantly more efficient are of limited importance in Europe. In some countries, for example, payment by cheque continues to play a major role, and thus the digitisation of cheque processing has been pursued as a high priority of late. This contrasts with Germany, where cheques are now only of marginal importance and the changeover to fully automated processing was already achieved a number of years ago. Conversely, both internationally and within Germany, the security aspect is becoming increasingly important, as demonstrated by the implementation of the two-factor authentication (2FA) of payments.¹¹ To cite an example, internet payments executed using a credit card can

be made much more secure by asking the user to enter an additional password (known as a 3D secure code).

Trends in the development of payment methods and systems

The large number of innovative developments and products demonstrates the dynamic evolution of payment methods and systems. In Germany, however, many of these innovative payment instruments are either still in the pilot or test phase or have only been able to secure a very limited foothold in the market in terms of their scope of application, for example in connection with ticketing or vending machines. In typical payment situations, conventional means of payment and payment instruments continue to prevail. In Germany, cash is by far the most commonly used method of payment at merchant points of sale as well as for private transactions (person-to-person payments).¹² Regular payments (eg rent), but also e-commerce payments (eg payment before or after receipt of goods), are frequently settled by means of credit transfer or direct debit. Similar trends can be discerned in cross-country comparisons. In fact, only in a small number of cases and in very few countries have innovations been able to make the transition to one of the most commonly used payment instruments.

Innovations have high growth potential

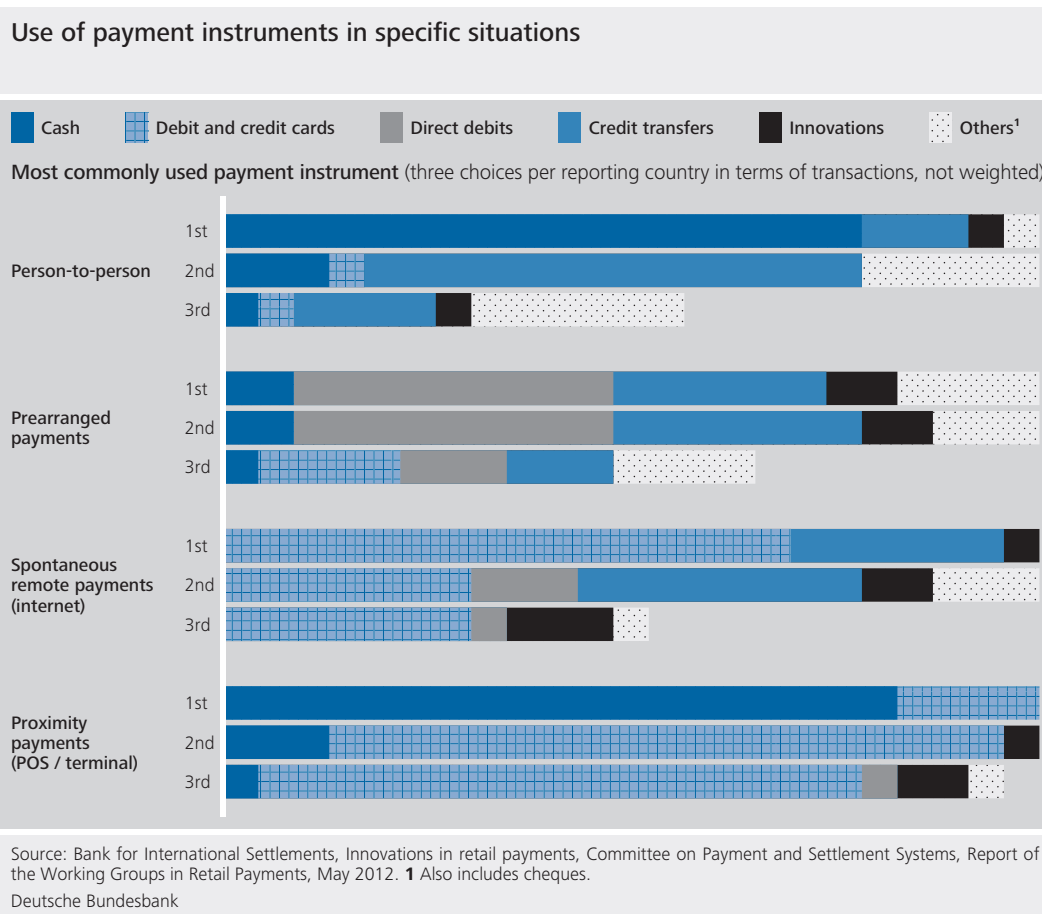
It should be noted, however, that most innovations are relatively new and have not been on the market long enough to become properly established. A study conducted by the ECB¹³

¹⁰ For more information, see B Koch, E-Rechnungen als Chance in einem veränderlichen Marktumfeld, Billentis, April 2012.

¹¹ In other words, the use of at least two of the following mechanisms for verifying the customer's identity: customer-specific passwords; customer-owned media (eg a card, token or mobile phone); biometric recognition (eg fingerprint).

¹² Deutsche Bundesbank, Zahlungsverhalten in Deutschland, 2009. The results of the most recent study will be published in the next Monthly Report.

¹³ ECB, Report on the Results of the e-SEPA Survey on Payment Innovations in 2010, October 2011.



comes to the conclusion that most innovations relating to European payments are still in the introduction or growth phase. Accordingly, the projected market potential for innovations is a long way from being met.

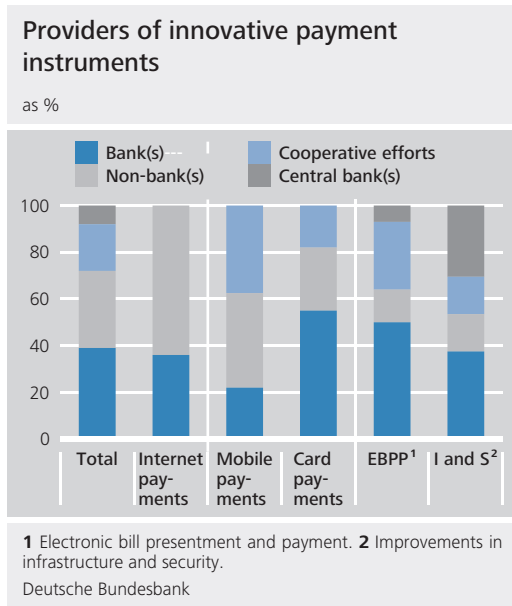
terms of customer numbers, non-banks are the leading providers in the field of internet and mobile payments. In many instances, the involvement of a non-bank leads to an interruption of the traditional supply chain for payments, which has been dominated by banks. For example, in the case of "sofortüberweisung.de", the non-bank provider is included in the communications loop linking the merchant, the purchaser and his/her bank. Non-banks, such as the mail order company Amazon, serve *inter alia* as payment portals inasmuch as they allow registered merchants to use either their own designated processing platform or to choose from several other payment channels on a one-stop basis.

Growing significance of non-banks

Non-banks are taking on an increasingly important role in the area of payments by acting as payment service providers without a banking licence in the conventional sense. Aside from technical factors, this development has also been fostered by the regulatory framework. In some cases, non-banks and the services they provide operate in a regulatory gap for which no legal rules have been deemed necessary up to now. In many countries, however, the regulatory provisions have since been adjusted to allow certain services to be provided not just by traditional banks, as in the past, but also by non-banks. These use innovative technologies to apply their specific technical expertise to payment transactions or to harness their existing customer base for this area of activity. In

In many cases, innovations in retail payments are specifically aimed at speeding up processing. They are being driven by concrete market demand, technological progress and, in some instances, regulatory pressure. On the one hand, these innovations are designed to accel-

Need for speedier payment processing



erate the initiation of payment, be this as a POS transaction or an e-commerce purchase. For example, the aforementioned options for contactless retail payments have the potential to greatly reduce the time needed to effect payment at the POS, which is to the benefit of both the retailer and the customer. On the other hand, efforts are underway in many countries to place the focus of payments more squarely on real-time or almost real-time settlement. To achieve this goal it is above all necessary to establish modern, high-speed processing systems to enable the exchange of funds between the payment service providers involved (interbank payment systems) and to install the corresponding access paths via which customers can initiate payment, be it through the internet, by mobile phone or by means of telephone banking. The ultimate objective is to ensure account-to-account settlement within a matter of seconds through the almost immediate crediting of the payment amount to the payee. With regard to e-commerce, for example, this should eliminate the risk incurred by a seller if he/she provides services upfront, while all parties involved should benefit from the liquidity management gains resulting from the elimination of processing times. Moreover, customers would be offered a quick electronic alternative to cash payments for private transactions (eg pocket money).

In Germany, and throughout the European Union, the speed of payments processing has accelerated significantly over the past ten years. Since the beginning of 2012, payment service providers have been required by law to ensure that payments are credited to the relevant account at the receiving bank Europe-wide no later than the following business day. As a consequence, many interbank payment systems have been adjusted to enable same-day or intraday settlement between the banks involved. For an array of recurring (date-specific) payments there is clearly no need for a further acceleration of the processing time, ie a shift to real-time settlement. In addition, the advantage of immediate receipt of payment by the payee using real-time settlement, eg in e-commerce transactions, could be replaced by a payment guarantee provided by the bank in advance of actual payment processing further downstream. Nevertheless, it should be borne in mind that internet payment platforms such as PayPal can already initiate an immediate transfer of funds from one PayPal-registered account to another. The key factor will therefore be the stance taken by payment service users: while many bank customers are probably content with the processing speed already on offer, they may revise their expectations in the future, taking their experience of high-speed internet communications as the benchmark for payments processing.

In countries with a high *per capita* income, more than 90 per cent of all households have (access to) a bank account, whereas in Latin America, for example, the rate is just 40 per cent and in sub-Saharan countries it is barely more than 10 per cent. The concept of "financial inclusion" sets out to extend the provision of financial and, in particular, payment-related services to include those sectors of the global population that have hitherto had no or only limited access to these services. Moreover, this could simplify the process and, above all, reduce the cost of remittances made by resident foreign workers to their families back home. Owing to the very high prevalence of bank ac-

Financial inclusion as an innovation driver

counts, such financial inclusion is only of minor importance in Germany. There is virtually no demand in Germany for schemes such as the provision of accounts with limited functions or non-bank systems for settling mobile payments via prepaid payment cards (which have proved innovative drivers of payment transactions in countries with less developed bank infrastructures), nor are these concepts likely to see much growth here in the future.

Success factors for payment system innovations

Special features of the payment services market

The payment services market has a number of special features which make it more difficult to introduce new products than in other markets. These include economies of scope and of scale, network effects and a two-sided demand structure, which is split between merchants and consumers. For an innovation to be commercially successful it is crucial to achieve a critical mass, in other words to reach a sufficiently large number of users. This is complicated further by the fact that innovations generally have to compete against established and widely-used schemes, meaning that (a large number of) users need to be persuaded to switch over. This may explain why payment system innovations rarely get beyond the pilot phase or need a longer period of time to become accepted in the market.

The extent to which innovations develop and succeed depends on several factors. Here, a distinction can be made between exogenous and endogenous determinants. While exogenous factors are usually instrumental in determining the framework conditions in which the payment industry operates, providers are better equipped to influence endogenous factors themselves. Each determinant has the potential to foster innovation (driver) or hinder it (barrier), depending on the specific features.

Aside from technical developments, the most significant exogenous factor is user behaviour.

In order for innovations to succeed, they have to meet the payment service user's needs and convince the user that the innovation is superior to existing payment schemes. Numerous projects in European countries aimed at introducing an e-wallet incorporated into payment cards have fallen at this hurdle. Likewise, in Germany the initially high hopes attached to the GeldKarte, which at last count (2011) had registered 36 million transactions, have not been fulfilled. This was due *inter alia* to its relative lack of appeal in the eyes of consumers, for example owing to its low level of acceptance by retailers and the limited degree of protection against financial loss.¹⁴ When choosing a payment instrument, the key deciding factors for users – both merchants and consumers – are cost, acceptance, speed and safety. With regard to the contactless payment schemes currently being piloted in Germany, it will therefore be extremely important for them to prove their practical worth in terms of their advantages for the user, also compared with existing payment methods.

Other factors influencing user choice are the specific payment situation and socio-economic aspects (eg age and level of education). It can generally be assumed that user preferences and payment habits are only likely to change at a slow pace. In principle, however, technological progress, a change of strategy by the provider or altered purchasing behaviour (eg greater internet use) could lead to a higher level of acceptance for innovations on the part of users.

The (exogenous) regulatory framework has become increasingly important over time. In recent years, various measures have been taken across Europe and in other CPSS countries to encourage innovative developments. In many cases, the aim was to stimulate competition in the payments industry and to increase efficiency by opening up the market to non-banks. For example, in 2009 the European Union im-

Exogenous factors: technical developments and user behaviour ...

... as well as the regulatory framework

¹⁴ See footnote 12.

Special features of the payment services market

Economies of scale

This concept is based on the assumption that rising output volumes reduce the average costs per unit. Economies of scale occur when output increases because the high fixed costs of production, being unrelated to output, can be apportioned to a greater number of products (as long as the system does not reach full capacity). In the field of payments, economies of scale mainly apply to the processing costs in payment service providers' systems or interbank payment operations.

Example: if doubling the volume of payments increased total costs by just 20%, the average costs per payment would drop by 40%.

Economies of scope

In this case, increasing output levels by using the same infrastructure to produce different goods brings about economies of scale.

Example: the Bundesbank's Retail Payment System (RPS) is used not only for processing credit transfers and direct debits but also for collecting card and cheque payments.

Network effects

This concept centres around the idea that the usefulness of a given service for existing users grows in proportion to the total number of users. Hence, the more widespread a service becomes, the greater the benefit for those using it. Combined with high fixed costs for providing the payment infrastructure, this means that a minimum number of

users ("critical mass") needs to be reached if the service is to offer a high value for users.

Example: the benefit of a bank card for merchants depends on as many customers as possible holding the card and being able to use it for payments.

Two-sided markets

Achieving critical mass becomes more difficult for providers when demand is split between two interdependent customer groups, eg merchants and consumers. For providers, this means that they have to reach critical mass on both sides. This is often referred to as the "chicken and egg dilemma". For unless both sides of the market have an incentive to simultaneously introduce a payment service, that service is destined to fail; the proposition loses its attractiveness if only one side is interested.

Example: a new card payment system can only gain acceptance in the market if it is accepted by consumers and merchants alike.

plemented the Payment Services Directive, which created a new category of payment service providers with the authority to offer payment services throughout Europe: payment institutions. In terms of organisation and capital, the legal requirements for payment institutions are much less stringent than those applying to banks which, among other activities, are additionally allowed to conduct deposit and lending business. In other countries, legislators have made targeted changes to existing legislation. These include enabling the use of more efficient payment instruments (eg EBPP) for tax payments or adapting the legal framework to promote financial inclusion. Moreover, some countries have strengthened consumer protection provisions in connection with payment systems and taken steps to enhance transparency regarding fees in the hope that this will motivate users to favour more cost-effective payment instruments.

banks' core competence in the management of financial risks.

Standardisation is a further key prerequisite if innovation is to succeed. Common standards shorten the road to reaching a critical mass as they ensure that different providers' products are interoperable and prevent the formation of competing insular solutions that lack sufficient mass. In addition, a shared platform offers new providers a stable basis for breaking into the market and avoids the need to invest resources in developing alternative technical norms. On the other hand, established standards can hamper innovation if the industry shies away from switching to new, improved standards because of the higher costs involved. Above and beyond this, it should be ensured that standardisation follows a transparent and open path from which no party with a legitimate interest is excluded.

... and standardisation

Endogenous factors ...

The main determinants that lie in the hands of the providers themselves include cooperation among providers and mutually agreed common standards.

In relation to innovations, price-setting is important in two senses. First, it determines the level of earnings providers can expect and is thus, alongside the cost factor, a determinant of the profitability of a given innovation. Second, the price of an innovation is a key determinant of the acceptance of that product by the user, especially relative to the other payment methods on offer. In Germany the high level of competitiveness which characterises the market is likely to narrow the scope for earning additional profits from innovative products.

Prices and price structure

... cooperation ...

Cooperation can either allow high fixed costs to be spread among several participating parties or make it easier to reach a critical mass by forming a joint pool of potential customers. Such cooperation can be either horizontal or vertical. Horizontal cooperation refers to collaborative arrangements between providers acting at the same operational level, as is the case when rival card systems facilitate the interoperability of terminals for merchants. Vertical cooperation, which is gaining in significance as innovative payment services become more and more technically complex, refers to joint efforts between providers at different levels of the supply chain. Mobile and internet payment processes, in particular, involve a strong degree of cooperation between the financial sector and non-bank enterprises. This makes it possible, for example, to combine the expertise of mobile phone companies in data transfer with

In Europe, and in other parts of the world, the focus of political debate on the price aspect has often been restricted to discussion of the need for and admissibility of interbank or interchange fees. These fees, which are normally paid by the retailer's bank to the cardholder's bank, are designed to distribute the profit among all the parties involved and thus make users more willing to use the system in question. However, one-sided interchange fees have also met with criticism in Europe on the grounds of competition law and have conse-

quently been made subject to regulation. Nevertheless, a sound scientific analysis of the correlation between innovation and interchange fees has yet to be presented; there is a need for further theoretical and empirical studies into this aspect.

Security

Innovations offer an opportunity to reduce the potential for fraud under existing procedures, either through the evolutionary refinement of these systems or the use of new ones. With respect to card payments, the switch from magnetic stripes to chip technology has brought about a considerable reduction in the level of damage caused by fraud. Increased use of two-factor authentication of late has generated some major successes in terms of combating internet payment fraud. At the same time, to protect their own interests, providers of innovative systems need to give top priority to the security aspect of their products as objective shortcomings or subjective doubts on the part of users concerning the level of protection provided, possibly triggered by press reports, can reduce or even block acceptance. When deployed, innovative technologies are often accompanied by new risks whose profiles can also change significantly over time. Hence, if contactless payment procedures or the use of mobile phones for payment purposes are to prove successful, users must have no doubts in their minds as to the guarantee of security offered by these products. For instance, personal data such as card numbers or PIN codes should be safe from interception by any eavesdropping technology or malware targeted at mobile phones

Consequences for central banks

Vested interest of central banks in innovations

Central banks have a vested interest in ensuring the smooth, safe processing of payments. For this reason, they keep a close eye on current payment-related trends and assess the effects on and implications for their own activities. Despite this shared interest, central banks' re-

actions to innovative developments display some notable differences, which can largely be attributed to each central bank's legal mandate, its perception of the role it should play and specific national circumstances with regard to payment systems and operations. Some central banks are authorised to institute statutory regulations and to impose sanctions, while the powers of others are confined to conducting a dialogue with the market in the form of "moral suasion". A number of central banks are explicitly striving to intensify their use of innovative, cashless payment methods (to the detriment of cash), whereas others view such decisions as the logical outcome of a purely market-driven process. Ultimately, it is up to the individual central bank, in line with the country's statutory regime, to decide whether and to what extent it wishes to act as a political catalyst, overseer and provider of payment services.

Every aspect of central banks' activity is based on the ongoing monitoring and assessment of new developments, for which they are primarily dependent on statistical data. Insufficient data can cause them to misjudge the relevance and consequences of innovations. Hence, central banks should ensure that the necessary data are available, where appropriate by adjusting the statistical reporting requirements, but taking care to avoid bureaucratic obstacles to innovation that may be generated by excessive reporting rules. In addition, expanding the scope of scientific analysis (research) can help to create a better understanding of interdependencies and risk assessments.

Need for reliable data

As standardisation and interoperability are particularly important for innovation in terms of surmounting economic hurdles, many central banks promote these goals by acting as a catalyst. Not least thanks to their individual expertise in the area of payment operations and systems as well as their neutral position between the policymakers and the markets, they are able to assist in overcoming the coordination problems which arise when different interests are involved. Here it is essential for central

Promoting standardisation and interoperability

banks to make their views, strategic objectives and policies transparent. Apart from publishing annual reports, some central banks base their strategies on public consultations, and occasionally they attempt to embed their envisaged goals in the public mind by announcing strategic guidelines.

fined to the national level, in this era of accelerating globalisation it makes sense to deepen international cooperation and, for example, apply harmonised standards so as to prevent regulatory arbitrage in which providers move their operations to more lightly regulated jurisdictions.

Expanding central banks' oversight function

Innovations have particular implications for central banks' oversight function. It is therefore important for them to review and strengthen their existing oversight framework. For example, the granting of an explicit legal mandate could effectively increase central banks' efficiency in the area of payment oversight. Where applicable, the focus of their oversight activities may need to be extended to incorporate new products and new providers. Furthermore, where the law allows, it may become necessary to supplement the set of instruments available for payment oversight.

Central banks can also promote innovation directly by modernising their own range of services. In the past few years, a number of central banks have made available new, high-end interbank payment systems and thus laid the basis for an innovative payment processing landscape. Central banks might also be affected by an accelerated transition to real-time payment processing in the retail sector as this would generate competition for the central banks' own real-time gross settlement systems, which are used not just for processing financial market transactions but frequently for urgent customer payments as well.

Overhaul of central banks' own range of services

Above and beyond this, innovative developments turn up the pressure on central banks to cooperate with other authorities. This is because the growing complexity of innovative payment services and the increased role of non-banks have a bearing not just on the oversight activities of central banks but also on the responsibilities borne by other authorities. Precisely because of the potential implications for the security and integrity of payment services, it is vital to have a harmonised regulatory framework which, ideally, places the same demands on different market players – banks and non-banks – with similar functions and avoids systemic risks and competitive distortions. This would also help to counter any potential double regulation of participants which could possibly ensue from the parallel activities of different authorities each operating independently. Likewise, the quality of regulation can be improved by making use of the expertise available in different fields. Owing to the high level of technical complexity involved, central banks would also be well advised to work closely with the authorities that are responsible for IT security. Although many innovations remain con-

Payment system innovations could result in a reduced demand for cash and, to put it more generally, curb commercial banks' demand for central bank money. This would complicate the task of managing monetary policy via the interest rate channel. Related analyses investigating the emergence of e-money were already conducted more than a decade ago. What is of greater relevance today is the advent of virtual currencies, which are being used as payment tools on several social networks. Most central banks, however, do not currently see payment system innovations as a threat to monetary policy. For one thing, no significant substitution effects detrimental to cash have been observed to date. For another, central banks have enough other options to ensure their ongoing ability to steer the demand for central bank money, which is key to monetary policy.

Impact on monetary policy

■ Outlook

Technological progress will further blur the boundaries between the various payment

Fiercer competition

products. As a result, the level of competition between the different instruments – and their providers – is likely to intensify further. Given the special economic framework applying in the field of payments and the extremely slow pace of change in users' payment habits, no revolutionary changes are to be expected in the medium term, particularly in developed payments markets like Germany. In spite of globalisation and the possibility that internationally active providers may gain in importance and exploit their strong market presence and financial resources in order to expand and break into national markets, significant differences between individual global regions will nonetheless remain in the area of payment services.

*Single Euro
Payments Area
(SEPA)*

The completion of the Single Euro Payments Area (SEPA) is of pivotal importance to the future evolution of the payments business in Germany and Europe. Against this background, innovations are only going to succeed in the medium term if they are actually in use through-

out Europe or their Europe-wide use is at least possible, for instance by means of common standards. Moreover, SEPA should be used to broaden the reach of innovative schemes, eg by setting up pan-European internet and mobile payment procedures. Here, it would seem particularly advisable for the European banking industry to implement procedures for issuing e-mandates in connection with the new standardised SEPA Direct Debit Scheme; otherwise, it will not be possible to use the SEPA direct debit for internet payments with any guarantee of security. It is also evident that strategic policy decisions regarding European payment operations and systems, especially the evolution of innovative payment instruments, will in future be taken in consultation with all the relevant user groups and policymakers in the form of a social dialogue. The banking industry should have a keen interest in actively helping to shape this process, bringing its expertise to bear in discussions and assuming key responsibility for the task of implementation.