dr Anna Iwańczuk

Uniwersytet Ekonomiczny w Poznaniu

Contemporary payment systems – characteristics and directions of changes

Introduction

Contemporary payment systems tend to be highly complex. Their structure and the instruments used within them result from the evolution taking place over the centuries as well as the intentionally implemented reforms. The escalating phenomena concerned with integration and globalization processes have greatly contributed to the standardization of principles governing the operation of payment systems and popularization of modern payment instruments. Payment systems of particular countries function in given economic, legal and cultural environments, thus their integration into one supranational system is currently impossible, even in the case of the countries with a single currency.

The objective of this study is to provide a comparison of selected features of national payment systems and designating future directions of their changes. For the purpose of the study, the definition of a payment system was provided, its elements were identified and its infrastructure was characterized. Special attention was paid to a link between the payment and banking systems. The provided analysis was based on the data concerning payment systems of ten countries with market economy, classified into three groups – the countries within the Euro zone, the member states of the European Union outside the Euro zone, and non-European countries. The conducted comparative analysis was focused on the scope of application of payment instruments as well as the tendencies in their development, the interbank payments settlement mechanism, the structure of participation in the settlement system, as well as the level of payment electronization. Based on the analysis results, attempts were made to define the directions of development of payment systems assuming that the present integration and globalization processes will be continued.

1. Definition and elements of a payment system

Payment system is undoubtedly one of the main components of a financial system of any country, and yet defining and interpreting this term involves encountering serious difficulties. The reasons why it happens may be sought in its close connection with other systems - financial, banking, monetary systems or in the lack of established terminology concerned with this issue[1].

In order to explain what a payment system is, the attempt was made to compare systems that are linked to it (table 1). Systems were defined on the basis of the latest interpretations included in academic literature, thus also considering the outcomes of system evolution. At the same time, only those definitions were selected which provided the broadest approach.

On the basis of the accepted system definitions found in academic literature we may assume that banking, monetary and payment systems constitute subsystems of the financial system, since each of them enables and determines the realization of its fundamental functions. The payment system conditions the functioning of the financial system by enabling cash and non-cash money transfers between financial and non-financial economic entities. Its efficiency and security constitute the basis for the proper functioning of the financial system as a whole (Compare: Szczepańska 2004, p. 9). Moreover, the payment system has an impact on the stability of the financial system, i.e. on the correct fulfilment of its basic functions which include guarantying the smooth flow of financial means between its participants and the secure and efficient transfer of payments. On the other hand, a crisis in the financial system will, among other things, lead to disruptions in the payment system (Allen 2001).

The theory points out the differences in payment systems concerned with the application of various payment instruments in the countries with different financial system models. This also finds confirmation in practice[2]. In the countries whose financial systems contain more characteristics of the Anglo-Saxon model (Great Britain, the USA) cheques tend to be quite common, whereas in the other country group (Germany, Japan) the credit transfer is the most popular kind of non-cash payments. The above mentioned tendencies are related to the function that banks serve in a given economy and how it influences the organization of the payment system; however, this does not determine the functions provided by the payment system in the economy.

[1] Many Authors use the terms of *a payment system* and *a payments system* interchangeably. The term *payments system* refers to the system of the transfer of funds, i.e. a formal agreement based on a contract or a legal regulation that involves many participants and provides common principles and procedures concerned with the transmission, clearing and settling of financial liabilities among the participants. The *payment system* is composed of all mechanisms and entities enabling money circulation in the economy.

[2] It is confirmed with statistical data (Bank for International Settlements 2009).

Table 1

The essence of financial, banking, monetary and payment systems

	Financial System	Banking System	Monetary System	Payment System
Term	A financial system constitutes an element of the contemporary market economy that enables the creation of money and the provision of services determining the circulation of the purchasing power (Polański 2004, p. 17) and the co-creation of the purchasing power by non-financial economic entities (Pietrzak 2006, p. 13).	A banking system is a collection of mutually related entities, operating in the market of banking services and the norms determining interactions and their relations with the environment (Pietrzak 2006, p. 91).	A monetary system means the entirety of legal norms, principles and organizational rules concerned with the issuance and creation of money as well as the regulation and control of its circulation (Knakiewicz 2000, p. 65, Jurek 2006, p. 18).	A payment system is a set of instruments, banking procedures and interbank funds transfer systems which facilitate the circulation of money (European Central Bank 2008, p. 15).
Market scope	financial market (monetary, capital, derivative instruments)	banking services market	–	payment services market
Instruments	financial instruments	financial instruments	money	payment instruments
Entities	financial institutions: – monetary financial institutions – insurance institutions – pension funds – other financial intermediaries	banks: – central bank – commercial banks – cooperative banks – special purpose banks	central bank	– central bank[3] and commercial banks – electronic money institutions – payment institutions – settlement intermediaries

[3] Central bank acts as a participant, organizer and supervisor of the payment system (Compare: Bank for International Settlements 2000).

	Financial System	Banking System	Monetary System	Payment System
Other institutional elements (Matysek-Jędrych 2007)	– regulatory and supervisory institutions – institutions protecting market participants – institutions increasing transparency of information – auxiliary institutions	– supervisory institutions – institutions guarantying deposits – institutions supporting bank activities	–	–
Legal and regulatory elements	– legal regulations concerned with the establishment and activities of financial institutions – financial market supervision principles – standards of financial services and instruments	– legal regulations concerned with the establishment and activities of banks – bank activity supervision principles – standards of bank services	– determining a monetary unit as the legal currency of a given country – principles of issuance of banknotes and coins and creation of deposit money – principles of regulation and control of money circulation	– regulations and standards of payment services and instruments – principles of payment system oversight
Functions	– co-creation and flow of money (Dębski 2005, p. 15) – intermediation between surplus and deficit entities of real economy	– creation of cash and deposit money – collecting financial means – financing of people and economic entities – carrying out money settlements	– provision of the legal currency – regulating money circulation	– transfer of money among the participants of economic circulation[4] (Tochmański 2006, p. 6)

Source: own study prepared on the basis of the sources specified in table.

[4] The objective of functioning of the payment system in Poland approved by the National Bank of Poland consists in guarantying to the society the provision of common payment services.

Banks constitute the main entities of the payment system. Money circulation involves cash and non-cash flows using the infrastructure of a given banking system. In the process of development of new technologies and payment instruments certain bank functions concerned with money transfers were adopted by other entities. This was approved by the European Union directives concerned with electronic money institutions (Directive 2000/46/EC) and payment services market (Directive 2007/64/EC). The said directives specify the conditions and principles governing the provision of payment services by new categories of entities – the electronic money institutions and the payment institutions.

The structural and institutional approach, as well as the functional concept of a payment system encompass institutional and infrastructural links between various entities and the processes occurring between them in order to enable cash and non-cash money transfers within a given country (Iwańczuk 2008, p. 12). In accordance with the definition adopted by the Bank for International Settlements (Bank for International Settlements 2006, p. 71) and the European Central Bank (European Central Bank 2008, p. 15) a payment system is a set of instruments, banking procedures and interbank funds transfer systems that ensure money circulation in a country or in a currency area.

The elements establishing a payment system should include (Iwańczuk 2008, p. 15):

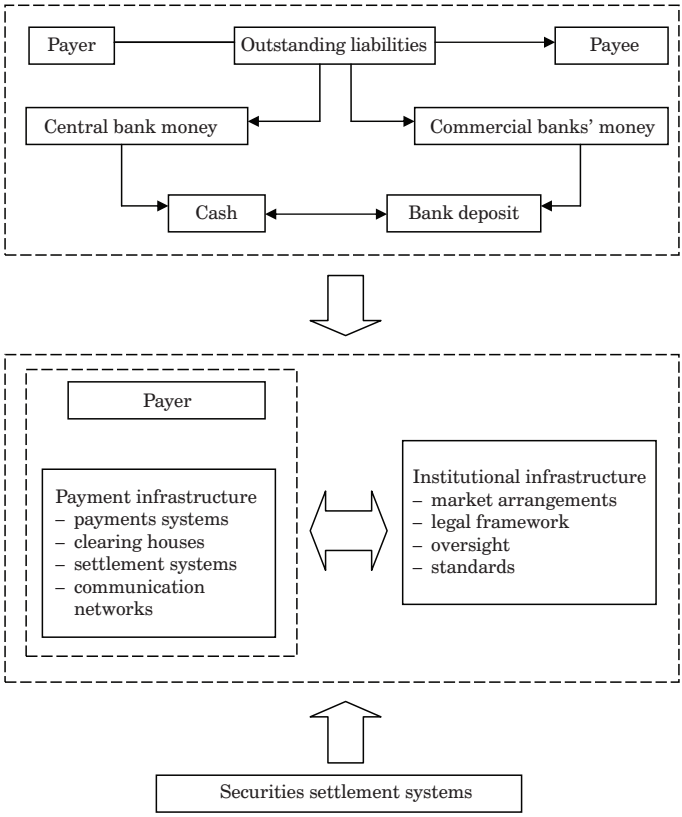
- payment instruments used in order to transfer money within cash and non-cash circulation;
- regulations and standards concerned with the functioning of payment instruments;
- network connections serving the transfer of payment information and payment settlements;
- institutions administering bank accounts (central bank and commercial banks) through which payments are executed between financial and non-financial entities;
- institutions providing compensation and settlement of payment orders;
- legal regulations sanctioning the mechanism of payment transfers and the functioning of the payment services market.

A payment system encompasses various systems of payments enabling the settlement of transactions conducted with the use of particular payment instruments (Narodowy Bank Polski 2004, p. 5). These systems form the basic infrastructure of a payment system.

The fundamental task of a payment system consists in enabling money circulation. This fact emphasizes its significance for economic activity and the related national and international payments. And thus, the main objectives of a payment system include:

– providing an efficient mechanism for money transfers between transaction parties[5],
– ensuring finality and irrevocability of payments and their settlement,
– enabling the management and reducing of risk related to the payment process, including the systemic risk.

Scheme 1
National payment system



Source: study prepared on the basis of Bank for International Settlements 2006, p. 7.

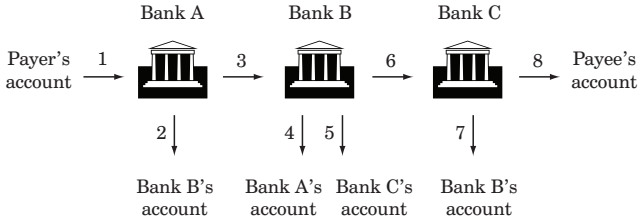
2. Payment system infrastructure

Payment infrastructure is based on banks and other institutions. The position of banks in the infrastructure is visible at two levels. The first involves interbank correspondent relations (scheme 2) which establish

[5] In relation to a payment system the efficiency of the system is closely related to its ability to fulfil the economic needs with regard to payment services (Compare: Bank of Italy 1999, p. 13).

a system of connections between banks of various scopes of activity. The essence of such a system consists in enabling smaller banks to be included in the national and international system of settlements between banks. Correspondent banking is based on using the commercial bank money as a means of settlement (Freixas 2001).

Scheme 2
Correspondent settlements between banks



1. Charging payer's account with Bank A
2. Crediting Bank B's account with Bank A
3. Transferring payment information from Bank A to Bank B via a communication network
4. Charging Bank A's account with Bank B
5. Crediting Bank C's account with Bank B
6. Transferring payment information from Bank B to Bank C via a communication network
7. Charging Bank B's account with Bank C
8. Crediting payee's account with Bank C

Source: own study.

Payment infrastructure that is based on a system with an open access is centralized (scheme 3). This is influenced by the special role of a central bank acting as the main settlement agent of the banks (Bank for International Settlements 2003, p. 10) as well as the only entity ensuring the so-called settlement finality (Pagès 2005, p. 7).

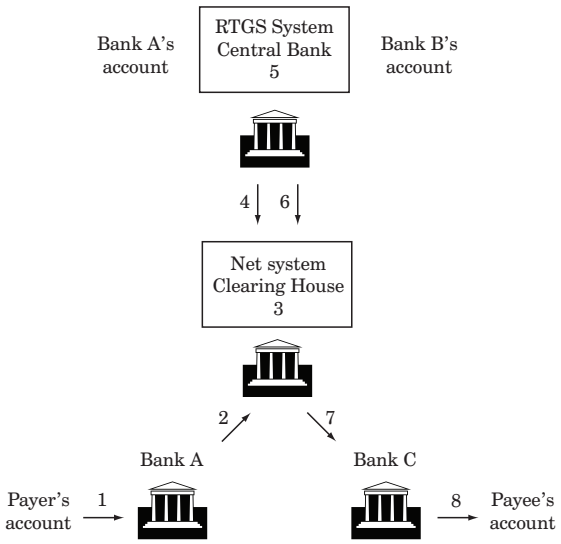
Within the payment system infrastructure the most significant role is played by interbank payment systems used in the settlement of the banks' payment orders and the execution of clients' orders. It is complimented with the payments systems settling transactions carried out with payment cards.

Non-banking institutions are playing a more and more important role in the payment infrastructure. Their significance for the payment system results from the technical advancement, the increasing scale of outsourcing and the use of new technologies. Such institutions are involved in many activities carried out at each stage of a payment process (Bradford 2003, p. 63).

The participation of non-bank institutions in payment transfers provides multiple implications for the payment system: it increases the level of innovativeness, competitiveness, facilitates the access and, at the same time, changes the risk profile. From the economic and political point of

view, it evokes the need for regulatory changes, examining the relations between risk and efficiency and complexity of technological solutions and institutional relations (European Central Bank 2007, p. 46).

Scheme 3
Centralized interbank settlement system



1. Charging payer's account with Bank A
2. Transferring payment information from Bank A to a clearing house via a communication network
3. Including payment order in compensation process
4. Transferring information on compensation result
5. Charging Bank A's account and crediting Bank B's account
6. Interbank settlement confirmation
7. Transferring information concerning payment and settlement
8. Crediting payee's account with Bank B

Source: own study.

3. Payment system characteristics

Payment systems are constantly evolving which is influenced by such factors as: the advancement of technology and IT techniques, globalization processes and the European integration. Also, structural transformations of financial and banking systems have an impact on payment systems.

The functioning of payments systems is based on processing and transferring of information concerned with the payment that is being realized. The effectiveness of such subsystems of the payment system relies on the security and speed of the said processes. This is why the occurrence of new technical and technological possibilities causes their fast implemen-

tation in the payment infrastructure. Moreover, it influences the development of new payment instruments. The result of taking advantage of the development of information technologies is lowering of transaction costs. At the same time it should be emphasized that such a progress has contributed to the increase in the importance of non-banking institutions in the administration of payment transactions.

The most significant consequence of globalization for payment systems is the rapid growth of the value of international financial flows that reflects the rapid increase in the activity of financial market participants functioning in the global market, as well as the increase in the related payments (Tuma 2006, p. 46). This leads to the creation of stronger and stronger links between the national payment systems which also have an impact on the risk of spreading of possible financial crises - contagion effect (Dornbusch 2000, p. 177–198). On the other hand, the needs related to international transactions settlements (including the transactions in the currency market) and the awareness of the related settlement risk led to the establishment of international infrastructure linking national payment systems and enabling settlements in many currencies, for example Continuous Linked System (Allsopp 2001, p. 56).

The transformation of the payment systems in the European countries is to a great extent due to the integration processes based on the standardization of principles governing the functioning of payment instruments (the so-called SEPA instruments) and interbank settlement systems. The said standardization is conducted on the basis of regulations and guidelines concerned with the evolution of payment systems and provided to national central banks[6]. The integration of the payment systems of the member states of the European Union in the organizational aspect has taken the form of pan-European interbank payments systems. The concept of the Single Euro Payments Area (SEPA) [7] may be seen as the attempt towards the creation of a payment system for the entire European Union.

Despite the increasing globalization and integration processes in the contemporary world also concerning the financial markets, still various payment systems operate in various countries. Thus, while discussing the topic of payment systems we may refer to their models or to particular national system.

---

[6] The document of particular importance in this area is the special report by the Payment Systems Working Group appointed by the Committee of Governors of Central Banks of the member states of the European Community (*Minimum…* 1993).

[7] The SEPA concept (Single Euro Payments Area) consists in enabling payments in the entire territory of the European Union based on the same simple principles and at the same cost as in particular countries (Compare: Iwańczuk 2004).

The following part of the study will look at a comparative analysis of ten national payment systems. The countries analysed were divided into three groups:

1. the countries within the Euro zone – Germany, Italy;
2. the member states of the European Union outside the Euro zone – Estonia, Poland, Great Britain;
3. non-European countries – Australia, Brazil, Canada, Japan, the United States.

The comparison will concern the following characteristics of the payment system:

- the scope of application of payment instruments and the tendencies in their development,
- the basic mechanism of interbank payments settlement,
- the structure of participation of banks and non-bank institutions in the settlement system,
- the level of payment electronization and the use of electronic money.

3.1. Payment instruments

Payment instruments constitute important elements of a payment system, representing a particular monetary value or enabling the initiation of a non-cash money transfer process (Denmarks Nationalbank 2005, p. 125). They include first of all: the cash, cheque, credit transfer, direct debit, payment card and electronic money instrument. Various principles of their functioning allow for their classification looking from different angles. A part of them, together with some examples, were presented in table 2 below. Payment instruments are constantly developing which allows for lowering costs, shortening the time of settlement, increasing security (Leinonen 2008, p. 44), and which, in practice, leads to the replacement of their paper forms with electronic forms and the popularization of electronic money.

The application of particular payment instruments in the researched countries is varied (table 3). Particular attention should be paid to quite a large discrepancy in the popularity of cheques. In Great Britain, Australia, Canada and the USA the use of cheques is very common. Thus, according to their users and banks, the necessity of exchanging cheques[8] does not pose significant inconvenience. Irrespective of the number of transactions carried out with their use per capita, all of the researched countries showed a slight decrease in the years 2002–2006. Due to the exclusion of cheques from the standardization process within the SEPA project, it

[8] Among the researched countries, cheque exchange into electronic form (trunctation) is used only in the USA.

is expected that these payment instruments will altogether disappear from the member states of the European Union.

Table 2

Classification of payment instruments

	Paper instruments		**Card instruments**	**Electronic instruments**
	cash	**non-cash**		
Pre-paid instruments	traveller's cheque		pre-paid card (electronic purse)	network based money
Credit instruments	cash cash deposit	credit transfer – order in paper form		credit transfer – order in electronic form
Debit instruments	cash cheque	disbursement cheque direct debit	debit card credit card charge card	direct debit

Source: own study based on Narodowy Bank Polski 2008, p. 12.

Table 3

Payment instruments – number of transactions per capita in the year 2006

	Cheque	**Credit transfer**	**Direct debit**	**Debit card**	**Credit card**	**Total**	**Increase since 2004**
Group 1							
Germany	1,3	81,1	80,8	28,8		192,0	nav
Italy	7,7	18,3	13,9	13,2	8,1	61,2	5%
Group 2							
Estonia	0	58,5	10,7	74,2	5,5	148,9	50%
G. Britain	29,3	50,5	47,2	81,5	29,5	238,0	8%
Poland	0	24,1	0,4	6,1	2,7	33,3	37%
Group 3							
Australia	21,8	62,8	25,0	64,7	63,9	238,2	10%
Brazil	9	6,3	5,4	8,5	10,6	39,8	28%
Canada	40,2	28,5	20,1	99,8	65,6	254,2	12%
Japan	1,1	10,7	Nav	0,1	23,9	35,7	0
USA	101,9	20,5	28,9	86,8	74,5	312,6	9%

Source: own study based on The World Bank 2008.

Based on the application of particular payment instruments it is possible to distinguish two groups of payment systems. The first involves the use of the credit transfer, direct debit and payment cards in non-cash settlements. Cheques are being gradually withdrawn from circulation, and in some countries they are not used at all. As far as the other group is concerned, cheques seem to have a large share in non-cash payments which, despite the downward trend, will allow for their retention in the upcoming years. These discrepancies between researched payment systems relate to different financial system models.

When considering the application scale of non-cash payment instruments it is difficult to notice any regularities concerning the distinguished groups of countries. It seems that significant discrepancies appear within all of the groups and they cannot be justified even by the differences in the level of economic development. Thus, the popularity of non-cash settlement forms stems from various non-economic factors.

3.2. Settlement mechanism

Apart from the transfer of information, the process of payment execution obviously requires transferring the money. This is performed with the use of two mechanisms. Within the gross mechanism, each realized payment order constitutes a source of cash flow. The infrastructure enabling a real time transfer is known as the RTGS system (real-time gross-settlement).

The real-time gross-settlement systems are usually maintained by central banks and are characterized by the following features:

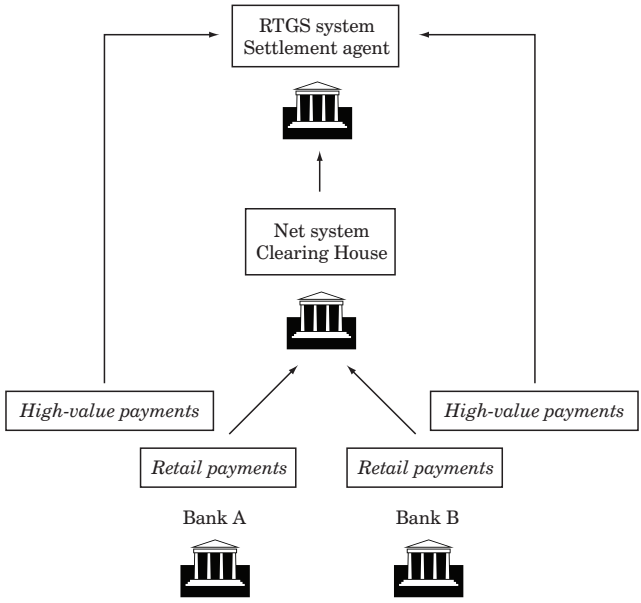
- immediate payment order realization after being processed in the system,
- no difference in time between charging the account of the sending bank and crediting of the account of the receiving bank,
- finality – irrevocability of settlement at the moment it is processed in settlement accounts,
- high level of settlement security for bank-participants as well as the operator and settlement agent – the central bank.

The net mechanism makes use of the compensation of payment orders realized by a group of institutions that signed for this purpose a proper agreement. The compensation can be realized on a bilateral or multilateral basis. In the case of the net mechanism the transfer of funds concerns only the net balance.

The results of the research (Angelini 1996, Beau 2000, Chakravorti 2000, Freixas 1998) concerned with the impact of the settlement mechanism on the liquidity and risk of its participants (mainly banks) as well as the awareness of the needs of the contemporary market economy led

to the establishment of a payment infrastructure in various countries composed of two kinds of systems (scheme 4):
– those enabling the settlement of retail payments – with the use of the net mechanism and operating as a clearing house;
– those enabling the settlement of high-value payments – with the use of the gross mechanism on real time basis, operating in the form of the RTGS system.

Scheme 4
The model of a national payment system infrastructure



Source: own study.

The systems used for settling retail payments are based on the operation of electronic clearing houses (table 4). They have a status of private entities which, most commonly, constitute a bank property or operate as separate units of the central bank. Clearing houses process payments initiated with credit and debit payment instruments; however, the settlement of all payment instruments is not possible in all clearing houses. Settling transactions carried out with the use of payment cards usually takes place outside the house.

The functioning of high-value settlement systems is based on the settlement (current) accounts of participants administered by the settlement agent – the central bank. In each of the researched countries there is at least one system within which the settlement of payment is carried out on a real time and gross basis (table 5). In some of the member states of

the European Union being outside the Euro zone, there are designated foreign currency RTGS systems for euro. Thus, they constitute a link between the national payment system and the payment systems operating within the Euro zone.

Table 4

Retail systems – electronic clearing houses

	Operator	Type of instruments exchanged		Direct participation reserved for banks	Settlement
		Credit transfer	Direct debit		
Group 1					
Germany	central bank	yes	no	yes	through central bank
Italy	central bank	yes	yes	no	through RTGS system
Group 2					
Estonia	central bank	yes	yes	no	through central bank
G. Britain	private	yes	yes	yes	through RTGS system
Poland	private	yes	yes	yes	through RTGS system
Group 3					
Australia	private	yes	yes	no	through RTGS system
Brazil	private	yes	yes	yes	through RTGS system
Canada	private	yes	yes	no	through RTGS system
Japan	private	yes	no	yes	through RTGS system
USA	central bank/ private	yes	yes	no	through central bank

Source: own study based on The World Bank 2008.

Table 5
High-value settlement systems

	Number of systems (including foreign currency systems)	Settlement mechanism	Operator of the system	The year in which basic RTGS system began operations on a full scale
Group 1				
Germany	1	RTGS	central bank	2001
Italy	1	RTGS	central bank	1997
Group 2				
Estonia	2 (1)	RTGS	central bank	2002
G. Britain	2 (1)	RTGS	central bank	1996
Poland	2 (1)	RTGS	central bank	1998
Group 3				
Australia	1	RTGS	central bank	1998
Brazil	2	RTGS	central bank/ /banks' association	2002
Canada	1	RTGS	payment organization	1999
Japan	2	RTGS (85% share) other (15% share)	central bank	2001
USA	2	RTGS (59% share) other* (41% share)	central bank	1918

* RTGS system with net settlement elements (CHIPS)
Source: own study based on The World Bank 2008.

3.3. Structure of participation in a settlement system

Payment services consisting in the execution of clients' orders with regard to money transfers are provided mainly by banks, but also, to a smaller extent, by non-banking institutions. The principles of their participation in settlement systems concerned with the status of participants and the costs inferred by them implicate their division into direct and indirect participants. Based on

the ratio of the number of participants of payment systems (including direct participants) to the number of institutions and organizations providing payment services (table 6) it is possible to conclude that the participation structure has at least two levels. What is also significant is that the participation in all of the researched countries (except for Germany) is limited to independent institutions. The branches of those institutions do not constitute parties in the process of settlement or compensation of payment orders.

Table 6
Settlement system participants

	Number of institutions offering payment services	**Number of branches and agencies**	**Number of RTGS system's participants (including direct)**	**Number of ACH's participants (including direct)**
Group 1				
Germany	2 049	42 438	8 513 (191)	252 (252)
Italy	824	45 413	767 (119)	740 (132)
Group 2				
Estonia	25	nav	13 (13)	nav
G. Britain	388	27 889	nav (15)	65 015 (15)
Poland	725	12 120	58 (58)	1509 (55)
Group 3				
Australia	nav	nav	nav	nav
Brazil	nav	nav	nav	nav
Canada	1 210	14 324	85 (15)	123 (12)
Japan	1 699	56 361	584 (584)	347 (105)
USA	17 466	111 040	6 605 (nav)	nav

Source: own study based on Bank for International Settlements 2008, Narodowy Bank Polski 2007.

3.4. The level of electronization in payments

The development of a payment system is related to many aspects – payment instruments, infrastructure, and communication. Modern technical solutions are applied in all of the market economy countries. Still, the level of electronization in payments in those countries varies. This is not

due to the encountered technical barriers, but rather to economic or social obstacles. One of the markers of electronization in payments is the application of electronic forms of payment (table 7). In all of the researched countries (except for Poland) there is at least one payment card per capita. However, due to lack of statistical data it is not possible to determine the scale of use of payment cards in non-cash payments[9].

Table 7

Application of electronic payment forms

	Number of cards in 2006 per 1000 inhabitants	**Increase since 2002**	**Cheque form in interbank settlements**	**Electronic credit transfer application level (share in the number of transactions)**	**Number of payments with electronic money (2007 in millions)**	**Increase since 2006**	**Value of transactions involving electronic money in relation to GDP in 2007**
Group 1							
Germany	1 287	-6%	electronic	80%	52,7	25%	0,01
Italy	1 160	36%	electronic and paper	28%	49,6	46%	0,22
Group 2							
Estonia	1 205	44%	nap	nav	–	–	–
G. Britain	2 284	17%	paper	92%	–	–	–
Poland	611	47%	nap	nav	–	–	–
Group 3							
Australia	2 317	20%	paper	nav	–	–	–
Brazil	1 409	73%	paper	nav	–	–	–
Canada	1 872	19%	paper	98%	–	–	–
Japan	5 200	8%	paper	nav	809,6	–	0,11
USA	5 297	6%	electronic and paper	100%	–	–	–

Source: own study based on The World Bank 2008, Bank for International Settlements 2007, European Central Bank 2008.

[9] Such data are available for Poland and indicate that the level of use of payment cards in non-cash payments reaches 40%. This means that in 60% of the cases they are used for cash machine transactions.

What is interesting in the case of some countries is the possibility of using only paper cheques in interbank settlements. What is even more surprising is the fact that it concerns mainly those countries in which the use of cheques is a popular form of settlements (Great Britain, Australia, and Canada).

In nearly all of the researched countries the credit transfer is the most popular form of payment which, at the stage of an interbank settlement, appears only as an electronic message. As a client's order, it may be submitted in paper form. Still, in the countries for which statistical data are available (except for Italy) its electronic form prevails.

Payment system innovativeness can be assessed with regard to the extent of use of electronic money. The lack of data concerned with this form of money in most countries should be understood as the lack of its use. In the countries where it is used (Germany, Italy, Japan) its share in payment transactions so far has been marginal.

5. Conclusions

The results of the conducted analysis lead to the conclusion that payment systems in the researched countries are highly diversified. The differences are concerned with the use of particular payment instruments, the structure of participation in payments systems as well as the level of payment electronization. The most significant similarities can be observed in the organization and the principles of interbank settlements (settlement mechanisms). Payment system infrastructure within national payments is centralized and based on the functioning of a clearing house and a real-time gross-settlement system enabling interbank settlements through central bank.

The tendencies connected with globalization and integration provide the necessity of maintaining an international dialogue concerned with the development of national payment systems. The directions of evolution of payment systems are set by guidelines[10] addressed to central banks as the entities responsible for their stability.

Another assumption underlying payment systems transformation relates to the evolving needs of the users of payment instruments and the growing requirements with regard to the cost of their use and the speed of execution of payments. In the present development of payment systems it is possible to observe the tendency for creating new solutions aiming at the promotion and assurance of effectiveness of electronic payment instruments. At the same time, it is noticeable that the reforms of payment

[10] The latest guidelines are specified in the report by the Committee on Payment and Settlement Systems of the Bank of International Settlements (Bank for International Settlements 2006).

instruments tend to disregard those instruments which do not meet the requirements of the modern market economy[11].

When considering the current stage of payment system development as well as the prospects of continuation of the integration and globalization processes it is possible to define several elements of the scenario of payment systems transformation.

One of the factors designating the direction and establishing the pace of payment system development still consists in the tradition of payment instruments being used. However, its importance will be diminishing with the increasing acceptance of modern solutions (electronic instruments, SEPA instruments) and the growing economic space in which particular units and economic entities operate.

The advantages of non-cash circulation seen by the governments from macroeconomic angle (Narodowy Bank Polski 2009, p. 44–46) will provide the reasons for introducing the obligation to use non-cash payment instruments on a national and international level in economic transactions as well as in public and private payments. Still, leaving a certain range of freedom (anonymity of settlement parties) in retail payments is justifiable. This may be ensured by intensified actions towards the popularization of electronic money.

The consolidation of national payment systems within their infrastructure is related to the process of European integration. It consists in providing links between various payments systems (e.g. the TARGET system). The entities guarantying their efficiency are central banks. However, non-bank institutions and supranational clearing houses are beginning to play a more and more significant role within retail payments. It is possible to observe the global tendency of linking payment systems infrastructures with regard to currency (forex) market transaction settlements.

On the one hand, the links between payment systems result from the decisions of the European Union authorities, whereas on the other – they arise from the reaction of private entities to market requirements. Irrespective of their origin they increase the risk of possible crises. Thus, it seems to be necessary to strengthen the cooperation between institutions supervising the financial market and central banks within the oversight on national and international payments systems as well as the entire payment systems operating in various countries.

[11] The instruments disregarded in reforms include cheques although they are still popular in some countries.

Bibliography

1. Allen W., *Financial Stability*, Public Policy and Central Banks, Bank of England, 2001.
2. Allsopp P., *CLS Bank: Facts and Future*, Central Banking 2001, nr 2.
3. Angelini P., Maresca G., Russo D., *Systemic Risk in Netting System*, in: „Journal of Banking and Finance" 1996.
4. Bank for International Settlements, *Core Principles for Systematically Important Payment Systems – the Core Principles*, Basel 2000.
5. Bank for International Settlements, *General Guidance for National Payment System Development,* January 2006.
6. Bank for International Settlements, *Statistics on Payment and Settlement Systems in Selected Countries – figures for 2006,* 2008.
7. Bank for International Settlements, *Statistics on Payment and Settlement Systems in Selected Countries,* March 2009.
8. Bank for International Settlements, *The Role of Central Bank Money in Payment Systems*, CPSS, August 2003.
9. Banca d'Italia, *White Paper on Payment System Oversight – Objectives, Methods, Areas of Interest*, Rome 1999.
10. Beau D., *Optimisation of Liquidity in Real-Time Settlement Systems*, in: The Contribution of Payment Systems to Financial Stability, Bank for International Settlements, Basel 2000.
11. Bradford T., Davies M., Weiner S., *Nonbanks in the Payments System*, Federal Reserve Bank of Kansas City, 2003.
12. Chakravorti S., *Analysis of Systemic Risk in Multilateral Net Settlement Systems*, in: „Journal of International Financial Markets, Institutions and Money" 2000, nr 10.
13. Dębski W., *Rynek finansowy i jego mechanizmy. Podstawy teorii i praktyki*, Wydawnictwo Naukowe PWN, Warszawa 2005.
14. Denmarks Nationalbank, *Payment Systems in Denmark*, 2005.
15. Dornbusch R., Park Y., Claessens S., *Contagion: Understanding How It Spreads*, in: „The World Bank Research Observer" 2000, Vol. 15, No. 2.
16. European Central Bank, *Glossary of Terms Related to Payment, Clearing and Settlements Systems,* September 2008.
17. European Central Bank, *Nonbanks in the Payments System: European and U.S. Perspectives,* „Working Paper" No. 1, 2007.
18. Freixas X., Holthausen C., Terol I., Thygesen C., *Settlement in Central Bank Money versus Commercial Bank Money*, European Central Bank 2001.
19. Freixas X., Parigi B., *Contagion and Efficiency in Gross and Net Interbank Payment Systems,* in: „Journal of Financial Intermediation" 1998.
20. Iwańczuk A., *Jednolity europejski obszar płatniczy – wyzwanie dla banków*, in: *Zastosowania rozwiązań informatycznych w instytucjach finansowych*, ed. by A. Gospodarowicz, Prace naukowe nr 1035, Akademia Ekonomiczna we Wrocławiu, Wrocław 2004.

21. Iwańczuk A., *System bankowy i system płatniczy – powiązania i wzajemne uwarunkowania*, w: *Problemy polskiego systemu bankowego*, ed. by A. Janc, Zeszyt Naukowy nr 111, Wydawnictwo AE w Poznaniu, Poznań 2008.
22. Jurek M., *Pojęcie i właściwości wielonarodowych systemów walutowych*, in: *Współczesny pieniądz w teorii i praktyce*, ed. by Z. Knakiewicz, Wydawnictwo AE w Poznaniu, Poznań 2006.
23. Knakiewicz Z., *Teoretyczne podłoże systemów pieniężnych*, in: *Finanse, banki i ubezpieczenia w Polsce u progu XXI wieku*, Wydawnictwo AE w Poznaniu, Poznań 2000.
24. Leinonen H., *Payment Habits and Trends in the Changing E-landscape 2010+,* Bank of Finland, 2008.
25. Matysek-Jędrych A., *Struktura i modele systemu finansowego*, in: „Bank i Kredyt" 2007, nr 11–12.
26. *Minimum Common Features for Domestic Payment Systems*, Report to the Committee of Governors of the Central Banks of the Member States of the European Economic Community, 1993.
27. Narodowy Bank Polski, *Obrót bezgotówkowy – zalety i korzyści wynikające z jego upowszechnienia,* Warszawa 2008.
28. Narodowy Bank Polski, *Rola Narodowego Banku Polskiego w zakresie nadzoru nad systemami płatności*, Warszawa 2004.
29. Narodowy Bank Polski, *Strategia rozwoju obrotu bezgotówkowego w Polsce na lata 2009–2013 (projekt)*, Związek Banków Polskich, Koalicja na Rzecz Obrotu Bezgotówkowego i Mikropłatności, luty 2009.
30. Narodowy Bank Polski, *Sytuacja finansowa banków w okresie styczeń – wrzesień 2006,* styczeń 2007.
31. Pagès H., Humphrey D., *Settlement Finality as a Public Good in Large-Value Payment Systems*, „European Central Bank, Working Paper Series" No. 506, July 2005.
32. Pietrzak E., Markiewicz M., *Finanse, bankowość i rynki finansowe*, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2006.
33. Polański Z., *Wprowadzenie. System finansowy we współczesnej gospodarce rynkowej*, in: B Pietrzak, Z. Polański, B. Woźniak, *System finansowy w Polsce*, Wydawnictwo Naukowe PWN, Warszawa 2004.
34. Szczepańska O., Sotomska-Krzysztofik P., Pawliszyn M., Pawlikowski A., *Instytucjonalne uwarunkowania stabilności finansowej na przykładzie wybranych krajów*, „Narodowy Bank Polski, Materiały i Studia", Zeszyt nr 173, Warszawa 2004.
35. The World Bank, *Payment Systems Worldwide – a Snapshot. Outcomes of the Global Payment Systems Survey 2008*.
36. Tochmański A., *Strategia rozwoju systemu płatniczego i obrotu bezgotówkowego w Polsce*, Narodowy Bank Polski, Warszawa 2006.
37. Tuma Z., *Financial Globalisation and Financial Stability*, in: „Financial Globalisation", BIS Papers, No. 32, Bank for International Settlements, Basle 2006.

Legal acts

Directive 2000/46/EC of the European Parliament and of the Council of 18 September 2000 on the taking up, pursuit and prudential supervision of the business of electronic money institutions.
Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market.

Contemporary payment systems – characteristics and directions of changes

Abstract

The objective of this study is to provide a comparison of selected features of national payment systems and designating future directions of their changes. The provided analysis was based on the data concerning payment systems of ten countries with market economy, classified into three groups. It was focused on the scope of application of payment instruments as well as the tendencies in their development, the interbank payments settlement mechanism, the structure of participation in the settlement system, as well as the level of payment electronization.

The results of the conducted analysis lead to the conclusion that payment systems in the researched countries are highly diversified. The most significant similarities can be observed in the organization and the principles of interbank settlements (settlement mechanisms). Further payment systems transformation will be related to the integration and globalization processes. It will result in high level of payment instruments unification and infrastructural connections between national payment systems.

Key words: payment system, settlements, payment instruments

Współczesne systemy płatnicze – cechy i kierunki zmian

Streszczenie

Celem niniejszego opracowania jest porównanie wybranych cech krajowych systemów płatniczych oraz wyznaczenie przyszłych kierunków zachodzących w nich zmian. W analizie wykorzystano dane dotyczące systemów płatniczych dziesięciu państw o gospodarce rynkowej, ujętych w trzy grupy. Analizą porównawczą objęto zakres zastosowania instrumentów płatniczych oraz tendencje w ich rozwoju, mechanizm rozrachunku płatności międzybankowych, strukturę uczestnictwa w systemie rozliczeniowym oraz poziom elektronizacji płatności.

Wyniki przeprowadzonej analizy pozwalają stwierdzić, że systemy płatnicze w badanych państwach wykazują istotne różnice. Największe podobieństwa można zaobserwować w zakresie organizacji i zasad rozliczeń międzybankowych (mechanizmu rozrachunku). Dalsza transformacja systemów płatniczych będzie związana z procesami integracyjnymi i globalizacyjnymi. Jej efektem będzie wysoki poziom ujednolicenia instrumentów płatniczych oraz infrastrukturalne więzi między krajowymi systemami płatniczymi.

Słowa kluczowe: system płatniczy, rozliczenia, instrumenty płatnicze