

**Book review**

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## PAYMENT SYSTEM TECHNOLOGIES AND FUNCTIONS – INNOVATIONS AND DEVELOPMENT

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In international economy, the period after the Second World War is characterized by a considerable growth of the economic activity. High rates of economic growth are also recorded at the national level, along with the growing volume of international trade and an increased economic interconnection between companies from different parts of the world at the international level. The payment system, as an element of the economic system, has a particular contribution to the increase in the economic activity. Efficient payment systems at a national level provide an adequate circulation of funds and the smooth progress of economic activities, while at the international level, they reduce the uncertainty of participants in international trade and contribute to an increase of its volume.

The book titled *Payment System Technologies and Functions – Innovations and Development* (2011) by Masashi Nakajima (Reitaku University, Japan), combines theoretical and practical approaches to

the problem of organizing the payment system at a national and the international levels, thanks to the fact that the author, in addition to his academic engagement at the University, worked in the Central bank of Japan for more than two decades, and also as a representative on the Committee for the Payment and Settlement System (CPSS) of the Bank for International Settlements (BIS) for a shorter period.

The book starts with the content appropriate to the basic academic level, which introduces the essential elements of the payment system to the reader. Then, the current trends in the development of the payment system are analyzed, and the key issues and current mechanisms for its solving are identified. Therefore, the book is not only intended for readers with no previous knowledge of this field and those who can follow the rest of the content after the first section, but also for experts because it contains an abundance of meticulously presented information. The book is divided into four sections, and each section is organized in several chapters.

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The first section of the book is titled *Basic Knowledge about Payment Systems* (pp. 1-28), consists of three chapters and provides an insight into the basic elements of payments necessary for understanding the remainder of the book. The first chapter defines the basic terms of a payment transaction and explains the difference between cash and non-cash payment systems, underlining the importance of a non-cash payment system for the functioning of an economy. The role of the central bank in the payment system is emphasized, regardless of whether it appears as a system operator or a liquidity support in a system operated by private institutions. In the second chapter, payment systems are classified through a number of standpoints, where the author points out that these classifications are not mutually exclusive and that it is possible to perform a classification based on multiple criteria. Settlement risks are discussed in the third chapter, which also provides the classification of these risks and an overview of the proposed measures to reduce them to an acceptable level.

The title of the second section of the book is *Basic Payment Systems and Advanced Payment Systems* (pp. 30-54). This section covers the fourth and the fifth chapters. In the fourth chapter, a distinction is made between the two basic payment systems, which differ from one another according to whether each payment transaction requires an immediate transfer of funds or it is possible to compensate for the amount of liquidity in transactions in which the same participants appear on the opposite sides – once as the payer and the other time as the payee. The first group is called Real Time Gross Settlement systems (RTGS), where each transaction is followed by an immediate transfer of funds between the parties. The second group is called Designated Time Net Settlement systems (DTNS), and in this case there is only one transfer or reception of funds at the time that is clearly specified by business standards. These two groups are complementary, because they are characterized by mutually complementary advantages and disadvantages. In the fifth chapter, the advanced payment systems, also known as hybrid and integrated systems are analyzed. Both advanced solutions are based on a combination of the positive solutions of the two basic payment

systems, aiming to overcome the shortcomings of each of these systems by adding the positive solutions from the other system.

In the third section, entitled *Innovations in Payment Systems* (pp. 56-94), the author analyzes trends and factors of innovation in payment systems throughout the three chapters. The sixth chapter shows the evolutionary path of the payment systems, beginning with the introduction of information and communication technology (ICT) and the creation of semi-electronic systems, through the DTNS system, as the first electronic payment system, up to integrated payment systems as the most advanced systems created in the 21st century. In the seventh chapter, the author identifies the four factors that led to constant innovation in payment systems, more specifically the development of ICT, which is a conditional factor, and the three driving factors: the growing amount of risk in payment systems due to an increasing number and sum of transactions, international recommendations and standards, with BIS playing a major role, and competition between different payment systems. In the eighth chapter, the key issues of a modern payment system are explained, which act as a driving factor of innovation in this area, as well as those not been adequately solved until now.

The fourth section, entitled *Developments of Payment Systems in Selected Countries* (pp. 96-212), brings an analysis of the development of payment systems in three major economies: the United States of America, the European Union and Japan, and in the end, it gives an analysis of the structure and functioning of the Continuous Linked Settlement (CLS). The ninth chapter is devoted to the payment systems in the United States as the first country to have introduced semi-electronic and electronic payment systems. The focus of the analysis is on the similarities and differences between the two systems for large-value payments, the Fedwire and the Clearing House Interbank Payment System (CHIPS). The analysis of the payment systems in the European Union in the tenth chapter of the book leads to drawing a conclusion that the European countries have taken a leading role in innovation at the global level. As a major factor, the author points out a higher level of competition between the payment systems

in the member states of the European Union, which has additionally been increased by the creation of the Single Euro Payments Area (SEPA). This type of competition is lower in the USA, and especially in Japan, whose case is analyzed in the eleventh chapter of the book. The distinctiveness of Japan compared to the other two studies is the existence of three parallel payment systems with precise responsibilities, caused by the currencies and payment amounts. In the twelfth chapter, the operation of the CLS Bank is analyzed. Although it is referred to in the literature as a „bank“, the CLS is in fact a cross-currency payment system allowing a simultaneous transfer of two currencies (payment-versus-payment, i.e. the PVP principle) in foreign-exchange transactions and reducing credit risk. The author critically analyzes contributions to the reduction of risk as well as he does the segments in which the CLS was not able to completely reduce the foreign-exchange transaction risk.

As the mistakes having emerged in the past due to the dysfunction of the payment systems have even led to the bankruptcy of financial institutions, payment systems are exceptionally important for the stability of the whole economy. The author defines possible problems arising in transaction processing (for example, the risk of foreign-exchange transactions, where there is a danger of changes in exchange rates

or a capital loss of one of the participants when a transaction is concluded between business entities in different time zones) and potential mechanisms for their solving (in this case, a problem can be solved by a simultaneous delivery of currencies for both parties in such a transaction, the PVP principle).

The analyzed content is contemporary and the practical examples of the payment systems in the most developed economies attach a special value to the book.

The greatest shortcoming of the book, which the author himself admits, is the absence of an analysis of the securities settlement systems, which are very important mechanisms of each national economy. Together with a securities settlement mechanism, payment systems enable the operation of the delivery-versus-payment (DVP) principle, i.e. the simultaneous delivery of securities with payment, which reduces a possibility of credit risk in transactions involving securities. Another shortcoming of the book may be the absence of payment systems solutions in emerging economies (primarily in China and Russia), which would enrich the book in addition to the experience of the most developed economies and open a possibility for a comparative analysis of payment systems.

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