Book review

UDC: 004.738.5:336.7(049.32); 004.738.5:339

doi: 10.5937/ekonhor1402161T

PAYMENT SYSTEM TECHNOLOGIES AND FUNCTIONS – INNOVATIONS AND DEVELOPMENT

Nakajima, M. (2011). Hershey, USA: Business Science Reference,
ISBN 978-1-61520-645-2, XV+225

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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.

Received on 26th June 2014,
after revision,
accepted for publication on 19th August 2014.

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Prikaz knjige

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Period nakon Drugog svetskog rata u međunarodnoj ekonomiji karakteriše izraziti rast obima ekonomske aktivnosti. Na nacionalnom nivou beleže se visoke stope privrednog rasta, a na međunarodnom planu, sve je veći obim međunarodne trgovine i povećana ekonomska povezanost kompanija iz različitih delova sveta. Platni sistem, kao jedan od elemenata ukupnog privrednog sistema, ima naročit doprinos povećanju ekonomskih aktivnosti. Efikasni platni sistemi na nacionalnom planu omogućavaju adekvatnu cirkulaciju finansijskih sredstava i neometano odvijanje ekonomskih aktivnosti, dok na međunarodnom planu redukuju nesigurnost učesnika u međunarodnoj trgovini i doprinose povećanju obima razmene.

Knjiga pod naslovom *Payment System Technologies and Functions – Innovations and Development* (2011), autora Masashi Nakajima (Reitaku University, Japan), spaja teorijski i praktični pristup problematici organizovanja platnog sistema na nacionalnom i međunarodnom planu, zahvaljujući tome što je autor, pored

akademskog anagažovanja, radio više od dve decenije u Centralnoj banci Japana, a, takođe, i kraći period, kao predstavnik u Komitetu za plaćanja i saldiranje (CPSS) Banke za međunarodna poravnanja (BIS).

Knjiga počinje sadržajem prilagođenim osnovnom akademskom nivou, kojim se čitalac upoznaje sa bitnim elementima sistema plaćanja. Zatim su analizirani savremeni trendovi u razvoju sistema plaćanja i identifikovani ključni problemi i aktuelni mehanizmi za njihovo prevazilaženje. Samim tim, knjiga je namenjena i onim čitaocima koji nemaju predznanja iz ove oblasti, koji nakon prvog dela mogu da prate ostatak knjige, ali i stručnoj javnosti, jer sadrži obilje studiozno predstavljenih informacija. Knjiga je podeljena u četiri dela, a svaki deo organizovan je kroz nekoliko poglavlja.

Prvi deo knjige nosi naslov: *Osnovna znanja o sistemima plaćanja* (1-28 str.). Sastoji se od tri poglavlja i daje uvid u osnovne elemente sistema plaćanja, neophodne za razumevanje preostalog dela knjige. Prvo poglavlje definiše osnovne pojmove platne transakcije i objašnjava razliku između gotovinskih i bezgotovinskih sistema plaćanja, apostrofirajući značaj

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bezgotovinskih sistema za funkcionisanje ekonomije. Naglašena je uloga centralne banke u sistemu plaćanja, bez obzira da li se pojavljuje kao operator sistema ili kao podrška likvidnosti sistema kojima upravljaju privatne institucije. U drugom poglavlju izvršena je klasifikacija sistema plaćanja prema više kriterijuma podele, pri čemu autor ističe da se kriterijumi međusobno ne isključuju, i da je moguće izvršiti višekriterijumsku klasifikaciju. Rizici saldiranja su predmet proučavanja trećeg poglavlja, u kome je izvršena klasifikacija ovih rizika i dat pregled predloženih mera kojima se oni svode na prihvatljiv nivo.

Naslov drugog dela knjige je: *Osnovni sistemi plaćanja i napredni sistemi plaćanja* (30-54 str.). Ovaj deo obuhvata četvrto i peto poglavlje. U četvrtom poglavlju napravljena je razlika između dva osnovna sistema plaćanja, koji se međusobno razlikuju prema tome da li svaka transakcija plaćanja učesnika u sistemu zahteva i trenutni prenos sredstava, ili je moguće kompenzovanje iznosa kod transakcija u kojima se isti učesnici pojavljuju na suprotnim stranama – jednom kao platioci, a drugi put kao primaoci sredstava. Prva grupa su *Real time gross settlement* sistemi (RTGS), kod kojih je svaka transakcija praćena trenutnim prenosom sredstava između učesnika. Druga grupa sistema nosi naziv *Designated time net settlement* sistemi (DTNS), i kod ovih sistema postoji samo jedan prenos ili prijem sredstava, u trenutku koji je tačno određen pravilima poslovanja. Ove dve grupe sistema su komplementarne, jer ih odlikuju međusobno dopunjive prednosti i nedostaci. Kroz peto poglavlje analizirani su napredni sistemi plaćanja, poznatiji kao hibridni i integrisani sistemi. Oba napredna rešenja zasnovana su na kombinaciji pozitivnih rešenja dva osnovna sistema plaćanja, sa ciljem prevazilaženja nedostataka koji svaki od ovih sistema nosi kroz dodavanje pozitivnih rešenja drugog osnovnog sistema.

U trećem delu, pod naslovom: *Inovacije u sistemima plaćanja* (56-94 str.), autor je kroz tri poglavlja analizirao trendove i faktore inoviranja sistema plaćanja. Šesto poglavlje prikazuje putanju evolucije sistema plaćanja, od početka uvođenja informaciono-komunikacionih tehnologija (ICT) i stvaranja poluelektronskih sistema, preko DTNS sistema, kao prvih elektronskih sistema plaćanja, sve do integrisanih sistema plaćanja, kao najsavremenijih sistema nastalih u XXI veku. U

sedmom poglavlju autor identifikuje četiri faktora koja su dovela do stalnih inovacija u sistemima plaćanja, i to: razvoj ICT-a, koji je uslovni faktor, i tri pokretačka faktora: rastući obim rizika u sistemima plaćanja zbog povećanja broja i iznosa transakcija, međunarodne preporuke i standardi, pri čemu najveću ulogu igra BIS, i konkurencija između različitih sistema plaćanja. Kroz osmo poglavlje objašnjeni su ključni problemi modernih sistema plaćanja, koji deluju kao pokretački faktor inovacija u ovoj oblasti, ali i oni koji do sada nisu rešeni na adekvatan način.

Četvrti deo, pod naslovom: *Razvoj sistema plaćanja u odabranim državama* (96-212 str.), donosi analizu razvoja sistema plaćanja u tri velike ekonomije: Sjedinjenim Američkim Državama (SAD), Evropskoj uniji i Japanu, a na samom kraju analizira se struktura i funkcionisanje *Continuous Linked Settlement* banke (CLS). Deveto poglavlje posvećeno je sistemima plaćanja u SAD-u, prvoj državi koja je uvela poluelektronske i elektronske sisteme plaćanja. U fokusu analize su sličnosti i razlike dva sistema za plaćanje velikih vrednosti, *Fedwire* i *Clearing House Interbank Payment System* (CHIPS). Analiza sistema plaćanja u Evropskoj uniji, u desetom poglavlju knjige, donosi zaključak da su evropske zemlje preuzele vodeću ulogu u inovacijama na globalnom nivou. Kao glavni faktor, autor navodi viši stepen konkurencije sistema plaćanja u zemljama Evropske unije, koji je dodatno povišen stvaranjem Jedinstvene platne zone u evro regiji (*Single Euro Payments Area* - SEPA). Ovakav vid konkurencije niži je u SAD-u, a naročito u Japanu, čiji je slučaj analiziran u jedanaestom poglavlju knjige. Specifičnost Japana, u odnosu na druge dve ekonomije, je postojanje tri paralelna sistema plaćanja sa tačno određenim odgovornostima, uslovljenim valutama i iznosima plaćanja. U dvanaestom poglavlju analizirano je funkcionisanje CLS banke. Iako u stručnoj literaturi nosi naziv „banka“, CLS je, zapravo, sistem međuvalutnih plaćanja koji omogućava simultan prenos dveju valuta (*payment-versus-payment* - PVP princip) u deviznim transakcijama i smanjuje kreditni rizik. Autor kritički analizira doprinose u smanjenju rizika, kao i segmente u kojima CLS nije mogao da u potpunosti anulira rizik deviznog poslovanja.

Kako su greške koje su u prošlosti nastajale usled disfunkcionalnosti sistema plaćanja dovodile i do

bankarotstava finansijskih institucija, značaj platnog sistema za stabilnost cele ekonomije je izuzetna. Autor definiše moguće probleme koji nastaju u procesiranju transakcija (na primer, rizik deviznih transakcija, pri čemu se javlja opasnost od promene deviznog kursa ili kapitalnog gubitka jednog od učesnika u slučaju kada transakciju zaključuju poslovni entiteti iz različitih vremenskih zona), i potencijalne mehanizme za njihovo rešavanje (u ovom slučaju problem se može rešiti simultanom isporukom valuta za oba učesnika u transakciji, po PVP principu).

Analizirana problematika je savremena, a posebnu vrednost knjizi daju praktični primeri organizacije sistema plaćanja najrazvijenijih ekonomija.

Najveći nedostatak knjige, koji priznaje i sam autor, je odsustvo analize sistema za saldiranje hartija od

vrednosti, koji su u savremenim uslovima važni mehanizmi svake nacionalne ekonomije. Zajedno sa mehanizmom za saldiranje hartija od vrednosti, sistemi plaćanja omogućavaju funkcionisanje *delivery-versus-payment* (DVP) principa, odnosno, simultanu isporuku hartija od vrednosti sa plaćanjem, kojim se smanjuje mogućnost nastanka kreditnog rizika u transakcijama sa hartijama od vrednosti. Kao poseban nedostatak knjige može biti i to što nisu inkorporirana rešenja platnih sistema u zemljama sa narastajućim ekonomijama (pre svega, u Kini i Rusiji), čime bi knjiga, pored iskustava najrazvijenih ekonomija, bila obogaćena i time otvorena mogućnost za komparativnu analizu sistema plaćanja.

Primljeno 26. juna 2014,
nakon revizije,
prihvaćeno za publikovanje 19. avgusta 2014.

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