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Payment systems in economy - present end future tendencies

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Abstract

A payment system is no more than an organized arrangement for transferring value between its participants. So defined, it is clear that payment systems are fundamental to the functioning of all monetary economies, no matter they are developed economies, transitional economies, or developing economies.

The aim of this work is to show how the architecture of payment systems (payment instruments, processing, participants and etc) influence to payment industry (microeconomic approach) and for the role of central bank in payment systems (macroeconomic - public approach). We use the method of qualitative analyse, not empirical measures**.**

Central banks, as issuers of money, have always had a keen interest in the smooth functioning of the national payment system and the way it affects the economy. Their involvement has, however, evolved over time, as central banks have increasingly taken on a prominent role in the pursuit of the public good of maintaining trust in the currency and ensuring its smooth circulation. Consequently, their involvement in payment, clearing and settlement has changed.

Also, the aim of this work is to paint a broad-brush picture of the economic links between central banks and payments in the present and the future. We research contemporary trends that affecting the role of the central bank, and trends in the future.

In the work we offer some ideas about the future direction of payments and central bank involvement in payment systems. We also explore the implications for the ability of central banks to carry out their core monetary and financial stability functions in the future trough the payment systems.

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1. Introduction

A "payment" is transfer of monetary value. A payment is therefore a transfer of funds which discharges an obligation on the part of a payer vis-à-vis a payee. A payment system consists of a set of instruments, banking procedures and, typically, interbank funds transfer systems that ensure the circulation of money.[2]

Economies of scale exist where the average unit cost decreases as output increases. The payment industry also exhibits considerable economies of scale. First, the value that an individual participant derives from using a particular payment system increases with the number of other parties using that same system. Second, high levels of initial investment (called "sunk costs") are required in order to establish a payment system, and considerable fixed costs are incurred in the operation of such a system (more payments less costs).

Economies of scope are present when the total output of a single firm producing two different products is greater than the total output that could be achieved by two different firms - production units (e.g. payment service providers) producing those two products separately. Payment systems may exhibit economies of scope arising from the integration of several functions in the transaction chain – i.e. from the bundling together of similar or interrelated payment services or activities.

Economies of scale and scope are important for microeconomics of payment systems. We point in the work that some disintermediation factors have had emerged over near past time and postponed and interrupted mergers in payment systems.

We offer a thesis that the future of payment systems is not only in considering the payment system as payment industry but also as a system of public interest. We will show that the maintenance of financial stability is a public policy goal, and only central bank can provide this public good.

We mark contemporary trends that affecting the role of the central bank in the present and may influence in the future.

We also discuss about some challenges for research in payments about the future.

2. The architecture of payment systems

2.1. Payment and the payment system

As we mentioned before, at a general level, the term "payment system" refers to the complete set of instruments, intermediaries, rules, procedures, processes and inter bank funds transfer systems which facilitate the circulation of money in a country (or currency area). In this sense, a payment system comprises three main elements or processes:[3]

- *payment instruments*, which are a means of authorising and submitting a payment (i.e. the means by which the payer gives its bank authorisation for funds to be transferred or the means by which the payee gives its bank instructions for funds to be collected from the payer);
- *processing* (including clearing), which involves the payment instruction being exchanged between the banks (and accounts) concerned;

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[2] BIS, CPSS, (March 2003) A Glossary of terms used in payment and settlement system

[3] European Central Bank, (2010), "The Payment Systems, Payments, Securities and Derivatives and the Role of the Euro system", p. 25-26.

- a means of *settlement* for the relevant banks (i.e. the payer's bank has to compensate the payee's bank, either bilaterally or through accounts that the two banks hold with a third-party settlement agent).

2.2. Participants in a payment system

In terms of the entity that participating in the payment system, the participants in a payment system are devoted as following:

Banks. Banks are the compulsory intermediates between users and payment systems as they hold a license to take deposits and effect payments for which they are subjected to regulation. They maintain accounts on behalf of their customers which are debited or credited when a payment is effected or funds are received.

The settlement agent. The settlement agent manages the settlement accounts of the direct members and transfers amounts between them to achieve finality. The central banks, all large-value systems and national Automated Clearing House (ACHs) are considered to be systemically important.

Central bank. The central banks act generally as settlement agent. Central banks are however responsible for oversight: a central bank task, principally intended to promote the smooth functioning of payment systems and to protect the financial system from possible "domino effects" which may occur when one or more participants in the payment system incur credit or liquidity problems.

Money market. The money market is an essential component of payment systems although it is not, strictly speaking, part of them. An efficient and liquid intraday market, offering a variety of instruments with varied maturities, is essential for the smooth operation of a payment system as it enables the commercial banks to fund their liquidity and settlement positions. From a macro-economic viewpoint, a payment system can only function if those members of the clearing with long positions accept to lend funds to those with short positions.

There is the chain of payment operations compound of set of participants in a payment system (figure 1).

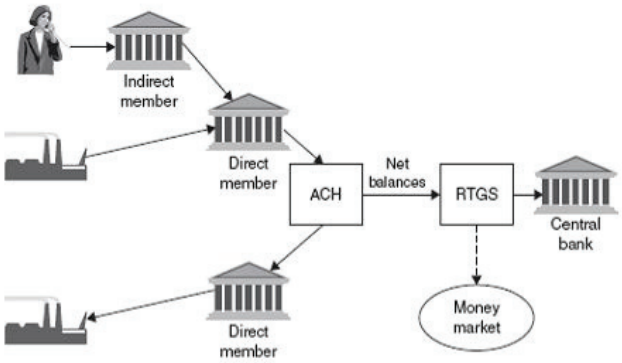

Fig. 1. The chain of payment operations between participants in payment system [4]

[4] D. Rambure, A. Nacamuli, (2008), Payment Systems, from the Salt Mines to the Board Room, *Palgrave Macmilian*, p. 13.

3. The challenges from operating of payment industry (microeconomics of payment systems)

3.1. Disintermediation in the payment systems

The access to most payment systems is restricted (regulated) to banks long time ago, but especially several disintermediation factors have emerged over the past 15 years and point this process, as following:

Legal factors. For banks, deposit taking is a regulated activity subject to minimum capital requirements, deposit insurance and supervision by a national regulatory authority. By contrast, for instance, the recently enacted Payment Services Directive (PSD) in the EU allows non-banks to offer payments services; these payment institutions will be subject to much lighter regulatory requirements

Functional factors. Non-banking payment systems operate with or without the involvement of banks. Most multinational corporations operate internal payment and netting systems for transfers between their different national subsidiaries and/or affiliated legal entities to reduce banking fees and float.

***Commercial*:** 1) Several closed payment systems operate almost in every country, particularly stored-value prepaid cards offered by transport authorities (for instance Oyster in London, MetroCard in New York, Navigo in Paris) and mobile phone operators. 2) Other organizations (for instance Western Union and Money Gram) offer cross-border low value transfers, known as remittances, to migrant workers sending money to their families back home. 3) Store and supermarket chains, which until recently just offered store cards accepted only by their outlets, now offer credit cards co-branded with Visa or MasterCard thereby gaining universal acceptance: banks are losing out on the fees and the interest on outstanding balances. It should be noted that the processes and IT systems required to operate these schemes are often subcontracted to banks or payments processors.

***Technical*:** The internet and mobile telephony have enabled a host of parallel payment systems to flourish and disintermediate the banks. Pay- Pal, building on the success of the on-line auction system eBay, is gaining its market share in the person-to-person (P2P). Several mobile phone operators are offering mobile payment services either independently or in cooperation with banks.

3.2. Central bank and potential failure in the payment infrastructure

There is a strong rationale for central bank involvement in payment, clearing and settlement issues. Modern economies are dependent on the safe and efficient flow of transactions. The smooth functioning of payment, clearing and settlement systems is a precondition for users' confidence in those systems and, ultimately, public confidence in the currency.

The main potential failures exist because of problems with payment infrastructures. Lets us address some of them:

- Situations may arise in which the market is unable or unwilling to develop adequate solutions to ensure the smooth functioning of payment, clearing and settlement systems;
- (an)existing of sufficient degree of competition or contestability in the base infrastructure and services in the financial market;
- Market imperfections as a presence of negative externalities;
- Balancing between costs and efficiency undertaken of the operators of payment because of their acting in competitive market;
- The question of moral hazard, or when some entities acting as "to big to fail" and believing the government will rescue them if the business failure;

Like all form of market, also in money market (market for payment) business failure is possible to happen. The main sources of such market failures in the area of payment, clearing and settlement systems relate to 1) insufficient competition, 2) negative externalities and 3) moral hazard.

Insufficient degree of competition. Well-functioning markets depend on there being a sufficient degree of competition or contestability in the underlying infrastructures and services. As payment, clearing and settlement systems involve considerable economies of scale, there is typically a strong tendency towards a high degree of concentration in the industry. Modern payment and securities infrastructures require substantial fixed investment in information and communication technology, while the marginal cost of processing additional transactions is typically very low. Hence, efficiency gains can generally be achieved by increasing the number of transactions in order to lower the average cost per transaction. The combination of significant economies of scale and substantial positive network effects typically leads to what economic theory calls "natural monopolies". Natural monopolies automatically imply the presence of imperfect markets and could have repercussions for competition and innovation in the long term.

N*egative externalities*. In payment, clearing and settlement systems, participants are dependent on each other as regards the liquidity (and collateral) needed to process their transactions. Liquidity problems can arise where flows of funds differ from those expected, or where a number of participants delay settlement. As a result, disruption caused by one participant in the infrastructure can cause disruptions for other participants. These externalities can spread across the network, resulting in systemic risk, a process also referred in literature as "financial contagion".

Operators balancing between costs and efficiency. Operators of payment, clearing and settlement systems have to safeguard their systems against financial and non-financial risks. When developing tools to mitigate risks, operators acting in a competitive market have to strike a balance between costs and efficiency. To reduce costs and stay competitive, operators could decide to pay less attention to safety measures in order to attract business.

A moral hazard question. A further issue facing systemically important payment infrastructures and important participants in such infrastructures is the question of moral hazard. In some cases, markets may be convinced that some entities are "too big to fail", which could lead to public intervention being expected in the event of any crisis. Commercial participants in a payment system try to bail out their financial loses (failure) by another entity (central bank or government).

Table 1 ranks the stylised models of intervention against their effectiveness in mitigating the systemic risk externalities that fall squarely within most central banks.

Model	*Degree of effectiveness in mitigating systemic risk externalities*	*Degree of effectiveness in achieving additional public sector objectives*
owner/operator	High/medium	low
owner	High/medium	Medium
operator	Medium/low	Medium/low
overseer	High/medium	high
overseer/operator	High	Medium/low
laissez-faire	Low	low

Table 1. Ranking models of intervention undertaken from public sector toward payment system [5]

4. Payment systems and the public interest

According to economic theory, a good or service is "public" if its use is "non-rival" (i.e. its use by one agent does not hinder another agent's use of it) and if no one can be prevented from using it once it has been produced or provided by someone else. The maintenance of financial stability is a public policy goal.

4.1. Contemporary trends that affecting the role of the central bank

To address such market failures and prevent them from occurring, central banks are involved in payment, clearing and settlement activities in a variety of capacities, as set out below.

In payment, clearing and settlement systems, central banks aim mainly to:

- Prevent systemic risk, thereby maintaining financial stability;
- Promote the efficiency of payment systems and instruments;
- Ensure the security of and public trust in the currency as the settlement asset; and
- Safeguarded the transmission channel for monetary policy.

National and international payment and settlement systems are influenced by various external factors and changes in the market environment. In particular, regional integration, globalisation, innovation and regulation have prompted significant changes in the area of payment, clearing and settlement systems, and these changes, together with amended or new legislation on market infrastructure services, may also affect the role and involvement of the central bank. It is reasonable to expect that these major drivers of change will, in many respects, continue to have a profound impact on the design and functioning of the systems in the various markets for the foreseeable future.

We will focus on four future trends that are expected to have an impact on markets for payment, clearing and settlement services (in developed and transitional economies):

- Innovation and technological progress;
- Increased interdependencies;
- Dislocation (decentralisation); and
- Concentration.

Innovation and technological progress. Innovation and technological progress allow improvements to be made in existing payment, clearing and settlement arrangements and allow new products, services and processes to be introduced. Improvement is possible to: 1) all type of payments (wholesale, retail and cash); 2) all type of amount of payments (small and large payments) and 3) all participants in the payment systems (operators, settlement agents, private entities and central banks).

Increased interdependencies. Regional integration, globalisation and rapid technological and business model changes in the payment, clearing and settlement landscape have led to a number of growing interdependencies in the market. Payment, clearing and settlement systems, and the markets they support, are becoming increasingly connected. Moreover, large international banks are participating in systems in various countries. This has led to an increase in efficiency (e.g. through interoperability and economies of scale). Interaction between systems has also allowed a reduction in settlement risk for some activities.

Dislocation. Another key development concerns "dislocation" – i.e. changes in the location of systems. Regional integration, globalisation and innovation have allowed many banks and markets to

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[5] A. G. Haldane, S. Millard and V. Saporta, (2008), "The Future of Payment Systems", *Routledge*. p.31

expand their operations across borders, with the result that markets have become international and services are increasingly being offered by international players. This may encourage the setting-up of market infrastructure outside the country of the currency used in transactions. Moreover, national markets are increasingly being contested by international players, which have the scale effects necessary to compete with national incumbents, with correspondent banking and custody services increasingly being provided through leading international players.

Concentration. The consolidation of financial institutions and market infrastructures may give rise to certain specific challenges for central banks. Particularly in the case of payment and securities infrastructures, consolidation and integration in the banking industry may lead to significant volumes being shifted from inter bank systems to intra bank processes, with banks increasingly internalising payments and securities transfers. When two institutions merge, their combined ability to offer in-house processing for transactions increases. However, they will also internalise an increased amount of risk. And as an institution, they will become more critical for the financial system. This type of development can be seen both in correspondent banking and in custody services. The consolidation of institutions and systems within and across jurisdictions and currencies creates further complexities. This increases the need for central banks to cooperate both with banking supervisors and securities regulators and with other central banks.

4.2. The payment systems and the central bank - the future

In this part of the work we offer some ideas about the future direction of payments and central bank involvement in payment systems. We first examine 1) whether cash will endure in future and we then move on to discuss 2) how wholesale financial transactions might be made in the future. In this contest, we also explore the implications for the ability of central banks to carry out their core monetary and financial stability functions in the future.

How will consumers pay for goods and services in the future? When thinking about the question of how consumers will pay for goods in the future, one question to ask is whether cash will endure or whether it will be replaced by some form of electronic money. In thinking about why cash is so enduring, it is important to note that any replacement would have to offer its user the same level of 1) anonymity, 2) universal acceptability and 3) recognisability. No current alternative has ever done this better of cash. Another advantage of cash over, say, credit and debit cards is the fact that final payment takes place simultaneously with the provision of the good or service; the seller is not exposed to settlement risk.

But the fact that no current alternative to cash is able to match its attributes does not mean that such an alternative will not exist in the future. One might think that eventually, in place of cash, some form of e-money will exist that offers the same complete anonymity, universal acceptability and recognisability as cash but will not be useable by anyone other than the holder of the e-money. This will reduce the incentive of others to steal the e-money and so make it a 'safer' asset to hold than cash. Some economists suggest that the demand for central bank money – and cash in particular – has fallen dramatically over recent years and that it will, possibly, fall to zero eventually.[6] Given this, they argue that changes in the supply of central bank money – that is, monetary policy – will increasingly have less impact on the wider economy, in the limit having no impact at all. In effect, central bank money is just one of a number of competing monies; the price level itself, at that point, would need to be tied to a commodity or, alternatively, a bundle of financial assets. But some economists[7] notes that as long as central bank money

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[6] K. Dowd, (1998), Monetary Policy in 21st century: an impossible task? *CATO Journal,* Vol. 17, p. 327-331.

[7] M. Woodford, (2004), Interested Prices: foundation of a theory of monetary policy, *Princeton University Press.*

is the ultimate settlement asset – that is, there is a need for it in order that banks can make payments to each other – there would always be *some* demand for it even in the absence of central bank notes and this would mean that central banks could carry out monetary policy exactly as before.

How will wholesale payments be made in the future? With respect to wholesale payments, the trends seem to point two opposing outcomes: 1) one integrated payment system perhaps covering the whole world (a mega-version of the Continuous Linked Settlement (CLS) system that settles foreign exchange transactions for the major world currencies) or a 2) large number of competing private payment systems.

The benefits of the one integrated payment system outcome would be large savings in: 1) collateral, 2) IT communications and 3) other costs. But, the downside would be the 'single point of failure' problem associated with a massive concentration of risk in one system and the general inefficiencies usually associated with monopoly providers.

But there is still the issue of what the acceptable settlement asset would be. Some economists[8] argue that payments must be made in terms of money rather than other assets because there is a commitment problem with repaying loans with returns from investment. But, there are authors[9] who make the point that central bank money is likely to continue being preferred to other assets for two reasons: 1) because it defines the unit of account, it will not be subject to bid-ask spreads, and 2) payment in it is final given its 'legal tender' status.

4.3. Some challenges for research in payments

The economics literature in the field of payment is surprisingly scarce. With some honourable exceptions, for example, mainstream monetary economics has largely ignored the mechanics of how payments are actually made. Also, and banking theory has largely ignored the management of liquidity intraday. Even within central banks, payment systems are often treated as simply 'the plumbing' and left to technocrats.

The field of payment systems is important also from point of researching in payments. Here, in short we mentioned only four questions which are in the same time a challenge for research in payments.

I address only four directions in payment research that provide particular challenges in both pure and applied economics, chosen from among the many important topics in this active field. They are:

- Formulating better basic models;
- Making market-microstructure data publicly available;
- Providing sound advice about payment systems risk;
- Understanding the relationship between payments and other business processes.

Payment economics comprises the topics that pertain to both monetary economics and industrial organisation. These definitions help define what a good economic model of payments should contain.

These are the foundations for models in payment economics, and some facts should be explained according to it. The basic fact is that virtually all trade utilises one of two institutions that coexist in the economy: 1) transfer tokens of *stored value (*coins or pieces of paper currency, electronic smart card); 2) institutional framework for recording entries in accounts of parties in transactions.

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[8] N.Kiyotaki, and J. Moore, (2004), Liquidity and Asset Prices, *London School of Economics*

[9] G.A. Selgin, and L.H. White, (2005), The Future of Fiat Money, *University of Georgia*

5. Conclusion

Payment systems are indispensable to our lives as individuals and to the smooth functioning of the economy. They allow money to fulfill its role of accepted means of exchange when purchasing goods or services. If money is the lifeblood of modern monetary economies, payment systems are the circulation system.

Well-designed payment infrastructure contributes to the proper functioning of markets and helps to eliminate frictions in trade.

Payment, clearing and settlement systems are typically characterised by significant economies of scale and have a tendency to evolve into natural monopolies or *quasi-monopolies*. To address such market failures and prevent them from occurring, central banks are involved in payment, clearing and settlement activities.

The smooth functioning of systemically important payment, clearing and settlement systems has a strong bearing on financial stability, and that is a public goal and public service.

The main potential failures exist because of problems with payment infrastructures. The central banks aim to prevent systemic risk, promote the efficiency of payment and instruments and ensure the security.

Central banks, as issuers of money, have always had a keen interest in the smooth functioning of the national payment system and the way it affects the economy. Their involvement has, however, evolved over time, as central banks have increasingly taken on a prominent role in the pursuit of the public good of maintaining trust in the currency and ensuring its smooth circulation. Consequently, their involvement in payment, clearing and settlement has changed.

Payment systems and central banks, historically, have evolved in tandem. The finish is the ultimate development of the core functions of modern central banks – monetary and financial stability – which has been closely linked to their role in the provision of the ultimate settlement asset in the payment system.

What about the payment systems and central banks in the future? There are two important aspects: 1) whether cash will endure in future and we then move on to discuss that 2) how wholesale financial transactions might be made in the future. The answers are confused and economists and planers still agree and disagree.

We conclude that the economics literature in the field of payment is surprisingly scarce. Because of this we offer some ideas that will meet researches in field of payments in the future.

References

BIS, CPSS, (March 2003) A Glossary of terms used in payment and settlement system.

European Central Bank, (2010), The Payment Sustems, Payments, Securities and Derivatives and the Role of the Eurosystem.

D. Rambure, A. Nacamuli, (2008), Payment Systems, from the Salt Mines to the Board Room, *Palgrave Macmilian*.

A. G. Haldane, S. Millard and V. Saporta, (2008), The Future of Payment Systems, *Routledge*. p.31

K. Dowd, (1998), Monetary Policy in 21st century: an impossible task? *CATO Journal,* Vol. 17.

M. Woodford, (2004), Interestand Pricees: foundation of a theory of monetary policy, *Princeton University Press.*

N.Kiyotaki, and J. Moore, (2004), Liquidity and Asset Prices, *London School of Economics*.

G.A. Selgin, and L.H. White, (2005), The Future of Fiat Money, *University of Georgia*