Chapter 3

ROLE OF PAYMENT AND SETTLEMENT SYSTEMS IN MONETARY POLICY AND FINANCIAL STABILITY IN CAMBODIA

By
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1. Introduction

One of the central bank functions is to oversee payment and settlement system (PSS) and ensure it operates in a safe and efficient manner. Safety and efficiency of PSS are fundamental to the smooth functioning of financial markets. A core role of central banks has always been to provide a safe settlement facility for many systems. This is not an easy task for a developing economy like Cambodia.

The recent history of Cambodia about the way people make payment is worth highlighting. Back in 1979, the Cambodian people were exchanging goods in a barter economy. Banknotes were reintroduced in Cambodia in March 1980, to be a means of facilitating the exchange of goods between producers and consumers in the different compartments of the socialist economy. Since the creation of bank deposit money was nil at that time, the main way of getting the riel into circulation was through the payment of civil servants' salaries. In the early 1990s, the economy was transformed from a centrally planned to a market economy. A two-tier banking system came to replace a mono-banking system, only then did the central bank release its commercial activities to the private sector and retain its supervisory and regulatory roles in the financial system. Starting from the second half of 1990s, the government worked on establishing the legal framework for the National Bank of Cambodia (NBC) to oversee, among other things, the payment and settlement systems.

A dramatic change in Cambodia's payment systems and instruments was observed in the late 1980s and early 1990s when the economy was transformed from a centrally planned to a free market economy. In a free

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market economy we need money in different forms (cash and non-cash) to ensure smooth and effective operation of the financial system (Geva, 2009).

The NBC started in the second half of the 1990s with a limited capacity in its task of modernising the payment systems in Cambodia. The situation at that time was very challenging for the NBC, and it faced a long road in designing a well functioning PSS to support the new market economy. By definition, a well functioning modern payment system can be described as a complex set of arrangements involving such diverse institutions as currency, the banking system, clearing houses, the central banks and possibly a government deposit insurance scheme (Goodfriend, 1991). Payment systems are the basic infrastructure of a market economy (Sheng, 1995).

With a number of Laws related to payment systems having been put into place in Cambodia, the authorities moved forward in upgrading the country's payment system in response to the market needs. The current payment systems in Cambodia consist of the large-value payment systems which is the NBC's clearing house, securities and cash settlement system of the Cambodia Securities Exchange (CSX), and the retail payment systems. It is important to note that Cambodia's payment and settlement systems still lag behind other countries in the region.

1.1 Payment Systems in Cambodia

The NBC has statutory responsibility for the oversight of the payment system under the Article 7 of the Law on Organisation and Conduct of NBC, adopted in January 1996. In accordance with this law, the NBC has continuously introduced new Prakas and regulations in order to develop and enhance a safe and sound payment system in Cambodia. Cambodia's payment system is at a very early stage of development. Cash is being widely used in the economy since the payments tools are very limited and are not easily accessible.

Cheques are the most commonly used non-cash payment instrument in Cambodia. Over the course of time, the use of other means for effecting transfers other than cash is gaining ground. Tax payments equivalent to or exceeding 4 million riels (US$1,000) must be paid by cheque, contributing to the increasing use of cheques in business transactions. The total amount of US dollar-denominated cheque clearing at the NBC's clearing house increased subsequently from nearly US$5 billion in 2007 to about US$9.5 billion in 2011, while those denominated in riel increased from about KHR860 billion to about KHR1,820 billion in the same period. However, the growth of the total amount of cheque clearance was negative (-23% for dollar-denominated cheques and -4% for riel-denominated cheques) in 2009.

Figure 1
USD Chequess cleared and GDP Growth

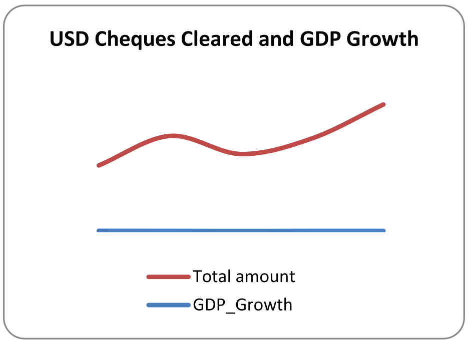
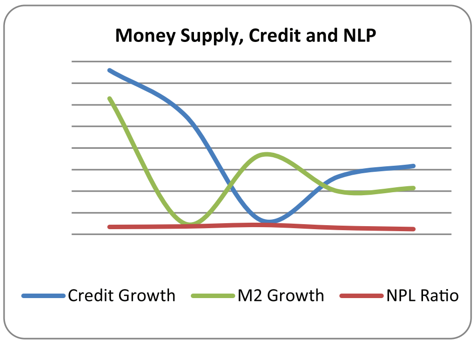


Figure 2
Money Supply, Credit and NPL



This is consistent with the movement in the GDP growth, which registered sharp contractions in late-2008 and in 2009, and the property bubble burst under the weight of weaker economic activity and foreign currency inflows (Cambodia Article IV, 2009). As a result, the growth was 6.7% in 2008 and 0.1% in 2009, but picked up quickly in 2010 at 6.0% (see Figure 1). Similarly, Figure 2 shows the developments on the monetary and financial fronts. Growth of credit to the private sector dropped from 55% in 2008 to only 6% in 2009. Non-performing loans ratio picked up slightly in 2009. Conversely, growth of broad money (M2) was lower in 2008 and 2010 than in 2009; this was due to the effects of monetary policy tightening which increased the statutory reserve ratio from 8 to 16% in 2008, and then which lowered the same to 12% in 2009.

Debit and credit cards (including ATMs) are becoming increasingly popular within the society, though the amount transacted via these channels is still not significantly visible. Debit and credit cards have been introduced and over 600 ATMs installed throughout the urban areas. Nearly one million debit cards and 18,000 credit cards have been issued by banks in Cambodia as of March 2012. In the meantime, some commercial banks have set up a clearing arrangement for their ATM transactions called "Easy Cash". On the other hand, several institutions introduced mobile phone banking or m-banking in Cambodia. Currently, there are three approved payment service providers, WING, ACLEDA Unity and CellCard Cash. M-banking has extended fund transfer services to rural and remote areas where formal services are not available.

Work on the fully centralised national clearing and settlement systems referred to as the “Full Solution”, including all PSSs in Cambodia, developed inside and outside of the central bank with the purpose to provide both local cheque clearing and same-day intercity electronic payments, has yet to be completed. It is expected to be completed by the end of 2012. Currently, an interim centralised clearing and settlement systems referred to as the “Interim Solution” has been introduced, which covers the NBC’s clearing house operation only. The Real Time Gross Settlement (RTGS) will be considered after the completion of “Full Solution” and in response to increasing market developments (FSDS, 2012). SWIFT is used for fund transfers from banks in Cambodia to other parties overseas. Currently, there are 36 banks using SWIFT. Western Union and Money Gram are available at a number of banks in Cambodia.

The National Payment System (NPS) is not yet established. Thus, the clearing house which is under the supervision of the NBC plays a dominant role in facilitating the settlements of the private sector, banking and financial institutions and the Royal Government. Since Cambodia’s economy is highly dollarised, the clearing arrangement caters for both US dollar and Khmer riel cheques. Settlements via the clearing house are dominated by dollar-denominated cheques. As shown in Table 1, the amount of riel-denominated cheques cleared was merely US$45 million in 2001 (equal to only 7% of the total clearing transactions); while the transaction in dollar-denominated cheques was US$643 million or 93% of the total (see Table 1). The settlement through the clearing house shows a remarkable increase from year to year, and reached US$9,573 million for dollar-denominated cheques in 2011 and US$447 million for riel-denominated cheques. Table 1 also shows that the percentage of the total transactions of cheques cleared to nominal GDP (measured in current prices) had increased significantly from 17% in 2001 to nearly 80% in 2011.

Table 1
Transactions through Clearing House at NBC

(USD million)

Year	USD Transaction	KHR Transaction	Total Transaction	Nominal GDP	Total Transaction to GDP
2001	643	45	688	4006	17%
2002	859	47	906	4260	21%
2003	931	64	996	4656	21%
2004	1,296	77	1,373	5,313	26%
2005	1,818	123	1,941	6,256	31%
2006	2,894	166	3,060	7,356	42%
2007	4,957	212	5,169	8,761	59%
2008	7,189	338	7,527	10,216	74%
2009	5,821	318	6,140	10,298	60%
2010	7,009	388	7,397	11,623	64%
2011	9,573	447	10,020	12,834	78%

Source: Banking Operation Department.

The CSX is regulated by the Securities and Exchange Commission of Cambodia (SECC) under the Law on the Issuance and Trading of Non-government Securities and other related rules and laws. In this regard, the CSX is to function as the operator of the securities market, clearing and settlement facility, and securities depository. Besides, the parties involved in the settlements and payment include three Cash Settlement Agents (commercial bank accreditation by the SECC), and there are also three Securities Registrar and Transfer Agents. Trading days are from Mondays to Fridays (except public holidays), so the closing days do not impact the settlement day, because the settlement and payment cycle is T+2 (business day). On a daily basis, the price of stock could fluctuate between $\pm$ 5%, while the fluctuation gap can be between 90-150% in the primary market (first session). As of November 6, 2012, the market capitalisation remained at KHR 539,234 million, decreasing from the highest point of KHR 887,126 million in April 23, 2012.[2]

2. All securities issued by firms listed in the CSX, price quotations in the CSX's trading system and cash settlement must be in local currency. However, under the SECC's guideline on the Procedure of Cash Settlement in the Securities Market, USD settlement are permitted for the first three (3) years of the establishment of the CSX.

1.2 Condition of Monetary Policy and Financial Stability

Cambodia's economy is very highly dollarised (over 95% of banks assets are in foreign currency) with a managed float exchange rate regime. Therefore, the monetary and exchange rate policies are influenced by policy of the greenback. The NBC's monetary policy is limited to determining the statutory reserve requirement (SRR) to adjust liquidity, intervening in the foreign exchange market to smoothen the exchange rate movements, and, to a lesser extent, making available other standing facilities to the banks and microfinance institutions. The SRR has been maintained at 12% for foreign currency deposits and 8% of riel deposits. Banks tend to maintain surplus liquidity in excess reserves at the NBC to buffer against liquidity risk.

Unfortunately, the financial stability function in Cambodia remains to be clarified. No mandate has been assigned to any institution to look after financial stability as a whole. The Bank Supervision Department (BSC) of the NBC monitors the stability of individual banks on a micro level. Currently, the NBC has established an internal financial stability team to acquire training and build capacity in this regard.

1.3 Role of Central Bank in Payment and Settlement Systems

In pursuit of their policy objectives with respect to monetary and financial stability, central banks as users and operators of payment systems have sought to influence the design and functioning of PSSs. Well designed and managed systems help maintain financial stability by preventing or containing financial crises and help reduce the cost and uncertainty of settlement, which could otherwise act as an impediment to economic activity. PSS thus plays a crucial role in a market economy and central banks have always had a close interest in them as part of their responsibilities for monetary and financial stability (CPSS, 2005).

Currently, the NBC's clearing house is considered as a systemically important PSS in Cambodia. The legal basis for the NBC's involvement in the PSS is covered by explicit provisions for the central bank's role. The Law on the Organisation and Conduct of the National Bank of Cambodia promulgated in 1996 entrusts the NBC with the role as payment system overseer. The NBC plays its oversight role not only to ensure safe and efficient operations of the PSSs but also to identify the potential risks of the PSSs and manage those risks. In addition, the NBC also plays the role as operator and regulator of the clearing house by providing net cheque clearing services as well as initiating and issuing Prakas and policies on the clearing house operations.

The legal framework that governs the overall payment, clearance and securities settlement systems consists of a number of statutes and Prakas issued over the past one and a half decades. A number of regulations/Prakas have been issued to participants in order to clarify the regulatory requirements arising from each statute, taking into consideration the development of the economy and the system.

A weak payment system can become a fertile ground for systemic crises and hamper economic development. Similarly, activities in the securities market usually entail large transaction values that are transmitted and settled through the payment system. However, the payment and securities settlement systems in Cambodia, which are a key component in the development of more inclusive financial systems, are operated under the SECC. To date, the newly launched CSX and one other company – the Phnom Penh Water Supply Authority – are listed so far, and their market capitalisation is still small in relation to GDP (about 1%). In addition, the securities settlement and cash settlement of securities trading are done by separate entities. However, at the end of the day, the NBC's clearing house remains the final cash settlement service provider for all cash settlement agents in the country.

1.4 Objectives of Study

Due to the important roles PSS plays in contributing to macroeconomic stability and growth, its roles in monetary policy and financial stability in Cambodia need to be looked at. This paper explains why effective PSSs are crucial for central banks and other authorities in their design and implementation of monetary policy and financial stability. On the basis of the analysis in the paper, in Section 2 we review the existing literatures for identifying vulnerabilities and risks of Cambodia's PSS in relation to monetary policy and financial stability, and analyse the correlation between PSS and monetary policy and financial stability with additional empirical evidence. We provide our assessment of the current PSS framework against the BIS Committee on Payment and Settlement System (CPSS)'s key principles for financial market infrastructures (FMIs) in Section 3. In Section 4 we present our findings and policy implications, and in Section 5 we provide our conclusion.

2. Literature Review

Central banks have always had a close interest in the safety and efficiency of payment and settlement systems. One of the principal functions of central banks is to be the guardian of public confidence in money, and this confidence depends crucially on the ability of economic agents to transmit money and financial instruments smoothly and securely through the PSSs. The systems must therefore be strong and reliable, available even when the markets around them are in crisis and never themselves the source of such crisis (CPSS, 2005).

Developing a sound PSS has been a burden and a tough job for central banks. With the modernisation of information technology and the continuous introduction of new financial products to the world financial market, PSSs need to be simultaneously developed. Efficient payment systems help promote the development of commerce, enhance economic policy oversight, control the risk inherent in moving large values, and reduce the financial, capital, and human resource devoted to the transfer of payment (Robert Listfield, 1994). In this sense, a sound PSS plays a significant role in the conduct of an effective monetary policy and maintenance of financial stability in the financial system via the effective and efficient measures of liquidity management. Realising and acknowledging this importance, not different from other emerging and developing countries, Cambodia is making best efforts to set up and develop a better payment system.

2.1 Monetary Policy Framework

One of the most important roles of the NBC is to determine the objective, formulate, implement and monitor Cambodia's monetary policy in consultation with the Royal Government and in consideration of the economic and financial policy framework of the Kingdom. The objective of its monetary policy is to maintain price stability, and a managed floating exchange rate policy has been adopted to meet this end.

To ensure effective conduct of monetary policy, a policy committee has been officially established within the organisation. This body is responsible for the enhancement of monetary policy capacity in managing reserve requirements, monitoring of liquidity, and improvement of the monetary decision-making process. It is chaired by the Governor and the membership comprises the NBC's senior officials at directorate level. The Committee meets once every two months to review the progress of the national economic and financial situations. The decision to use monetary tools to fight inflation or to stabilise exchange rate will be made, if necessary. To support the decision making process of the Committee, the Economic Research and International Cooperation Department (ERICD) of the NBC closely monitors and analyses the performance of the various key economic variables and makes assessment of their impact on inflation and on the country's international reserves and, then, submits its reports to the Committee. The department is currently reviewing the reporting standard to improve its analysis and policy recommendations for the Committee.

However, with very high degree of dollarisation, absence of Open Market Operations (OMOs), and the cash-based economy, Cambodia's monetary policy instruments are very limited and it poses huge barriers for the NBC's capability to implement effective monetary policy. In general, the monetary policy instruments are limited to three tools: foreign exchange invention, SRR, and standing facilities which consist of fixed deposit, overdraft facility and refinancing window. Among the three tools, foreign exchange intervention has been actively utilised to smoothen foreign exchange volatility and to promote price stability while the other two tools have been used occasionally. The NBC intervenes in the foreign exchange market to smoothen foreign exchange movements through foreign exchange auctions to avoid market sentiments and psychological factors from causing disorder in the foreign exchange market (Bonnang, 2009).

2.2 Financial Stability Framework

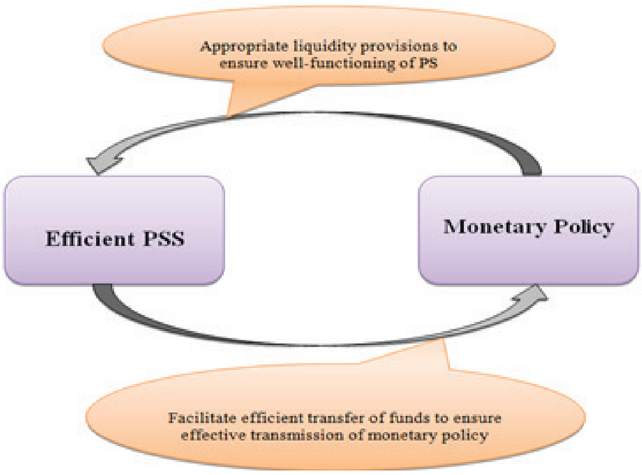
Financial stability is a brand new concept for Cambodia. In accordance with a recommendation of the Financial Sector Assessment Programme (FSAP), which was jointly conducted by the IMF and the World Bank in 2010, the NBC, with assistance from the IMF TA, has established a working group on financial stability called the Financial Stability Team (FST). This is an inter-departmental group consisting of senior staff from the various departments, including Banking Supervision, ERICD, Foreign Exchange, Banking Operation, and Statistics. The team was trained by the resident IMF TA. However, the formal structure of the financial stability framework does not exist as yet. The group meets weekly and reviews the current situation pertaining to Cambodia's economy and financial system, focusing on the banking system by selecting some prudential ratios to analyse and give comments.

2.3 Relations of PSS in Monetary Policy and Financial Stability

2.3.1 Relations of PSS in Monetary Policy

There are many empirical researches on the causality link between payment system and monetary policy. Overall, it is recognised that the payment system design, efficiency and safety have played a significant role in the conduct of monetary policy since they facilitate the speed and predictability of the demand for money and the efficacy of some monetary policy tools. On the other hand, monetary policy influences the liquidity available in the payment system and its opportunity cost to settle payment obligations (see Figure 2).

Figure 2
Relations between PSS and Monetary Policy



Similarly, the relationship between the payment system and monetary policy can be explained by the reserve variable in the banking system. Reserves are the means of interbank payment and reserves itself is also an important element of the monetary base of the central bank. Therefore, the change in reserves would affect both the payment system and monetary policy stance (Schmitz, S., 2006). By the same token, the payment system can be a very useful tool for the conduct of monetary policy via the interest rate channel.

An efficient payment system provides the central bank adequate capacity to control, predict and arrange liquidity provision to the banking system. In this connection, the central bank will take an interest in the payment systems employed by the banking system to exercise its own credit intermediation, and thereby transmit policy more widely throughout the economy (ECB, 2007). However, in Cambodia, the payment system has not yet played a significant role in monetary policy. The interbank market is not yet established. The PSSs are almost entirely centered at the NBC's clearing house. The demand of liquidity is based wholly on the amount of cheques transacted each day. The NBC, in this case, plays a role as the intermediary to facilitate payments and settlements of the banking and financial institutions by matching the surplus and deficit amounts needed via the accounts of the banking and financial institutions held with the NBC. In short, to date the payment system and monetary policy in Cambodia have no direct linkage. The stance of monetary policy does not negatively influence the liquidity in the payment system. Although an indirect link can be observed, for example, any attempts by the central bank to squeeze liquidity in the system may result in a shortage of liquidity in some banks, and thus affect their ability to meet their daily obligations on cheque clearance.

2.3.2 Testing for Correlation between PSS and Monetary Policy

We identify above the relation of PSS and monetary policy. While PSS helps ensure effective transmission of monetary policy implementation by facilitating efficient transfers of funds, monetary policy helps provide appropriate liquidity to ensure a well functioning PSS. In this section, we use historical data associated with the clearing house transactions and banks' liquidity to assess how one is correlated with another.

In an analysis by Humphrey (1995), the principle underlying the relationship between payment systems and money supply (hence monetary policy), is shown by the equality of MV = PT or the money supply (M) times its velocity (V) is equal to the price level (P) times of the number of economic transaction (T). PT represents the aggregate level of economic activities (or GDP). Since velocity represents the efficiency of the payment systems, which is reflected in the money turnover rate indicating how many time the money supply has to be reused in order to meet the transaction and payment demands associated with the given level of aggregate economic activities.

Velocity (V) would have a positive relationship with the aggregate level of economic activities (PT) and a negative relationship with the money supply (M). Using GDP and broad money data of the country from 2005 to 2001 to derive for velocity, Table 2 below shows the results of downward trend of velocity.

Table 2
Velocity in a Downward Trend

	2005	2006	2007	2008	2009	2010	2011
Nominal GDP (in million USD using FX Rate End)	6,256	7,356	8,761	10,216	10,298	11,623	12,834
Money supply (M)	1,221	1,711	2,828	2,887	3,881	4,811	5,831
Velocity (V)	5.13	4.30	3.10	3.54	2.65	2.42	2.20

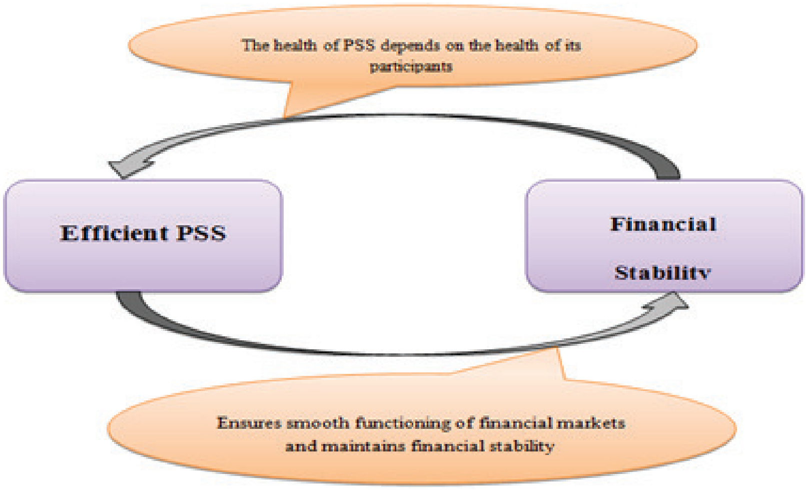
Some obvious reasons can be adduced to explain the downward trend of velocity over time. The rates of growth of money supply are greater than economic growth, the economy remains mainly cash-based, and the payment systems remain to be developed. We will discuss more about this in the policy implication section.

2.3.3 Relations of PSS in Financial Stability

The role of payment system in financial stability is a new concept and becomes an increasingly popular topic, especially for central bankers, over the past few years. As the development of the financial system gradually emerges, there have been some implications for payment system and financial stability. Financial instruments and products have been introduced to the world financial markets so as to address market risk and credit risk for the sake of enhancing liquidity of the financial asset while simultaneously the size of financial sector in relation to the real economy has significantly grown. Hence, it is suggested that stability of the financial system is becoming more crucial (ECB, 2007).

A payment system is vitally important in the sense that the flow of money in the economy or big commercial settlement of private firms, and banking and financial institutions are heavily dependent on it. An efficient PSS helps ensure the smooth functioning of the financial markets and maintenance of financial stability, while the health of PSS depends on the health of its participants (see Figure 4 below). In this connection, if the payment system is disrupted, money transferred and settled is also delayed or cancelled. Hence, risk of liquidity shortage or constraint may result for a certain time period for beneficiaries. This can cause a systemic risk on payment in banking system and it may lead to financial instability in the financial system of a country, possibly spreading to other countries if the level of financial and economic integration is significantly inter-correlated.

Figure 3
Relations between PSS and Financial Stability



2.3.4 Testing for Correlation between PSS and Financial Stability

We identified the relation between the PSS and financial stability in the above section. While PSS helps to ensure the smooth functioning of financial markets, the health of individual banks is fundamental in maintaining the health of the PSS. In this section, we analyse the relationship between financial stability and the clearing house transaction.

The stability of the payment system has empirical links to the quality of the overall financial system – in this case, the depth of the financial system (M2/GDP). We use data of the clearing house transaction to represent the country's PSS transaction assuming that other payment systems' transactions other than those of the clearing house are in the same increasing trend. We measure the clearing house turnover in terms of number of days by which the value of the clearing house transaction is equal to the country's GDP.

Table 3 below shows that the clearing house turnover has negative relationships with the financial depth ratios. In other words, the total value processed by the clearing house has strong positive relationship with the financial depth ratios.

Table 3
Clearing House Turnover Has Negative Relationship with Financial Depth Ratio

	2005	2006	2007	2008	2009	2010	2011
Nominal GDP (in million USD using FX Rate End)	6,256	7,356	8,761	10,216	10,298	11,623	12,834
Value of Clearing House Transactions	1,940	3,062	4,958	7,189	5,822	7,009	9,573
Financial Depth Ratios (in percent)	19.51	23.26	32.28	28.26	37.69	41.40	45.43
Clearing House Turnovers	1,177	877	645	519	646	605	489

It is a fact that an unstable and unsafe payment system can itself represent a source of financial instability. It is evident that if a payment system fails, it can destroy a healthy financial system. On the other hand, it is obvious that financial instability can influence healthy payment systems and eventually destroy all the positive externalities related to the existence of a well functioning payment system.

Even though an efficient payment system helps reduce the cost of business transaction and provide uninterrupted flows of liquidity to facilitate the development and growth of the economy, it can be subject to some major risks such as:

- Systemic risk: the risk where counterparty risk increases so much that it causes a domino effect in the payment system. Even those participants who were originally assumed to be healthy, run into serious problems due to these second-run effects, and the survival of the whole payment system is threatened.
- Credit risk: the risk that a party within the system will be unable to meet fully its financial obligations within the system currently or at any time in the future.
- Liquidity risk: the risk that a party within the system will have insufficient funds to meet financial obligations within the system as and when expected, although it may be able to do so at some time in the future.

- Legal risk: the risk that a poor legal framework or legal uncertainties will cause or exacerbate credit or liquidity risks.
- Operational risk: the risk that operational factors such as technical malfunctions or operational errors will cause or exacerbate credit or liquidity risks.

All of these types of risk, whether in isolation or in conjunction with each other, can have systemic consequences – that is the inability of one of the participants to meet its obligations, or a disruption in the system itself, could result in the inability of other system participants or of financial institutions in other parts of the financial system to meet their obligations as they become due. Such a failure could cause widespread liquidity or credit problems and, as a result, could threaten financial system stability.

Box 1: Monetary Hyperinflation in Cambodia – 1989 to 1993

Cambodia had gone through a tough period of hyperinflation during the early 1990s. With the socialist disengagement in 1989 and absence of international fund support, the government went to the central bank for budget financing. Government financing through inflation (GFI) kept climbing from 1989 until 1991 and the central bank cranked up money-printing machine to monetise the budget deficits, resulted in oversupply of money, sky-rocketed inflation, and slump in riel's value (see Table 4 below). In addition, during the period, with poor use of chequeing accounts, no clearing services and no electronic tools, cash was the only means of payment and liquidity provision.

Action by the NBC to finance the government's fiscal balance affected inflation expectation and raised concern on the central bank's independence in formulating monetary policy. Monetisation of the budget deficits during the period resulted in money imbalances. While the money supply increased by four times in 1990 and by three times in 1992, the GDP increased only slightly above 5% on average from 1990-1992. Continued over-supply of the local currency coupled with rapid inflows of UNTAC's US dollars kept injecting more liquidity to the system and jeopardised price stability and the exchange rates. Three-digit inflations during the period consistently followed the over-supply of money in the markets.

Table 4
Money Supply and Exchange Rates during the Period of Hyperinflation

Year	1989	1990	1991	1992	1993
Nominal GDP (in million KHR)*	1,678,107	1,698,245	1,827,311	1,955,223	2,035,387
GFI (in million KHR)**	5,900	14,900	12,300	5,000	-
Inflation rates**	63%	141%	197%	75%	114%
Increase in money supply (M2)**	-	4 times	-	3 times	-
Exchange rates (riel/dollar)**	-	-	625	1,165	2,400

* Data extracted from the IMF's World Economic Outlook database.
** Data cited from the book "Money and Sovereignty: An Exploration of the Economic, Political and Monetary History of Cambodia", by Jean-Daniel Gardere[3].

Furthermore, in the hyperinflation periods, inflationary expectations strongly influenced the nominal exchange rate. The riel lost its value against the US dollar; the confidence in riel began to erode; the foreign exchange markets were unstable; and the sudden and simultaneous inflow of US dollars caused the economy without brake to become highly dollarised since.

However, there was a lack of reliable databases and insight with regard to the economic and financial policy during the period, aggravated by two important factors of uncertainty: first, dollarisation of the economy, which makes it impossible to know precisely the real money supply; and, second, instability of foreign exchange rates introduces great uncertainty regarding the real value of the money supply when translated entirely into riel.

3. Assessment of Large-value Payment Systems in Cambodia

The central bank law mandates the NBC to oversee payment systems in the Kingdom of Cambodia to ensure they operate in a safe and efficient manner. The NBC has set up a Payment Policy Unit (PPU) with a key task

3. Jean-Daniel Gardere is a former minister-counselor for economic affairs in Washington and director general of the French Oversea Trade Center. The original version of the book is in French and was released in October 2009. The English version was printed in August 2010.

of developing and modernising the payment systems in Cambodia. The development of a transparent, comprehensive and sound PSS is specifically endorsed by the Bank for International Settlements (BIS) as a guideline for the development of a national payment system. Oversight is an important component of the BIS- CPSS' Core Principles for Systemically Important Payment Systems (BIS-CPSS, 2005). The PPU of the NBC depends on data collected from banks through bank supervisors. The General Directorate of Bank Supervision of the NBC collects data from banks on a periodical basis. Liquidity challenges faced by a clearing bank are most likely to become apparent to the overseer through the daily settlement arrangements.

We assess the systemically important large-value payment system, in this case the NBC's clearing house, against 14 key principles for efficient FMI of the CPSS. However, the Cambodia's securities and securities cash settlement systems, which belong to the CSX, will not be assessed as part of the study. More specifically, the legal framework governing the issuance and holding of intermediated securities will not be reviewed.

Principle 1: Legal Basis

The NBC's clearing house should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities as defined by CPSS**.** The legal framework that governs the overall payment, clearance and settlement systems consists of a number of statutes and Prakas issued over the past one and a half decades.

The Law on the Organisation and Conduct (LOC) of the NBC was enacted on 26 January 1996, and amended on 29 December 2006. It details the central bank's role in the financial markets, its overall mission and duties, including the duty of overseeing payment systems in the Kingdom of Cambodia and of enhancing interbank payments.

The Law on Foreign Exchange (LFE) was enacted on 22 August 1997. It establishes the rules for foreign exchange operations related to payments for commercial transactions, transfers, or capital flows, including investment.

The Law on Banking and Financial Institutions (LBFI) was ratified in October 1999. It sets forth the acceptable activities of banks and specialised banks, among other items, revolving around bank operations and activities that banks perform on behalf of their customers, and securities-related activities.

The Law on Negotiable Instruments and Payment Transactions (LNIPT) was enacted on 19 September 2005. It recognises payment transactions in various forms and makes the most explicit pronouncement on the NBC's role in payment systems. It gives the NBC powers to "determine, formulate, adopt, publicly disclosed and oversee the implementation of a payment system policy, which shall be consistent with best international practice and standards and promote competition in the market for payment services consistent with overall stability of the financial system." It spells out clearly the drawing, form, presentment and payment of a cheque.

The LNIPT covers payment mechanisms and credit instruments. The bulk of the Law consisting of Chapters II to V is composed of two distinct main parts. One consists of Chapters II, III and IV that deal with negotiable instruments, namely, cheques, bills of exchange, and promissory notes. The second main part consists of Chapter V and covers payment transactions. Chapter I, containing general provisions, deals with the scope of the Law and provides the definitions applicable throughout the Law. Chapter VI spells out the administrative and criminal sanctions required to fight abuses in connection with negotiable instruments and payment instructions. Chapter VII contains final provisions, such as relating to the regulatory powers of the NBC and the relationship between this law and other laws.

The regulatory powers assigned to the NBC in Chapter VII are quite wide; they address all aspects required for the implementation of the Law and include powers in relation to consumer protection measures, the determination of standards for the performance of duties, the determination and modification of statutory time limits, rights and obligations in case of computer breakdown, and all matters relating to format of payment orders and instruments as well as communication, and account identification. This is on the top of the regulatory and licensing powers specifically assigned to the NBC in Articles 226 and 227 in relation to payment system policy and the operation of the payment system.

A number of regulations/Prakas have been issued to participants in order to clarify the regulatory requirements arising from each statute. In particular, the following Prakas have been issued by the NBC to clarify various statutory requirements:

- The Prakas on the Licensing of Microfinance Institutions, as amended by the Prakas B7-07-133, dated 27 August 2007, stipulates the acceptable banking operations for microfinance institutions. Similar to commercial banks, microfinance institutions can conduct banking operations as defined in Article 2 of the LBFI.

- The Prakas on the Clearing Systems, dated 2006, describes the NBC's role in regulating and overseeing payment clearing systems as well as setting the rules for governing the PSSs.

- The Prakas on the Control of Systemic Risk of Payment Systems, enacted on 8 November 2006, authorises the NBC to designate clearing and settlement systems as systemically important, assess whether the risk controls of such systems are adequate, and instruct the operators of those systems to take certain actions to adjust their levels of controls.

- The Prakas on Money Changer Licenses lays out licensing requirements for operators in the money changing business.

The NBC issued in 2009 the rules and procedures to guide participants in implementing the interim solution of the clearing house. This guidance of rules and procedures is being revised by the NBC in conjunction with the introduction of the full solution, which will provide guidance regarding the rights and obligations of each member and enable the members to understand the operations and functionalities of the clearing house.

Principle 2: Governance

The NBC's clearing house should have governance arrangements that are clear and transparent, promote its safety and efficiency, and support the stability of the broader financial system as well as other relevant public interest considerations and the objectives of relevant stakeholders, as defined by CPSS. The business of the clearing house may be augmented by an Operations Committee. Article 7 of the Prakas on Khmer Riel Denominated Clearing House provides a definition of the Operations Committee (OC) as consisting of one representative from each participating bank, and presided over by a Chair selected by the participants. The Chair shall serve a term of one year. Subsequent leaders will be nominated and elected by the participants in the Clearing house. The general provisions of the Prakas also stipulate functions and meeting regularity of the OC.

The Chairman of the clearing house in charge of its operations shall be designated by the NBC. The Chairman may delegate the supervision and control of the daily function to a Clearing House Leader. Both the Chairman and the Leader will be employees of the NBC. In the event of any dispute arising between the representatives of participating banks, when delivering or accepting payments or in connection with settlement amounts due to or from participants, the decision of the clearing house leader shall be accepted temporarily, subject to ratification by the chairman. In the event of the dispute continuing after settlement, it shall be resolved directly between the banks concerned.

The clearing house under the full solution still requires clear guidance stipulating the rules and procedures governing a wide variety of legal, business and operational issues and include the information required for the activity of participants in the clearing house. The new guidance on clearing house rules and procedures is being revised by the NBC. The guidance may include:

- General introduction of purposes, obligations, services, currencies, payment value limit and clearing facilities
- Membership of the clearing house
- Roles and responsibilities of the clearing house, management, members, and the operation committee
- Standard of cheques and payment orders
- Clearing house operation
- NBC account management
- Settlement process
- Financial balance
- Record keeping and reporting
- Fees, charges and penalties

Principle 3: Framework for Comprehensive Management of Risks

The NBC's clearing house should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks. The NBC issued a Prakas on the Control of Systemic Risk of Payment System in 2006. Article 2 of the Prakas provides NBC with full power to designate the clearing and settlement system as systemically important. Article 3 of the Prakas states that the NBC may enter into an agreement with, or issue instructions to, a clearing house or a participant of a designated clearing and settlement system, or both, in respect of:

- Netting arrangements;
- Risk sharing and risk control mechanisms;
- Certainty of settlement and finality of payment;
- The nature of financial arrangements among participants;
- The operational systems and financial soundness of the clearing house; and
- Such other matters that in the view of the NBC pertain to systemic risk.

Article 4 and 5 of the Prakas entitle the NBC with the right to issue instruction to the clearing house and its participants with regards to their operations that the NBC deems necessary pertaining to systemic risk and the ability to provide a secured or unsecured guarantee of settlement by participants; make liquidity loans to the clearing house; and act as the central counter-party to the participants.

While Article 11 of the Prakas stipulates the need for participants to comply with the obligations imposed under the Prakas and instructions issued by the NBC, Article 12 empowers NBC with the authority to enforce compliance through application to a court of competent jurisdiction for an order directing compliance with the provision, rule, instruction or request.

Principle 4: Credit Risk

A payment system may face credit risk from its participants, its payment and settlement processes, or both. The clearing house may carry credit risk when extending overdraft facility to its participants whose account balance held at the NBC falls short to meet its daily payment and settlement obligations. In this case, the NBC requires the borrowing bank to provide collateral to secure the borrowing.

The clearing house should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes**.** Normally, the NBC requires collateral for its exposure to banks in the form of certificate of deposits (CDs) placed in their other account held at the NBC. The clearing house needs timely information on the collateral valuation to frequently and regularly measure and monitor its credit risk. Requiring CDs as collateral could help ensure the clearing house have adequate information on the value of the collateral.

Settlements in the NBC's clearing house are on net basis. Representatives from each participating banks meet at the clearing house twice a day – first at 9:30 am and second at 3:30 pm – to clear their cheques. This practice provides participants with information to measure and monitor their current exposure. However, some forms of modeling or estimation are needed for measuring and monitoring future exposure.

Principle 5: Collateral

The NBC's clearing house that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks as defined by CPSS. All members of the clearing house are required to maintain balance in their account at the NBC for daily settlement of their position. The NBC provides overdraft facility to any banks whose account balance fall short for settlement. In this case, the NBC requires collateral from the banks for providing overdraft. This collateral can be in the form of CDs placed in their other account held with the NBC. Such collateral is considered low credit, liquidity, and market risks.

The clearing house should also set and enforce appropriately conservative haircuts and concentration limits. The PPU of the NBC is considering applying haircuts and concentration limits on this collateral and this consideration may be incorporated in the new revised rules and procedures of the clearing house.

Principle 7: Liquidity Risk

According to the CPSS, an FMI should effectively measure, monitor, and manage its liquidity risk. It should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions. Given the net settlement arrangement effective at end of day, the liquidity risk that could occur to the NBC's clearing house is considered limited. Plus, the NBC can provide sufficient liquid resources to the clearing house in both US dollar and Khmer riel to affect same-day net settlement of payment obligations.

However, the clearing house in Cambodia is divided into two – KHR cheque clearing service and USD cheque clearing service. In the case of KHR clearance it is considered as no apparent risk on liquidity since the NBC as the sole operator and facilitator of the clearing house is the ultimate supplier of KHR liquidity to the system. The issue of liquidity risk might arise on the USD clearance side should the settlement volume of USD cheque cleared get larger and larger in the future.

Principle 8: Settlement Finality

The NBC's clearing house should provide clear and certain final settlement, at a minimum by the end of the value date and, where necessary or preferable, it should provide final settlement intraday, as defined by CPSS. Net settlement arrangements of the NBC's clearing house are to be done through the transfers between accounts of members held at the NBC and settlement finality is to be done on the same day.

Principle 13: Participant-default Rules and Procedures

According to FMI principle, the NBC's clearing house should have effective and clearly defined rules and procedures for managing a participant default. The NBC's guidance of rules and procedures of the clearing house states that if a full member does not provide sufficient fund for its net debit settlement obligations arising from the clearing house operation within the time nominated for closure of the business day, then the NBC Settlement Accounting will inform the relevant senior management within the NBC who should authorise and coordinate remedial action, which may comprise one or more of the following options:

- Extension of settlement closing: the NBC may elect to delay the closure of the business day to provide additional time for the clearing member to arrange for settlement liquidity from another bank through the purchase and sale of qualifying financial instruments.
- Use of reserve assets: at its discretion, the NBC may agree to provide certain repurchase facilities for financial assets held as a component of the reserve asset requirement for a bank to enable that bank to meet its daily net settlement obligations.

- Provision of Overnight Overdraft Facilities: the NBC may make available certain limited overnight liquidity overdraft facilities with consequent disincentive fees and prices for such facilities to enable a full clearing member to meet its daily net settlement commitment.
- Unwinding of clearing: as a last resort, the NBC may order that the daily net settlement clearing is unwound with the effect that all items in the net clearing activity are reprocessed except that the items to or from (debit or credit) in respect of the failing full clearing member are excluded from the clearing for that day and from the resulting calculation of net settlement obligations.

Principle 17: Operational Risk

The clearing house should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfillment of the FMI's obligations, including in the event of a wide-scale or major disruption.

Principle 18: Access and Participation Requirements

The clearing house should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access as defined by the CPSS. The Clearing System Membership regulation promulgated by the NBC states that banks who have intention to be participants of the clearing house may submit applications for participation. Such banks, if qualified, will be approved for participation by the NBC on the first business day of the subsequent month. Banks who are not participants may be represented in the clearing house on their behalf by approved participants for purposes of clearing and settlement cheques. This relationship shall be announced and approved by letter of the NBC.

The clearing house rules and procedures determine the qualifications for participation in the system and departure from participation.

Principle 19: Tiered Participation Agreements

The clearing house can identify, monitor, and manage the material risks arising from tiered participation arrangements. Almost all banks and microfinance institutions are participants of the clearing house. There are no indirect participants. Therefore, the concern on any material risks that may arise from tiered participation arrangements can be eased.

Principle 21: Efficiency and Effectiveness

The current arrangement of the clearing house can be considered as broadly efficient and effective in terms of specification of the rules and procedures in meeting the requirements of its participants and in response to the current market demands.

Principle 22: Communication Procedures and Standards

The clearing house should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording. Representatives of participating banks send report of the list of cheque input by the presenting banks and report of the list of cheques received from the paying banks. Reports are provided in electronic format with a selection of these reports being printed for use at the NBC's clearing house.

Principle 23: Disclosure of Rules, Key Procedures and Market Data

The current rules and procedures of the clearing house are clear and comprehensive providing sufficient information enabling participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the clearing house.

4. Policy Implications

Despite the substantial progress made, Cambodia is still running behind countries in the region and lagging even further behind the developed countries in terms of payment system development. Clearly, there is a need to further develop the payment system in the country. Many lessons can be learned from the planning and design of payment systems in the developed and developing countries. In his paper, Andrew Sheng (1995) lists out a number of factors what to do and what not to do in the design of payment systems for a developing country. In addition, policy formulation should take into consideration market development and should balance between moving toward regional integration and readiness of the authorities in terms of capacity.

Furthermore, it was evident that Cambodia may have suffered indirect impacts of the global financial crisis in 2009. By indirect impact, I mean, the trade and real sector were affected that translated their effect on the financial institution balance sheet, but no direct impact on the financial system was identified. This may be due to the relatively less developed financial system and payment systems of the country. When payment systems become more developed in the future with better technology, faster settlement arrangement, and higher settlement volume and value, there will be stronger need in policy design to take into account its interconnection with monetary policy and financial stability of the country.

Cambodia's latest Financial Sector Development Strategy (FSDS), 2011-2020, incorporates steps to upgrade payment system in Cambodia. For instance, the introduction of the RTGS will be considered in the medium term after putting the "Full Solution" into operation enhancing the increased operations and settlements of high-value transactions in the market. The full solution phase of the clearing that incorporates the whole national payment systems, including electronic transfers to effect "delivery vs payment", ACH implementation, centralised settlement, defining settlement cash, introduction of direct credit operation, development of money market operations for US dollar/riel traders cash settlement, shared switch implementation, intraday settlement, and introduction of direct debit operation, has been commissioned. The law on the national payment system should be enacted.

The NBC has subsequently updated the road map for national payment system development. In terms of regulatory framework, the NBC's involvement in particular in the clearing house as operator and overseer is legally provided for by law. However, there is a need to further strengthen the operational rules and procedures to fully implement the full solution of the clearing house.

Policy should aim to address the immediate needs in the marketplace by considering the implementation of specific regulations for certain innovations, while working on a new, overarching national payment systems law. Once enacted, the national payment systems law can reduce or eliminate the need for the individual regulation. This is a very positive step toward a more comprehensive, broad-based approach to payment system regulation. A methodical step-by-step payment system development action plan provided for in the FSDS 2011-2020 takes care of the evolution of payment systems and addresses a number of components necessary for legal soundness – including clarity in terms of finality of settlement, especially in the case of insolvency. The law must ensure that the transactions are finalised and that there is no unwinding in the event of insolvency by a participant in the system.

Limitation of reliable data on other payment transactions other than the NBC's *Domain Name System* (*DNS)* clearing house makes it difficult to identify any direct linkages between the payment systems and monetary policy. The downward trend of velocity indicates that the rate of broad money growth is greater than the economic growth rates – reflecting the popularity of cash used in economic activities and the need to further develop the payment systems. Using velocity to reflect the efficiency of the payment systems in Cambodia can explain this linkage with qualification because it does not allow us to assess the efficiency of a relatively large-value payment system versus other retail payment systems separately. Future study can build from this to assess how efficient each payment system is. In addition, the current clearing house arrangement, which includes payment and settlement transactions of the other financial markets, will provide a better source for future study as well. Moving forward, as the new markets and their PSS develop, there will be stronger demands for further improving oversight capacity to capture the link between the PSS and monetary policy.

In conducting the test for correlation between Cambodia's PSS and financial stability, we assume that other payment systems' transactions other than those transacted at the clearing house have increased in the same manner as the clearing house's transactions. The result shows significant negative relationship between the clearing house turnover and the financial depth ratios. The relationship implies that risks of any disruption to the PSS could trigger financial instability. Therefore, it is important to review existing policies to mitigate risks. However, this interpretation is based on data of the clearing house only. The result and interpretation may, or may not, be different if future analysts attempt to use data of the country's payment systems as a whole. We leave it to future study when data become more available.

5. Conclusion

Cambodia's payment system is at an early stage of development lagging far behind other countries in the region. Cash remains widely used in the economy. There is increasing but limited use of cheques in business transactions. There are increasing uses of other payments tools such as credit cards, debit cards and electronic transfers from a very low base. The NBC's cheque clearing house is a DNS-type of PSS. It is considered as the most important PSS in the Kingdom. Its system is being enhanced in terms of technology and rules and procedures, and is upgraded from NBC's system only to a system that incorporates other payment systems developed outside of NBC.

The central bank plays an important role as operator, facilitator and overseer of the clearing house. The PSS in Cambodia are important building blocks in the establishment of a solid legal framework designed to underpin commercial activities and financial transactions. They set the grid for the development and enhancement of a market economy based on the rule of law. They are also building blocks in the development of statutory models for payment laws which others ought to be encouraged to consider for use elsewhere.

The payment system has interconnection with monetary policy and financial stability. This interconnection has gained more interests among policy makers. On top of the above- mentioned importance of the PSS, it is crystal clear that the payment system in Cambodia is well underway to be further developed to meet the future demand arising from new market development of the financial markets, such as money/interbank markets, stock markets, insurance markets, and pensions. When these markets are developed, there will be significant demand for a rapid and more efficient payment and settlement arrangement. It is necessary for the NBC to enhance its capacity in controlling, forecasting, and arranging liquidity provision to, or absorption from, the banking system, although it is very difficult at this stage to identify any direct linkage between payment system and monetary policy in Cambodia.

While developing this crucial aspect of macro-financial landscape, rigorous consideration and attention should also be paid to the stability of the financial system as a whole, for any incipient risk which can emerge from the Kingdom's payment system may trigger off financial instability through either visible or invisible propagation channels.

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Appendix

Data and Statistics

Table 5: Basic Statistical Data

	2005	2006	2007	2008	2009	2010	2011
Nominal GDP (in million USD using FX Rate End)	6,256	7,356	8,761	10,216	10,298	11,623	12,834
Population (in millions)	13.4	13.5	13.7	13.4	13.9	14.1	14.3
GDP per capita (in USD)	468.2	544.1	640.9	762.4	740.9	822.0	896.9
Exchange rate (End period)	4117	4058	4000	4108	4181	4048	4057
Exchange rate (Average)	4113	4055	4001	4063	4166	4056	4036

Table 6: Settlement Media Used by Non-bank

	2005	2006	2007	2008	2009	2010	2011
Currency in circulation (in millions riel)	1,282,144	1,599,550	1,989,737	2,294,775	3,001,602	3,098,628	3,771,652
USD in circulation *,**	2,803	3,548	4,477	5,028	6,461	6,889	8,367
Deposit by non-banks (Excluding bank to bank)**	963	1,402	2,479	2,521	3,320	4,313	5,193
Narrow Money (M1) (in millions riel)	1,322,788	1,657,686	2,052,008	2,399,567	3,120,191	3,220,917	3,956,210
Broad money (M2) (in millions riel)	5,024,914	6,942,262	11,310,681	11,858,907	16,228,311	19,476,806	23,654,675

* Amount of USD in circulation about 90% of total currency in circulation estimated by IMF cited in ADB working paper series 2008

** In million of USD.

Table 7: Settlement Media Used by Banks

	2005	2006	2007	2008	2009	2010	2011
Total Bank's reserve at NBC (in millions USD)	321	428	742	898	1,344	1,724	1,733
of which:							
required reserves	73	105	194	397	401	527	649
free reserves	248	322	548	500	943	1,197	1,084
Bank's deposits held at other banks (in million USD)	7	10	21	86	218	420	715
Bank's borrowing from central bank	0	0	51,794,156	107,773,692	22,511,613	0	548,916

Table 8: Institutional Framework

Categories	Institutions	Branches
Central bank	1	19
Banks	39	170
Domestic banks	13	100
Subsidiary banks	10	67
Foreign bank branches	9	3
Specialized banks	7	0
Microfinance institutions		
Licensed MFIs	33	68
deposit-taking MFIs	7	68
non-deposit-taking MFIs	26	0
Registered MFIs	31	0
Unregister micro credit operators*	60	

* Estimated number

Table 9: Volume & Value of Payment Instructions Handled by Selected Interbank Settlement Systems

	2005	2006	2007	2008	2009	2010	2011
Large-value payment system							
NBC's clearing house							
Volume of KHR checks transactions	18,078	20,050	23,646	32,116	31,287	32,854	34,742
Value of KHR checks transactions (in billion KHR)	502,833	682,416	859	1,371	1,319	1,627	1,821
Volume of USD checks transactions	199,847	260,327	331,568	413,367	420,440	485,189	558,894
Value of USD checks transactions (in million USD)	1,818	2,894	4,957	7,189	5,821	7,009	9,573
Retail payment systems	NA	NA	NA	NA	NA	NA	NA