ADBI Working Paper Series

Payment System in Indonesia: Recent Developments and Policy Issues

Ira S. Titiheruw and Raymond Atje

No. 149
September 2009

Asian Development Bank Institute

Ira S. Titiheruw is a research associate at the Centre for Strategic and International Studies, Jakarta. Raymond Atje is a senior researcher and head of the Department of Economics, also at the Centre for Strategic and International Studies, Jakarta. This paper was presented at the international conference Strengthening Payment Systems in Asia, jointly organized by ADBI, the Financial Research and Training Center of the Financial Services Agency of Japan, and Keio University in Tokyo on 10 February 2009.

The Working Paper series is a continuation of the formerly named Discussion Paper series; the numbering of the papers continued without interruption or change. ADBI's working papers reflect initial ideas on a topic and are posted online for discussion. ADBI encourages readers to post their comments on the main page for each working paper (given in the citation below). Some working papers may develop into other forms of publication.

Suggested citation:

Titiheruw, Ira S., and Raymond Atje. 2009. Payment System in Indonesia: Recent Developments and Policy Issues. ADBI Working Paper 149. Tokyo: Asian Development Bank Institute. Available: http://www.adbi.org/working-paper/2009/08/31/3323.payment.system.indonesia/

Asian Development Bank Institute
Kasumigaseki Building 8F
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

This paper describes the existing payment system in Indonesia, which is comprised of cash and non-cash payment systems. The non-cash payment system has evolved swiftly due to improvements in information technology and the resulting transition from a paper-based to a card-based system. With the development of e-money, it is already moving toward a paperless payment system. As the monetary authority in Indonesia, Bank Indonesia is responsible for regulating and safeguarding the smooth and efficient operation of the national payment system. In 2004, the bank revised the blueprint of the system, which was originally introduced in 1995 in anticipation of efficiency-related challenges and legal implications arising from economic and technological development. Although Bank Indonesia expects to be able to provide equitable access and offer consumer protection, potential benefits arising from technological advances to the payment system, such as access in remote areas, remains an issue for small- and medium-sized enterprises. This paper examines this issue closely, with an eye to making the payment system more inclusive. It also examines the impact of the recent global financial crisis on Indonesia's payment system. The authors found that the system has remained safe, secure, and reliable despite some minor liquidity problems experienced by small banks in the last quarter of 2008 as the effects of the global crisis began to penetrate the country's financial sector.

JEL Classification: E02, E42

Contents

1. INTRODUCTION

This paper's focus is on Indonesia's payment system, which is essentially a legal framework for transferring funds from one party to another. Over the years, it has evolved from a simple system involving money as a means of exchange to a more sophisticated system involving various institutions and related regulations (Bank Indonesia, 2007e). At the core of the national payment system are commercial banks and non-bank financial institutions (NBFIs), which function as payment system participants. Bank Indonesia, the country's central bank, serves as regulator; its main responsibility is to ensure that the payment system runs smoothly.

After the Asian 1997–1998 financial crisis, Indonesia's government decided to reduce its external debts and rely more on domestic financing to finance its budget. This policy has affected the flow of funds in that it tends to reduce the inflow of external funds. However, the new strategy has also resulted in financial deepening in Indonesia as government securities have dominated capital market since 2001. This issue will be elaborated upon further in Section 2. In Section 3, the authors discuss recent development in Indonesia's payment system.

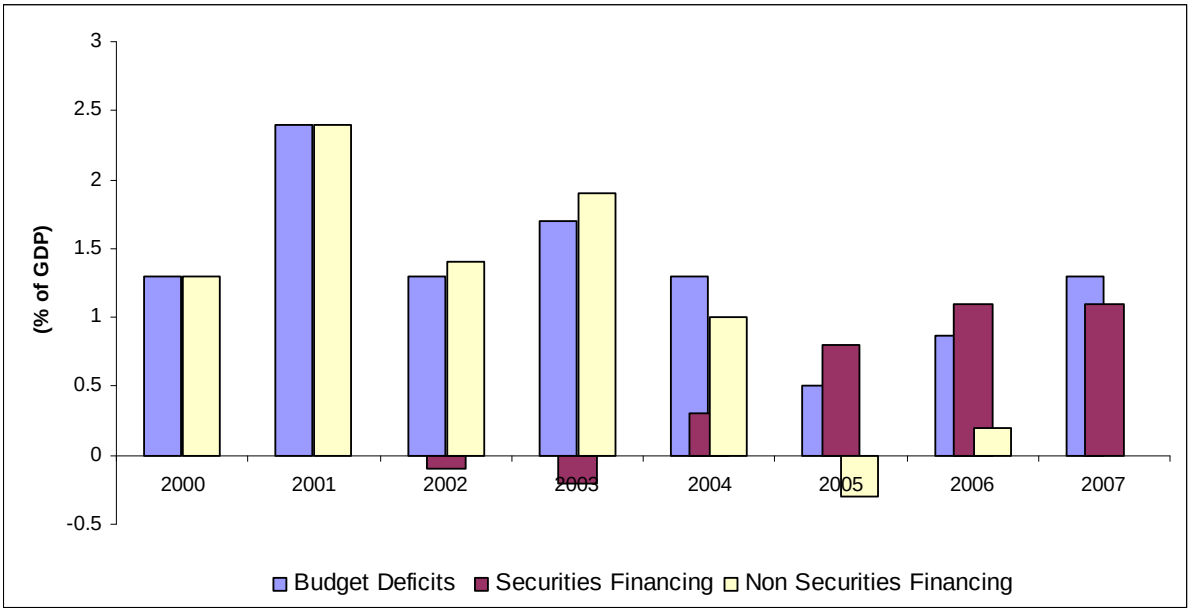
Section 4 explores how small- and medium-sized enterprises (SMEs) can benefit from technological advances to the payment system. In particular, it will be argued that SMEs in Indonesia have not been able to take advantage of recent improvements to the payment system to the extent they should have been. Finally, Section 5 analyzes the impact of current crisis on capital flows.

2. FLOW OF FUNDS

As the Indonesian economy continues its steady growth and, in many ways, becomes more integrated in the world economy, the development of a national payment system has received a lot of attention as a smooth payment system is crucial for almost all daily economic activities—between domestic parties and between countries.

Learning from the hard lessons of the Asian 1997–1998 financial crisis, the Government of Indonesia (GoI) pursued a new development-financing strategy that focused more on domestic and private sector financing (relying on the private sector for 85% of financing). Since 2005, government securities have also become a major source of financing for budget deficits. Figure 1 shows that since 2005, the government has relied on securities financing to close the budget deficit. The role of non-securities financing (e.g., privatization, external loans) dropped sharply from 2005 onwards.

Figure 1: Financing Source—Securities vs. Non-securities (% GDP)



GDP = gross domestic product.

Notes: (a) Preliminary 2007 data.
(b) Non-securities financing includes government revenues from privatization and other sources.

Source: Government of Indonesia (2008).

Several measures have been adopted to implement the new strategy. First, the GoI issued government securities to finance a banking recapitalization program in May 1999 (tradable on 1 February 2000). Then, toward the end of 2002, the government issued market-determined bonds for the first time to finance budget deficits. Consequently, the state budget became exposed to a market environment. Next, in 2004, the government issued its first international bonds. Table 1 shows domestic and international debt securities issued by the GoI and the Indonesian corporate sector (including financial institutions).

Table 1: Domestic and International Debt Securities—Amount Outstanding (billion USD)

	2006	2007	March 2008	June 2008
Domestic Debt Securities	77.2	85.6	85.8	82.1
Corporate	4.0	4.9	5.0	4.9
Financial Sector	3.7	4.4	4.4	4.1
Government	69.4	76.3	76.4	73.1
International Debt Securities	18.2	20.0	24.4	24.3
Corporate	0.2	1.4	1.4	1.4
Financial Sector	12.5	11.6	11.8	11.8
Government	5.5	7.0	11.2	11.2

USD = United States dollar.

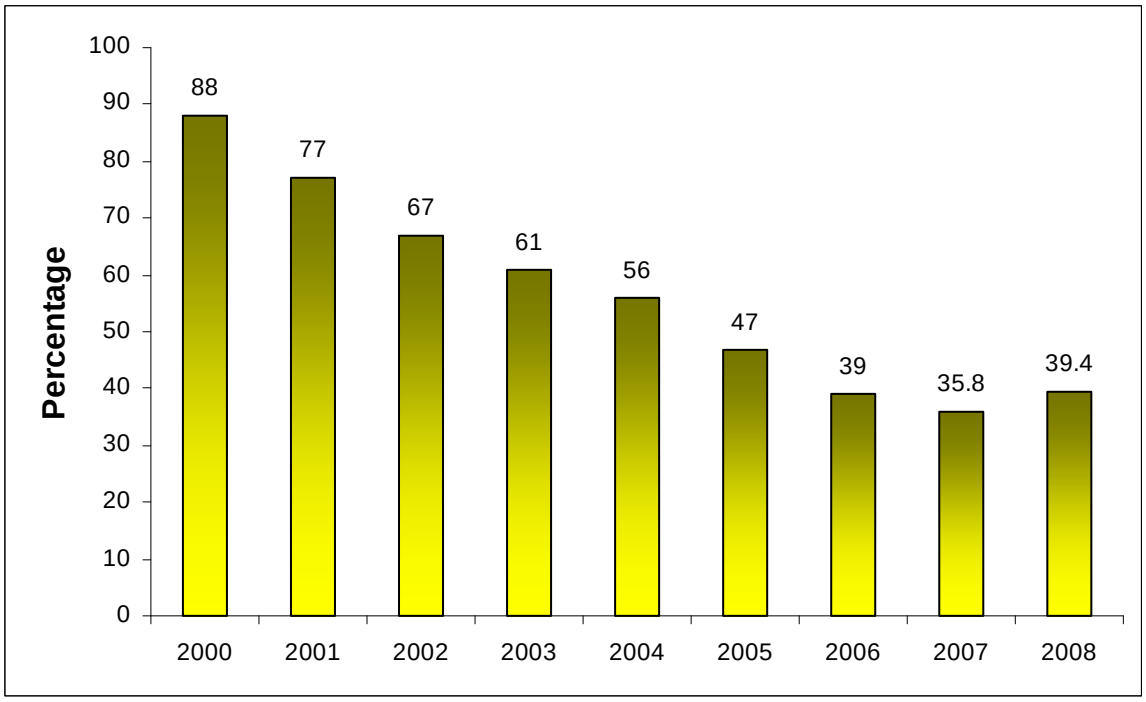
Note: calculated using period average exchange rate.

Source: Bank for International Settlements (2008).

Second, the GoI tried to reduce external debt by focusing on obtaining soft loans and grants, rather than commercial overseas loans. The ratio of outstanding government debt to gross domestic product (GDP) declined until June 2008, when it was recorded at 39.4%

(compared to 88% in 2000). This was the result of the negative growth of net external debt (see Figure 2).

Figure 2: Ratio of Government Debt to GDP, 2000–2008
(%)



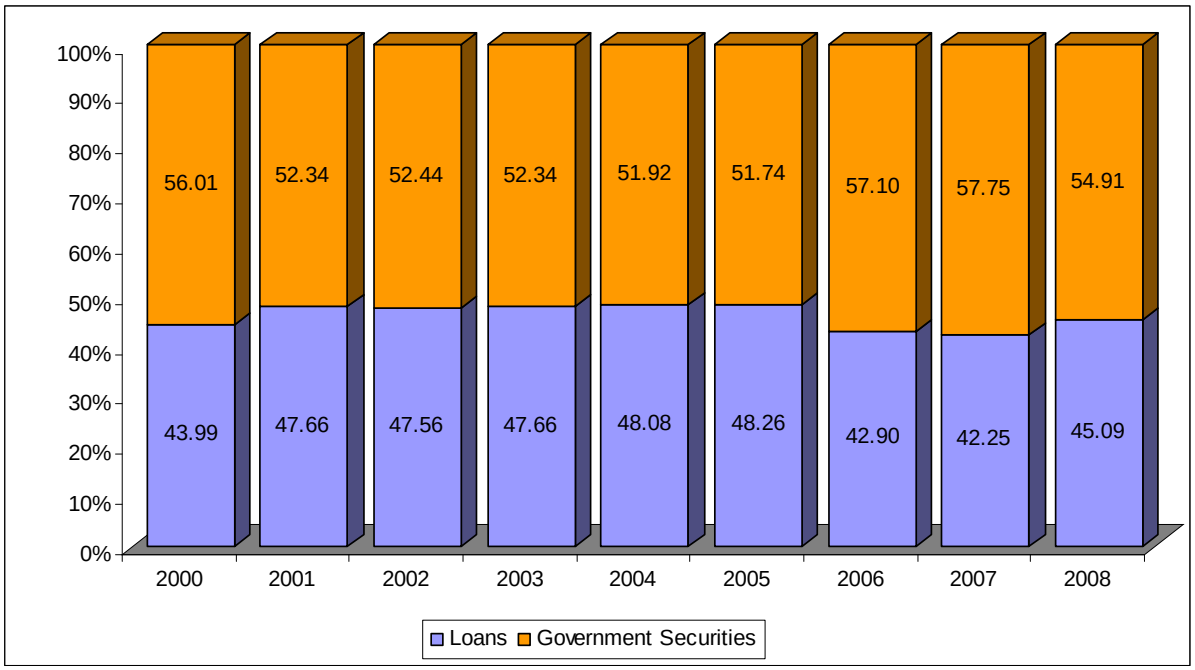
GDP = gross domestic product.

Note: 2008 data is preliminary (up to November 2008).

Source: Government of Indonesia (2008).

Net government securities have increased since 2005. Their apparent decline in 2008 was due to an increase in government loans, (obtained to finance bigger budget deficits in order to fight the impacts of the global financial and economic crisis). Government debt (up to November 2008) was distributed as follows (see Figure 3).

Figure 3: Government Debt Composition, 2000–2008
(%)



Note: 2008 data is preliminary (up to November 2008).

Source: Government of Indonesia (2008).

The above description of the current flow of funds in Indonesia shows that substantial changes have occurred due to the government's new development-financing strategy. The domestic capital market has grown in terms of both market capitalization (for equity and bonds) and daily transaction volume. In addition to the government's new strategy, which focuses primarily on domestic debt and private sector financing, an improved business and economic climate in the country has resulted in a significant increase in daily transactions. Table 2 shows how much the flow of funds in Indonesia has increased since 2000.

Table 2: Indicators of Fund Flow, 2000–2008

Indicator	Year								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
M2/GDP (%)	53.75	51.27	48.52	47.46	45.02	43.37	41.39	41.61	38.03
M2/Cash (%)	10.32	11.06	10.95	10.11	9.46	9.68	9.15	8.96	9.00
Market capitalization (% GDP) – equity market	18.68	14.53	14.73	22.86	29.62	28.88	37.41	50.35	21.73
Government outstanding bonds (% GDP) – bond market	-	26.44	23.02	20.04	17.51	14.41	12.54	12.10	10.61
Total trade (exports + imports) (% GDP)	58.73	54.43	44.96	39.84	46.23	50.39	44.31	43.76	52.37
Capital Flows (Inflows + Outflows)/GDP (%)	-	-	-	-	4.98	9.56	5.30	7.14	6.38
Remittances (US$ million)	-	-	-	-	-	4,462	4,500	4,833	5,464
Money market transaction-Interbank call money (average daily, in US$ million)	268.68	395.32	520.12	484.63	494.05	635.11	918.98	1,293.21	1,073.81

- = data unavailable, GDP = gross domestic product, M2 = money supply, including currency outside banks, demand deposits, and quasi money in rupiah and foreign currency.

Note: 2008 data is preliminary.

Source: CEIC Asia Database (available: http://www.ceicdata.com/Regional.html).

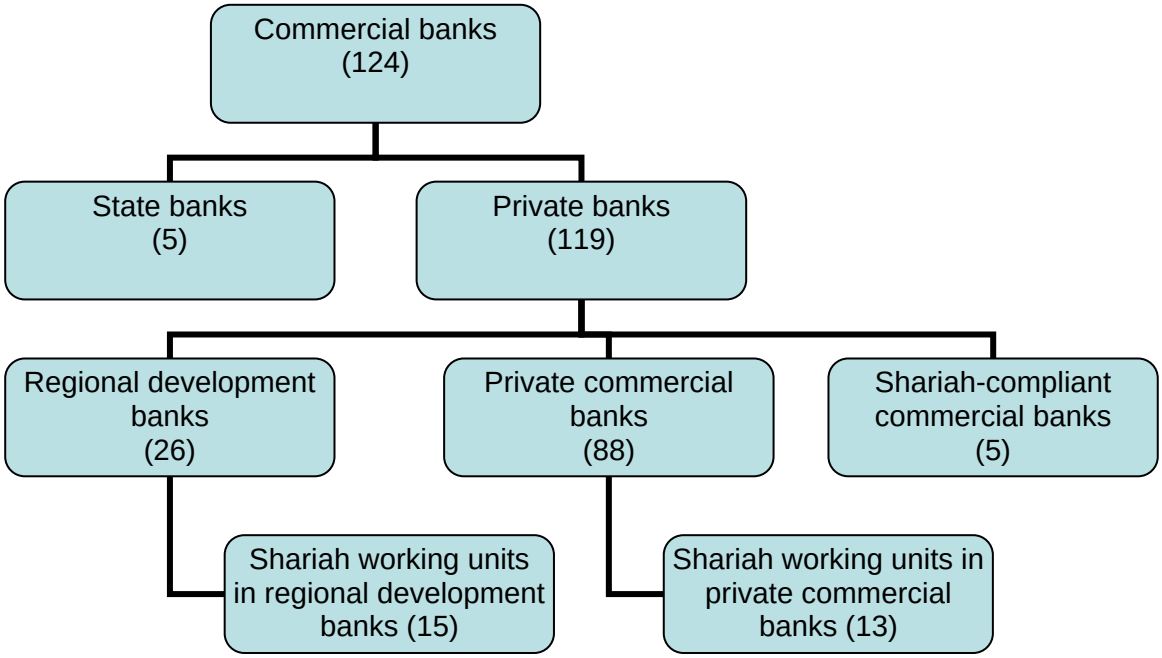
All indicators in Table 2 confirm that Indonesia's financial development has been experiencing progress, resulting in a higher volume of large value transactions and more-volatile flows of funds. The most recent data shows that total transactions have reached 46,000 trillion rupiah (Rp) (Bank Indonesia 2007f). This represents the highest transaction value in the previous 10 years. It is obvious that the increased number of transactions, volatility, and linkages between local and foreign financial markets—indicated by higher transaction values in export-import activities—necessitates a change in the policy guidelines to accommodate market requirements.

3. PAYMENT SYSTEMS

By definition, Indonesia's national payment system covers a legal and regulatory framework, as well as institutions and mechanisms for transferring funds to settle liabilities arising from economic activities (Bank Indonesia 2004). At the core of the system are commercial banks and NBFIs, which function as payment system participants. As of December 2008, there were 124 commercial banks under the supervision of Bank Indonesia: five state banks and 119 private banks (including foreign-owned institutions). Of the private banks, 88 were private commercial banks, 26 were regional development banks, and five were Shariah-compliant banks (see Figure 4). According to the latest data (March 2008), Bank Mandiri (a state bank) held the largest assets of any Indonesian bank, valued at Rp282.71 trillion. The second largest assets (Rp213.957 trillion) were held by Bank Central Asia, a private commercial bank. Other than these commercial banks, there were 1897 regional credit banks that were not members of the national payment system.[1] NBFIs comprise leasing companies, insurance companies, pension funds, and capital-market-related institutions, such as mutual funds and securities companies; all are under the supervision of the Badan Pengawas Pasar Modal and Lembaga Keuangan (Indonesia Capital Market and Financial Institution Supervisory Agency) (BAPEPAM-LK) and the Ministry of Finance.

[1] Regional credit banks can only accept a small number of regional loans and deposits as they typically have limited capital.

Figure 4: Indonesia: Commercial Bank Sector, 2008

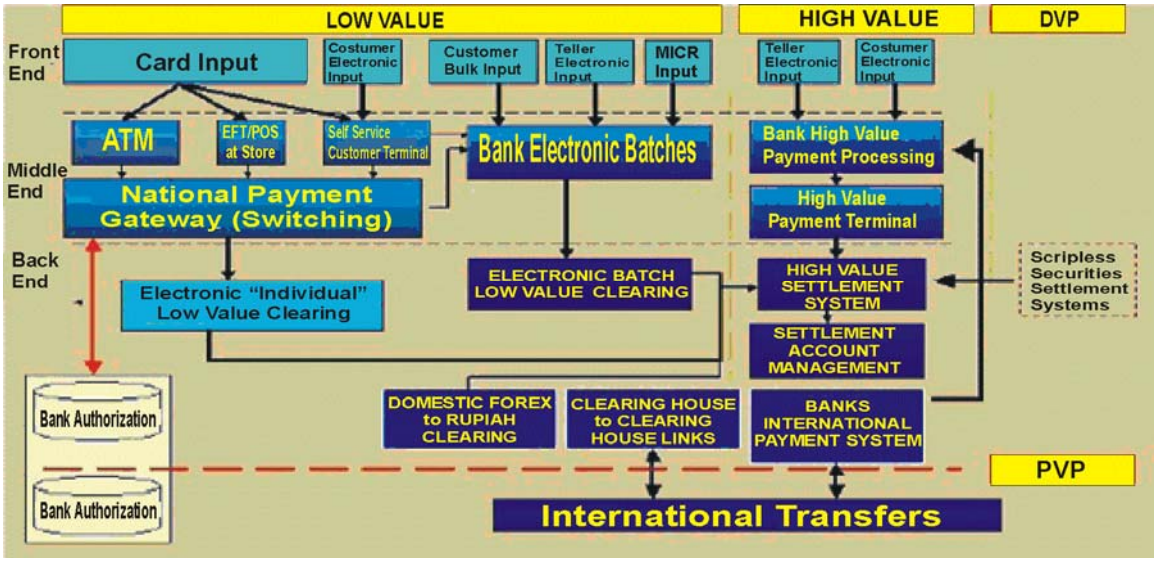


Source: Bank Indonesia (2008b).

Law 3/2004 states that the central bank (Bank Indonesia) is responsible for regulating the national payment system (Bank Indonesia 2004). Bank Indonesia is also responsible for further developing the national payment system in order to help ensure effective monetary policy and maintain the stability of the financial system. In recent years, efforts to develop the system have intensified as a result of changes made to the national payment system blueprint in 2004.[2] In addition to increased daily economic activity, an update to the system blueprint was necessary to accommodate: (i) more sophisticated technology, (ii) deeper regional cooperation among central banks, and (iii) stronger linkages between systems for retail and high-value payments. These factors led to innovative changes to the system, and to a shift in the preferred method of conducting payment transactions—from traditional means of payment such as cash, to safer, more-reliable, and more-accurate (non-cash) instruments. As a result of this shift, the use of paper-based instruments, such as demand deposits, and card-based instruments, such as credit cards, debit cards, and automated teller machine (ATM) cards has grown in popularity. In the future, payment instruments will become more sophisticated, eventually making possible a completely paperless payment system when combined with new high-tech and legal infrastructures. Figure 5 illustrates the amended technical architecture of the national payment system.

[2] The first blueprint was introduced in 1995.

Figure 5: Blueprint of National Payment System



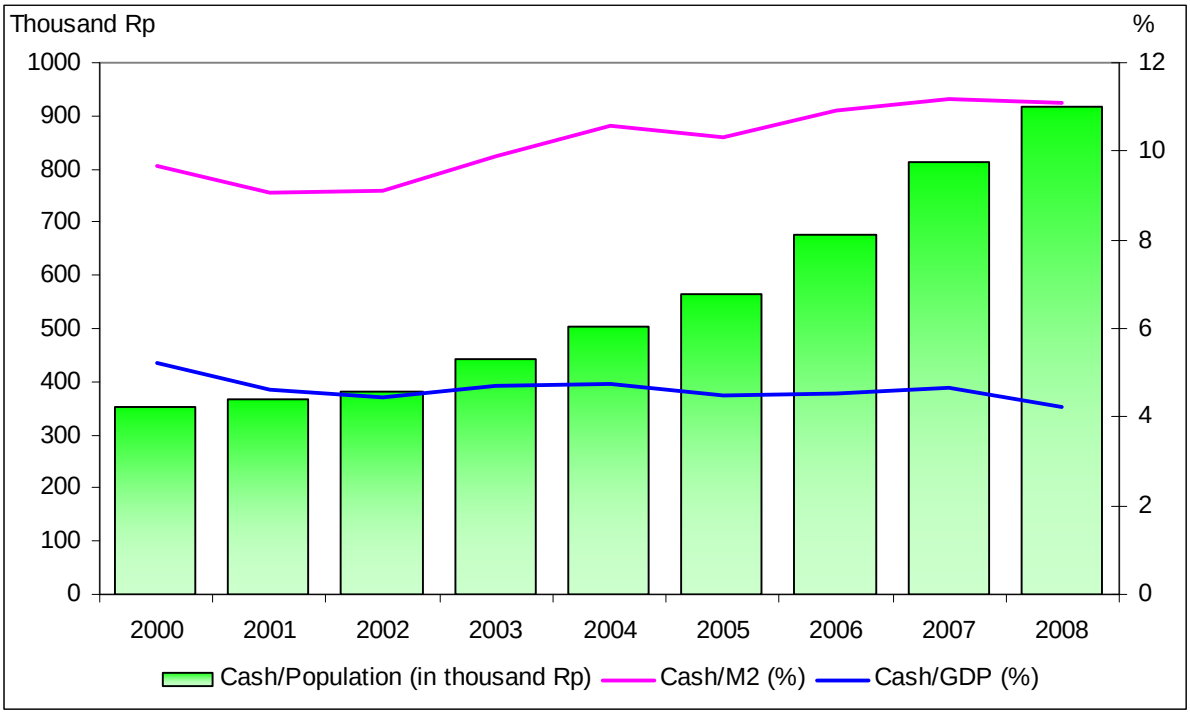
Source: Bank Indonesia (2004).

The new blueprint was intended to provide clear guidance for developing a reliable, efficient, accurate, safe, and effective national payment system. The 2004 amendments identify four areas of focus: low-value payments, high-value payments, linkages with the securities settlement system (delivery versus payment), and linkages with the international payment system (payment versus payment [PVP]). The low-value payment system is characterized by high transaction volume and routine, scheduled transactions of relatively low monetary value. The settlement of low-value payments is usually conducted through a clearing mechanism. Though the transaction value of paper-based payment instruments is less than 5% of inter-bank payments, its volume continues to increase—in 2008, the transaction volume of paper-based instruments grew 6.1% from 39–42 million transactions (Bank Indonesia 2009a). Conversely, the high-value payment system typically processes a low volume of high-value, potentially risky transactions. In the future, the central bank will develop the national payment system such that it can support settlements of multi-currency transactions by domestic and cross-border parties. The current clearing system and real-time gross settlement system (RTGS) are not able to accommodate these types of settlements efficiently. At this time, multi-currency transactions must be settled in rupiah, while cross-border transactions must be settled through bilateral relationships between banks in Indonesia and their counterparts abroad.

3.1 Cash Payment System

People still use cash instruments in Indonesia—mostly banknotes and coins. Cash cannot be completely replaced by non-cash instruments, particularly for low-value payment transactions. In 2008, the ratio of cash to money supply was 11.11 % (Bank Indonesia 2009a). Figure 6 below shows some indicators of cash instrument use in Indonesia.

Figure 6: Indicators of Cash Use, 2000–2008



GDP = gross domestic product, M2 = money supply, including currency outside banks, demand deposits, and quasi money in rupiah and foreign currency, Rp = rupiah.

Sources: CEIC Asia Database (available: http://www.ceicdata.com/Regional.html), Bank Indonesia (2009a).

Cash use in Indonesia during 2008 reached its highest level in 10 years. This was partly due to heavy inflationary pressure, which began in early 2008. Another contributing factor was the preoccupation of the country's political parties with the 2009 election, which was identified as the reason behind the increased number of fake banknotes and coins in circulation (16.6% higher than in 2007).

3.2 Non-cash Payment System

Indonesian banks and NBFIs provide non-cash payment services, and advances in technology have encouraged the development of non-cash payment instruments. Current options available for fund transfers, clearing operations, and settlements include paper-based (e.g., checks, drafts, and non-negotiable payment orders), card-based, and paperless (electronic) instruments. High value non-cash payments are processed by Bank Indonesia through the Bank Indonesia-Real Time Gross Settlement (BI-RTGS) system. For low value non-cash payments, the most common mechanism used is the interbank clearing process, currently known as the Sistem Kliring Nasional Bank Indonesia (SKBNI) (Bank Indonesia's national clearing system). High-value payments no longer always dominate the BI-RTGS, as bank customers have begun using the system for retail/low-value transactions. Bank customers, it seems, are willing to pay more (than for using Bank Indonesia's clearing system) to obtain more efficient, secure, and real-time access to BI-RTGS (Bank Indonesia 2009a).

Advances in technology have also facilitated the development of retail payment instruments, such as card-based instruments (e.g., credit cards, ATM cards, and ATM/debit cards) and e-money. In 2008, the transaction value of cash-based payments already exceeded clearing transaction values. Total transactions reached Rp48,000 trillion (an increase of 4.23% from 2007). About 92% of transactions were processed through BI-RTGS—4.5% through card-based payment systems and 3.5% through BI's clearing operations.

3.2.1 Paper-based Payment System

Checks, *bilyet giro* (an instruction presented to a bank to debit the issuer's account and credit another account—it cannot be cashed in), and *lalu lintas giro* (a paper-based credit transfer) are commonly used, but to some extent have been replaced by paperless electronic bank transfers administered by SKBNI or BI-RTGS. Nevertheless, between 2007 and 2008, there was 6.1% increase in paper-based transactions (from 39 to 42 million). The nominal value of these transactions rose 23.9% to 1,200 trillion in 2008.

Bank Indonesia's national clearing system, SKNBI, covers debit clearing and credit clearing, with settlements processed nationwide (Bank Indonesia 2007a). Clearing is an exchange of clearing documents (e.g., checks and direct debit orders) or of electronic financial data between clearing members, on behalf of a bank or customer, for which settlements are calculated at specified times. Based on Regulation 23/1999 (which was amended later in Regulation 3/2004), Bank Indonesia serves as both host and administrator of the clearing system for rupiah and foreign currencies. As administrator, Bank Indonesia can appoint a third party as interbank clearing administrator in regions where there is no Bank Indonesia representative office. Established in 2005, SKBNI provides national coverage through 108 clearing houses—37 operated by Bank Indonesia and the other 71 operated by Bank Indonesia-appointed commercial banks. Regional credit banks cannot act as clearing houses.

During 2007, the value of clearing transactions increased to Rp1,400 trillion, with an average daily transaction value of Rp5.62 trillion and an average daily volume of 319,000 (Bank Indonesia, 2007f). In 2008, the total value of transactions reached Rp1,664 trillion (an increase of 19.7%), with an average daily transaction value of Rp6.8 trillion (Bank Indonesia 2008a). The total volume of transactions in 2008 was 85.6 million with an average daily volume of 349,000. Table 3 shows how the value and volume of clearing transactions in Indonesia has changed since 2000.

Table 3: Value and Volume of Clearing Transactions, 2000–2004, 2006–2008

	Nominal Value (IDR billion)	Volume (in 000)	Average Value (IDR billion)
2000	7,323,698.00	75,518.00	96.98
2001	2,043,649.00	71,767.00	28.48
2002	1,550,206.00	72,932.00	21.26
2003	1,155,164.68	72,511.83	15.93
2004	1,188,022.24	67,619.08	17.57

Source: CEIC Asia Database (available: http://www.ceicdata.com/Regional.html).

	Nominal Value (IDR billion)	Volume (in 000)	Average Value (IDR billion)
2006	948,375.21	60,575.14	15.66
2007	1,359,936.65	77,763.78	17.49
2008	1,663,996.15	85,588.81	19.44

Source: Bank Indonesia (2009a).

Note: For 2005, the clearing transaction volume was 78.1 million (full data was unavailable for that year).

SKBNI comprises two subsystems: debit clearing and credit clearing. Debit clearing involves incoming and return clearing for interbank debit transfers supported by paper instruments, such as checks, *bilyet giro*, and debit notes. Debit clearing operates locally within each clearing area, and is carried out by the local clearing operator. This operator calculates the debit clearing result based on debit electronic financial data sent in by member banks. There is no limit on amount for fund transfers processed in debit clearing. Credit clearing involves the paperless processing of credit transfers between banks. The credit clearing operator (usually a special unit at Bank Indonesia's head office in Jakarta) processes credit transfers nationwide. The operator calculates credit clearing results on the basis of credit electronic

financial data (EFD) sent in by members. The maximum amount that can be processed through credit clearing is Rp100 million. Any transfers exceeding this limit must be processed through BI-RTGS.

The clearing system's settlement process occurs at the end of a specified period by offsetting liabilities against claims to produce a single net claim or liability to be settled for each bank account. In 2005, Bank Indonesia and participating banks established a failure-to-settle arrangement to handle cases in which a clearing member defaults on settlement obligations (Bank Indonesia 2009a). Under the failure-to-settle arrangement, SKNBI member banks are required to set up a pre-fund in their settlement accounts at Bank Indonesia. If a bank has a clearing deficit (i.e., payment obligations exceed claims), outstanding payment obligations are to be covered by the cash pre-fund provided by the bank. If the pre-fund is insufficient to cover the amount outstanding, the shortfall is to be covered by the demand deposit account held by the bank at Bank Indonesia. If available funds are still insufficient, the member bank may avail itself of the intraday liquidity facility for clearing. Finally, any remaining obligation can be covered by bank-held securities converted through a short-term funding facility.[3]

Checks and *bilyet giro* declined by the clearing process—mostly due to insufficient funds—result in the issuer being added to the national blacklist. Blacklisted individuals are banned from making transactions for a six-month period.

EFD is transferred twice daily for credit-clearing purposes: once at 08:15–11:30, and again at 12:45–15:30 (West Indonesia Time). For debit clearing, an exchange of EFD/bank drafts occurs daily at a time set by local clearing operators, with the proviso that data must be sent to the national clearing center by 15:30 West Indonesia Time.

The charge to member banks for debit clearing in areas capable of automatically sorting debit items is Rp1,500 per transaction. In areas that sort debit items manually, the charge is Rp1,000 per transaction. Credit clearing charges are Rp1,000 per transaction. Note that fees charged to bank customers are determined by the internal regulations of each bank member.

3.2.2 Card-Based Payment System

Card-based payment instruments comprise credit cards and account-based cards such as ATM and ATM/debit cards. In Indonesia, banks and NBFIs are permitted to issue credit cards, ATM cards, and ATM/debit cards—assuming they hold a license to do so from Bank Indonesia/the Ministry of Finance. In 2007, about 77.7% of card-based payment instruments in circulation were account-based cards, while the rest were credit cards and prepaid cards that were classified as electronic money (e-money).

Use of credit cards has increased significantly as more banks have begun to issue credit cards (mostly Visa International and MasterCard). In December 2008, the number of credit cards issued reached 11.5 million, a 25% increase from 2007. 19 banks and five NBFIs were issuing credit cards as of 31 December 2008. The total transaction value of credit card use between 2007 and 2008 increased by 47.4% to Rp107.3 trillion, while the volume of transactions jumped 28.7% to 166.7 million (see Table 4).

Table 4: Nominal Value and Volume of Credit Card Transactions, 2006-2008

	Nominal Value (IDR billion)	Volume
2006	57,344,084.81	113,902,401
2007	72,776,111.15	129,535,742
2008	107,113,855.13	166,702,597

Source: Bank Indonesia (2009a).

[3] See Section 5.

An account-based card is a payment instrument for which funds are instantly deducted from a customer's account balance. The ATM card was first introduced in Indonesia in 1995. The card was originally intended simply to replace services provided by bank tellers, so its early functions were limited to cash withdrawal, checking of account balances, and intrabank transfers. Later, as the ATM network infrastructure became more sophisticated, it became possible to support interbank fund transfers. Banks now also offer other features to customers with ATM cards, such as the ability to make regular payments (e.g., for electricity, water, and telephone service). In addition, banks have been installing electronic data capture machines at many points of sale, including shops, supermarkets, and other merchants. With this development, ATM cards can now function as debit cards.

According to a Bank Indonesia survey conducted on public (and service provider) perceptions, preferences, and behaviors regarding non-cash payments, customers preferred using ATM/debit cards for the security and convenience of not having to carry large amounts of cash (Bank Indonesia, 2007f). Merchants and service providers also preferred ATM/debit cards, for the reason that, unlike with credit/charge cards, funds are transferred to their accounts on the day of the transaction. In 2008, the number of account-based cards reached 42.8 million, up 21.6% from the 35.2 million cards in circulation in 2007. The total nominal value of transactions using account-based cards rose 22.4% in the same period, from Rp1.679 trillion in 2007 to Rp2.056 trillion in 2008. The total transaction volume increased by 22.7%, from 1,103 transactions in 2007 to 1,353 in 2008.

On 13 April 2009, Bank Indonesia issued a new regulation on the conduct of card-based payment systems (Bank Indonesia 2009b), which included ATM, debit, and credit cards. (A separate regulation was issued for e-money—see 3.2.3 below.) The regulation states that all issuers of card-based payment instruments (i.e., banks and NBFIs) are required to obtain a license from Bank Indonesia. Banks and NBFIs that were already issuing and administering card-based payment instruments according to the previous regulation (Bank Indonesia 2005) are only required to submit a few additional documents as defined in BI Circular Letter no. 11/10/DASP (Bank Indonesia 2009a). With regard to credit cardholders, the regulation stipulated a minimum age (21 years old), a minimum monthly income, and maximum (income-based) credit limits. To improve security and curb credit card fraud/crime, Bank Indonesia has called for a full migration to chip-based cards by the end of 2009. With regard to ATM cards, the regulation set a maximum daily limit on fund transfers between accounts using ATM machines of Rp25 million per account. A daily limit of Rp10 million per account was set on cash withdrawal from ATM machines (by ATM or credit card).

3.2.3 E-Money

E-money instruments, in the form of prepaid cards, were introduced in Indonesia in mid-2007. By 2008, the number of e-money instruments—both chip-based and server-based—had already reached 430,000, accounting for a transaction value of Rp76.7 billion and a volume of 2.5 million transactions. As of the end of December 2008, there were nine e-money issuers: five banks and four NBFIs.

According to a new regulation on e-money, issued by Bank Indonesia on 13 April 2009 (Bank Indonesia 2009c), the e-money classification is to be based on whether or not an e-money holder's personal identity must be registered. Previously, the e-money classification was based on its purpose (i.e., multipurpose or single purpose). Issuance of e-money by banks or NBFIs must be licensed by Bank Indonesia. For NBFIs, licenses will only be approved if the minimum float fund of Rp1 billion has been met (Bank Indonesia 2009c). The new regulation also stated that the maximum nominal value of unregistered e-money is limited to Rp1 million per person (Rp5 million for registered e-money)—and must be in rupiah. In addition, primarily to deter money laundering, Bank Indonesia's circular letter set a monthly limit for e-money transactions of Rp20 million. This amount includes payment transactions, fund transfers, and other types of transactions offered by the issuers.

3.2.4 High-Value Payment System

The high-value payment system typically handles a low volume of high-value, high-risk transactions requiring fast and secure settlement. This is usually achieved via a real-time settlement mechanism, such as the BI-RTGS system. Launched in 2000, and designed and operated by Bank Indonesia, the BI-RTGS mechanism is an electronic fund transfer system that enables real-time settlement (in rupiah) of individual transactions (Bank Indonesia 2007b). Member accounts may be debited or credited multiple times in one day, as per payment orders and incoming payments. With the BI-RTGS system, senders use RTGS terminals in their offices to transmit payment instructions to the RTGS central computer at Bank Indonesia for settlement processing. If settlement is successful, the payment is electronically forwarded to the receiver in an automated procedure. Successful completion of settlement requires BI-RTGS members have a sufficient balance in their accounts at Bank Indonesia before transferring funds to other BI-RTGS members. To manage any intraday gaps, Bank Indonesia provides a clearing intraday liquidity facility where banks can deposit Bank Indonesia certificates (SBI) or government bonds administered by Bank Indonesia.

About 95% of financial transaction settlements are conducted through BI-RTGS. The system is used primarily for high-value payments such as interbank money market transactions, capital market transactions, foreign exchange, payments to the government (e.g., income tax), and transfers between Bank Indonesia accounts. The BI-RTGS is categorized as a systematically important payment system, while the SKBNI, described above, is classified as a system-wide important payment system. When the BI-RTGS was introduced, there were 75 participating banks. By 2008, there were 154 members, including the central bank, commercial banks, and NBFIs.

Bank Indonesia conducts RTGS transactions during weekdays from 6:00 to 16:30 Jakarta Time. For bank customers, RTGS transactions can be handled during time windows set by each bank. The cap on daily clearing transactions, set by Bank Indonesia in October 2002, is currently Rp100 million. This cap will eventually be lowered to minimize the risks associated with using net settlement in the clearing process.

Bank Indonesia charges the same transaction fees to all BI-RTGS members: Rp7,000 for transactions made before 15:00 and Rp14,000 after 15:00. Charges applied to customers depend on each member bank's policy. It is mandatory, however, for each member bank to announce the breakdown of these fees to its customers (i.e., how much Bank Indonesia charges the bank and how much the bank charges its customers).

The total value of transactions settled through BI-RTGS in 2008 was Rp39.9 trillion. This represents a 7.7% decline from the 2007 value of Rp42.9 trillion. The total volume increased slightly from 8.611 million to 10.39 million transactions (a 19.7% increase). The average daily RTGS transaction value was Rp184.2 trillion, while the average daily volume reached 43,200. See Tables 5 and 6 below for more detail.

The decline in the value of BI-RTGS transactions was due to a drop in interbank money market transactions (-28%) and in capital market transaction settlements (-23%). The worsening global financial crisis was also a factor.

Table 5: RTGS Transaction Volume, 2004–2008
(million Rp)

Year	Customers	Interbank Money Market	Government	Monetary Authority	Others
2004	3,659,687.00	106,171.00	147,504.00	80,366.00	1,034,781.00
2005	4,498,715.00	114,815.00	149,780.00	50,721.00	1,128,367.00
2006	5,289,787.00	131,984.00	174,767.00	53,275.00	1,179,152.00
2007	6,821,628.00	148,992.00	244,956.00	46,757.00	1,384,806.00
2008	8,598,849.00	111,835.00	351,644.00	55,075.00	1,273,584.00

Rp = rupiah, RTGS = real-time gross settlement system.

Source: Bank Indonesia (2009a).

Table 6: RTGS Transaction Value, 2004–2008
(million Rp)

Year	Customers	Interbank Money Market	Government	Monetary Authority	Others
2004	3,692,686.16	2,163,199.79	677,294.06	12,418,189.85	4,424,814.26
2005	4,655,071.37	3,008,182.23	755,681.19	6,329,525.82	5,432,960.34
2006	5,026,786.53	4,152,030.34	973,395.33	10,020,478.52	8,495,793.65
2007	7,174,072.00	5,955,650.42	1,191,935.26	15,670,744.18	12,933,570.19
2008	8,554,210.03	4,201,032.86	1,536,017.88	12,857,287.89	12,772,195.80

Rp = rupiah, RTGS = real-time gross settlement system.

Source: Bank Indonesia (2009a).

3.2.5 Scripless Securities Settlement Systems (Bank Indonesia 2006)

The first stock exchange in Indonesia was established in 1912 during the Dutch colonial era. The GoI reactivated its capital market in 1977. See Appendix 1 for a brief history of Indonesia's capital market.

The institutional organization of the capital market consists of BAPEPAM-LK and three "self-regulatory organizations:" Bursa Efek Indonesia (Indonesia Stock Exchange), Kliring Penjaminan Efek Indonesia (Indonesian Clearing and Guarantee Corporation), and Kustodian Sentral Efek Indonesia (Indonesian Central Securities Depository).

As of 31 December 2008, market capitalization amounted to Rp1.68 quadrillion, comprising stock capitalization (Rp1.08 trillion), corporate bonds (Rp72.98 billion), and government securities (Rp5.26 trillion) (see Table 7). While equity market capitalization declined in 2007–2008, the average daily transaction value rose by 4.17%, from Rp4.27 trillion to Rp4.45 trillion. The average daily transaction volume dropped by 22.34% to Rp3.28 billion.

Table 7: Capital Market Capitalization, 2000–2008 (billion Rp)

	Market Capitalization			Total
	Equity	Corp. Bonds	Govt Bonds	Capitalization
2000	259,621.00	19,891.41	31,634.88	311,147.29
2001	239,271.00	19,236.59	64,654.28	323,161.87
2002	268,776.60	20,205.28	397,967.17	686,949.05
2003	460,366.00	45,465.01	390,482.24	896,313.25
2004	679,949.10	61,300.20	399,304.20	1,140,553.50
2005	801,252.70	62,891.34	399,859.31	1,264,003.35
2006	1,249,074.50	67,805.54	418,751.20	1,735,631.24
2007	1,988,326.20	84,653.03	475,577.78	2,548,557.01
2008	1,076,490.53	72,979.44	525,694.73	1,675,164.70

Source: Badan Pengawas Pasar Modal and Lembaga Keuangan (2008).

Prior to 2007, both corporate and government bonds were listed on the Surabaya Stock Exchange;[4] as of 1 January 2007, both bonds were listed on the Indonesia Stock Exchange. Trading in corporate bonds weakened during 2008, recording a 23% drop from the Rp68.72 trillion reported in 2007. The average daily transactions of corporate bonds were valued at Rp279 billion in 2007. In 2008, the number dropped to Rp218 billion per day (a 22% decline) as a result of foreign investors pulling out of capital markets in emerging economies.

In the current capital market,[5] government bonds continued to dominate. Nevertheless, due to the economic slowdown and recent trouble in global stock markets, trading in government bonds has weakened by 23% compared to 2007. The average daily transaction value has fallen 22%, from Rp5.02 billion in 2007 to Rp3.91 billion at the end of 2008. The Ministry of Finance's latest data on government bonds, covering up to October 2008, is illustrated in Table 8.

Table 8: Domestic Government Bonds, 2002–2008 (trillion Rp)

	2002	2003	2004	2005	2006	2007	2008
Tradable	394.1	390.5	399.3	399.8	418.8	477.7	537
Zero Coupon	-	-	-	-	-	14.7	27.3
Fixed Rate	154.5	159	178.7	189.2	238.6	294.5	354.9
Variable Rate	239.6	231.4	220.6	210.7	180.2	168.6	154.8
Non Tradable	264.3	259.6	253.6	258.8	274.4	259.4	258.2
SU	236.2	245.3	250.9	258.8	274.4	259.4	258.2
Hedge Bonds	28.1	14.3	2.7	-	-	-	-

Note: 2008 data is up to October 2008.

Source: Government of Indonesia (2008).

Table 9 shows that banks and non-bank institutions have accounted for almost the same share of tradable government bonds in recent years.

[4] Prior to 2007, the Jakarta Stock Exchange Market was considered Indonesia's equity market, while the Surabaya Stock Exchange dealt with corporate and government bonds.

[5] As of October 2008.

Table 9: Tradable Government Securities, 2002–2008
(trillion Rp)

	2002	2003	2004	2005	2006	2007	2008
Banks	348.4	321.54	287.56	289.65	269.11	268.65	265
-Recapitalized State Bank	228.18	194.98	158.84	154.50	152.76	154.67	
-Recapitalized Private Bank	105.19	97.19	95.14	85.38	80.79	72.63	
-Non-recapitalized Bank	13.83	27.29	32.40	45.79	32.78	35.37	
-Recapitalized Regional Development Bank	1.21	2.07	1.18	3.96	2.78	5.97	
-Shariah-compliant Bank							0.73
Bank Indonesia				10.52	7.54	14.86	25.62
Ministry of Finance	0.87						
Non-bank Institutions	44.78	68.95	111.74	99.67	142.09	194.24	243.84
-Mutual Funds	35.72	41.38	53.98	9.12	21.43	26.33	33.54
-Insurance	6.51	16.68	27.08	32.30	35.04	43.47	55.60
-Foreign	1.04	6.06	10.74	31.09	54.92	78.16	86.42
-Pension Fund	0.36	3.83	16.42	22.02	23.08	25.50	33.15
-Securities	0.13	0.25	0.43	0.46	1.00	0.28	0.67
-Others	1.02	0.75	3.08	4.68	6.63	20.50	34.47
Total	394.05	390.48	399.30	399.84	418.75	477.75	534.46

Notes: (a) 2008 data covers up to 30 November 2008.

(b) Empty cells indicate that detailed data on banks holding tradable government securities were not available at the time of writing.

Source: Government of Indonesia (2008).

Corporate and government bonds are mostly traded in the over-the-counter market. As Law 24/2002 stipulates, Bank Indonesia is responsible for the administration of government securities in the primary and secondary markets (Bank Indonesia 2006). This responsibility includes ownership registration, clearing and settlement, and payment of interest and principal to the paying agent.

In February 2004, as the central registry for government bonds, Bank Indonesia introduced the Scripless Securities Settlement System (BI-SSSS). BI-SSSS provides a facility for financial market players to make transactions with Bank Indonesia, such as funding for banks, and trades in SBIs and government securities. BI-SSSS provides depository, matching, and settlement services for trades in SBI and government bonds and securities. BI-SSSS is an integrated, automated registry system that connects Bank Indonesia (the central registry) with sub-registries and with its other direct clients.

Settlement through BI-SSSS is conducted on a delivery versus payment basis using the following process:

(i.) Buyer and seller input settlement instruction details at a BI-SSSS terminal, which are sent to the BI-SSSS central computer (SCC).

(ii.) The SCC starts the instruction-matching process. If buyer and seller instructions match, the system checks if there are sufficient securities in the seller's account.

(iii.) If there are sufficient securities, the system sends the payment request to the BI-RTGS system to check the availability of funds in the buyer's or paying bank's account. If there are insufficient funds, the transaction request will queue; otherwise, the buyer's account is debited and the seller's or seller's paying bank's account is credited. The current queue time is set for four hours. After that time, or at the end of the day, the pending request is cancelled by the system if there are still insufficient funds to make the transaction.

(iv.) The SCC transfers ownership of securities after receiving payment confirmation from the BI-RTGS system.

Settlement is carried out on the same day unless instructions arrive at the SCC after 17:00 Jakarta Time. There is no central counterparty in a government bond transaction. If one party fails to settle, the transaction is rendered void.

Corporate bond transaction settlement involves its own specific procedures. For over-the-counter fixed-income securities, the computer system displays bid and offer quotations, as well as revised quotations and cancellations during trading hours (Monday–Thursday, 9:30–12:00 and 13:30–17:00; and Fridays, 9:30–11:30 and 14:00–17:00 Jakarta Time. Transaction settlement is conducted two days after trading day (T+2). For corporate bonds, the Kustodian Sentral Efek Indonesia (Indonesian Central Securities Depository) (KSEI) performs the role of central registry and handles securities settlement.

For shares, there is yet another settlement process. KSEI (2009) uses the Central Depository and Book Entry Settlement System for share transaction processing (whether or not the issuing company is listed on the Indonesian stock exchange). Trading on the stock exchange is divided into four markets: (i) the regular market, for which settlement takes place on T+3; (ii) the immediate market, for which settlement is conducted on T+1; (iii) the cash market, for which settlement is carried out on the same day (T+0); and (iv) the negotiated market, for which the timing of settlement is decided by the seller and buyer. Securities transactions are, by definition, "locked-in," with the understanding that they are to be settled according to market category. At the end of each day, data on stock exchange trading is delivered to the Kliring Penjaminan Efek Indonesia (Indonesian Clearing and Guarantee Corporation) (KPEI), where it is settled through a netting process. KPEI guarantees trading outcomes, with the exception of those in the negotiated market. On the designated settlement date, KSEI processes regular-market, immediate-market, and cash-market transactions that have undergone the netting process at KPEI. KSEI also processes negotiated-market trading on a per transaction basis. The process of cash settlement for stock exchange transactions is conducted by appointed payment banks.

The different types of payment systems in Indonesia are summarized in Appendix 2.

4. PAYMENT SYSTEM AND SMALL AND MEDIUM ENTERPRISES

According to data released in 2008 by the Central Bureau of Statistics and the Ministry of Cooperatives and Small and Medium Enterprises, the number of SMEs in Indonesia has reached 49.8 million. As of 2007, SMEs in Indonesia had employed 91.8 million workers, and had contributed about 20% of non-oil export value and approximately 53.6% of GDP (Kementerian Negara Koperasi dan Usaha Kecil dan Menengah Republik Indonesia 2008). Most SMEs in Indonesia are domestic-market oriented and approximately 80% do not have access to the banking system—they used their own capital and/or take out loans from non-banking institutions.

Ideally, access to the benefits derived from improvements to the country's payment system should be universal. Whether or not Indonesia's SMEs have been benefiting from such improvements is an empirical question. To the authors' knowledge, no research has yet been done to address this question. Nevertheless, anecdotal evidence (outlined below) suggests that SMEs have not been able to take full advantage of recent developments to the payment system.

First, as noted, commercial banks and NBFIs form the core of the national payment system. SMEs (small enterprises in particular), however, are not able to access all the services provided by these institutions. For instance, SMEs may be able to transfer money through banks, but many of them still use cash for most of their business activities. Bank Indonesia

has identified two reasons for this: (i) low availability of payment instruments accessible by SMEs, and (ii) weak payment and customer service infrastructures (e.g., communication networks and information technology systems). Other problems stem from the public's lingering distrust of non-cash payments.

Second, despite the fact that SMEs can achieve substantial savings by moving to electronic payments—in actual transaction costs and productivity gains—many SMEs have been slow to do so. Some make individual payments via internet banking, but few have fully automated the payment process. One reason is that few SMEs have computers (20% in 2007) (Wahid and Indarti 2007). Another reason is that computer literacy among SME staff is relatively low.

According to the most recent data (Ure 2008), around 40% of the Indonesian population uses (mostly prepaid) mobile phones—this number represents a 30% increase in mobile phone subscriptions from 2007 Mobile payment systems have great potential in Indonesia, as they would be accessible to people in rural areas where ATM machines are difficult to find. The option of mobile payment would also allow people without bank accounts to make payment transactions. A key challenge to progress, however, is a lack of legal infrastructure. For example, it took until 2008 for the first law on electronic information and transfers to be enacted (Bank Indonesia 2009a). Other problems in developing this type of payment system are due to banking sector delays in adopting "know-your-customer"[6] guidelines (Bank Indonesia 2003) (although these have been made mandatory by Bank Indonesia to prevent money laundering) and mobile network organizations' reluctance to make registration compulsory for prepaid subscribers. The latter has resulted in a lack of customer protection, as mobile network organizations cannot disable fraudulent subscriber identity module (SIM) cards.

5. IMPACT OF THE CURRENT CRISIS ON CAPITAL FLOWS AND PAYMENT SYSTEMS

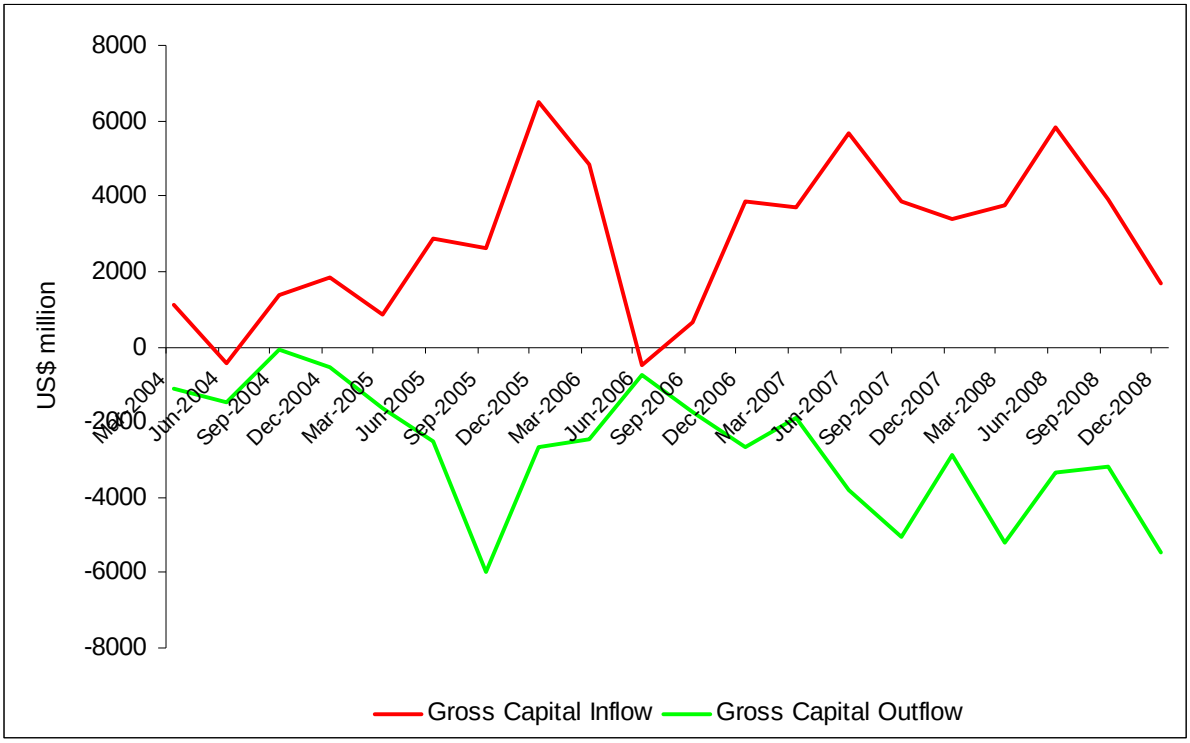
Until recently, many people supported the "decoupling"[7] myth. Now, however, it is recognized that no country will be left unscathed by the current global crisis. As the worst may still come, some of the data presented here is very preliminary, even for determining the overall impact of the global financial and economic crisis on the Indonesian economy. Since Indonesia's development financing relies on debt securities and the private sector, it is very vulnerable to external shocks that disrupt foreign capital flows. Most foreign funds in Indonesia's financial market are invested in short-term instruments (that mature less than one year) and could flow out of the country easily.

Figure 7 illustrates Indonesia's gross capital inflows and outflows in 2004–2008. Since June 2008, the country has experienced a downward trend in gross capital inflows due to foreign investors' declining appetite for emerging market financial assets. In terms of gross capital outflows, other investment assets contributed to volatility toward the end of 2008. These recorded large deficits at the end of December 2008 as a result of increases in Nostro accounts (domestic banking accounts in foreign banks), whereas in the third quarter of 2008, these assets had booked a surplus (Bank Indonesia 2008a).

[6] In 2001, Bank Indonesia issued a regulation on the implementation of "Know Your Customer" principles (PBI no. 3/10/PBI/2001). Banks are required to implement these principles, which consist of policies and procedures to approve and identify customers, monitor customer accounts and transactions, and apply risk management policies. By obtaining customer profiles and transaction characteristics, banks will be able to identify suspicious transactions and report these to Pusat Pelaporan dan Analisis Transaksi Keuangan.

[7] Early in 2008, when most developed countries were already suffering from the global financial and economic crisis, it was thought that developing economies would not be similarly affected. Most analysts predicted that huge domestic market power and prudent macroeconomic policies would keep developing countries afloat—that these countries had "decoupled" themselves from the crisis (*Economist* 2008).

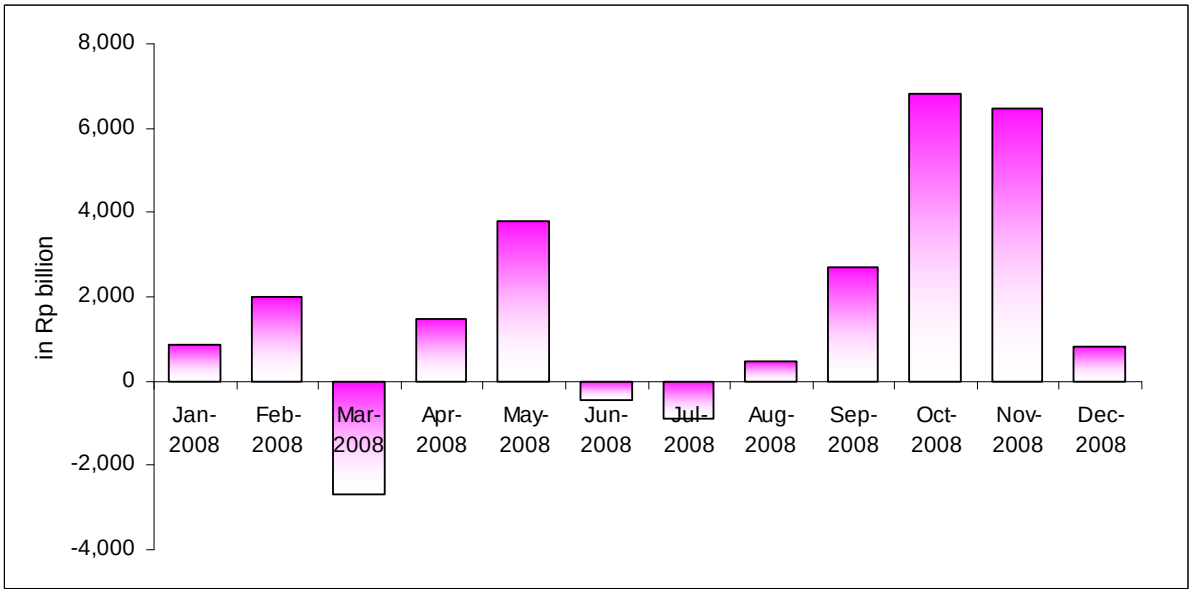
Figure 7: Gross Capital Inflows and Outflows, 2004–2008



Source: Bank Indonesia (2008a).

During 2008, the Indonesia Stock Exchange (ISX) index also experienced massive fluctuations due to foreign investor misgivings (at the time, foreign investors accounted for almost 60% of total market capitalization in Jakarta). At the end of 2008, the ISX index recorded a 51.17% drop. Market capitalization for equity at the end of year fell by 46.42%. Net equity foreign purchases during 2008 experienced volatile movement, as Figure 8 illustrates. Domestic investors, whose actions had mirrored foreign investor behavior (herding), also contributed to the sharp drop of the ISX index in 2008.

Figure 8: Indonesia Net Equity Foreign Purchases, 2008 (in rupiah)



Source: Indonesia Stock Exchange (2009).

As mentioned briefly above, the total transaction value of RTGS in 2008 declined by 7.7% from 2007. Declining activity in the stock market, foreign exchange market[8] and inter-bank money market in response to the global economic downturn may have caused the drop.

In terms of the management of SKBNI, one domestic bank could not continue its clearing activities in the fourth quarter of 2008 due to its exposure to the global financial crisis. In response, Bank Indonesia established a "no money no game" policy for debit clearing transaction settlement (Bank Indonesia 2007a). Overall, however, despite heavy pressure on Indonesia's flow of funds, no significant disruption of Bank Indonesia's administration of electronic fund transfers through either BI-RTGS or SKBNI materialized. Some banks have been exposed to modest liquidity problems, particularly due to inter-bank market segmentation,[9] but they were able to maintain some liquid assets such as government securities and Bank Indonesia Certificates.

6. CONCLUDING REMARKS AND POLICY AND REGULATORY IMPLICATIONS

Several issues related to the development of the payment system in Indonesia remain that need to be addressed further. As Bank Indonesia has encouraged the development of a less cash-dependent society since 2006, the use of information technology has become an important part of the payment system. Too much reliance on a technology-based system, however, can invite risks. Computer viruses, hackers, and data theft are a few sources of technology failure that can disrupt the national payment system. Other than technology-related operational risk, the payment system also faces potential liquidity-related operational risk stemming from payment system participants who fail to settle their transactions. To mitigate this risk, Bank Indonesia has enacted legislation to regulate any liquidity problems of payment system participants.

Bank Indonesia issued PBI 10/6/PBI/08, which reflects the four principles of payment system policy. This new regulation fully complies with the Bank for International Settlements core principles for systematically important payment systems (Bank for International Settlements 2001). Operational risk mitigation for RTGS, which was administered by Bank Indonesia, began with system design, reliability of technology, and supporting networks. This included live tests conducted by certified information technology auditors. In the second quarter of 2008, a guest bank facility or RTGS terminal was established for member banks that experience disruptions in their systems. As a result, operations can now be maintained at Bank Indonesia offices. To overcome credit risk, gridlock, and line mechanism issues, facilities have been put in place to prevent liquidity crunches at member banks (Bank Indonesia 2009a). Bank Indonesia also provides a daily liquidity facility (a short-term funding facility) to banks that require funds. Funding is secured against quality bonds such as SBI and Surat Utang Negara[10] as collateral.

In 2007, Bank Indonesia conducted three live tests, which involved all vendors, banks, and non-banks institutions who were members of the settlement system, clearing system, and securities settlement system. In March 2008, a second live test was conducted. Bank Indonesia has also instituted a disaster recovery plan and disaster recovery centre to ensure the smooth functioning of a payment system fully supported by reliable infrastructure to minimize downtime. All member banks are required to put in place and maintain an

[8] The latest data are not available for foreign exchange and stock market transactions settled through BI-RTGS. These figures are included in the customer data for 2008.

[9] This refers to the practice of large banks lending money primarily to similarly sized banks, resulting in small- and medium-sized banks suffering from a liquidity squeeze. Bank Indonesia has attempted to create pooled funds (guaranteed by the Deposit Insurance Corporation) and increase the scope and usability of the Sistem Informasi Debitur/Debitor Information System database (SID) to address inter-bank market segmentation.

[10] Bonds issued by the GoI for state budget deficit financing.

adequate backup system and to conduct regular live tests of their disaster recovery plan to improve its performance (Bank Indonesia 2007c).

To mitigate foreign exchange settlement risk (of payment settlement failures in interbank foreign exchange transactions), Bank Indonesia plans to develop a PVP settlement mechanism within BI-RTGS, which will make simultaneous settlement possible. Since US dollar/rupiah transactions dominate interbank foreign exchange transactions in Indonesia, this has become a priority. A US dollar/rupiah PVP system will be developed by building a US dollar/rupiah PVP link connecting BI-RTGS (for rupiah payment settlement) with the US Dollar-Clearing House Automated System (for US dollar payment settlement) in Hong Kong, China (Bank Indonesia 2009a). To facilitate this endeavor, Bank Indonesia and the Hong Kong Monetary Authority signed a memorandum of understanding on 24 October 2008.

To encourage the use of non-cash payment systems, which are deemed to be more secure than cash-based systems, since 2006 Bank Indonesia has undertaken several programs to endorse a “Less Cash Society” under its main program “Ayo ke Bank” (let’s go to the bank). Programs to date have included a card education campaign and electronic banking (Bank Indonesia 2007d). From the demand side, a key challenge has been changing the cultural mindset in Indonesia that “cash is king.” From the supply side, there is an urgent need to improve security, technology, and the legal infrastructure. In 2008, an important step was taken to ensure the legality of electronic transactions in Indonesia. On 21 April 2008, Law 11/2008 on Electronic Information and Transactions was enacted (Bank Indonesia 2009a). It is expected that the new law will accelerate Indonesia’s transition toward a less cash-based society in the near future.

REFERENCES

Badan Pengawas Pasar Modal and Lembaga Keuangan (BAPEPAM-LK). 2008. Statistik Pasar Modal. [Capital Market Statistics]. Available: http://www.bapepam.go.id/pasar_modal/publikasi_pm/statistik_pm/2008/2008_XII_4.pdf (accessed January 2009).

Bank Indonesia. 2003. Pedoman Standar Prinsip Penerapan Mengenal Nasabah. [Standard Guideline on Know Your Customer Principles]. Available: http://www.bi.go.id/NR/rdonlyres/22285E23-E06C-4ECE-A8F7-1068027BB731/1418/lamp_se53203.pdf (accessed March 2009).

———. 2004. Crucial, Developing A Safe and Reliable Payment System. In *Annual Report of Development of Payment System*. Jakarta: Bank Indonesia.

———. 2005. Peraturan no. 7/52/PBI/2005 tentang Penyelenggaraan Kegiatan Alat Pembayaran dengan Kartu. [Card-based Payment Instruments]. Available: http://www.bi.go.id/NR/rdonlyres/A7D7908B-169C-4214-95BF-0F3B01A03737/16472/se_111009.pdf (accessed March 2009).

———. 2006. Disclosure Framework BI-SSSS. Available: http://www.bi.go.id/NR/rdonlyres/1C75AEA4-64EA-4C51-9DB6-6AAE38EA738D/8137/Disc_framework_s4.zip (accessed January 2009).

———. 2007a. About the National Clearing System. Available: http://www.bi.go.id/NR/rdonlyres/CA@E0E12-D136-46AD-944C-F2E14F62F889/13360/AbouttheNationalClearingSystem.pdf (accessed March 2009).

———. 2007b. Bank Indonesia Real Time Gross Settlement. Available: http://www.bi.go.id/NR/rdonlyres/C14A178C-14DC-47AC-BBA3-FAFA7CD24534/14129/SystemBIRTGS Englrev.pdf (accessed March 2009).

———. 2007c. Peraturan no 9/15/PBI/2007 tentang Penerapan Manajemen Resiko dalam Penggunaan Teknologi Informasi oleh Bank Umum dan Lampiran. [Risk Management Implementation in the Use of Information Technology by Commercial Banks]. Available: http://www.bi.go.id/NR/rdonlyres/95DF6EE0-E636-439F-802B-1C756D01598E/11868/PBINo915PBI2007Tgl30Nov2007.pdf (accessed Mar 2009).

———. 2007d. Siaran Pers no 9/22/PSHM/Humas: Edukasi Masyarakat di Bidang Perbankan Ditingkatkan. [People's Education in Banking Enhanced]. Available: http://www.bi.go.id/web/id/Ruang+Media/Siaran+Pers/sp_092207.htm (accessed July 2009).

———. 2007e. Sistem Pembayaran Nasional. [National Payment System]. Available: http://www.bi.go.id/web/en/Tentang+BI/Edukasi/Sistem+Pembayaran/nps.htm (accessed March 2009).

———. 2007f. Terciptanya Peningkatan Efisiensi dalam Pelaksanaan Sistem Pembayaran. [Efficiency Improvement on the Implementation of Payment System]. In *Annual Report of Development of Payment System*. Jakarta: Bank Indonesia.

———. 2008a. Financial Stability Review No 11 – September 2008. Jakarta: Bank Indonesia.

———. 2008b. Institusi Perbankan di Indonesia. [Banking Institutions in Indonesia]. Available: http://www.bi.go.id/web/id/Perbankan/Ikhtisar+Perbankan/Lembaga+Perbankan/ (accessed January 2009).

———. 2008c. Laporan Sistem Pembayaran dan Pengedaran Uang. [Report on Payment System and Cash Circulation]. Available: http://www.bi.go.id/NR/rdonlyres/5235BDB2-6197-4747-B240-ABC8E31BA743/16516/LSPPU2008.pdf (accessed April 2009).

———. 2009a. Peraturan no. 11/11/PBI/09 tentang Penyelenggaraan Kegiatan Alat Pembayaran dengan Kartu. [Card-based Payment Instruments]. Available: http://www.bi.go.id/NR/rdonlyres/59731C91-513A-4C12-86CB-F413F8437368/16443/pbi_111109f.pdf (accessed March 2009).

———. 2009b. Peraturan no. 11/12/PBI/09 tentang Uang Elektronik. [Regulation on Electronic Money]. Available: http://www.bi.go.id/NR/rdonlyres/E99A309C-7333-415C-A0AB-AAA3E2E3F827/16446/pbi_111209.pdf (accessed March 2009).

———. 2009c. Surat Edaran BI no. 11/11/DASP tentang Uang Elektronik. [Circular Letter on Electronic Money]. Available: http://www.bi.go.id/NR/rdonlyres/B032EEDF-3CB1-4C1A-ADE1-5FF7E61E0235/16474/se_111109.pdf (accessed March 2009).

Bank for International Settlements. 2001. Core Principles for Systematically Important Payment Systems. Available: http://www.bis.org/publ/cpss43.pdf (accessed January 2009).

———. 2008. Securities Statistics and Syndicated Loans. Available: http://www.bis.org/statistics/secstats.htm (accessed January 2009).

Economist, The. 2008. Decoupling 1: Emerging Asia: An Independent Streak. *The Economist Print Edition* 386(8564): 84.

Government of Indonesia, Ministry of Finance, Debt Management Office. 2008. Perkembangan Utang Indonesia (Pinjaman Luar Negeri dan Surat Utang Negara) 2000-2008. [Development of Government of Indonesia's External Debt and Securities]. Available: http://www.dmo.or.id/dmodata/5Statistik/1Posisi_Utang/1Posisi_Utang_LN/Perkembangan_Utang_Negara_20081130.pdf (accessed January 2009).

Indonesia Stock Exchange. 2008. Growth through Integration. Laporan Tahunan 2007. [2007 Annual Report]. Jakarta: PT Bursa Efek Indonesia.

———. 2009. Building Confidence in the Global Turbulence. Laporan Tahunan 2008. [2008 Annual Report]. Jakarta: PT Bursa Efek Indonesia.

Kementerian Negara Koperasi dan Usaha Kecil dan Menengah Republik Indonesia. 2008. Perkembangan Indikator Makro UKM Tahun 2008. [Development of Macro Indicators on Small Medium Enterprises]. Available: http://www.depkop.go.id/statistik-ukm/cat_view/35-statistik/37-statistik-ukm/186-statistik-ukm-2008.html (accessed March 2009).

Kustodian Sentral Efek Indonesia (KSEI). 2009. Jasa Pelayanan Penyelesaian Transaksi Bursa. [Bourse Transaction Settlement Services]. Available: http://www.ksei.co.id/content.asp?id=4&no=1&bhs=I&page=c (accessed January 2009).

Ure, J. 2008. M-Banking and M-Payments in Asia Pacific. Presentation delivered to the International Finance Corporation, Telecommunication Research Project Corp, Jakarta, 20 August. Available: http://www.trpc.com.hk/bank/presfiles/ifc_jakarta_0808.pdf (accessed March 2009).

Wahid, F., and N. Indarti. 2007. Rendah, Adopsi Teknologi Informasi oleh UKM di Indonesia [Low Adoption of Information Technology by SMEs in Indonesia]. *Majalah Pusat Informasi Perkoperasian edisi 281/Januari/XXIV*. Available: http://www.majalah-pip.com/majalah2008/readstory.php?cR=1251342196&pID=11&stID=509 (accessed March 2009).

APPENDIX 1
INDONESIA: CAPITAL MARKET DEVELOPMENT 1977–2008

August 10, 1977	The Exchange was re-activated by the President Soeharto. It was supervised under the management of the Capital Market Supervisory Agency (Badan Pengawas Pasar Modal, or BAPEPAM). The re-activation of the capital market was also marked by the go public of PT Semen Cibinong as the first issuer listed in the JSX. July 10th is celebrated as the anniversary of the Capital Market in Indonesia.
1977 – 1987	The activity of stock trading in JSX was dull. There were only 24 listed companies in JSX. Most people prefered to invest their money in Banks rather than the Capital Market.
1987	PAKDES 87 (December Package 1987) was issued to give ways for companies to go public and foreign investors to invest their money in Indonesia.
1988 – 1990	Deregulations packages in Banking and Capital Market were made. JSX welcomed foreign investors. The activities of JSX were improving.
June 2,1988	Indonesia Pararel Bourse started to operate and managed by the Securities and Money Trading Organization. It consisted of brokers and dealers.
December 1988	The government issued PAKDES 88 to give ways for companies to go public, and some other regulations that brought positive impacts on the capital market growth were made.
June 16, 1989	Surabaya Stock Exchange started to operate and was managed by the Surabaya Stock Exchange Inc.
July 13, 1992	JSX was privatized, and as a result, the functions of BAPEPAM changed to become the Capital Market Supervisory Agency (BAPEPAM-LK). This date is celebrated as the anniversary of Jakarta Stock Exchange.
May 22, 1995	JSX introduced its computerized Jakarta Automatic Trading System (JATS).
November 10, 1995	The Government of Indonesia issued Regulations No. 8 year 1995 on capital market. This regulation was effective on January 1996.
1995	Indonesia Pararel Bourse was merged into Surabaya Stock Exchange.
2000	Scripless trading system was introduced for the first time in Indonesia's Capital Market.
2002	JSX started to implement the remote trading system.
2007	Surabaya Stock Exchange was merged into Jakarta Stock Exchange. As a result, JSX changed its name into the Indonesia Stock Exchange.

JSX = Jakarta Stock Exchange

Source: Indonesia Stock Exchange (2008).

APPENDIX 2
INDONESIA: OTHER PAYMENT SYSTEMS

System	Transaction Types	Operator	Members
BI-RTGS	- large value electronic fund transfer - transaction settlements: interbank money market, government and monetary authority - fund settlement from SBI and SUN which transaction is made through BI-SSSS	Bank Indonesia	- all banks in Indonesia, incl. shariah-based unit (193 banks) - one switching company - one postal service company and one capital market settlement provider (KSEI)
SKNBI	- debit transfer (cheques, bank draft, debit notes) - retail credit transfer for amount less than IDR 100 million	Bank Indonesia	all banks in Indonesia (152) including shariah units
Bank Indonesia Scripless Securities Settlement System (BI-SSSS)	- Electronic settlement and custody of securities - Settlement is made through BI-SSSS by Delivery Versus Payment mechanism	Bank Indonesia	-140 banks including shariah units -Sub-registry which consists of 16 banks as custodian banks -Brokers: 13 NBFIs and 1 LPS (Lembaga Penjamin Simpanan/Indonesia Deposit Insurance Corp)
Central Depository and Book Entry Settlement System (C-BEST)	fund leg of securities settlements in capital market	PT KSEI (Central Depository and Settlement Indonesia)	all members of ISX
Shared ATM network-domestic	electronic fund transfer (retail)	PT Artajasa Pembayaran Elektronis (ATM Bersama) LINK	67 member banks and 2 BPRs, settlement of interbank bilateral positions done through BI-RTGS system 3 state banks, bilateral linkages, gross positions settled through BI-RTGS system

System	Transaction Types	Operator	Members
Shared ATM network-domestic (cont'd)	electronic fund transfer (retail)	PT Rintis sejahtera (PRIMA)	33 banks, gross positions settled through members account at BCA Bank (private bank)
		PT Daya Network Lestari (ALTO)	14 banks and 1 BPR, gross positions settled through members account at 1 member bank
Shared ATM network-international		Mastercard International (Cirrus)	13 members of Cirrus network and PT Artajasa, settlement through member account at 1 member bank
		Visa International (Plus)	26 banks of Plus members, settlement throuh member account at 1 member bank
Debit Card network-domestic	eletronic funds transfer at point of sales	BCA (Debit BCA)	23 banks
		Debit Link	3 state banks
Debit Card-international		Visa International (Electron)	26 banks, settlement through member account at 1 member bank
		Mastercard International (Maestro)	13 banks and PT Artajasa, settlement through member account at 1 member bank
Credit Card	electronic payment with credit cards	Visa International	19 banks, settlement through member account at 1 member bank
		Mastercard International	19 banks and 5 nonbank financial inst.s, settlement through member account at 1 member bank
		JCB	2 banks, settlement through member account at 1 member bank
		BCA (Debit BCA)	1 bank (BCA)

System	Transaction Types	Operator	Members
Funds transfer/remittance-domestic	domestic remittance	PT Pos Indonesia-state postal company (postal draft)	-
		Private postal companies	-
		Special remittance companies who have registered themselves to Bank Indonesia as regulated by SEBI no. 8/32/DASP	-
		Money changer	-
		Perum Pegadaian	-
Funds transfer/remittance-international	cross-border remittance	Western Union	18 banks, PT Pos Indonesia, pawn shops, and non-bank institutions who are Western Union agents
		MoneyGram	2 banks and non-bank institutions such as travel bureau and other shops who are MoneyGram agents

BI-RTGS = Bank Indonesia-Real Time Gross Settlement, BI-SSSS = Bank Indonesia-Scripless Securities Settlement System, IDR = rupiah, SBI = Sertifikat Bank Indonesia/Bank Indonesia Certificate, SUN = Surat Utang Negara/government bond.

Source: Bank Indonesia (2008c).