



BANCO CENTRAL DO BRASIL

Brazilian Payment System

September, 2009

Brazilian Payment System

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Brazilian Payment System

Introduction

Prior to the mid-1990s, changes in the Brazilian payment system were motivated by the need to cope with high inflation rates. During that time, the system achieved significant technological progress, especially aimed at enhancing the speed of processing financial transactions. In the reform carried out by the Banco Central do Brasil in 2001 and 2002, the focus shifted to risk management. In this vein, the launch of the *Sistema de Transferência de Reservas - STR* (Reserves Transfer System), on April 22, 2002, marked the beginning of a new phase of the Brazilian payment system. With this system, Brazil entered in the group of countries where interbank funds transfers can be settled irrevocably and unconditionally, i.e. with finality, on a real-time basis. This fact by itself provides settlement risk reduction for interbank transactions and consequently systemic risk reduction, that is, reduction of the risk that the bankruptcy of a bank causes the bankruptcy of other banks, namely *domino effect*. In the scope of the reform, there was another important change, as the completion of funds transfers between reserves accounts nowadays depends on the existence of sufficient balance in the account of the sending participant. Therefore, overdrafts are no longer allowed.

Real-time settlement is also being used in transactions with federal government securities carried out in the *Sistema Especial de Liquidação e de Custódia - SELIC* (Special System for Settlement and Custody), which came to be possible with the connection between this system and STR. Therefore, since April 2002, SELIC has been a DVP model 1 securities settlement system.

The Brazilian payment system reform, however, goes beyond the launch of STR and the SELIC's *modus operandi* changes. To reduce the systemic risk, the main goal of the reform, legal changes were also made. For example, Law 10,214, enacted in March 2001, recognized multilateral netting in the environment of a clearing and settlement system and set forth that, in all multilateral netting system which is considered systemically important by the Banco Central do Brasil, the corresponding clearinghouse must act as central counterparty.

All these changes intended to strengthen the financial system, following the reform started in 1995 with PROER (Program for Restructuring and Strengthening of the National Financial System) and later with PROES (Program for Reducing the Presence of the State Public Sector in Banking Activity). These government-sponsored programs aimed to strengthen the financial institutions mainly through mergers and transfers of controlling interest, and to reduce public sector presence in banking activities, respectively.

More recently, the Banco Central do Brasil has been acting in order to promote the development of the retail payment systems, mainly to take advantage of gains of efficiency relating to, for example, larger use of electronic payment instruments, better use of ATM and POS networks, and higher level of integration among the related clearing and settlement systems¹.

1. Institutional aspects

1.1 – Legal aspects

Law 4,595 regulates the functioning of Brazilian financial system. It sets forth that the National Monetary Council - CMN is the entity in charge of elaborating the money and credit policy. CMN is also responsible for promoting the improvement of institutions and financial instruments to ensure higher efficiency of the payments system. Besides being the main component for the implementation of the CMN policy directives, it's up to the Banco Central do Brasil to authorize the functioning of financial institutions², supervise them, issue currency and carry out services related to currency in circulation. In addition, the Banco Central do Brasil is empowered to intervene in the financial institutions or place them under special administrative regimes, and to determine their extra-judicial liquidation (Decree-Law 2,321 and Law 6,024).

Law 10,214 is the main legal instrument for the Brazilian payment system. It sets forth among other things that:

- it's up to the Banco Central do Brasil to define which systems are systemically important;

¹ For details, see the "Report on the Brazilian Retail Payment System", from May 2005, available at www.bcb.gov/Pom/Spb/Ing/ReportontheBrazilianRetailPaymentSystem.pdf.

² According to the legal framework in place, financial institutions are public or private legal entities whose main or accessory activity is collection, intermediation, investment of own or third-parties financial resources, in national or foreign currency, and custody of third-parties' values.

- multilateral netting of obligations in a clearing and settlement system is admitted;
- in systemically important system, the entity operating it must act as central counterparty and adopt mechanisms and safeguards that ensure certainty of settlement of the transactions;
- assets posted as collateral to clearinghouses cannot be seized even by judicial order; and
- the bankruptcy law does not affect the fulfillment by a participant of its obligations to a clearing or settlement system, which will be brought to completion and settled in accordance with the system regulation.

CMN's Resolution 2,882 sets forth core principles for the Brazilian payment system. These principles comply with recommendations made by BIS/CPSS through the report "Core principles for systemically important payment systems", as well with the CPSS/IOSCO joint reports "Recommendations for securities settlement systems" and "Recommendations for central counterparties". The mentioned Resolution empowers the Banco Central do Brasil to regulate, authorize and supervise the clearing and settlement systems. These activities are shared with the Comissão de Valores Mobiliários - CVM (Securities and Exchange Commission) in case of systems that settle securities³

The Banco Central do Brasil, in its capacity to regulate the functioning of clearing and settlement systems, has set forth, among other things, that⁴:

- systemically important deferred settlement systems should promote the final settlement of net positions directly in accounts held at the Banco Central do Brasil;
- all settlement systems that settle transactions with securities and other financial assets, including foreign currency and financial derivatives, are considered as systemically important, as well as the funds transfer systems presenting average daily turnover higher than 4% of the STR average daily turnover, or that, at the Banco Central do Brasil discretion, has the potential to pose risk to the smooth functioning of the Brazilian Payment System;
- maximum settlement lag is: (1) at end of day for systemically important funds transfer system; (2) one business day for spot transactions with securities (except stocks); and (3) three business days for transactions with stocks carried out in stock exchanges. The settlement deadline in any other situation is established by the Banco Central do Brasil, which examines each particular case;
- clearinghouses should keep Net Worth compatible to their risk exposure, observing a minimum limit of R\$ 30 million for system considered systemically important and R\$ 5 million for system that is not.

Checks are regulated according to the general principles of the Geneva Convention (Law 7,357). Financial relationship between economic agents, including issues related to funds transfers and clearing and settlement of obligations, are governed by contracts between parts, which are subject to requirements mainly of the Civil Code (Law 10,406), the Commercial Code (Law 556), the Securities Exchange Law (Law 4,728) and the so called "White Collar" Law (Law 7,492), besides Law 10,214. The relationship between financial institutions and their customers are also under the requirements of the Consumer Protection Law (Law 8,078).

1.2 – The role of financial intermediaries

In the current arrangement of the financial system, the main institutions are constituted as universal banks, which provide a wide range of banking services. Other institutions present a certain degree of specialization, as showed in the following examples:

- commercial banks collect demand and savings deposits, and are traditional credit providers to firms (specially working capital) and households;
- investment banks collect time deposits and are specialized in medium and long term financial operations;
- savings banks collect demand and savings deposits and operate strongly in credit to housing;

³ Settlement systems for either government securities or bank-issued bonds are under the supervision of the BCB only.

⁴ Circular 3,057, as amended by Circular 3,437.

- cooperative banks and credit unions provide credit and banking services to their members, which are rural producers in their majority;
- savings and loan associations also provide credit to housing;
- consumer finance companies provide consumer credit; and
- brokers intermediate trading of foreign exchange, government securities, corporate bonds, stocks, and commodities and futures contracts.

Among these institutions, those of relevance in the Brazilian payment system are commercial banks, universal banks with commercial bank activities, savings banks and, to lesser extent, credit unions. These institutions collect sight deposits and provide their clients with free-movement accounts used by the public at large (firms and households) to make payments and funds transfers. In December 2008, there were some 1.6 thousand of them, including credit unions, which provide a network of some 19.1 thousand branches and some 125.7 million of accounts. The so-called "correspondentes bancários"⁵ (banking correspondents), some 108 thousand at the end of 2008, have an important role as well.

The chart 1 shows the institutions that integrate the Brazilian financial system:

Chart 1: Financial system composition

Regulating entities	Supervision entities	Operators			
National Monetary Council (CMN)	Central Bank of Brazil (BCB)	Financial institutions taking sight deposits	Other financial institutions Foreign exchange banks	Other financial intermediaries and entities administering financial assets of third parties	
	Securities and Exchange Commission (CVM)	Commodities and futures exchanges	Stock exchanges		
National Council for Private Insurance (CNSP)	Private Insurance Superintendence (SUSEP)	IRB – Brasil Resseguros	Insurance companies	Capitalization companies	Entities operating private open pension funds
Management Council for Complementary Pension	Complementary Pension Secretariat (SPC)	Entities operating private closed pension funds			

1.3 – The role of the central bank

The stability of the purchasing power of the Brazilian currency and the soundness of the financial system are the main Banco Central do Brasil's institutional objectives. As set forth by CMN's Resolution 2,882, it is up to it to promote the soundness, normal functioning and improvement of the Brazilian payment system, and, as already mentioned, it is responsible for authorizing and overseeing clearing and settlement systems, including those that settle securities, foreign exchange and derivatives transactions⁶. Additionally, according

⁵ Typically, "correspondentes bancários" are postal offices, lottery houses, supermarkets, drugstores and other small retailers, which, acting on behalf of banks and under agreement, are authorized to receive payments, as well as, among other things, proposals related to sight, term and savings deposit accounts.

⁶ Systems that settle securities are under BCB and CVM joint supervision, but aspects related to systemic risk are exclusively assessed by the BCB. Systems that settle both government securities or securities issued by banks are out of this rule -- they are under exclusive supervision of the BCB.

to Law 10,214, it's up to the Banco Central do Brasil to define which settlement systems are systemically important. The institution is also settlement service provider and in this role operates the STR (item 3.2.1) and the SELIC (item 3.3.1), respectively a funds transfer system and a government securities settlement system.

To make some of its responsibilities operative, the Banco Central do Brasil provides bank reserves accounts which are mandatory for institutions taking sight deposits, excluding credit unions, and are optional for investment banks and foreign exchange transactions banks. Through these accounts, banks fulfill reserves requirements set by the Banco Central do Brasil and they are used for settlement purposes as well. Each bank keeps a single, centralized account.

In Brazil, a legal provision sets that a bank taking sight deposits cannot hold an account in another bank. Therefore, except for payments made in cash or those made within a bank --the payer and the payee are clients of the same bank--, all payments have their final settlement in the bank reserves accounts. As set in the Federal Constitution, the Banco Central do Brasil is the exclusive depository of the National Treasury funds. Entities operating systemically important deferred net settlement systems should also maintain account at the Banco Central do Brasil to settle the net results they calculate in each settlement session.

To ensure a smooth performance of the Brazilian payment system in the real-time settlement environment, the Banco Central do Brasil extends fully collateralized, unlimited and free of charge intraday credit facility to reserves account holders.

1.4 – The role of other public and private entities

As previously mentioned, systems that settle securities (except government securities and corporate bonds issued by banks) are subject to CVM authorization and supervision (CVM shares this responsibility with the Banco Central do Brasil). The Brazilian Association of Financial and Capital Market Entities - ANBIMA, which is a non-for-profit civil association that congregates the interests of open market institutions, supports the SELIC (item 3.3.1). The Interbank Payments Clearinghouse - CIP, which is a non-for-profit civil association, operates the SITRAF (item 3.2.2) and the SILOC (item 3.2.4). The Banking Technology Corporation - TECBAN, a for-profit company, operates a shared ATM network ("Banco24Horas").

BM&FBOVESPA S.A., a for-profit company that has its headquarter in Sao Paulo, which is the main Brazilian stock, commodities and futures exchange, operates four settlement systems (stocks – item 3.3.3; government securities – item 3.3.4; derivatives – item 3.3.5; and FX transactions – item 3.3.6). Also regarding securities, it is important to mention CETIP (item 3.3.2), nowadays a for-profit company.

Regarding clearing of checks, Banco do Brasil S.A., a federal government bank, plays an important role, since it is responsible for operating COMPE (Centralizer for Clearing of Checks - item 3.2.3). An advisory group (COMPE Group), with participants from the Banco Central do Brasil, Banco do Brasil S.A. and many bank associations, is in charge of examining preliminarily proposals for improvement and other issues related to this area.

Due to the observed growing use of electronic payment instruments, the payment card companies have started to play a more important role in the payment system. The main of them are VISA, MasterCard, American Express and Hipercard.

ECT, the Brazilian post office, nowadays plays an important role in the Brazilian payment system, since, acting as "correspondente bancário"⁷, it serves almost all the municipalities where there is no bank branch.

2. Payment instruments used by non-banks⁸

2.1 - Cash payments

Cash payments are essentially used in small-value transactions relating to everyday purchases. They account for some 77% of payments carried out by individuals, according to a 2007 Banco Central do Brazil survey. At the end of 2008, the total amount of currency in circulation was about R\$ 115.6 billion, approximately R\$112.7 billion in banknotes and R\$ 2.9 billion in coins. Banknotes are issued in seven denominations (1; 2; 5; 10; 20; 50 and 100), and coins in six denominations (0.01; 0.05; 0.10; 0.25; 0,50 and

⁷ See footnote 4.

⁸ All economic agents but sight deposit taking institutions.

1.00). Both banknotes and coins are legal tender in the Brazilian territory, but the acceptance of coins, as a payment instrument, is mandatory only up to 100 units of each denomination.

From 2004 to 2008, in average the currency held by the public stood for 39.5% of the monetary aggregate M1, as shown below:

Chart 2: Share of currency held by the public in the monetary aggregate M1¹

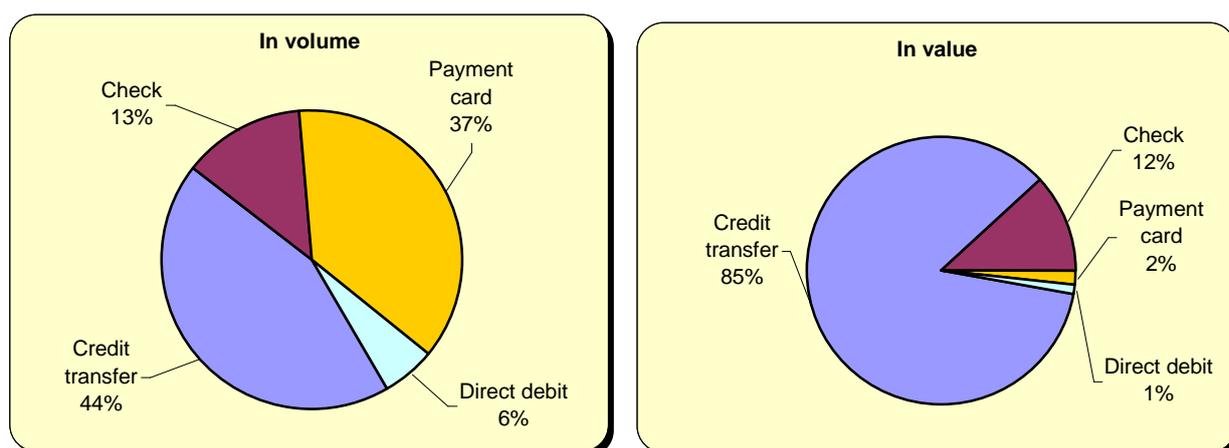
Year	Currency held by the public (chp) R\$ million	M1 R\$ million	chp / M1 %
2004	52,019	127,946	40.7
2005	58,272	144,778	40.4
2006	68,925	174,345	39.5
2007	82,251	231,431	35.5
2008	92,379	223,440	41.3
Average			39.5
Source: Banco Central do Brasil			
¹ At the end of the year.			

2.2 - Non-cash payments

Non-cash payments are mostly made by means of credit transfers, payment cards and checks. Payments are made in national currency only.

The following graphs show the share of each payment instrument, in volume and value, in 2008:

Relative use of payment instruments - 2008⁹



2.2.1 - Credit transfers

In Brazil, interbank credit transfers ordered by non-banks include TED (Electronic Funds Transfer), DOC (Credit Transfer Document), TEC (Special Credit Transfer) and those related to "bloquetos de cobrança"¹⁰. In case of both TED and TEC, the related funds are made available at the beneficiary's account on the same day (in case of TED, typically after few minutes from the moment the transfer is initiated by the

⁹ Comprises credit, debit and retailer cards.

¹⁰ Bar-coded standardized document that allows bills to be paid in any bank.

payer). As to DOC, funds are made available at the beneficiary's account, for withdrawal, on the following day (T+1)¹¹, while in case of "bloquetos de cobrança" availability of funds at the beneficiary's account will depend on the agreement between the beneficiary and its financial institution. Regarding intrabank credit transfers, which are also important, typically the debit at the sender's account and the credit at the receiver's account occur simultaneously at the moment the transfer is ordered.

Credit transfers can be initiated either by the payer himself, through an electronic access channel (ATM terminals, personal computers (internet banking) and mobile phones, for example), or by a bank cashier on behalf of him. Even when initiated in paper by the customers, all credit transfers are electronically processed.

In 2008, some 6.7 billion of credit transfers were made, which amounted to about R\$ 18.1 trillion (average of R\$ 2.7 thousand per transaction).

2.2.2 - Checks

Check still represents an important payment instrument in Brazil, though there has been a decrease in its use in the last years due mainly to its substitution for electronic instruments. Having standardized format and basic features, checks have got what is known as 'Magnetic Ink Character Recognition' (MICR), a device that allows its basic data to be read automatically. Sometimes, checks are written to be withdrawn in a future date (the so-called "pre-dated checks") and, in this case, they can be seen as credit instruments. In Brazil, sight deposit accounts are the only ones in which check transactions can occur. Checks are still physically presented to the drawee bank, even though they can be truncated according to bilateral agreements.

Check interbank settlement occurs on T+1, observing different procedures according to its value¹². In customers' accounts, considering the date in which the document is collected as a reference date, entries are normally made:

- in the payer's account, as debit, at the night of T, in case of "above of the limit" checks¹³, or at the night of T+1, in case of "below of the limit" checks; and
- in the payee's account, as credit, at the night on T+1, in case of "above of the limit" checks, or at the night of T+2, in case of "below of the limit" checks .

In 2008, approximately 2 billion checks were written, amounting to some R\$ 2.6 trillion (average of R\$ 1.3 thousand per check).

2.2.3 - Credit cards

Launched in Brazil in 1956, credit cards have achieved greater importance from the 1990s. The eradication of some restrictions, such as the prohibition on buying fuel by credit cards and also the "private label" requirement, a market condition that existed until 1996 and that prohibited an issuer (bank) from operating more than one brand, contributed to their widespread use¹⁴. In Brazil, the credit card holder does not pay financial charges if the bill, related to the goods and services that were bought, is totally paid on the next due date. The average time from the date of shopping to the date of payment is 28 days, according to firms of the credit card sector.

The number of credit cards changed from 53.5 million in 2004 (average of 1 card per 3.4 inhabitant) to 137.8 million in 2008 (average of 1 card per 1.4 inhabitant), corresponding to an increment of 157.6% in the period (yearly average growth of 26.7%). In 2008, around 2.5 billion credit card transactions were made, amounting to about R\$ 217.9 billion (average value of R\$ 86 per transaction). From 2004 to 2008, credit card transactions increased about 101.2% in volume (19.1% yearly).

2.2.4 - Debit cards

Debit cards are typically issued as bank cards, many times having credit and cash withdrawal functions as well. As payment cards, they are used mainly in POS terminals located at the commercial firms' premises. The main brands are *Visa Electron*, Mastercard's *Maestro*, and TecBan's *Electronic Check*. As in the case of credit cards, debit cards with microchips have been gradually replacing the ones with magnetic band.

¹¹ Though interbank settlement takes place in the morning of T+1, some banks consider that funds have been transferred at the night of the previous day (T), as it used to be before the existence of TED.

¹² From 02.18.2005 on, checks which value are equal to or larger than a referential value (R\$ 250 thousand, presently) are settled bilaterally among banks, without netting, through STR. Checks which value is lower than this referential value are settled with multilateral netting in a specific clearing system (COMPE).

¹³ "Above of the limit" checks are the ones which value is equal to or larger than a referential value (R\$ 299.99, presently).

¹⁴ The main brands are Visa, Mastercard, American Express and Hipercard.

Payer account is usually debited at the moment of the purchase, while credit in the payee account is made in a certain term, shorter or longer depending on the agreement between the commercial firm and the respective acquirer.

In 2008, around 2.1 billion debit card payments were made, amounting to a total of about R\$ 105.3 billion, with an average value of R\$ 50 per transaction. From 2004 to 2008, the number of debit cards increased from 149.1 million (average of 0.8 card per inhabitant) to 207.9 million (average of 1.1 card per inhabitant), which is equivalent to a growth of about 39.4% (8.7% yearly). In the same period, debit cards payments increased around 129.9% in volume (yearly average of 23.1%).

2.2.5 - Retailer cards

Retailer cards, which are mainly issued by major stores, can usually be used only at the shops of the same group, i.e., they are "in-store" cards. The use of this instrument implies payment deferment, since the cardholder can usually settle his total obligation between one and two months later, generally without charges, or pay it in installments. On the due date, having to return to the shop, the payer normally uses either cash, check or debit card to settle his obligation.

Retailer cards units evolved from 86 million in 2004 to 173 million in 2008, which is equivalent to a 101.1% increase in the period (yearly average of 19.1%). In 2008, there were around 1,019 million retailer card transactions, amounting to some R\$ 53 billion (average value of some R\$ 52 per transaction).

2.2.6 - Charge cards

Charge cards are used for payment of specific services, mostly related to telephone and public means of transport, or bulk value goods shopping. In the first case, which is the most common, public service companies issue their own cards, which can be acquired at some accredited shops. In this case, services are pre-paid and the card becomes disposable when its charge runs out. In the second case, the card is issued by a financial institution, which charges it up to a limit, for the use of its customer at accredited shops. Such type of card, usually an embedded microprocessor card, can be re-loaded many times. At each time, the charge limit determined by the issuer must be observed. In Brazil, though, charge cards are at a very early stage in its development, having pioneer projects by Visa and Mastercard as good examples.

Financial institution-issued charge cards amount to some 472 thousand units, through which some 2.5 million transactions were carried out, in the value of about R\$ 535 million (2008).

2.2.7 - Direct debits

Direct debit is normally used for recurrent payments, that is, those that are made on a periodic basis, mostly related to utility services (water, electricity and telephone, for example). For such payments, the payer should preauthorize his bank to accept funds transfers initiated by the payee, which should previously send to the payer, for his control, the correspondent invoice. The authorization is usually for an indefinite time, therefore valid until not cancelled. On the day that the payment is due, there is an automatic and direct debit on the payer's account.

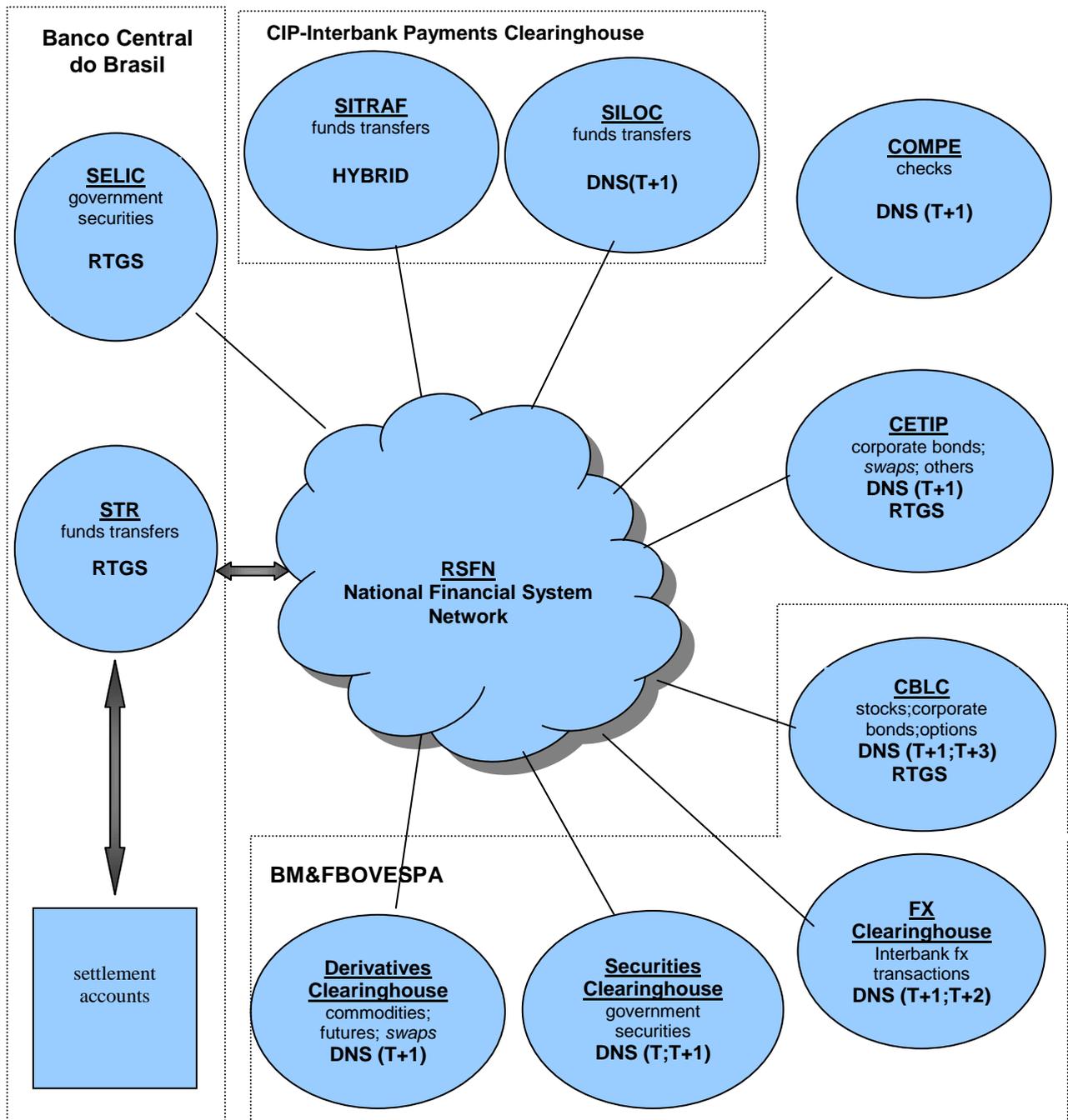
In 2008, around 871.3 million direct debit transactions were made, amounting to about R\$ 217.9 billion (average value of R\$ 250 per transaction). From 2004 to 2008, direct debit transactions increased about 33.5% in volume (yearly average of 7.3%).

3. Clearing and Settlement systems

3.1 – Overview of clearing and settlement systems

The following diagram presents an overview of the clearing and settlement systems:

Diagram 1: General arrangement of the settlement systems



3.2 – Interbank funds transfer settlement systems

STR is the hub of the Brazilian payment system, since:

- under legal provision (Law 4,595), all banking financial institutions are obligated to deposit their available funds at accounts held at the Banco Central do Brasil (reserves accounts);
- according to Banco Central do Brasil's Circular 3,057, net positions stemming from systemically important clearing system have to be settled in central bank money;

- as provided by Banco Central do Brasil's Circular 3,101, all funds transfers between accounts hold at the Banco Central do Brasil have to be made through STR.

Interbank funds transfers are as well settled by means of SITRAF, SILOC and COMPE. SITRAF is a hybrid settlement system that is considered systemically important and, as in the case of STR, allows intraday funds transfers. SILOC and COMPE are non-systemically important multilateral netting systems.

For the smooth functioning of the Brazilian payment system, the following aspects are especially important:

- Banco Central do Brasil extends fully collateralized, unlimited and free of charge intraday credit to banks holding reserves accounts. For this purpose, repo transactions with government securities are used;
- balances at the end of day are used to verify banks' compliance with reserves requirements, so these funds can be freely used throughout the day to settle obligations;
- Banco Central do Brasil can activate STR's optimization routines should a gridlock situation arises.

3.2.1 – Reserves Transfer System (Sistema de Transferência de Reservas) - STR

STR is a real-time gross settlement system for interbank funds transfer, which is provided and operated by the Banco Central do Brasil. A participant, on behalf of its own or of client, can send funds transfer orders of unlimited value to be credited to the receiving participant or to client of the receiving participant. The system is of fundamental importance for the settlement of interbank transactions carried out in the monetary, foreign exchange and capital markets, including clearinghouses' net results.

Checks with value over the so-called VLB-Check, a referential value presently stipulated in R\$ 250 thousand, are also settled through STR, as well as the "bloquetos de cobrança" over the VLB-Cobrança (R\$ 5 thousand). In both cases, settlement is made bilaterally between banks, in accrued values (without netting).

STR allows credit orders only, i.e., only the one holding the account to be debited can order the respective funds transfer. Upon sending a funds transfer order, the participant defines its priority, which can be, in decreasing order, "A", "B", "C" or "D". The priority level "A" is applied exclusively to funds transfer orders related to withdrawals and deposits made by banks at the Banco Central do Brasil, and to the settlement of clearinghouses' net financial results. If there is no indication of preference, the STR classifies the order at the lowest level.

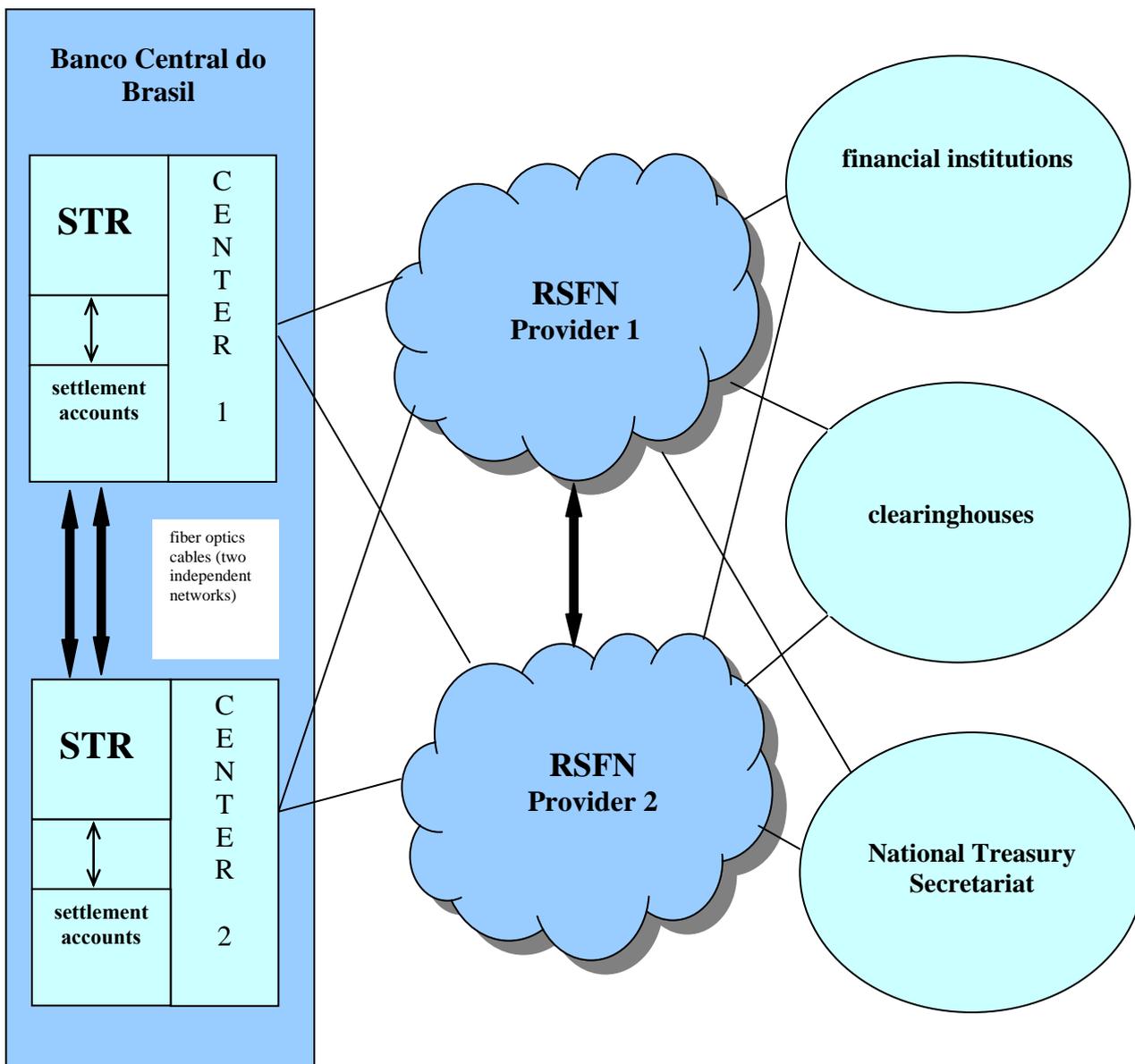
The funds transfer order is submitted to settlement at the time STR receives it and will be queued if any one of the following events occurs: (1) insufficiency of funds at settlement account of the sending participant; or (2) existence of queued funds transfer orders from the same participant with equal or higher preference level. Queuing is not applicable to funds transfer orders related to SELIC (item 3.3.1), as well as to orders sent by entities that operate clearing and settlement systems. In these cases, if funds are insufficient, STR will immediately reject the order.

Queued orders are arranged by participant, by preference level and, when they observe the same preference level, by the chronological order in which they were received. In general, a queued order cannot be settled before the previous one, i.e., the settlement occurs on a FIFO (*first in first out*) basis. In order to avoid gridlock situations in the payments flow, the Banco Central do Brasil can put in action if, and when, it judges necessary a routine to optimize the settlement process of queued funds transfer orders.

A funds transfer is considered final, i.e. irrevocable and unconditional, at the moment it is posted in the settlement accounts. The receiving participant will be informed about the funds transfer at the moment in which the settlement occurs.

The following diagram shows the STR general technical framework:

Diagram 2: STR – Technical structure (September, 2009)



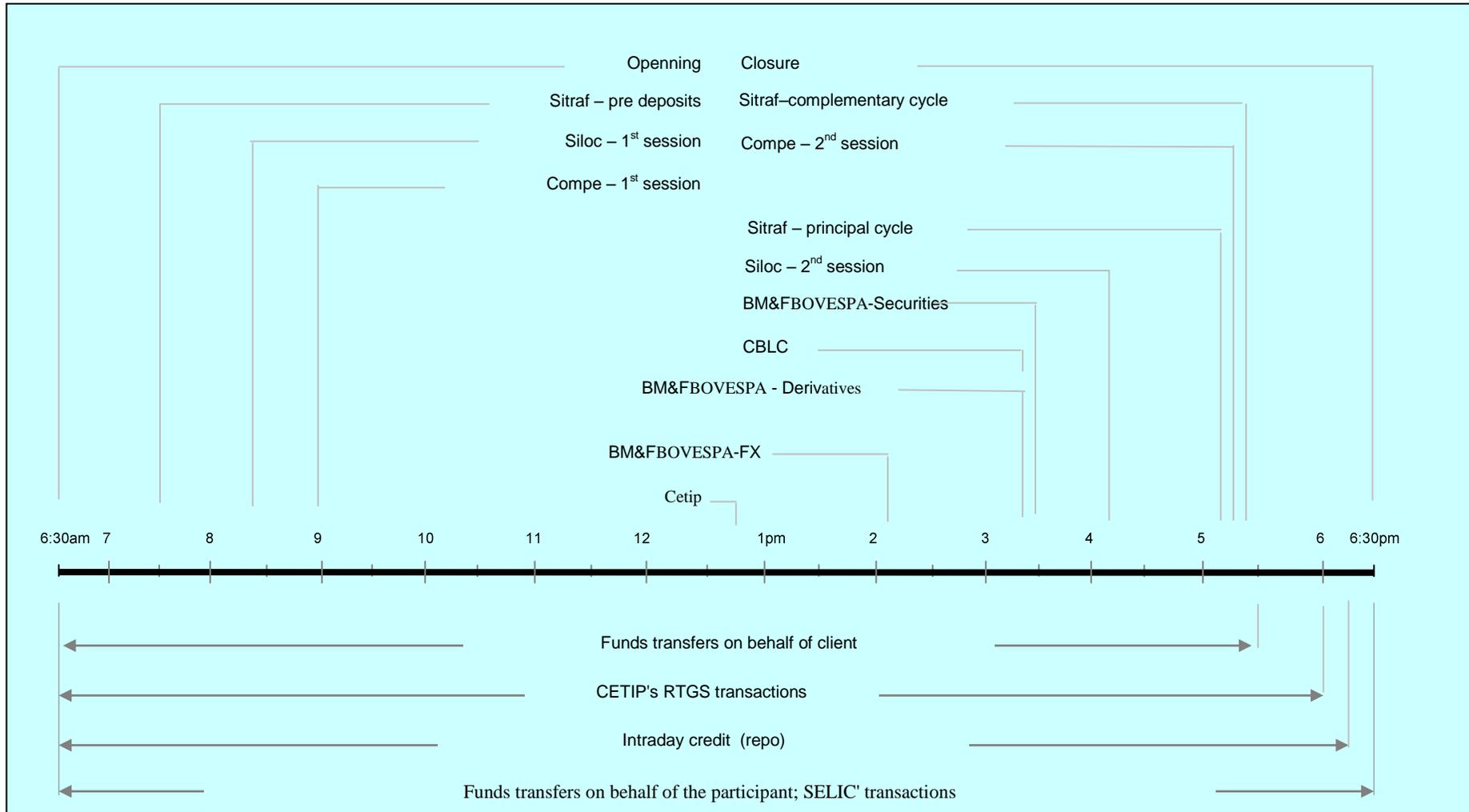
Participation in the STR is mandatory for both banking reserves account holders¹⁵ and entities that operate systemically important settlement systems. At the discretion of each one, both non-bank financial institutions and entities operating non-systemically important settlement systems can participate in STR as well. STN (National Treasury Secretariat) also participates in the system, since STR settles, among others, funds transfers related to collection of income taxes and payment of federal government expenditures. In September 2009, STR was composed of 136 banks and 3 clearinghouses, besides the Banco Central do Brasil and STN.

The STR pricing policy aims at full cost recovery, i.e., fees are charged to cover all costs, both fixed and variable. Both sides of each funds transfer order (sending bank and receiving bank) pay the basic fee. If the funds transfer order is issued until 9 am, half of the basic fee will be charged. A surcharge will apply if the funds transfer order is submitted off-line.

STR is open in all business days from 6:30 am to 6:30 pm (Brasilia time), but funds transfers on behalf of clients are allowed until 5:30pm only. The STR settlement schedule, with the main events, is shown in the following diagram:

¹⁵ Reserves account is mandatory for commercial banks, universal banks with a commercial bank portfolio and savings banks, and optional for investment banks.

Diagram 3: STR – Schedule



3.2.2 – Funds Transfer System (Sistema de Transferência de Fundos) - SITRAF

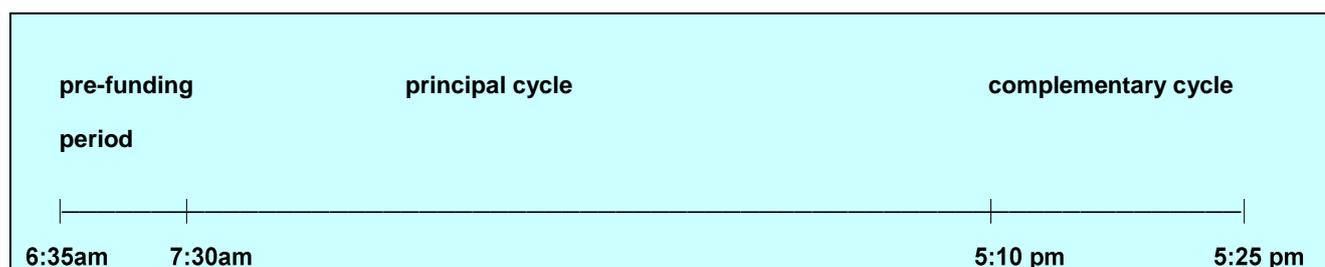
SITRAF started its operations on December 6, 2002. It is a hybrid settlement system operated by CIP, which uses the so-called continuous net settlement. As the STR, the system accepts credit orders only, and settlement is carried out using funds at the Banco Central do Brasil. Usually, the funds transfers orders are issued to be settled on the same day, lets say, in “quasi-real time”. If it is issued to be settled in a future day, the funds transfer order will be submitted to settlement process in the beginning of that day.

Electronic payment messages are exchanged between participants exclusively by means of RSFN (item 4), and the system is supported by two data processing centers (principal and secondary) located in Rio de Janeiro (the secondary center works in hot standby). SITRAF operates in a low platform environment and can process some 90 thousand funds transfer orders per hour.

At the beginning of each operational cycle, i.e. from 6:35am to 7:30pm, each participant makes an initial deposit (pre-deposit) in the SITRAF settlement account at the Banco Central do Brasil, which value is calculated in accordance with its operations history, i.e., based on statistical data. In the SITRAF environment, the initial deposit is credited in its settlement account, which balance is modified by funds transfer orders that the system releases. The participant can make further deposits to its SITRAF account, and, if there is excess of funds in the SITRAF environment, it can transfer funds from its SITRAF account to its STR account from 10:00am to 4:30pm.

Interbank funds transfer orders can be submitted to the system from 7:30am to 5:00pm. Each daily settlement cycle is composed of a principal cycle and a complementary cycle, as shown below:

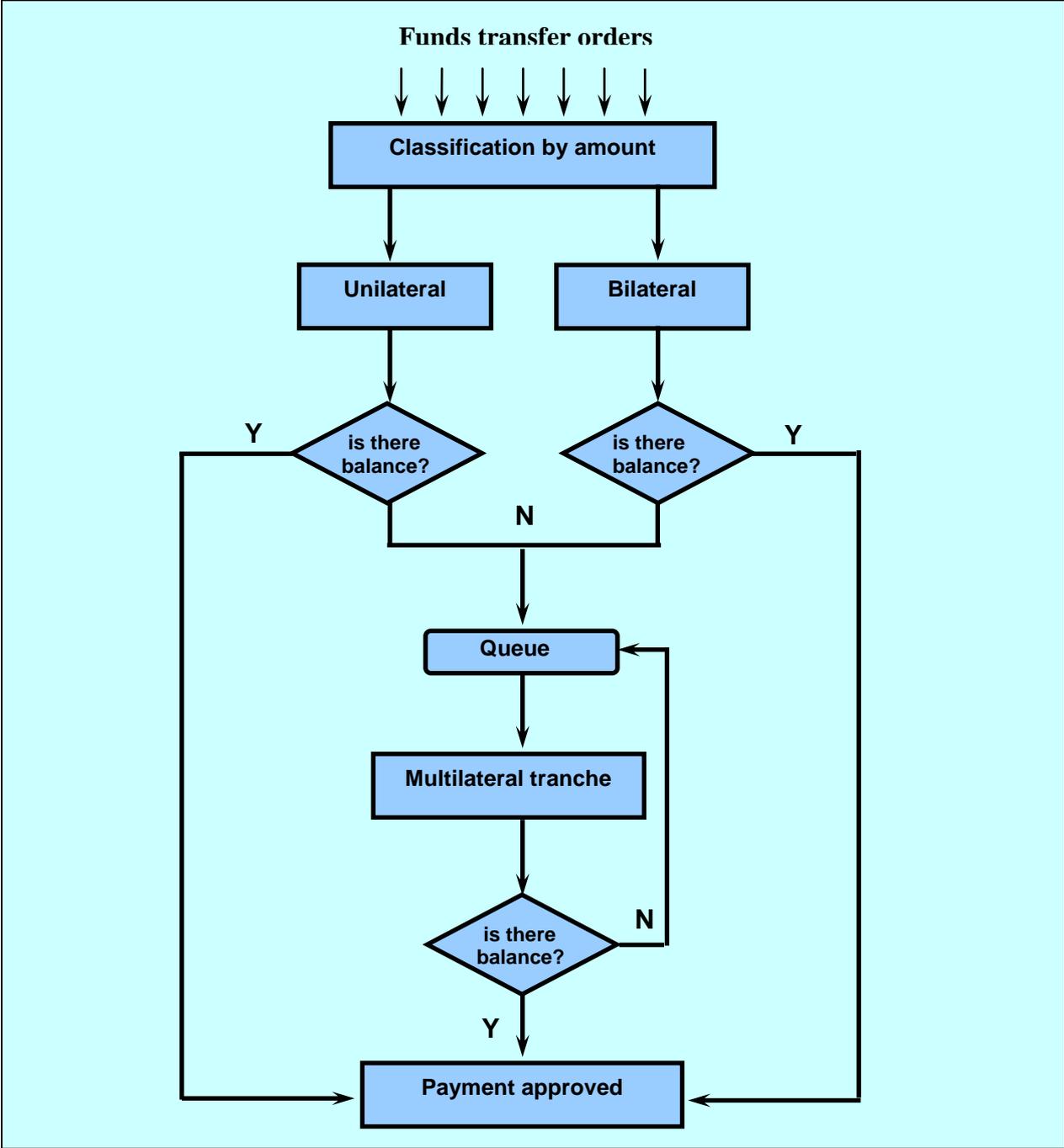
Diagram 4: SITRAF - Schedule



During the principal cycle, funds transfer orders are settled based on the balance of each participant settlement account in the SITRAF environment (all accounts must always present balance equal or higher than zero). In order to avoid a possible liquidity concentration during the principal cycle, the system observes a second requirement whereby no account can present balance higher than “n” times the amount of the pre-deposit initially deposited by the participant (“n” is established for CIP and can be changed from time to time). This upper limit is eliminated during the last ten minutes of the principal cycle.

A funds transfer can be settled alone, or in a batch of bilateral or multilateral netting. The processing flow is showed at the following diagram:

Diagram 5: SITRAF – Processing flow



In the complementary cycle, participants that present pending funds transfer orders must deposit, in the SITRAF settlement account at the Banco Central do Brasil, the necessary funds up to a pre-set deadline (5:20pm). The remaining funds transfer orders are then processed and released. At the end of the complementary cycle (5:25pm), CIP transfers to the participants' central bank accounts remaining balances in their respective accounts in the SITRAF environment.

Funds transfers related to initial and complementary deposits made during the principal and complementary cycles, as well as funds transfer made by the participant itself from its SITRAF account to its STR account, and refunds of remaining balances at the end of complementary cycle, are made by means of STR. As an operational principle, the receiving participant is informed about the funds transfer only at the moment in which it is released by the system.

Direct participation is restricted to institutions that hold bank reserves accounts (91 participants in December, 2008). Fees are charged to both sending bank and receiving bank, and full cost recovery is aimed.

3.2.3 – Centralizer Clearance for Checks (*Centralizadora da Compensação de Cheques*) - COMPE

COMPE clears interbank obligations related to checks, which values are lower than a referential value (VLB-Check) presently set in R\$ 250 thousand. The system has nationwide coverage and, to make the physical movement of documents¹⁶, is composed by a national clearinghouse, fifteen regional clearinghouses and ten local clearinghouses. Checks' data are always converted into electronic files (Magnetic Ink Character Recognition-MICR is used).

Two clearing sessions are carried out every business day. In each session, a single, nationwide multilateral net settlement position for each participant is computed. Based on the date in which the document is deposited in the collecting bank, the COMPE interbank settlement is processed, by means of STR, in the participants' accounts held at the Banco Central do Brasil, on T+1.

Banco do Brasil S.A., which is the system operator, provides facilities and logistical support that are necessary for both the physical exchange of documents and electronic clearing of all obligations. The operator maintains the principal processing center in Brasília and the secondary center, working in hot standby, in Rio de Janeiro.

Participation in the COMPE system is mandatory for financial institutions taking sight deposits, which totalizes 133 institutions in September, 2009. To participate in each session, each participant should deposit funds in a specific account at the Banco Central do Brasil, which are released only at the beginning of the next day. This deposit is not remunerated and its value, for each participant, is determined by the Banco Central do Brasil.

On the day in which checks are deposited (T), electronic files comprising those with values higher than a referential value (currently at R\$ 299.99), called "above of the limit" checks, are sent to the principal processing center, and simultaneously to the secondary processing center. These checks are exchanged physically in the clearinghouses on the same day (night session). Electronic files comprising checks with values lower than the referential value ("below of the limit" checks) are sent to the processing centers on the next morning (T+1), with physical exchanges being processed in the daylight session of T+1. The multilateral balances stemming from the clearing sessions are always settled in the Banco Central do Brasil accounts on the following day: i) "above of the limit" checks at 9am; ii) "below of the limit" checks at 5:15pm.

3.2.4 – Deferred Settlement System for Interbank Credit Orders (*Sistema de Liquidação Diferida das Transferências Interbancárias de Ordens de Crédito*) - SILOC

SILOC settles interbank obligations related to Document of Credit (DOC), Special Credit Transfer (TEC) and "bloqueto de cobrança" presenting value lower than R\$ 5 thousand. Multilateral net positions are settled in reserves accounts held by participants in the Banco Central do Brasil, through STR, usually in the same day, in case of TEC, and T+1 in case of both DOC and "bloqueto de cobrança". The system, which is operated by CIP, went on live on February 18, 2004, and comprises 116 sight deposit taking financial institutions (December, 2008).

On each business day, two settlement sessions are carried out. Net positions are informed to the participants, through electronic files, up to 5:10am in case of the morning session, and up to 3:05pm in case of the afternoon session. In each session, just one nationwide net position is calculated. In the first session, which ends at 8:20am, interbank obligations related to documents addressed the day before in the banking network are settled. In the second session, which ends 4:10pm, mainly returned items are settled, i.e. documents previously settled in the morning session and that, for any reason, are sent back to the sending bank.

¹⁶ Check truncation is admitted under bilateral agreements.

3.3 – Securities, derivatives and foreign exchange settlement systems

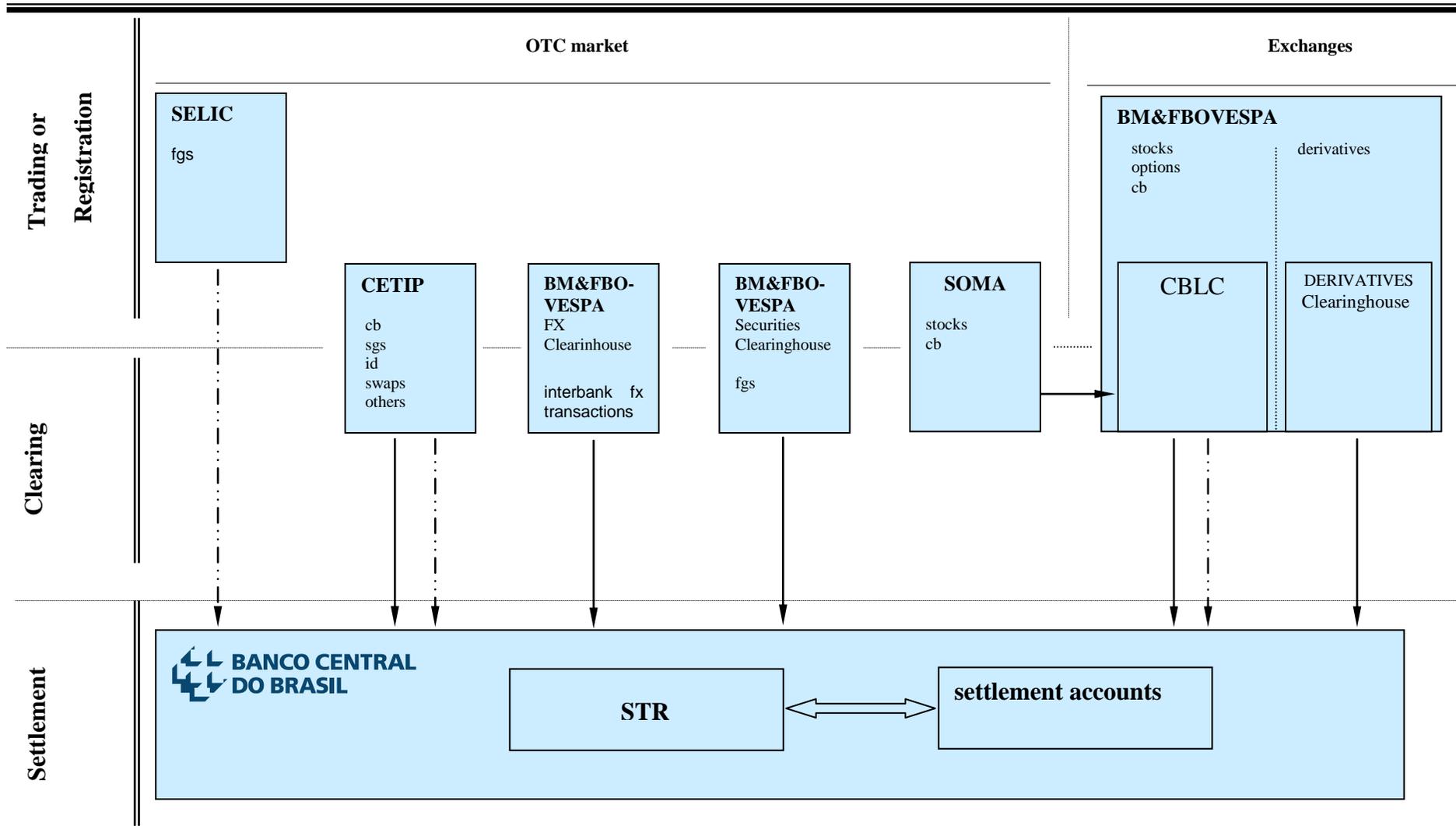
In Brazil, nearly 100% of all securities are dematerialized. Trading, clearing and settlement systems are highly automated, straight-through processing (STP) is broadly used, and DVP is observed in all securities settlement systems. In case of interbank foreign exchange transactions, PVP is observed as well if settlement is carried out through BM&FBOVESPA Foreign Exchange Clearinghouse.

Regarding securities settlement systems, the Brazilian payment system presents certain segmentation. SELIC, operated by the BCB, settles federal government securities¹⁷. BM&FBOVESPA Securities Clearinghouse also settles these securities using a different settlement model. CBLC settles mainly transactions with stocks carried out through BM&FBOVESPA and SOMA, while corporate bonds are mainly settled through CETIP.

Apart from CBLC, FX Clearinghouse and Securities Clearinghouse, BM&FBOVESPA also operates a derivatives settlement system. The following figure shows an overview of the Brazilian financial system, regarding trading, clearing and settlement of securities, derivatives and FX transactions:

¹⁷ Settlement of financial and security legs takes place simultaneously throughout the day, transaction-by-transaction.

Diagram 6 : Overview of the securities, derivatives and FX transactions market



fgs – federal government securities
 sgs – state government securities

cb – corporate bonds
 id – interbanking deposits

↓ DNS
 ↓ RTGS

3.3.1 – SELIC - Special System for Settlement and Custody (*Sistema Especial de Liquidação e de Custódia*)

SELIC is the central depository of securities issued by the National Treasury and the Banco Central do Brasil, and a DVP model 1 settlement system for outright and repo transactions with these securities¹⁸. All securities are dematerialized and transferred by book entries, while settlement of financial leg of each transaction is processed by means of the STR, to which SELIC is linked.

Besides the National Treasury and the Banco Central do Brasil, commercial banks, universal banks, investment banks, savings banks, dealers and brokers, clearing and settlement system operators, mutual investment funds and many other institutions that integrate the financial system participate in SELIC as custody account holders. To settle obligations, they are classified as settling and non-settling participants according to their nature. The non-settling participants settle their obligations by means of settling participants, which are institutions that hold reserves accounts at the Banco Central do Brasil. Each non-settling participant can use the services of more than one settling participant, except in some specific transactions such as interest payment and redemption of securities, which are settled through a previously indicated settling participant. Non-settling participants are classified as independent or subordinated, respectively those that register their transactions directly or by means of settling participants to whom they are tied. In September 2009, the system was composed of 6,879 participants.

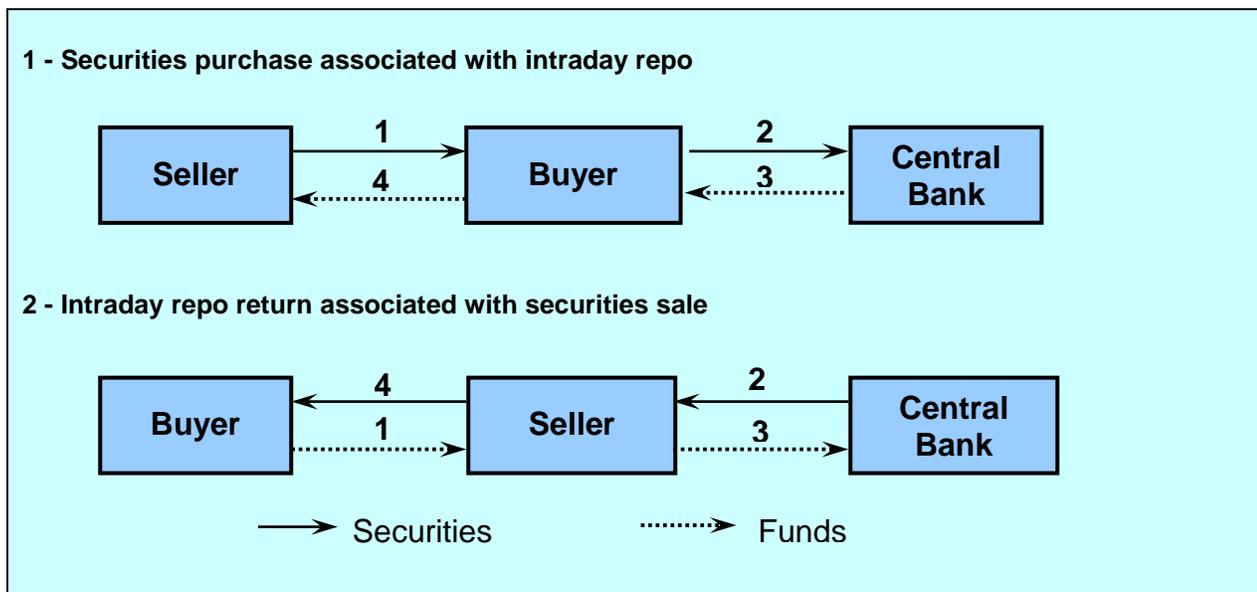
The Banco Central do Brasil manages the SELIC and operates it jointly with ANBIMA. The system has two operational centers – principal and secondary – located in Rio de Janeiro. Settlement participants submit their transactions through RSFN, following standards and procedures set in the specific network manuals. Other participants use different networks, according to the procedures set in the system's regulation. The system is open from 6:30am to 6.30pm.

Since it is a real-time gross settlement system, the settlement of each transaction is always conditioned to the availability of the traded securities in the seller's custody account and the availability of funds in the settlement participant's STR account. If the seller's custody account does not present sufficient balance of securities, the transaction will be held as pending for no longer than 60 minutes or till 6:30pm, whichever occurs first (selling transactions of securities acquired in primary auction carried out at the day do not fit this restriction). Transactions are forwarded to STR to settlement of financial leg only after blockade of the traded securities. The non-settlement of the transaction due to insufficiency of funds implies its prompt rejection by STR, and SELIC as well.

Under the system's regulation, some associated transactions are allowed. In these cases, though settlement is processed transaction-by-transaction, net positions (securities and funds) of the set of the transactions are considered.

¹⁸ The final settlement of financial and securities legs occurs all day long, simultaneously, operation by operation.

Diagram 7: SELIC – Examples of associated transactions



3.3.2 – CETIP S.A. – Organized Over-the-Counter Market for Securities and Derivatives (Balcão Organizado de Ativos e Derivativos)

CETIP is depository of corporate bonds¹⁹, state and municipal government securities and securities that represent National Treasury's special responsibilities²⁰. As depository, the entity processes issuing, redemption and custody of securities, as well as, when applicable, interests payment. All securities are dematerialized and transferred by book entries and transactions with them are carried out at over-the-counter market, including those traded through CETIP's electronic trading system (Cetipnet).

According to the type of transaction and the time it is carried out, settlement is on T or T+1. Multilateral netting is normally used in the case of primary market transactions. Bilateral netting and real-time gross settlement are used as well, respectively for derivatives transactions and for securities traded at secondary market.

CETIP does not act as a central counterparty. Therefore, if a settlement bank does not confirm the payment of a clearing member obligation, participants' multilateral net positions will be recalculated with the exclusion of transactions cleared through the failing clearing member, and they will be settled bilaterally in RTGS mode. In case of a settlement bank default, multilateral net positions that would be otherwise settled through it can be settled by means of another settlement bank. In any case, DVP is observed and final settlement occurs in settlement accounts held at the Banco Central do Brasil.

Commercial banks, universal banks, savings banks, investment banks, development banks, brokers and dealers, leasing companies, insurance companies and institutional investors, including mutual investment funds and private pension funds, foreign investors, besides other institutions that are also authorized to operate in financial and capital markets, participate in CETIP. Participants not holding bank reserves accounts settle their obligations by means of institutions holding these accounts. The system comprises about 8,400 participants (September, 2009).

¹⁹ Certificates of Banking Deposit – CDB, Receipts of Banking Deposit – RDB, Interfinancial Deposits – DI, Bills of Exchange – LC, Bills of Mortgage – LH, debentures and commercial papers, among others.

²⁰ The obligations are mainly related to state companies, some of them extinct, the Fundo de Compensação de Variações Salariais - FCVS (Salary Variation Compensation Fund), the Programa de Garantia da Atividade Agropecuária - PROAGRO (Agricultural Activity Guarantee Program) and Títulos da Dívida Agrária - TDA (Agricultural Debt Securities).

CETIP maintains two processing centers (the secondary center works in hot standby) and, in contingency cases, the transaction can be retaken from the secondary center less than one hour later. To register transactions, the Market Telecommunication Network (Rede de Telecomunicações do Mercado - RTM) is used, while RSFN is used for the flow of messages related to the settlement phase. In any event, *straight-through processing* is used.

3.3.3 – BM&FBOVESPA-CBLC

CBLC settles transactions traded at both BM&FBOVESPA and SOMA involving stocks (spot market and derivative market - options, term and futures) and corporate bonds (nowadays only outright transactions in the spot market). CBLC also acts as central depository for stocks and corporate bonds, and operates a securities loan program. As a central depository, CBLC maintains individual custody account for every investor. Multilateral netting is normally used to settle transactions, but in specific situations, as set in the system's regulation, settlement can be carried out on a real-time basis, transaction-by-transaction. In the case of multilateral netting, BM&FBOVESPA acts as central counterparty and ensures the settlement of transactions among clearing members. DVP model 3 is observed.

The final financial settlement is always carried out through STR at accounts held at the Banco Central do Brasil²¹. The settlement day depends on both the market and the moment in which the transaction is carried out, according to the following chart:

Chart 3: CBLC – Settlement cycle by type of security and transaction

Market	Type of transaction	Settlement date
Corporate bonds	Spot	T for transactions registered up to 1pm and T+1 for others
Stocks	Spot	T+3
	Term	T+n (the maturity date)
	Futures ²²	(T+n)+3 (third day following maturity date)
	Options ²³	T+1

Banks, brokers and dealers participate in the system as clearing members, which are classified into three categories: self-clearing member; full clearing member; and specific agent. The former clears only trades conducted by it on behalf of its own or of its clients. Full clearing member clears additionally transactions conducted by other brokers and special clients, such as mutual funds, pension funds, insurance companies etc, while specific agent clears some specific transactions involving corporate bonds. To settle its financial positions, it is mandatory for the non-bank participant to use services of an institution holding an account at the Banco Central do Brasil, according to an agreement between them. The system is composed of 57 direct participants (September, 2009).

CBLC counts on two processing centers located in Sao Paulo (the secondary center operates in hot standby). Transactions are registered in systems of the trading environments²⁴ and are informed to CBLC on a real-time basis.

In the responsibility chain, the system has “principal-to-principal” relationship only with clearing members, which are responsible for default of brokers associated to them, and brokers, in turn, are responsible for default of

²¹ If the buyer and the seller have accounts in the same settling bank, a funds transfer is made between their accounts in that bank.

²² Daily adjustments are settled on T+1.

²³ Date for premium payment (in case of exercise, it is observed the settlement normal cycle of the spot market).

²⁴ BM&FBOVESPA's Megabolsa and Bovespa Fix respectively for stocks and corporate bonds, and Soma's Somatrader.

their clients. As a general operational rule, all participants must deposit collateral to cover their open positions, and, based on collateral posted by them, CBLC determines the credit limit to each clearing member. The clearing member distributes this limit to the brokers tied to it and each broker, in turn, to its clients. At each level, the limit can be divided among different markets.

CBLC adopts the CM-TIMS²⁵ to call margin on derivatives and securities lending transactions. The Risk Watch algorithmic²⁶, among others, is used to monitor transactional limits and set the value of the settlement fund necessary to conclude the settlement process even in case of default of clearing members with the two largest single settlement positions. For these purposes, CBLC uses historical simulation and stress tests, respectively. The settlement fund, which is updated on a monthly basis, is formed with contributions of clearing members (they are calculated according to the risk presented by each clearing member).

To process settlement in case of participant default, CBLC uses the following remedies in the order indicated:

- collateral posted by the defaulting clearing member or by investors tied to it;
- resources from the settlement fund correspondent to the defaulting clearing member;
- resources from the settlement fund correspondent to the share of other clearing members; and
- resources related to the system's Special Net Worth²⁷.

3.3.4 – BM&FBOVESPA Securities Clearinghouse (Câmara de Ativos)

The BM&FBOVESPA Securities Clearinghouse is a government securities multilateral net settlement system, which went on live on May 17, 2004. The system settles both transactions traded at SISBEX, which is an electronic trading platform operated by BM&FBOVESPA, and traditional OTC transactions. BM&FBOVESPA is central counterparty for all of these transactions, and DVP model 3 is observed.

The system settles outright transactions (both spot and term transactions) and repurchase agreements as well. Spot transactions can be settled at the same day (T), if they are traded and registered up to 11am. Term transactions are settled in the future date contracted between the original counterparties, which can be up to T+23 (T+1 is more usual). Regarding repurchase agreements, the front leg is usually settled at the same day, and the back leg is usually settled in T+1 (it is allowed up to T+23)²⁸. Short sales are allowed only with securities integrating the securities loan program provided by SELIC or BM&FBOVESPA itself.

The following participants can have a principal-to-principal relationship with the clearinghouse, therefore posting collateral directly:

- clearing members, which are banks and securities brokers that can settle transactions on behalf of their own or on behalf of their clients;
- centralized settlement participants, which are typically investment funds, pension funds and insurance companies, which can settle their own transactions only.

Settlement of cash lag is made, via STR, at accounts maintained at the Banco Central do Brasil, and 45 settling banks are used for this purpose. Securities transfer leg is made in the environment of the relevant central depository (SELIC).

All participants are subject to transactional limits, which are based on the collateral previously posted, and assets traded as well. These limits are monitored in real time, and all assets are marked-to-market in 'quasi real time'. For managing its risk exposure, the clearinghouse adopts the so-called portfolio risk methodology, and

²⁵ CM-TIMS was developed by The Options Clearing Corporation - OCC.

²⁶ Risk Watch is a product of the Algorithmics Incorporated, from Canada. It has been customized to the Brazilian market.

²⁷ Assets segregated according to BCB regulations.

²⁸ Repurchase agreements can have specific collateral, in which case it is specified since the beginning of each transaction, or, in some cases, according to the clearinghouse's rules, generic collateral (specific collateral is indicated at the end of the day and regarding the participant net position).

considers different sceneries (stress testing). Risk exposure is assessed using the same methodology observed by the Derivatives Clearinghouse, which is based on the analysis of risk primitive factors.

As a complementary mechanism, the system counts on a guarantee fund, which contributor is the BM&FBOVESPA itself. This fund can be used to cover both participants' default and losses imposed to a third by its broker in registering incorrectly the related transaction in the SISBEX system.

The clearinghouse comprises 60 clearing members and 398 centralized settlement participants (September, 2009). As it happens in the case of other clearing systems operated by BM&FBOVESPA, two processing centers located in Sao Paulo are used (the secondary center operates in hot standby).

3.3.5 – BM&FBOVESPA Derivatives Clearinghouse (*Câmara de Derivativos*)

Spot, forward, futures, options and swaps contracts are traded at BM&FBOVESPA. They are mostly referred to interest rates, foreign exchange rates, and price and stock indices. Related obligations are settled on T+1, by means of STR, at accounts held at the Banco Central do Brasil. BM&FBOVESPA acts as central counterparty and guarantees the settlement of clearing members' multilateral net positions. To ensure settlement of transactions, besides mechanisms of protection based on transactional limits and daily margin calls, the clearinghouse maintains three settlement funds. The clearinghouse also registers OTC derivatives, whose settlement can or cannot be guaranteed according to contracting parties' option. For guaranteed transactions, the clearinghouse also acts as central counterparty.

The clearinghouse operates with two processing centers located in Sao Paulo. The secondary center works in hot standby and, in case of failure of the primary center, operation can be retaken in the secondary center in less than two hours. To communicate with BM&FBOVESPA, participants can use either the BM&FBOVESPA communication network or RSFN. The latter is also used for settling net positions through STR, which is mandatory in this case.

Clearing members²⁹, settling banks, and direct settlement participants³⁰ are the main direct participants. Banks and brokers complying with the requirements set in the system's regulation – including minimum capital requirement and proof of managerial, organizational and operational capability – can act as clearing member, or as direct settlement participant. To settle its positions, it is mandatory for the non-bank clearing member to maintain an agreement with an institution holding account at the Banco Central do Brasil. The clearinghouse comprises 79 clearing members and 29 direct settlement participants (September, 2009).

In the spot market, *DVP* is observed. In the derivatives market, the clearinghouse processes daily margin calls, always marking to market the collateral and applying haircut, larger or smaller according to credit and liquidity risk of each asset. The risk monitoring comprises two phases: on the trade day (T), on a real-time basis, based on the net positions of clearing members; on the following days (T+n, with n > 0), on a gross basis, i.e., risk is managed client by client.

Cash deposit, pledge of high-liquidity assets – specially federal government securities –, stocks of the theoretical portfolio of Ibovespa (BM&FBOVESPA Index), certificates of bank deposits, certificates of gold posted in custody at BM&FBOVESPA, among others, are accepted for margin calls, either initial or additional. Normally, the margin call is met on T+1, but the clearinghouse has, under its regulation, the right to call additional intraday margin if, and when, it judges necessary. BM&FBOVESPA also sets limits on open positions and prices oscillation to manage its liquidity risks exposure.

To assess its risk exposure, the clearinghouse:

- analyzes the contracts as risk primitive factors;
- establishes a set of stress sceneries for each risk factor;
- calculates the risk for different sets of risk factors;

²⁹ Typically a broker settling transactions either on behalf of its own or on behalf of clients.

³⁰ A clearing member that settles its own transactions only, or transactions relating to some special investors.

- chooses the worst combination.

In case of default, i.e. when a collateral call is not met or a daily adjustment is not paid, the defaulting participant's positions are closed. If, after contracts are cleared, net debt position is observed, the system will use resources from different settlement funds, which are formed with contributions made by brokers, clearing members and BM&FBOVESPA itself, and, as a last resource, BM&FBOVESPA's assets can be used.

3.3.6 – BM&FBOVESPA Foreign Exchange Clearinghouse (*Câmara de Câmbio*)

The system settles interbank foreign exchange transactions carried out over-the-counter³¹ or on the floor in the BM&FBOVESPA's environment. Nowadays, the FX Clearinghouse settles transactions involving US dollar only, typically on T+2³². PVP is observed, i.e. the national currency delivery and the foreign currency delivery are reciprocally dependent. For this purpose, BM&FBOVESPA monitors and coordinates the settlement process of both legs.

The clearinghouse acts as central counterparty. In each settlement cycle, net positions are settled:

- in domestic currency, at bank reserves accounts held by participants in the Banco Central do Brasil;
- in US dollar, at accounts held by participants at correspondent banks in New York.

To limit its exposure to settlement risks, the clearinghouse imposes operational limits to the participants, as well as requires collateral – mainly federal government securities – to cover the foreign exchange rate volatility. BM&FBOVESPA counts on liquidity lines contracted in both domestic and foreign currency to render the timely completion of the settlement cycle possible even in case of participant default. Furthermore, the clearinghouse has selected foreign correspondent banks with low credit risk, and has diversified its operations among them.

Acceptance of a transaction for settlement observes an automated process of analysis, which takes into consideration the net position traded by each participant, their respective operational limits, uncommitted collateral necessary to cover the foreign exchange rate volatility, and the reasonability of the contracted foreign exchange rate in comparison with the market average rate. If a transaction is contracted at a value out of usual range of prices, its acceptance depends on the additional collateral posted by the participant. The assets for collateral are daily marked to market.

At the end of trading session of the previous day, the clearinghouse informs the participants about their net positions to be settled on the following day. At the settlement day, participants with net debit positions, in domestic or foreign currency, must transfer the corresponding resources to the clearinghouse. For domestic currency, transfers are made by means of STR to the settlement account of the clearinghouse at the Banco Central do Brasil and, for foreign currency, to the clearinghouse account at the correspondent bank indicated by it³³. At the time set in the system's regulation, the clearinghouse processes the funds transfer to participants with net credit positions. This implies transfers in domestic currency, by means of STR, to participants with net short position in foreign currency and transfers in US dollar to participants with net long position in foreign currency, using Swift messages to order foreign transfers to its correspondent banks.

In case of default, the defaulting participant does not receive its respective currency amount and the clearinghouse uses the resources collected from the surviving party to the necessary purchase of currency, i.e. domestic currency or dollars, as the surviving counterparty is, in the original transaction, respectively, seller or buyer of foreign currency. This currency purchase is made through an outright transaction or a repurchase agreement, as the clearinghouse considers the participant in irregular situation respectively an actual defaulter or debtor for operational reasons exclusively.

³¹ OTC transactions can be settled either directly between the counterparties or through the FX Clearinghouse. In the former case, settlement in the national currency is made through STR, while settlement in foreign currency is made through foreign correspondent banks.

³² Settlement on T or T+1 is possible as well.

³³ Where both the clearinghouse and the participant hold account at the same correspondent bank, fund transfers can be made between accounts of such correspondent bank. On the other hand, when transfers involve different banks, they must be made through the funds transfer system operated by the Federal Reserve Bank (Fedwire).

To process a repurchase agreement, therefore subject to reversal, the participant considered operational debtor must deposit to the clearinghouse, up to the deadline set in the regulation, the amount related to the cost of this transaction³⁴. In any event, the purchase of currency is made with the bank offering the best proposal among those previously contracted by the clearinghouse. The repurchase agreement will be converted into outright transaction if the defaulter, initially declared operational debtor, does not regularize its situation up to a pre-established deadline.

The clearinghouse will foreclose collateral posted by the defaulter in the amount sufficient to cover the foreign exchange rate variation, if exchange rate variation determines so (the surviving party is the buyer or the seller of foreign currency respectively when the foreign exchange rate depreciates or appreciates). In any event, on the contracted maturity date the surviving party receives its respective amount of currency. If necessary, the clearinghouse uses the previously contracted liquidity lines, in domestic or foreign currency according to the case.

Banks and foreign exchange brokerage firms can participate in the clearinghouse subject to its evaluation. To act as settling agent, the participant must hold an account at the Banco Central do Brasil. The system comprises 70 settling banks and 22 brokers (September, 2009).

BM&FBOVESPA maintains two processing centers located in Sao Paulo. In case of contingency, operation can be retaken at the secondary center, which operates in hot standby, in less than 30 minutes.

4. RSFN - National Financial System Network (*Rede do Sistema Financeiro Nacional*)

RSFN is the financial system network created to carry the message flow throughout the environment of the Brazilian payment system. Institutions holding account at the Banco Central do Brasil, clearinghouses, the Secretaria do Tesouro Nacional (National Treasury Secretariat) and the Banco Central do Brasil are interlinked in real time, by means of this infrastructure. This technological platform is mainly used to access STR and SITRAF.

Under the operational point of view, two independent telecommunication networks compose RSFN. Each one operates as a backup service for the other, and both networks meet stringent security, availability and operational reliability criteria established by the Banco Central do Brasil. All participants are required to sign up for both relevant providers.

In order to monitor the network and promote its continuous development, three technical working groups have been constituted (network, messages and security). The Banco Central do Brasil has the exclusive right to co-ordinate them.

RSFN has a proprietary messaging protocol developed jointly by the Banco Central do Brasil, banks' associations and clearing and settlement system providers. The message standard format is XML (Extensible Markup Language), which is a simple, very flexible text format. Among others, messages related to funds transfers, collateral pledges and securities transactions are sent through RSFN.

³⁴ The requirement is always met in domestic currency. STR is used for the correspondent funds transfer.

5. Statistics ³⁵

Table 1: Basic statistical data					
	2004	2005	2006	2007	2008
Population (million)	181.1	183.4	185.6	187.6	189.6
GDP (R\$ billion)	1,941.5	2,147.2	2,369.8	2,597.6	2,889.7
GDP per capita (R\$)	10,720.6	11,707.7	12,768.3	13,846.5	15,241.0
Exchange rate (Real/USD)					
<i>year end</i>	2.6544	2.3407	2.1380	1.7713	2.3370
<i>Average</i>	2.9257	2.4341	2.1771	1.9483	1.8375

Source: Banco Central do Brasil and IBGE.

Table 2: Settlement media used by non-banks (year-end)					
	R\$ million				
	2004	2005	2006	2007	2008
Notes and coins held by public	52,019.4	58,272.2	68,924.7	82,250.8	92,378.5
Transferable deposits ¹	75,927.0	86,505.9	105,421.6	149,179.0	132,125.4
Narrow money supply (M1)	127,946.4	144,778.1	174,345.3	231,429.8	223,439.9
Broad money supply (M4)	1,109,518.9	1,312,399.0	1,558,613.4	1,884,846.0	2,239,553.1

Source: Banco Central do Brasil

¹ *Sight deposits.*

³⁵ In the tables, “...” means “not applicable”, “n.a.” means “not available” and “neg” means “negligible datum”.

Table 3: Settlement media used by banks (year-end)

R\$ billion					
	2004	2005	2006	2007	2008
Transferable balances held at central bank ¹	26.8	31.2	35.3	43.7	32.0
Transferable deposits at other institutions	...	...	...	...	...
Funds borrowed from the central bank:	4.2	24.0	0.5	2.8	10.4

Source: Banco Central do Brasil
¹ Balances at reserves accounts.

Table 4: Institutional framework (year end – 2008)

Categories	Number of institutions	Number of branches (thousand)	Number of accounts (million)	Value of Accounts (R\$ billion)
Central bank	1	9 ²	129 ²	43.7
Banks ¹	131	19.1	125.7	132.1
Others ³	1,961	n.a.	n.a.	n.a.

Source: Banco Central do Brasil
¹ Includes commercial banks, universal banks with commercial portfolio and Caixa Econômica Federal.
² Unities.
³ Credit cooperatives and non-banking financial institutions.

Table 5: Bank notes and coins (year end)

	R\$ million				
	2004	2005	2006	2007	2008
Total currency issued	<u>61,935.6</u>	<u>70,033.6</u>	<u>85,824.8</u>	<u>102,885.0</u>	<u>115,590.7</u>
<i>Notes issued</i>	60,581.1	68,430.7	83,882.3	100,529.3	112,722.5
<i>of which:</i>					
<i>BRL 100</i>	2,031.8	2,052.9	2,750.0	9,758.9	19,638.0
<i>BRL 50</i>	43,476.9	50,031.9	61,158.2	68,613.6	71,261.1
<i>BRL 20</i>	4,190.5	5,365.0	7,993.5	10,595.9	11,129.1
<i>BRL 10</i>	8,341.3	8,289.6	9,010.5	8,338.2	7,208.6
<i>BRL 5</i>	1,293.2	1,395.8	1,599.3	1,752.3	1,947.3
<i>BRL 2</i>	590.0	712.4	942.4	1,187.0	1,344.5
<i>BRL 1</i>	657.4	583.1	428.4	283.5	193.8
<i>Coins issued</i>	1,354.5	1,602.9	1,942.5	2,355.7	2,868.2
Notes and coins held by banks	<u>9,916.2</u>	<u>11,761.4</u>	<u>16,900.0</u>	<u>20,634.3</u>	<u>23,212.2</u>
Notes and coins circulating outside banks	<u>52,019.4</u>	<u>58,272.2</u>	<u>68,924.7</u>	<u>82,250.8</u>	<u>92,378.5</u>

Source: Banco Central do Brasil

Table 6: Cash dispensers, ATMs and EFTPOS terminals

	2004	2005	2006	2007	2008
<u>Cash dispensers and ATMs</u>					
Number of networks	28	26	26	25	26
<i>National</i> ¹	16	9	9	11	9
<i>Regional</i>	12	17	17	14	17
Number of terminals (thousand)	139.5	146.8	147.5	153.2	158.6
Volume of transactions (million)	6,191.9	6,782.3	7,341.6	7,551.8	7,951.5
Value of transactions (R\$ billion)	959.5	1,127.4	1,039.1	1,268.3	1,521.4
<u>EFTPOS:</u>					
Number of networks	6	6	7	7	8
<i>Debit cards</i>	3	3	3	3	3
<i>Credit cards</i>	3	3	4	4	5
Number of terminals (thousand)	1,187.3	1,338.2	1,944.9	2,469.3	3,177.1
Volume of transactions (million)	2,164.6	2,641.9	3,241.7	3,860.5	4,617.1
Value of Transactions (R\$ billion)	134.7	169.5	212.7	264.7	323.1

Source: Market institutions (banks, debit and credit card administrators).

¹ Networks that act in at least 2/3 of the Brazilian States.

Table 7: Number of payment cards in circulation

	million				
	2004	2005	2006	2007	2008
Cards with debit function	149.1	163.9	174.5	182.4	207.9
Cards with credit function	53.5	67.5	85.2	117.7	137.8
Retailer cards	86	97	118	144	173

Source: Market institutions (banks, debit and credit card administrators, ABECS and Partner Consultores)

Table 8: Indicators of use of cashless payment instruments by non-banks
Volume of transactions

	million				
	2004	2005	2006	2007	2008
Checks	1,996.9	2,526.8	2,242.0	1,999.0	1,962.8
-Checks collected through interbank settlement systems	1,966.9	1,838.6	1,621.7	1,449.2	1,373.0
-On-us checks	n.a.	688.2	620.3	549.8	589.8
Payments by cards	2,653.7	3,218.0	3,927.7	4,711.5	5,636.0
- debit card	912.1	1,140.7	1,427.7	1,700.1	2,097.2
- credit card	1,252.6	1,501.3	1,814.0	2,160.4	2,519.8
- retailer and fidelity cards ¹	489	576	686	851	1,019
Credit transfers	1,015.7	4,763.9	5,296.3	5,954.0	6,649.6
-interbank ²	1,015.7	1,027.2	1,309.3	1,508.9	1,717.7
-intrabank	n.a.	3,736.7	3,987.0	4,445.1	4,932.0
Direct Debits	657.4	781.1	840.1	852.6	871.3

Source: Banco Central do Brasil and market institutions, (banks, debit and credit card administrators, and ABECS).

¹ Rounded numbers (ABECS).

² Corresponds to DOCs, TECs, "bloquetos de cobrança", and TED issued by clients.

Table 9: Indicators of use of cashless payment instruments by non-banks
Value of transactions

R\$ billion					
	2004	2005	2006	2007	2008
Checks	1,002.6	2,213.1	2,080.7	2,191.8	2,553.7
-checks collected through interbank settlement systems	1,002.6	1,025.0	1,011.1	1,037.8	1,146.7
-on-us checks	n.a.	1,188.1	1,069.6	1,154.0	1,407.0
Payments by cards	156.4	198.0	249.1	310.2	376.1
- debit card	42.2	52.9	66.9	83.1	105.3
- credit card	92.5	116.6	145.8	181.6	217.8
-retailer and fidelity cards	21.7	28.5	36.4	45.5	53
Credit transfers	2,714.4	7,776.4	9,417.8	14,215.4	18,050.8
- interbank	2,714.4	2,957.2	3,664.9	4,671.5	5,763.3
- intrabank	n.a.	4,819.2	5,752.9	9,543.9	12,287.5
Direct Debits	118.5	148.7	154.5	180.5	217.9

Source: Banco Central do Brasil and market institutions, (banks, debit and credit card administrators, and ABECS).

¹ Corresponds to DOCs, TECs, "bloquetos de cobrança", and TED issued by clients.

Table 10: Interbank funds transfer settlement systems
Volume of transactions

million					
	2004	2005	2006	2007	2008
STR	13.4	13.2	10.7	10.9	10.5
COMPE	3,125.4	2,194.6	1,734.3	1,546.3	1,465.9
SITRAF	25.4	34.5	41.6	51.9	59.9
SILOC	94.2 ²	967.7	1,239.8	1,427.2	1,623.9

Source: Banco Central do Brasil and clearing and clearing and settlement service providers.

Table 11: Interbank funds transfer settlement systems					
Value of transactions					
	R\$ billion				
	2004	2005	2006	2007	2008
STR	71,819.4	88,265.6	97,961.1	109,605.7	112,328.1
COMPE	2,151.0	1,248.7	1,011.2	1,009.2	1,124.5
SITRAF	1,840.3	2,462.3	3,129.6	4,079.9	5,118.3
SILOC	89.8 ²	497.0	627.1	726.8	852.9

Source: Banco Central do Brasil and clearing and settlement service providers.

Table 12: Securities holdings in central securities depositories					
	2004	2005	2006	2007	2008
SELIC					
<i>Volume (million)</i>	3,001.8	3,144.6	3,236.3	2,209.0	2,051.8
<i>Value (R\$ billion)</i>	1,064.7	1,216.8	1,370.4	1,541.5	1,708.4
<i>Government securities</i>	1,064.7	1,216.8	1,370.4	1,541.5	1,708.4
CETIP					
<i>Volume (million)</i>	326	1,016	1,357	1,577	2,138
<i>Value (R\$ billion)</i>	590.7	894.2	1,484.6	1,949.5	2,287.8
<i>Corporate bonds</i>	544.2	853.1	1,151.6	1,542.9	2,256.8
<i>Government securities</i>	46.5	41.1	36.2	37.6	31.0
BM&FBOVESPA-CBLC					
<i>Volume (billion)</i>	7,018	4,894	4,916	2,115	1,919.1
<i>Value (R\$ billion)</i>	389.7	518.6	729.8	1,123.3	650.4
<i>Stocks</i>	386.8	513.9	724.2	1,116.7	645.1
<i>Corporate bonds</i>	2.9	4.7	5.6	6.6	5.4

Source: Banco Central do Brasil and clearing and settlement service providers.

Table 13: Securities, derivatives and FX transactions settlement systems
Volume of transactions

	million				
	2004	2005	2006	2007	2008
SELIC	2.24	2.45	2.68	2.75	2.90
<i>Government Securities</i>	2.24	2.45	2.68	2.75	2.90
CETIP	0.81	1.07	2.04	3.31	5.17
<i>Corporate Bonds</i>	0.75	1.02	1.97	3.25	5.00
<i>Government Securities</i>	0.04	0.04	0.05	0.04	0.04
<i>Derivatives</i>	0.02	0.01	0.02	0.02	0.12
BM&FBOVESPA-CBLC	18.77	21.49	28.37	47.09	73.44
<i>Stocks</i>	13.25	15.50	21.54	37.46	60.92
<i>Government Securities</i>	...	...	...	...	...
<i>Corporate bonds</i>	neg.	neg.	neg.	neg.	neg.
<i>Derivatives</i>	5.52	5.99	6.83	9.63	12.52
BM&FBOVESPA FX	0.11	0.09	0.07	0.06	0.06
BM&FBOVESPA SECURITIES	0.05²	0.03	0.02	0.01	0.01
BM&FBOVESPA DERIVATIVES	3.18	2.86	4.05	5.70	7.2

Source: Banco Central do Brasil and clearing and settlement service providers.

Table 14: Securities, derivatives and fx transactions settlement systems
Value of transactions

	R\$ billion				
	2004	2005	2006	2007	2008
SELIC	98,576.3	107,444.3	132,616.6	160,005.8	185,895.0
<i>Government Securities</i>	98,576.3	107,444.3	132,616.6	160,005.8	185,895.0
CETIP	3,686.3	3,443.0	3,669.7	4,429.6	6,956.1
<i>Corporate Bonds</i>	3,598.6	3,417.7	3,644.9	4,357.8	6,833.9
<i>Government Securities</i>	78.1	9.9	11.9	11.5	8.4
<i>Derivatives</i>	9.6	15.4	12.8	60.3	113.9
BM&FBOVESPA-CBLC	342.5	455.7	671.1	1,354.6	1,511.28
<i>Stocks</i>	295.6	417.4	625.6	1,270.4	1,414.42
<i>Government Securities</i>	...	...	...	...	...
<i>Corporate bonds</i>	3.5	3.8	2.1	1.9	1.5
<i>Derivatives</i>	43.4	34.5	43.4	82.3	95.3
BM&FBOVESPA FX	779.4	878.8	957.8	1,369.7	1,397.1
BM&FBOVESPA SECURITIES	1,339.9²	1,191.3	3,412.2	4,175.0	540.2
BM&FBOVESPA DERIVATIVES	241.0	229.1	327.8	476.9	666.6

Source: Banco Central do Brasil and settlement service providers.

Table 15: Netting rate in clearing systems - 2008

System	Value of transactions R\$ million¹	Value of settlement R\$ million¹	Netting rate² %
COMPE	1,124.5	101.6	91
SILOC	852.9	137.4	84
CETIP	6,956.1	2,973.5	57
CBLC	6,033.6	545.7	91
BM&FBOVESPA SECURITIES	4,222.0	1,414.2	67
BM&FBOVESPA FX	5,728.8	1,522.7	73
BM&FBOVESPA DERIVATIVES	2,677.1	942.9	65

Source: Banco Central do Brasil and clearing and settlement service providers.

¹ Daily average value. ² Netting rate = ((value of transactions – value of settlement)/value of transactions)*100

Table 16: Intraday credit transactions (daily average)

Year	Quantity¹	Total value R\$ million	Average value per transaction R\$ million
2002	400	32,664.1	81.9
2003	389	26,465.0	67.9
2004	418	35,598.9	85.3
2005	486	56,374.4	115.4
2006	531	66,608.2	124.6
2007	476	64,012.7	134.7
2008	389	47,188.5	121.4

Source: Banco Central do Brasil.

¹ Rounded numbers.

List of acronyms and abbreviations

Anbima – Brazilian Association of Financial and Capital Market Entities (www.anbima.com.br)

BIS – Bank for International Settlements (www.bis.org)

BM&FBOVEPA – Stocks, Mercantile & Futures Exchange (www.bmfbovespa.com.br)

BVRJ – Rio de Janeiro Stock Exchange (www.bvrj.com.br)

CETIP S.A – Organized OTC Market for Securities and Derivatives (www.cetip.com.br)

CHIPS - Clearinghouse Interbank Payments System

CIP – Interbank Payment Clearinghouse (<http://www.cip-bancos.org.br/>)

Compe - Centralizadora da Compensação de Cheques e Outros Papéis

CVM – Securities and Exchange Commission (www.cvm.gov.br)

RTGS – Real time gross settlement

DNS – Delayed net settlement

RSFN – National Financial System Network (www.rsfm.net.br)

RTM – Financial Market Telecommunication Network (www.rtm.net.br)

Selic – Special System for Settlement and Custody

Sitraf – Funds Transfer System

Soma – Society for Market of Assets (www.somativos.com.br)

SPC – Complementary Pension Secretariat (www.mpas.gov.br/08.asp)

STN – National Treasury Secretariat (www.stn.fazenda.gov.br)

STR – Reserves Transfer System

SUSEP – Private Insurance Superintendency (www.susep.gov.br)

TecBan - Tecnologia Bancária S.A. (www.tecban.com.br)