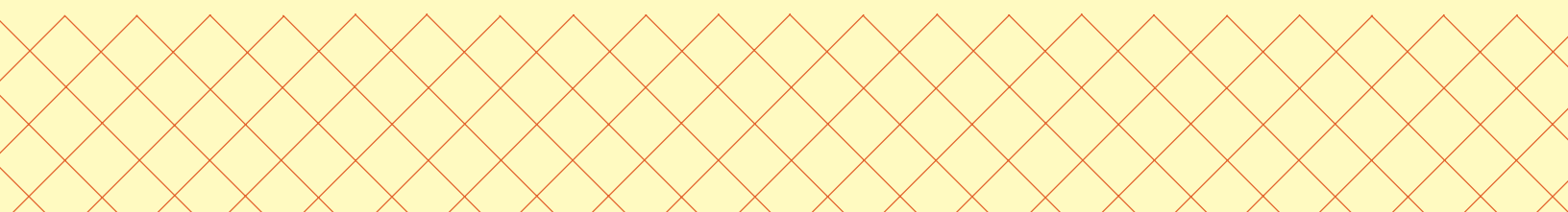


WESTERN HEMISPHERE PAYMENTS AND SECURITIES CLEARANCE AND SETTLEMENT FORUM  
CENTRE FOR LATIN AMERICAN MONETARY STUDIES  
THE WORLD BANK

**PAYMENTS AND SECURITIES  
CLEARANCE AND  
SETTLEMENT SYSTEMS  
IN BRAZIL**

SEPTEMBER 2004



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## Foreword

Following a request from the Western Hemisphere Finance Ministers, the World Bank launched in January 1999 the *Western Hemisphere Payments and Securities Clearance and Settlement Initiative*. The World Bank in partnership with the Centre for Latin American Monetary Studies (CEMLA) first led this Initiative, which, over the years, has evolved into a permanent Forum as a result of the capacity already created throughout the Region. The *Western Hemisphere Payments and Securities Settlement Forum* represents a new set of organizational arrangements to give continuity to the efforts initiated under the Initiative and was launched formally in June 2003.

The objective of the Forum is to describe and assess the payments systems of the Western Hemisphere with a view to identifying possible improvement measures in their safety, efficiency and integrity. To carry out this mandate an International Advisory Council (IAC) was established in March 1999 comprised of experts in the field from several institutions. In addition to representatives from the WB and CEMLA this Council includes members from the: Bank for International Settlements, Bank of Italy, Bank of Portugal, Bank of Spain, Council of Securities Regulators of the Americas (COSRA), De Nederlandsche Bank, European Central Bank, Federal Reserve Board, Federal Reserve Bank of New York, Inter-American Development Bank, International Monetary Fund, International Organization of Securities Regulators (IOSCO), Securities Commission of Spain, Swiss National Bank and U.S. Securities Commission (SEC).

To assure quality and effectiveness, the Forum includes two important components. First, all studies are conducted with the active participation of country officials and the project builds on the existing work being undertaken in the respective countries. Second, the Forum draws on international and national expertise on the subject, through the IAC, to provide guidance, advice and alternatives to current practices.

The Forum has undertaken a number of activities in order to respond to the Western Hemisphere Finance Ministers' request. These include: the preparation of public reports containing a systematic in-depth description of each country's payments clearance and settlement systems; the delivery of recommendations reports to country authorities on a confidential basis; the organization of IAC meetings to review country studies and provide input for future work; the organization of workshops focusing on issues of particular interest; the creation of a web-page ([www.ipho-whpi.org](http://www.ipho-whpi.org)) to present the outputs of the Forum and other information of interest in the payments systems area; and the promotion of working groups to ensure a continuation of the project activity.

CEMLA has been acting as the Technical Secretariat and is playing a major role in making the process sustainable and capable of extension to all the countries in the Hemisphere. To this end, the Forum has helped strengthen CEMLA's in-house expertise. Additionally, practitioners in payments and securities clearance and settlement in some countries in the Region have participated in the studies under the Initiative and at present under the Forum, through CEMLA coordination, and this has contributed to the broadening of knowledge and the transfer of know-how within the Region. The endeavors of the working groups in coordination with CEMLA already provide this permanent Forum for the countries in the Region to discuss, coordinate, and add a collective impetus to the work in the area of payments and securities clearance and settlement systems.

This Report "Payments and Securities Clearance and Settlement Systems in Brazil" is one of the public reports in the series and was prepared under the coordination of CEMLA and the World Bank. The *Banco Central do Brasil* and the *Comissão de Valores Mobiliários* of Brazil also participated actively in its preparation.

Kenneth Coates  
Director General  
CEMLA

David de Ferranti  
Vice President, LAC  
World Bank

Cesare Calari  
Vice President, Financial Sector  
World Bank

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*This report was prepared by Massimo Cirasino, Emanuel Di Stefano B. Freire and José Antonio García (CEMLA and WGPS-LAC\*), and benefited from comments by Mario Guadamillas (World Bank) and by the BCB team lead by José Antonio Marciano.*

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\* Working Group on Payment System Issues of Latin America and the Caribbean.

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# 1 ECONOMIC AND FINANCIAL MARKET OVERVIEW

## 1.1 OVERVIEW OF RECENT REFORMS

Brazil, like most Latin American countries, underwent major economic reforms during the 1990s. Although each country had its own agenda, they shared a similar core of reforms based on privatization, deregulation, lower trade tariffs, and efforts to trim the state, achieve macroeconomic stability, and foster economic growth.

For many years and up to 1994, high inflation rates were one of the main features of the Brazilian economy. In fact, since October 1942, Brazil has experienced nine reforms of its monetary system. Inflation during the second half of the 1980s and the first of the 1990s was particularly problematic. Five price stabilization plans were launched from February 1986 to January 1991, none of which lasted more than seven months.

The frequent changes in the monetary standard suggests both the difficulty of establishing macroeconomic conditions consistent with long-run stability and the capacity developed in the Brazilian economy to coexist with inflation for long periods, preserving both the pricing system and economic growth. This coexistence was made possible through, inter alia, the indexation of virtually all prices in the economy, including wages, contracts, exchange, and interest. This arrangement allowed the government and a minority with access to the mechanisms for protecting themselves from inflation not only to remain insulated from its negative effects but even to benefit from them.

With the launching of the Real as the national currency in 1994 (see box 1), the Brazilian economy successfully moved to lower and sustainable levels of inflation. The consumer price index (IPCA) dropped from 2,477 percent in 1993 to 1.65 percent in 1998. Price stability induced more transparency to the broad public finances, which pushed the government into implementing reforms aimed primarily at fiscal consolidation coherent with sustainable low inflation.

### Box 1: The Launching of the Real Plan

In early 1993, Minister of Finance Fernando Henrique Cardoso and his economic team set out a strategy to tackle inflation, which, at the time, had reached 30 percent a month. The Plan of Immediate Action was launched in June 1993 and comprised the following measures: (a) reduction of expenditures and more efficient spending, (b) recovery of tax revenues, (c) resolution of the financial situation of states and municipalities, (d) control over the state-owned banks, (e) financial rescue of the federal banks, and (f) enhancement of the stabilization program. In July 1, 1994, the Real, a new currency, was launched. In order to put downward pressure on inflation, the government boosted the ongoing process of opening up the domestic market to foreign competition. In line with this policy, the Banco Central do Brasil established a ceiling for the exchange rate beyond which it would sell foreign currency, gradually dismantled indexation

arrangements, and raised domestic interest rates. This de-indexation movement throughout the economy was preceded by a movement to break the inertial component of inflation. For this purpose, in February 1994 the real unit of value (unidade real de valor) was created. Initially, the URV was only a unit of account and reference (including for purposes of exchange rate policy), without the prerogatives of means of payment or reserve of value. Later on, with the possibility to invest in financial assets denominated in URV, it also acquired the characteristic of reserve of value.

This provisional “half” currency allowed for a smooth transition to the new currency in July 1994. The disarray in the financial markets associated with the conversion of assets was less severe than in previous stabilization plans. The URV had its daily parity with the old currency, readjusted by an index composed of three price indexes. During this period, relative prices were realigned naturally. As nominal prices were eventually denominated in URV, an automatic pegging to the United States dollar (USD) occurred. The stability of prices in URV allowed agents to identify the distortions in relative prices caused by years of high inflation rates and indexation. The URV gave agents an anticipated vision of the upcoming economic scenario with stable prices. Paradoxically, the URV can be depicted as an “over indexation” that allowed for a smooth transition to an unindexed economy without compromising the regular provision of goods and services. In the context of high interest rates and availability of international capital, there was a strong inflow of foreign capital. As the BCB did not intervene in the foreign exchange market in the aftermath of the launching of the Real, the monetization necessary to make up for the increased demand for currency (natural in a recent stabilization) was achieved through the net redemption of public debt instead of through the accumulation of foreign reserves. Thus the excess of liquidity in USD in a semi fixed exchange rate regime promoted the appreciation of the exchange rate. The foreign trade balance deteriorated significantly as a result. However, the combination of exchange rate appreciation and trade liberalization was very effective in minimizing the growth of internal prices that characterized the so-called foreign exchange anchoring. This policy was successful in breaking inertial inflation and in stabilizing the purchasing power of the new currency. Moreover, it forced domestic industries to transform their production processes. Technology transfers through imports of equipment and goods raised the quality of made-in-Brazil products and, thus, improved Brazil’s competitiveness in international markets.

Recent governments have attempted other major reforms on the following fronts:

- *administrative reform*: administrative adjustments and correction of distortions in the payroll of local, state, and national governments.
- *reform of the pension system*: efforts to reach actuarial equilibrium in the pension system; some progress was made, but important issues like actuarial equilibrium for civil servants’ retirement remain pending.
- *reform of the economic order*: efforts to eliminate monopolies and allow private investment in areas previously reserved for the public sector; much has been done on this front, especially in the case of state monopolies.

- *patrimonial reform*: efforts to promote the restructuring of public sector assets and liabilities; much progress has been made in this area, including the renegotiation of state debts and recognition of the so-called “*esqueletos*” (hidden public sector liabilities).
- *fiscal reform*: crucial efforts to remove tax distortions that hamper production, investments, and exports; although fiscal discipline was enacted, little progress was made during the past eight years.

These so-called “structural reforms” were rejected or approved only partially, and price stabilization stood up to all international financial crises during the 1990s—from the Mexican crisis in December 1994 to the January 1999 currency crisis in Brazil—thanks to improvements in the fiscal stance, a strong inflow of foreign direct investment, and tight monetary policy conducted by a more independent central bank.

In the financial system, a whole set of reforms was put forward and implemented. After the 1995 banking crisis, prudential regulation and bank inspection procedures were thoroughly revised and improved. State-owned banks were either closed down or privatized. Many were acquired by foreign banks, which increased their share to 25 percent of banking system assets. Federal banks were restructured and recapitalized.

An important event in the monetary policy framework took place in January 1999, when Brazil was forced to adopt a floating exchange rate as a result of several external and internal imbalances. Mainly as a result of exchange rate appreciation, the current account deficit reached USD 33.4 billion<sup>1</sup> in 1998, nearly 4.5 percent of gross domestic product (GDP). High domestic interest rates to support an overvalued Real also damaged the government’s consolidated fiscal position.

Further adjustments were made to the Real due to the currency crisis. On the fiscal front, the government put forward a set of measures to improve its primary surplus. Congress eventually approved some of them. On the monetary side, an inflation-targeting framework was introduced in mid-1999. Since then, the new policy framework has been tested by a new wave of internal and external shocks, including the surge in oil prices, electricity shortages, and increased volatility in international financial markets.

The newly elected president has shown firm commitment to fiscal austerity and has built a political coalition to get some other reforms, like the one regarding the pension system for civil servants, approved in 2003; others related to taxes are still being discussed in Congress. Top officials of the government have repeatedly expressed their support for fiscal equilibrium.

## 1.2 MACROECONOMIC BACKGROUND

The Brazilian economy continues to grow. Although growth in exports is a major factor underlying this process, recovery in internal demand, particularly during the second half of 2003, is also fueling the burgeoning dynamism of the nation’s economy.

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<sup>1</sup> Throughout this report, USD is used to represent the United States dollar, while R\$ is used to represent the Real, the national currency of Brazil. A billion is 1,000 million.



The credibility of macroeconomic policy was regained with the austerity of fiscal and monetary policies. The commitment to a primary surplus and the fight against inflation were reflected in reversal of the expectation for inflation-targeting objectives, the improvement in the ratios that measure the perception of country risk, and the favorable trajectory of the exchange rate.

External sector results have clearly benefited from the positive performance of the world economy (see Table 1). The current account has improved significantly—from a surplus of USD 123 million in the first quarter of 2002 to a surplus of USD 1.6 billion USD in the same period of 2003—mainly as a result of a 29 percent growth in exports. Moreover, the expansion of imports in 2004 is consistent with an upturn in the pace of economic activity. Analysis of the accumulated 12-month result indicates that the positive current account balance closed May 2004 at USD 6.4 billion, equivalent to 1.24 percent of GDP, the best result since December 1993.

**Table 1: Macroeconomic Indicators**

	1999	2000	2001	2002	2003
GDP (real annual growth rate)	0.8	4.4	1.3	1.9	-0.2
Imports (in USD million)	49,210	55,783	55,572	47,241	48,283
Exports (in USD million)	48,011	55,086	58,223	60,362	73,084
Current account balance (as percentage of the GDP)	-4.7	-4.0	-4.6	-1.7	0.8
National Consumer Price Index (inter-annual growth rate)	8.4	5.3	9.4	14.7	10.4
Unemployment (in %)	7.1	5.6	10.6	10.5	10.5
Public Sector Deficit (as % of the GDP, nominal result)	5.8	3.6	3.6	4.6	5.2
Basis Interest Rate (SELIC)	18.9	16.2	19.1	23	16.9
<i>Memo:</i> Exchange rate Reais per USD (annual average)	1.8	1.9	2.3	3.5	2.9

*Sources: Banco Central do Brasil, Secretaria do Tesouro Nacional and Instituto Brasileiro de Geografia e Estatística.*

In the first quarter of 2004, GDP expanded by 2.7 percent from the same period of the previous year. Growth in recent months, which has been confirmed by the GDP result and indicators of monthly activity level, reflects the continued recovery in internal demand coupled with a highly dynamic export sector (Inflation Report, June 2004).

The Monetary Policy Committee (COPOM) of the Banco Central do Brasil (BCB) has reduced interest rates since June 2003. One of the key rates, the SELIC rate, declined from 26 percent in June 2003 to 15.8 percent in July 2004.

The policy mix also involved a tight fiscal stance. In April 2004, the non-financial public sector registered a primary surplus of USD 35 billion. When this result is incorporated, the surplus accumulated in 2004 was USD 95.5 billion, down from USD 191.2 billion in 2003. Responsibility in fiscal affairs at all government levels was secured and institutionalized by a Fiscal Responsibility Law approved in May 2000. This law basically states that there must be



equivalent new revenues or expenditure cuts if a new permanent expenditure is to be created. It also defines ceilings for the public debt and personnel expenditures, and, perhaps more important, it imposes sanctions on public authorities that break or neglect the rules.

Notwithstanding the improving fiscal position, the devaluation of the exchange rate and the persistently high interest rates were detrimental to the public sector debt. On May 2004, 67.2 percent of the outstanding government securities were indexed either to the U.S. dollar or to the SELIC rate. The ratio of net public debt to GDP increased from 55.5 percent in December 2002 to 58.7 percent in December 2003. The average maturity of government securities in public offerings followed a downward trend, from 26 months in June 2003 to 23 months in June 2004.

International investment flows, as indicated by the Emerging Markets Bond Index,<sup>2</sup> which declined continuously during 2003, were more confident in relation to their perceptions toward Brazil. This was mainly due to the expanding international liquidity and, principally, renewed foreign investor confidence in the administration of economic policy.

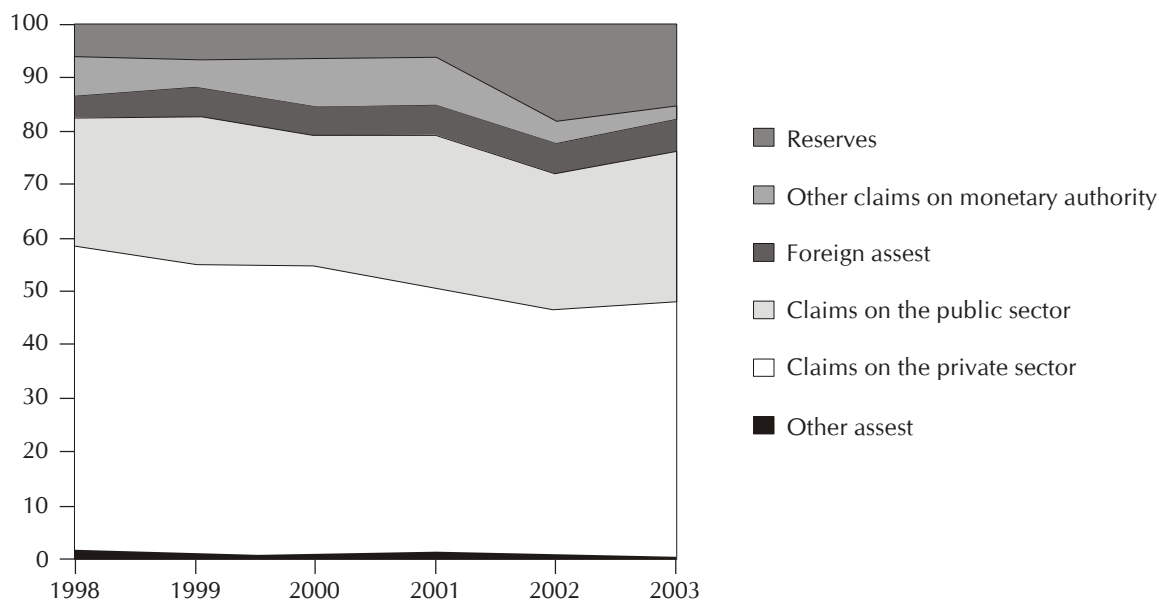
### 1.3 THE FINANCIAL SECTOR

The financial sector has become sounder in recent years and, at present, is no longer a source of systemic vulnerability. This process of improvement in the banking system dates back to 1994–5, when banks experienced a sudden decline in inflation-derived revenues after the stabilization plan. The introduction of the Program of Incentives for the Restructuring and Strengthening of the National Financial System (PROER) and the Program for the Restructuring of the State-Owned Financial System (PROES) as well as the creation of the Credit Guarantee Fund (FGC) contributed to a fast and orderly consolidation, including the almost complete phasing out of state-owned banks. Under these programs, the BCB was given a mandate to deal with issues related to the control of stockholders, the adoption of preventive measures aimed at restructuring failing institutions, including possible market solutions, and a more flexible approach to privatization. More than 40 percent of the operating bank licenses that existed at end-1993 have since changed owners or exited the system via mergers or closures. Four large banks were absorbed between 1994 and 1998. Some smaller institutions were liquidated. In addition, foreign participation in the Brazilian financial sector increased.

The financial system is large in terms of assets but shallow in terms of financing to the private sector. Banks are typically at the center of complex financial conglomerates. Considering the banking sector alone, financing to the private sector, as measured by total claims on the private sector, diminished during the past six years and accounted for only 47.4 percent of total assets in 2003 (see figure 1). One interesting aspect is that the amount of credit operations with non-earmarked funds increased from 27.6 percent of total credit operations in December 1996 to 54.7 percent in December 2003, which might indicate some deregulation in the credit markets.

However, the financial system continues to be dominated by public institutions, which held 37.2 percent of banking sector assets in December 2003. As long as other subsectors of the financial system are concerned, the reinsurance industry is a state monopoly. The insurance and pension

<sup>2</sup> The Emerging Markets Bond Index, published by J. P. Morgan Chase, measures the spread of sovereign debts (for example, Brazilian Brady bonds) over equivalent U.S. securities.

**Figure 1: Allocation of Bank Assets**

sectors are among the largest in Latin America but have not given rise to significant long-term financing for the private sector. Securities markets do not yet constitute a significant alternative to bank financing for the private sector.

Some of the structural problems still to be addressed by the Brazilian authorities include (a) the crowding out of the private sector by the government; (b) distorted financial sector taxation (particularly, but not limited to, the debit tax—CPMF); (c) high intermediation spreads (for example, 30 to 40 percentage points); and (d) massive shifting of risk to the public sector, as the government is the main provider of hedges for market risks to the private sector.

## 1.4 CAPITAL MARKETS

Capital markets in Brazil are relatively sophisticated in their infrastructure and the availability of instruments. However, private corporations do not use capital markets intensively as an alternative source of financing.

The Comissão de Valores Mobiliários (CVM) is the main regulatory agency in this field and has jurisdiction over brokers and dealers, some commodities brokers, exchanges, and securities clearing and settlement systems. A provisional act published on October 31, 2001, and converted into Law 10,411 on February 26, 2002, made the CVM an independent regulatory agency, increasing its operational and financial autonomy. This legal reform also endowed the CVM with adequate enforcement powers. In addition, the CVM's jurisdiction was considerably enlarged as a result of reforms to both the Corporate Law (Lei das SA—6,404/76) and the Securities Markets Law on October 2001. Mutual funds and derivative instruments were included under the scope of CVM.

The market for government debt dwarfs the market for private equity and debt securities, and securities market liquidity has been adversely affected by taxation, fragmentation, concentration, and continued migration of large issuers to the main international markets. Liquidity is also hampered by a high degree of fragmentation—that is, a large variety of non-standardized securities, particularly in the private equity and corporate debenture markets.

Despite the recent reforms, there has been a general decline in activity. Stock issuances in 2003 amounted to only R\$80 million, 93 percent below the already poor performance of R\$1.1 billion in 2002. The number of companies listed on BOVESPA, Brazil's main stock exchange, has declined steadily over the years, from 550 in December 1996 to 361 in June 2004. The debentures market grew 2 percent in 2002, reaching R\$15.4 billion, and performed poorly in 2003, 66 percent below the performance in 2002. These figures refer to registration and not necessarily to actual placements.

To cope with this decline in activity, stock exchanges in Brazil recently merged under the leadership of BOVESPA. Under the agreement, the stock exchanges of Bahia-Sergipe-Alagoas, Bolsa Regional, Extremo Sul, Minas-Espírito Santo-Brasília, Paraná, Pernambuco and Paraíba, Rio de Janeiro, Santos, and São Paulo now constitute a single stock market on a nationwide level, with a single trading, custody, and settlement system. Stocks are now traded in São Paulo, while public securities are traded in Rio de Janeiro. The other regional exchanges conduct activities such as market development and provision of services to the local markets.

Recent developments in the securities markets have concentrated on modernizing the framework for corporate governance. Particularly important are the new Corporate Law, which, among other things, gives more adequate protection to minority shareholder rights, BOVESPA's creation of the *Novo Mercado* (New Market), a rigorous level for share listing, and the issuance of a Code of Best Practices on Corporate Governance by the CVM on June 2002. However, the concentrated ownership structure, coupled with a high proportion of non-voting shares, still represents a structural hurdle to improved corporate governance.

## **1.5 MAJOR TRENDS IN PAYMENT SYSTEMS**

Brazil had some fairly sophisticated payment systems even before the recent reforms. In particular, payment instruments and networks were highly automated, in part because hyperinflation prompted banks to make heavy investments in information technology so as to provide their customers with products and services that allowed them to move their money faster and, hence, prevent significant losses of purchasing power.

Inflation appears to have been under considerable control since 1995. As the economy stabilized, attention shifted from the speed of payment processing to risk management. It became clear that the Brazilian payment system posed serious risks, which were incurred mainly by the BCB and, ultimately, by the system as a whole.

The first shortfall was the lack of a sound and reliable legal framework for payments. Regulations governing the rights and obligations of participants in payment transactions were scattered, and

large gaps existed in the legal underpinning for many transactions involved in the payments process. Key examples were the lack of legal validation of multilateral netting, the existence of the zero-hour rule, the lack of protection of assets pledged as collateral in the case of failure of a participant, and the lack of legal empowerment of the central bank to undertake oversight of the payment system. These features made the Brazilian payment system particularly vulnerable to shocks and crises.

Second, implicit in the previous system was an informal assumption that, should any problem occur, the BCB would guarantee the closure of the settlement cycle. In particular, the BCB and the banks did not know their reserve account balances of the previous day until the following morning. As the payment system worked on a deferred net settlement mode, there was a high degree of intraday credit exposure. Therefore, during the day the payment system worked on the understanding that each transaction was final because market participants believed that the BCB would fund any shortfalls at settlement time. In this environment, the Brazilian large-value payment system was not compliant with many of the Committee on Payment and Settlement Systems (CPSS) core principles, and the BCB was bearing the ultimate risks.

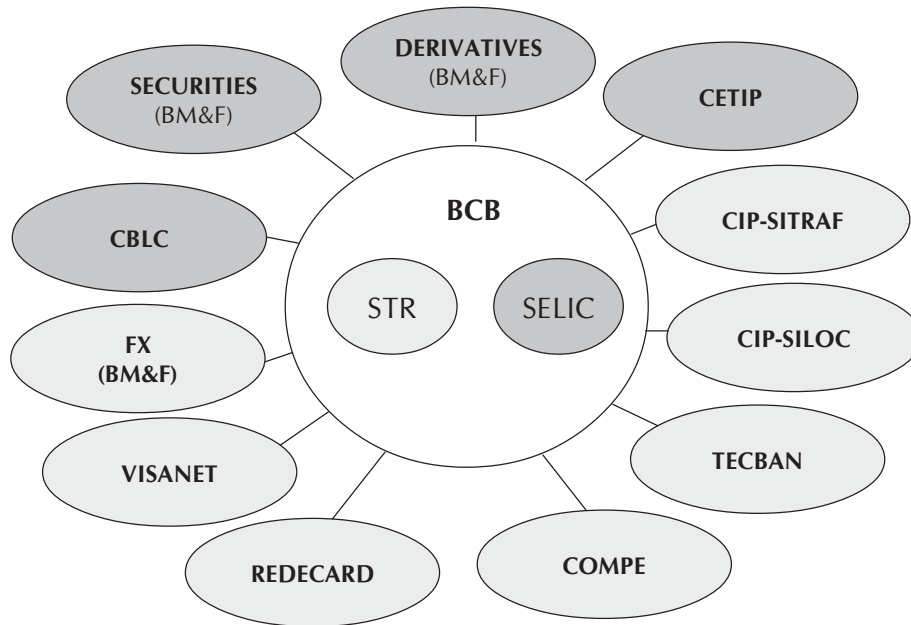
Third, the system did not allow an efficient integration of payments and securities settlement procedures. Several additional and cumbersome steps were needed to guarantee delivery versus payment in the settlement of securities transactions.

Four, there was no specific payment system for critical funds transfers, and both large-value and retail payments were settled within the COMPE, a clearinghouse for cheques and credit transfers, on a consolidated multilateral netting basis, in which no risk management mechanisms were in place.

As a result of the diagnosis, the BCB undertook a major reform of the payment and securities system with the overall objective of satisfying the evolving need for funds and securities transfers of all sectors of the economy. The reform of the Brazilian payment system had four main objectives:

- develop a real-time gross settlement payment system within the BCB to migrate large-value payments away from the traditional cheque clearinghouse, the *Centralizadora da Compensação de Cheques e Outros Papéis* (COMPE).
- strengthen the major clearinghouses.
- achieve a more balanced sharing of settlement risks between the central bank and the participants.
- ensure the compliance of the main systemically important payment systems of the country with international standards and best practices.

A number of actions were envisaged in this program, many of which have already been accomplished, and some of which are ongoing. The launch of the new system—the Reserves Transfer System (*Sistema de Transferência de Reservas*, STR)—occurred on April 22, 2002. The main features of this system are as follows: (a) bank reserve account balances are settled in real

**Figure 2: General Architecture of the Brazilian Payments System**

Note: Systems associated with fund transfers are shaded in light color, while systems dealing with securities clearance and settlement are shaded in dark color.

time and on a gross basis; (b) the risk for the central bank is reduced to zero, since funds are transferred only if the paying institution has the necessary positive balance in its reserve account; and (c) the system is consistent with international standards and best practices since, among other things, it allows only credit transfers.

The BCB also aimed to provide irrevocability and finality in the shortest time possible. With implementation of the STR, fund transfers are considered final in the exact moment when the accounts are moved at the central bank.

The scope of the reform initiative was comprehensive, covering large-value fund transfer systems, payment clearinghouses, securities trading and settlement systems, foreign exchange clearance and settlement systems, and commodities and futures clearance and settlement systems.

In 2002, along with the launching of STR, four new payment clearinghouses were created: the Câmara Interbancária de Pagamentos (CIP), a CHIPS-type system; the TecBan, which settles transactions from Banco24Horas, a shared automated teller machine (ATM) network with 52 associated financial institutions; and RedeCard and VisaNet, which settle credit and debit card transactions.<sup>3</sup> The traditional cheque clearinghouse, the COMPE, still exists. Figure 2 shows the general architecture of the new system.

<sup>3</sup> RedeCard and VisaNet together process more than 93 percent of the transactions with payment cards.

Regarding other retail payment systems, several developments are under way in the Brazilian retail market, in part as a result of the ongoing reform of the large-value payment systems. The BCB believes there is considerable room for improvement in the efficiency of retail payment instruments and systems.

In particular, ATMs and electronic funds transfer at the point of sale (EFTPOS) systems still lack interoperability in many cases. The BCB is currently pushing the banking system into higher levels of consolidation and interoperability among proprietary ATM networks. The BCB believes that the new payment system will force banks to rethink the strategy of having a private ATM network as a source of competitive advantage. However, the multiplicity of EFTPOS at the same merchant would be mitigated if CrediCard and VisaNet would install new-generation mutually compatible EFTPOS.

Additionally, the BCB is working on a program called SPB-2, a second-generation set of reforms aimed at modernizing payment instruments, especially those intended for low-value payments, in order to promote cheaper and more efficient substitutes for cheques and cash itself.<sup>4</sup> According to BCB's preliminary documents, SPB-2 should comply with the following actions:

- evaluation of inefficiencies.
- incentives to foster cooperation.
- adjustment of the legal and regulatory base.
- standardization of communication protocols to be used by systems that convey payment transactions.
- integration of networks.
- truncation of cheques.
- promotion of a more intensive use of electronic instruments.

## **1.6 MAJOR TRENDS IN SECURITIES CLEARANCE AND SETTLEMENT SYSTEMS**

The securities clearance and settlement industry is fragmented in Brazil, as the various types of securities are deposited, cleared, and settled in specific central securities depositories. All securities are dematerialized, and ownership is transferred through book entries at the relevant depository.

Five clearance and settlement systems are operating in Brazil, one for derivatives and four for securities:

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<sup>4</sup> The BCB recently indicated publicly its interest in catalyzing the effort to improve the efficiency of the retail system.

- The SELIC, which is owned and operated by the BCB, is the central depository for government securities.
- The Clearinghouse for Custody and Settlement (*Câmara de Custódia e Liquidação, CETIP*) is the main central depository and clearinghouse for debt securities issued by private sector entities.
- The Brazilian Clearinghouse for Settlement and Custody (*Câmara Brasileira de Liquidação e Custódia, CBLC*), a BOVESPA affiliate, is the central depository and clearinghouse for equities and some equities derivatives.
- The BM&F Securities Clearinghouse (*Câmara de Ativos*) is operated by the Brazilian Mercantile and Futures Exchange (*Bolsa de Mercadorias e Futuros, BM&F*).
- The BM&F Derivatives Clearinghouse (*Câmara de Derivativos*), which is operated by the BM&F, is the main clearinghouse for commodities and derivatives.

With the launch of the new Brazilian payment system in April 2002 the securities clearance and settlement systems are approaching full compliance with international standards. In particular, the SELIC is now able to settle all transactions (securities and cash) in real time on a gross basis, achieving delivery versus payment for all trades. For this purpose, the SELIC maintains a direct link with the BCB's real-time gross settlement fund transfer system.

Another recent event in this area is the enactment of Law 10,214, the Payment System Law, which states that systemically important payment and securities clearance and settlement systems (as defined by the BCB) must hold settlement accounts within the BCB, act as central counterparties, and guarantee the final settlement of the transactions they accept for clearance and settlement. At present, the CBLC and the BM&F, the latter in its capacity as clearinghouse for commodities, derivatives, and securities, fall under the BCB's definition.

The BM&F Securities Clearinghouse was launched on May 13, 2004. The SISBEX, an electronic trading platform, was relaunched on the same date. This should contribute to the further development of the secondary market for fixed-income securities in Brazil.



## 2 INSTITUTIONAL ASPECTS

### 2.1 GENERAL LEGAL FRAMEWORK

The regulatory framework for Brazil's financial system and markets operates on multiple levels. These include the Ministry of Finance (*Ministério de Fazenda*), the National Monetary Council (*Conselho Monetário Nacional*, CMN), the BCB, and the CVM. The BCB and the CVM are under the umbrella of the Ministry of Finance, which has overall authority over them as well as over other key regulatory agencies.

The CMN is the highest regulatory entity within the national financial system. It is made up of the Minister of Finance, who presides over the council, the minister of financial planning and budgeting, and the governor of the BCB. Law 4,595/64 created the CMN and assigned it regulatory-making powers; the regulations it issues—namely, *resoluções*—are binding on all members of the system, including the BCB. In practice, the CMN approves the main regulations relating to market intermediaries and issues general policy guidelines, and the BCB complements them in the areas under its responsibility. Before the amendment of Law 6,385/76, which came into force on March 1, 2002, the CVM was also subject to regulations approved by the CMN. This amendment eliminated the CMN's power to enact regulations for the securities markets. At present, it only enacts general policy guidelines that must be taken into account by the CVM when performing its functions.

The BCB and the CVM are also subject to other rules, such as the so-called provisional acts, which, according to Brazil's constitution, are enacted directly by the president.

In turn, the BCB issues infralaw regulations. The main types are the *circulares*, issued by the BCB's board of directors, and the *cartas-circulares* and *comunicados*, issued by any of the BCB's heads of department, which are intended to go into further detail or explain what is stated in the *circulares*. The CVM issues regulatory instructions (*instruções normativas*).

#### 2.1.1 Payments

The general responsibilities of the BCB are stated in Law 4,595 of December 1964. The Payment System Law (Law 10,214 of March 27, 2001) defines the scope of the Brazilian payment system, which comprises the entities, systems, and procedures regarding the transfer of funds and other financial assets or the processing, clearing, and settlement of payments by any means. This law sets out the specific responsibilities of the BCB toward payment systems. In particular, it reinforces the BCB's broad mandate stated in Law 4,595 to regulate payment and securities clearance and settlement systems.

The CMN's Resolution 2,882 of August 30, 2001, sets out the objectives of the BCB regarding the payment system: namely, efficiency, safety, integrity, and reliability (Article 1). It also defines the scope of application of BCB's rules and interventions: namely, all clearinghouses and system operators that handle interbank transfers and settle among at least three direct participants (Article 3). This resolution specifies nine general rules with which payment system operators must comply. In general, these rules resemble the CPSS Core Principles for Systemically Important Payment Systems.



Furthermore, according to this resolution, the BCB will conduct oversight on a continuous basis over payment systems, and to this purpose it is entitled to regulate the activities of system operators, authorize the functioning of the systems, and apply sanctions. The resolution also specifies that the BCB may apply specific provisions to those systems that are considered systemically important and clarifies the role of the securities regulator (that is, the CVM) and the cooperative framework between it and the BCB. Finally, it states that the BCB will only operate payment systems that settle on a gross basis, in real time.

Following up on this resolution, in August 31, 2001, the BCB issued Circular 3,057. This circular contains the detailed regulation of the functioning of clearinghouses and other payment system operators and defines several features with which these entities must comply, including capital requirements, transparency standards, risk control measures, and operational requirements. All these elements were submitted to the BCB for their revision and approval. The annex to the circular also defines a formula for determining whether a system is systemically important, based on the average value of the largest transaction or the aggregate value, both over a six-month time span. Several other BCB circulars and letter-circulars have been issued to regulate a wide spectrum of aspects within the national payment system.

### **2.1.2 Securities**

The legal framework of the securities market was improved and modernized recently in many areas, including the protection of minority shareholders, the need to develop a culture for corporate governance, and the need to increase transparency. These legislative changes also defined and toughened capital market crimes. For example, a five-year prison sentence can now be imposed in cases involving market manipulation or the use of insider information.

CVM's regulatory instructions are used to supplement these laws. For example, Instruction 358 deals with the use of privileged and insider information. Instruction 361 outlines important shareholder protections in tender offers or transfers of corporate control.

### **2.1.3 Derivatives**

An array of derivatives is traded in the Brazilian financial markets. Futures and forwards are the most common, followed by options. As far as clearance and settlement are concerned, derivatives exchanges are governed by the same legal framework applicable to securities exchanges.

### **2.1.4 Specific Legal Issues Related to Clearance and Settlement**

#### ***2.1.4.1 Netting, Settlement Finality, and Zero-Hour Rule***

The legal framework established by Law 10,214 in March 2001 granted private clearinghouses certain legal rights and protections, for example, regarding the use of collateral and the legal recognition of multilateral netting. More specifically, it granted legal rights to seize the collateral of bankrupt participants held to secure financial transactions, protected the payment system against

the implications of a zero-hour rule, and gave legal recognition to multilateral netting schemes. The new legal framework also clarified specific responsibilities for clearinghouses. According to this law, clearinghouses designated as systemically important by the BCB must act as central counterparties and guarantee final settlement of the transactions they accept for clearance and settlement; they must also include the legal segregation of the net assets of each discrete clearing and settlement environment, thus assuring that any collateral posted in a specific environment is used solely for settlement in that specific environment. In addition, clearinghouses are now subject to sanctions similar to those that are applicable to financial institutions. A specific restriction is that the net assets of a clearinghouse cannot be used as pledged collateral for any loans sought by the clearinghouse.

#### **2.1.4.2 Electronic Documents and Signatures**

The electronic signature is protected legally. However, some issues regarding the certification authority for cryptography are still open.

#### **2.1.5 Anti-Money Laundering Measures**

Following the signing of the Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances—the 1988 United Nations Vienna Convention—the Brazilian government undertook a series of international obligations directed toward fighting the crime of money laundering. Other international accords signed on this matter include those under the auspices of the Organization for Economic Co-operation and Development, the Organization for American States, and the United Nations.

In response to these obligations, the Brazilian government enacted an anti-money laundering law (Law 9,613 of March 3, 1998), which created the Council for the Control of Financial Activities (COAF), which functions as a financial intelligence unit. Its primary tasks are to evaluate reports of suspicious transactions and to refer cases for investigation and prosecution. Law 9,613 also requires COAF to issue customer due diligence and reporting instructions to nine business sectors that fall outside the jurisdiction of the banking, securities, and insurance supervisors. It is also responsible for monitoring compliance with and enforcement of the anti-money laundering legislation in these sectors; it is the principal agency involved in arrangements for domestic and international cooperation. In this regard, the COAF coordinates the efforts of various government agencies in Brazil to implement anti-money laundering policies on a nationwide basis.

Article 12 of Law 9,613 applies the following administrative sanctions to the institutions under the control of the COAF. These sanctions apply together or separately in case of failure to comply with the regulations and information requirements established by the COAF:

- a warning.
- a monetary fine of R\$200,000 or, alternatively, a fine ranging from 1 percent to twice the value of the corresponding transaction or up to 200 percent of the profit made or that presumably would have been made with the transaction.

- a ban of up to 10 years from holding any management position in entities under the scope of the referred law.
- cancellation of the authorization to operate.

In case of noncompliance with the administrative decision of COAF, a member of the Office of the Attorney General is entitled to make a judicial case.

According to the 2001/02 annual reports of the Financial Action Task Force (FATF), Brazil has complied with the "Forty Recommendations against Money Laundering."<sup>5</sup>

## **2.2 THE ROLE OF FINANCIAL INSTITUTIONS: PAYMENTS**

### **2.2.1 The Banking Sector**

Banking institutions in Brazil can be commercial banks, universal banks with commercial bank capabilities, and the Caixa Econômica Federal (Caixa), a state-owned savings and loan institution equivalent to a commercial bank. As of December 2003, there were a total of 116 universal banks with commercial bank capabilities, 23 commercial banks, and the Caixa.

Banking institutions are allowed to take deposits in current accounts from the public and to hold reserve accounts, which are also settlement accounts, at the BCB. Regarding payment services, bank customers may use cheques, money transfers, and payments of bills, which are processed through the cheque-clearing system. Moreover, through the payment systems operated by the BCB, banks are also able to offer electronic payment products that allow their customers to make same-day or even real-time interbank payments.

Additionally, banks are the major issuers of credit and debit cards in Brazil. As of December 2003, there were more than 44 million credit cards in the country.

#### **2.2.1.1 Banco do Brasil**

Banco do Brasil plays a very important role in the national payment system as, under a mandate of the BCB, it operates the COMPE, the cheque clearinghouse. Banco do Brasil also holds a seat in the COMPE Group, which assists the BCB in policy issues regarding the clearance of cheques and works as a forum for the discussion of operational problems and proposals for improvements.<sup>6</sup>

### **2.2.2 Other Institutions That Provide Payment and Settlement Services**

*Tecnologia Bancária* (Tecban) operates Banco24Horas, which is a shared ATM network that connects 52 financial institutions. It also offers a debit card (*cheque eletrônico*) and a payment card for e-commerce transactions (*cheque eletrônico.com*).

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<sup>5</sup> Only three other countries had achieved this as of 2002.

<sup>6</sup> The BCB and bankers associations also hold seats in the COMPE Group.

Rede Verde-Amarela, another ATM shared network operated by the Brazilian Association of State and Regional Banks (*Associação Brasileira de Bancos Estaduais e Regionais*, ASBACE), offers ATM services, on a smaller scale, for 11 state-owned banks.

The Brazilian postal service, the *Empresa Brasileira de Correios e Telégrafos* (ECT) offers a credit-type retail payment service called *vale postal*. This service is very important for individuals who do not have access to banking services or for situations in which either the payer or the payee is located in a very small town not yet served by banks (see Table 2). In 2000, this service processed credit orders worth R\$300 million.

**Table 2: Bank Branches**

	Dec-2001	Dec-2002	Dec-2003
Municipalities in Brazil	5,654	5,658	5,578
Municipalities not served by banks	1,681	1,665	1,600
Municipalities served by only one branch <sup>(a)</sup>	2,013	2,060	2,066

Source. Banco Central do Brasil.

<sup>(a)</sup> Includes service outpost (PAA's).

Recently, ECT and Banco Bradesco, the largest private bank in Brazil, launched the Banco Postal. Through this joint venture, ECT and Banco Bradesco provide banking services for lower-income individuals and are present in virtually all municipalities in Brazil.

## 2.3 THE ROLE OF FINANCIAL INSTITUTIONS: SECURITIES

### 2.3.1 Securities Market Participants

The main participants in the Brazilian securities markets are the following:

- issuers: Issuers can be private and public sector corporations, governments, or private companies that meet the registration requirements of the CVM to sell an offering of securities. There are currently more than 800 publicly held companies in Brazil.
- underwriters: In Brazil, underwriters, usually investment banks or universal banks with investment bank capabilities, may or may not assume the risks of bringing the issue to the market.
- brokers-dealers: At present, there are approximately 400 brokers-dealers in the country.
- banks: The role of banks in the securities markets is threefold. Banks can operate as settlement agents for securities market transactions as long as this is for a non-bank institution.<sup>7</sup> Second,

<sup>7</sup> By law, banks are not allowed to hold settlement accounts at other banks.

banks may become members of a clearinghouse designated as systemically important, in which case they are responsible before the clearinghouse for the timely settlement of transactions they made on behalf of third parties. Finally, banks can act as custodians of securities on behalf of third parties who do not hold a securities account at a central securities depository.

- institutional investors: These are usually mutual funds, insurance companies, and pension funds. At present, more than 1,000 mutual funds are operating in the country.
- securities risk-rating firms: The main risk-rating firms operating in Brazil are Fitch, Moody's Investors Services, and Standard & Poor's.
- central securities depositories: In Brazil, all entities that act as a central security depository offer clearance and settlement facilities as well.
- registrars: Registrars are authorized by a securities issuer to keep the records of the number of securities issued; the registrar is usually a commercial bank.

### 2.3.2 Exchanges

Equities are traded mainly on the BOVESPA, which is located in São Paulo. BOVESPA consolidated its leadership after reaching a merger agreement between the exchanges of Bahia-Sergipe-Alagoas, Bolsa Regional, Extremo Sul, Minas-Espírito Santo-Brasília, Paraná, Pernambuco and Paraíba, Rio de Janeiro, Santos, and São Paulo to create a national equities market with a single trading, settlement, and custody system. Currently, the other regional exchanges only perform a variety of services related mainly to market development.

The BM&F, also located in São Paulo, is the commodities and derivatives exchange.

### 2.3.3 Securities and Derivatives Clearance and Settlement Institutions

The securities clearance and settlement industry in Brazil is fragmented, as the various types of securities (that is, government securities, equities, and others) are deposited, cleared, and settled in specific securities depositories. Four securities settlement systems are currently operating in Brazil: SELIC, which settles securities issued by the federal government, with settlement in real-time gross settlement mode; BM&F Securities Clearinghouse, which settles federal government securities in deferred net settlement mode; CBLC, a BOVESPA affiliate, which settles equities and some equities derivatives; and CETIP, which settles private securities and some low-liquidity state and federal government securities. BM&F Derivatives is the main system for settling commodities and derivatives.

## 2.4 MARKET STRUCTURE AND REGULATION

Four agencies are responsible—under the aegis of the CMN—for the regulation and supervision of financial entities. The CMN is the highest regulatory entity within the national financial system,

and it holds the ultimate responsibility for issuing the sector's regulatory policies. The BCB supervises banks as well as several other types of financial intermediaries, including credit cooperatives. Bank-based conglomerates are supervised on a consolidated basis by the BCB. The CVM supervises the stock exchanges, the exchanges' clearing systems (jointly with the BCB), and mutual funds.<sup>8</sup> The insurance supervisor, the Superintendência de Seguros Privados (SUSEP), supervises open-end pension funds and the insurance industry.<sup>9</sup>

Regarding the supervision of financial markets, the BCB is responsible for supervising all transactions in the foreign exchange, credit, and money markets. Due to its responsibility over the money market, the BCB has jurisdiction over government securities (federal, state, and local) and debentures and notes issued by financial institutions. In turn, the CVM is responsible for regulation and supervision of the equities and derivatives markets as well as for transactions involving all other debt securities.

## **2.5 THE ROLE OF THE CENTRAL BANK**

### **2.5.1 Monetary Policy and Other Functions**

The CMN is the principal decision-making body in charge of formulating the country's monetary policy, while the BCB is responsible for implementing such policies. The Monetary and Credit Technical Committee (*Comissão Técnica da Moeda e do Crédito*, COMOC), established by Presidential Decree 1,304 of November 9, 1994, provides technical support to the CMN in the formulation of monetary and credit policies.

The COPOM was created within the BCB, denoting an institutional advancement toward a more autonomous central bank. In particular, the COPOM has a prominent role in the formulation of monetary policy, as it sets up the target for the overnight interest rate for open-market operations (the so-called SELIC rate) and is in charge of elaborating quarterly inflation reports.

Other functions of the BCB include foreign exchange policies, the prudential supervision of financial institutions (shared with other agencies), and the oversight of the payment system.

### **2.5.2 Supervision of Financial Entities**

The BCB is in charge of the prudential supervision of banks as well as several other types of financial intermediaries. It also supervises bank-based conglomerates on a consolidated basis.

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<sup>8</sup> Legal amendments in February 2002 gave the CVM jurisdiction over debt and equity mutual funds. Until then, debt funds were supervised by the BCB.

<sup>9</sup> The Ministry of Social Security, through the Secretaria de Previdência Complementar (SPC), supervises private closed pension funds. The government-owned reinsurance monopoly, Instituto de Reaseguros do Brasil (IRB), has also some supervisory roles.



## Box 2: Deposit Insurance and Bank Resolution Framework

The Brazilian deposit insurance scheme (*Fundo Garantidor de Créditos*, FGC) was established in August 1995 by Resolution 2,197 of the CMN as a response to the banking crisis experienced in the mid-1990s. The FGC is a non-government, not-for-profit, tax-exempt, industry-based organization whose purpose is to promote public confidence in the banking system and protect the savings of small depositors by providing limited deposit insurance. It is directed by a board elected by member banks, although it receives public policy guidance from the CMN (all changes in the statutes of the FGC also have to be approved by the CMN).

FGC membership is compulsory and includes all financial institutions, both private and public, that collect deposits from the public (with the exception of credit cooperatives, which have their own solidarity-based guarantee scheme). The insurance covers all types of deposits (demand, time, and savings), bills of exchange, real estate financing notes, and mortgage notes. The coverage limit is R\$20,000 per depositor per bank, and there is no co-insurance (as of December 2003 the limit of R\$20,000 would fully cover approximately 97 percent of the total number of depositors and about 33 percent of total deposits).

Article 192 of the Brazilian constitution states that no federal funding is available to the FGC and that the FGC cannot borrow from the BCB because it does not have the status of a financial institution. Thus its funding comes mainly from the contributions of member banks. All member banks pay a flat monthly premium of 0.025 percent of total deposits, which translates into an average premium of 0.7 percent on insured deposits. Approximately 10 percent of its income stems from penalty fees imposed on returned cheques (financial institutions are charged for the inclusion and exclusion of names in the national record of accounts that have been closed due to cheques returned because of lack of funds).

If the liquid assets of the FGC are insufficient to cover insurance obligations in case of a bank failure, the FGC board may approve an extraordinary contribution of up to 50 percent of the regular contribution or the payment in advance of 12 months' worth of contributions. Once the FGC's liquid assets reach 5 percent of insured deposits, the CMN may decide to temporarily suspend or reduce the contributions.

In the nine years of its existence, the FGC has reimbursed insured deposits of 24 failed banks, including one large bank (Bamerindus) and one public bank (Banco do Estado do Amapá). Moreover, it has generated confidence in its ability to pay out depositors of failed banks quickly, enhancing the willingness of authorities not to delay the closure of nonviable banks.

Law 9,447 contains the legal framework for bank resolutions. This law gives the BCB strong powers to require prompt injections of capital by shareholders or a solution via a merger or acquisition and, if that fails, to intervene or liquidate the bank.

Brazil has signed the Basel Accord on Minimum Capital Requirements and has imposed even higher capital requirements. Minimum capital requirements in Brazil have been raised from 10 to 11 percent of risk-weighted assets, 3 percentage points higher than the minimum standard set by the Basel Committee on Banking Supervision.

### 2.5.3 Payments System Oversight

The BCB oversees the national payment system and provides payment and securities settlement services.

As overseer, the BCB is responsible for supervising all the settlement systems, including those that settle securities, derivatives, and foreign exchange transactions. The BCB indicates which systems are systemically important. So far this distinction applies to the BM&F's Foreign Exchange Clearinghouse (*Clearing de Câmbio*), the BM&F Securities Clearinghouse (*Câmara de Ativos*), the CBLC, the CETIP, the SELIC, the SITRAF (*Sistema de Transferência de Fundos*), and the BM&F Derivatives (*Câmara de Derivativos*).

In its capacity as provider of payment services, the BCB currently operates the STR, the Brazilian real-time gross settlement system, and the SELIC, the central depository and settlement system for government securities.

## 2.6 THE ROLE OF THE SECURITIES REGULATOR

The responsibilities of the CVM are stated in two main laws—Law 6,385 and Law 6,404—and in complementary regulations. Law 10,303, of October 2001, which eliminated the power of CMN to enact regulations for the securities markets, strengthened the role of the CVM after the amendment of Law 6,385.

Law 10,411 of February 26, 2002, granted the CVM independent administrative authority and gave CVM directors the necessary stability by, among other things, fixing their term in office.

As defined in Article 2 of Law 6,385, the CVM is responsible for the regulation and supervision of transactions with securities (*valores mobiliários*). However, not all securities fall under the jurisdiction of the CVM, which is only responsible for transactions made with equities, debentures, subscription rights and warrants, and all other privately issued securities and derivatives. Government securities and debt securities issued by financial institutions fall under the jurisdiction of the BCB.

In practice, the CVM is responsible for supervising the operations of exchanges associated with securities and their trading systems. This includes the BOVESPA, the BM&F, and the SISBEX. Under Law 10,303, which amends Law 6,385, the CVM is also responsible for supervising privately traded securities. Also, effective March 1, 2002, the CVM was granted responsibility for authorizing and supervising all types of pooled investment vehicles.

Some securities settlement systems, like the ones that settle stocks and debentures, are supervised by the CVM jointly with the BCB.

## 2.7 THE ROLE OF OTHER PRIVATE AND PUBLIC SECTOR ENTITIES

The National Association of Open-Market Institutions (*Associação Nacional das Instituições do Mercado Aberto*, ANDIMA) is a not-for-profit civil association located in Rio de Janeiro that holds a controlling stake in the CETIP. Together with the BCB, it manages the SELIC.



### 3 PAYMENT MEDIA USED BY NONFINANCIAL ENTITIES

#### 3.1 CASH

The currency unit in Brazil is the Real. Paper money is legal tender. Coins are legal tender as well, except for a sum in excess of R\$100. Cash is used for very low-value payment transactions.

The BCB has the exclusive legal mandate to issue money, which it does by hiring external providers for printing and coinage services. At the end of 2003, total currency issued amounted to R\$51.4 billion, of which R\$43.1 billion are outside banks. Currency in circulation comes out in seven denominations of banknotes (R\$1, R\$2, R\$5, R\$10, R\$20, R\$50, and R\$100) and in six denominations of coins (R\$0.01, R\$0.05, R\$0.10, R\$0.25, R\$0.50, and R\$1.00). The amounts issued for each currency denomination are depicted in Table 3.

**Table 3: Local Currency Denominations**

<i>Banknotes</i>			<i>Coins</i>		
<i>Denomination</i>	<i>Quantity</i>	<i>Value in R\$</i>	<i>Denomination</i>	<i>Quantity</i>	<i>Value in R\$</i>
R\$ 1.00	708,075,054	708,075,054	R\$ 0.01	2,979,169,845	29,791,698
R\$ 2.00	197,128,414	394,256,828	R\$ 0.05	2,017,878,432	100,893,922
R\$ 5.00	224,286,170	1,121,430,850	R\$ 0.10	2,089,613,385	208,961,338
R\$ 10.00	769,676,170	7,696,761,700	R\$ 0.25	816,425,206	204,106,301
R\$ 20.00	145,593,752	2,911,875,040	R\$ 0.50	734,964,086	367,482,043
R\$ 50.00	709,745,388	35,487,269,400	R\$ 1.00	308,021,294	308,021,294
R\$ 100.00	18,243,365	1,824,336,500			
	<b>Total</b>	<b>50,144,005,372</b>		<b>Total</b>	<b>1,219,256,596</b>

Source: Banco Central do Brasil.

Posicion on 12/31/2003.

Currency distribution is also the responsibility of the BCB. This duty is carried out through 10 decentralized regional offices located in the cities of Belém, Belo Horizonte, Brasília, Curitiba, Fortaleza, Porto Alegre, Recife, Rio de Janeiro, Salvador, and São Paulo. Given the size of the Brazilian territory and the need to improve capillarity in money distribution, the BCB uses the services of Banco do Brasil, a state-owned commercial bank with a large branch network throughout the country.

In recent years, along with the restructuring of the Brazilian payment system, significant changes were made to the procedure for commercial banks to request cash from the BCB. Prior to April 2002, cash withdrawals and deposits from or to either the BCB or the Banco do Brasil were settled at the end of the day on a net basis. The BCB had no assurance that the net debit positions generated from cash withdrawals would be settled in a timely manner.

Under the new framework, banks are now able to make requests through a messaging protocol that connects their computers to those of the BCB with no interruption. Thus the BCB is able to reject, on a real-time basis, any requests for withdrawals due to lack of funds in the reserve accounts. If sufficient balances exist, the requested amount is set aside in the reserve account and remains unavailable until the banknotes are physically delivered or until the end of the day, whatever comes first.

During the 1999–2003 period, the average ratio of currency outside banks and M1 was 39.4 percent (see Table 4).

**Table 4: Currency Outside Banks to M1 Ratio**  
(in R\$ million, end-of-period balances)

Year	Outside	M1 (B)	A/B (%)
1999	25,951	62,744	41.4
2000	28,641	74,352	38.5
2001	32,628	83,707	39.0
2002	42,351	107,846	39.3
2003	43,064	109,648	39.3

Source: Banco Central do Brasil.

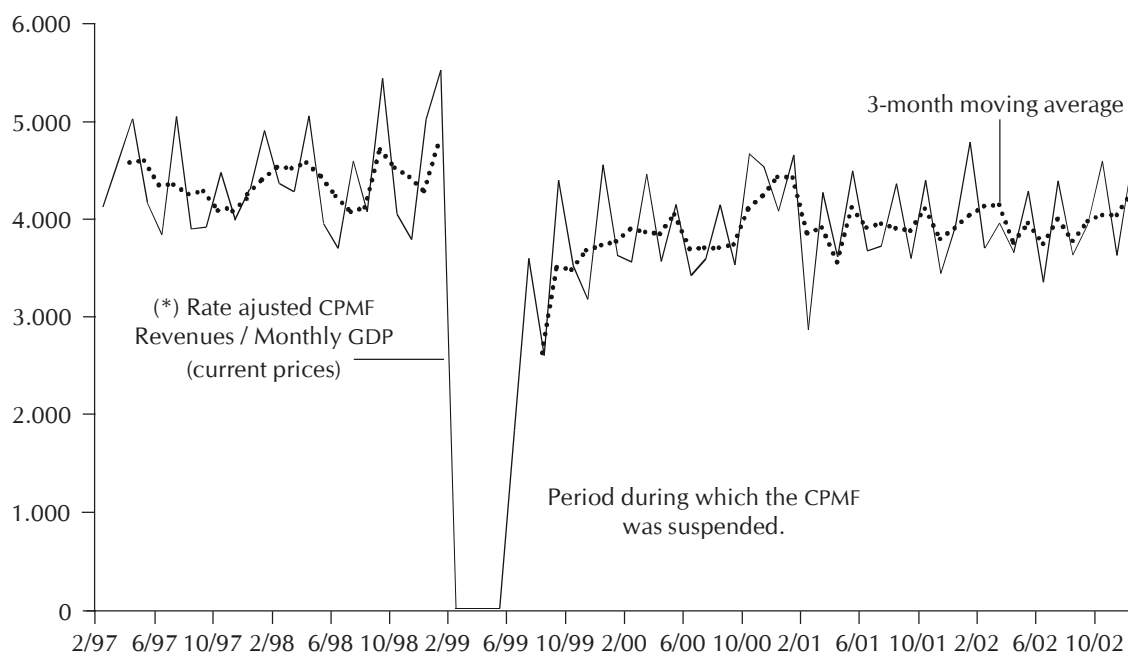
One event that could have affected the use of cash for payment transactions was the introduction, in January 1997, of the provisional contribution on financial transactions (*contribuição provisória sobre movimentação financeira*, CPMF), a tax levied on financial transactions. The CPMF was first introduced with a rate of 0.20 percent over financial transactions. Subsequently, the tax rate moved up to 0.38 and down to 0.30 percent, while financial transactions related to equities markets and capital inflows were exempted. At present, the CPMF rate is 0.38 percent.

Figure 3 shows the evolution of the ratio of the CPMF tax base to GDP, which was obtained by dividing monthly CPMF revenues by the prevailing tax rate and then dividing the result by GDP during the same period. These data suggest that CPMF has had no considerable effect on the level of financial intermediation provided by the banking system.

## 3.2 PAYMENT MEANS AND INSTRUMENTS OTHER THAN CASH

### 3.2.1 Cheques

Consumers and non-financial economic agents usually hold current accounts at banks to make cashless payments. Cheques and electronic payment instruments can only be drawn from bank current accounts. The number of current accounts increased from 52.5 million in 1998 to 87.0 million in 2003. This represents 51.2 percent growth in the number of accounts per capita. Funds available in savings accounts, time deposits, or mutual funds can be moved easily back and forth to current accounts.

**Figure 3: CPMF Tax Base\* as a Percentage of GDP**

Sources: Banco Central do Brasil and Secretaria da Receita Federal.

Cheques were the most important payment instrument in Brazil for many years. Cheques were used not only to purchase goods and services but also to settle transactions in financial markets. At present, cheques are used almost exclusively for the first purpose, although on a smaller scale. Postdated cheques frequently are used as a credit instrument.

**Table 5: Evolution of Cheque Usage**

	1999	2000	2001	2002	2003
Number of per capita issued cheques	16	16	15	14	13
Volume of cheques above threshold <sup>(a)</sup>	455	465	472	481	505
Volume of cheques below threshold	2,157	2,172	2,128	1,916	1,741
Value of cheques as a percentage of C	179%	164%	157%	129%	72%
Value of cheques above threshold	867,902	891,838	725,420	522,024	301,666
Value of cheques below threshold	90,920	95,193	75,931	58,244	53,985

Source: Banco Central do Brasil.

<sup>(a)</sup> The Central bank establishes a value threshold which is used by Compe - the Check Clearing House - for settlement lag definition purposes. This threshold is currently R\$300.00.

In recent years, payments through electronic means have far outgrown payments through cheques, both for large-value transactions as well as for retail ones (see Table 5). One relevant indicator, the ratio of total cheque clearinghouse settlement throughput to GDP, shows a 63.2 percent decrease over the last six years. The annual number of cheques cleared through COMPE, the cheque

clearinghouse, declined from 2.9 billion to 2.2 billion in the same period. Finally, the number of payments made by cheque as a percentage of total payments<sup>10</sup> decreased from 68.3 percent in 1998 to 40.7 percent in 2003; the value of payments made by cheque as a percentage of the value of total payments declined from 41.9 to 21.9 percent in the same period.

Two events made possible this significant reduction in the systemic importance of cheques. First, the BCB's real-time gross settlement system—the STR—was launched in April 2002. The average daily settlement throughput at the COMPE, the cheque clearinghouse, declined from R\$7.0 billion in March 2002 to R\$4.5 billion in March 2003.

Later on, the BCB introduced the *Depósito Prévio sobre Cheques e DOCs*,<sup>11</sup> a policy intended to boost the migration of large-value cheques toward electronic instruments by imposing a compulsory, non-interest-bearing deposit on banks (see Section 4.2.1.2 and Box 4). This policy became effective on November 6, 2002. Now, the *depósito prévio* applies to cheques only.

The BCB keeps a record of the issuers of unpaid cheques. In 2003, returned unpaid cheques represented 5.3 percent in volume and 5.8 percent in value in relation to all exchanged documents. In the same year, cheques returned because of lack of funds accounted for 94.2 and 91 percent, in volume and value, respectively, in relation to all returned cheques.

### 3.2.2 Bar-Coded Documents for Bills Payment

The bar-coded document for paying bills, the *bloqueto de cobrança*, is a paper document that providers of goods and services began to issue to facilitate the payment of bills. A customer who receives one of these documents takes it to a bank and authorizes payment through his account by paying in cash, using a debit card, or writing a cheque to authorize payment through his account. Alternatively, the customer can enter the bar-coded numbers at an ATM, home banking, or Internet banking station. Banks charge the payee an interbank fee. The payments are cleared and settled electronically, and, when applicable, the physical item is truncated at the collecting bank.

The *bloqueto de cobrança* is typically a retail instrument, because 97 percent of the documents are R\$5,000 or less, and the average value in 2003 was R\$1,013. On average, these documents constitute about 25.2 percent of the volume processed in the COMPE and 38.6 percent of the value (see Tables 6 and 7).

Beginning in February 2005, the *bloquetos de cobrança* are settled through CIP-SILOC (*Sistema de Liquidação Diferida de Ordens de Crédito Interbancárias*) or STR according to whether their value is lower or higher, respectively, than R\$5,000.

<sup>10</sup> Cheques, debit and credit cards, direct debits, and interbank credit transfers.

<sup>11</sup> DOCs are credit-type payment instruments that, at the time of introduction of the *depósito prévio*, were cleared and settled at the COMPE (now they are settled at the SILOC). For more details, see Section 3.2.3.

**Table 6: Relative Importance of the Main Instruments Cleared and Settled in the COMPE**

	1999 (%)	2000 (%)	2001 (%)	2002 (%)	2003 (%)
Volume					
DOC	1.8	2.1	2.4	3.1	3.0
Checks	80.7	79.2	77.3	74.0	71.8
Bloquetos de Cobrança	17.5	18.7	20.3	22.8	25.2
Value					
DOC	46.2	37.5	42.7	35.9	8.9
Checks	43.3	48.7	43.5	45.6	52.5
Bloquetos de Cobrança	10.5	13.9	13.8	18.5	38.6

Source: Banco Central do Brasil.

**Table 7: DOCs and Bloquetos de Cobrança**

	1999	2000	2001	2002	2003
DOC					
Volume (in millions)	59	70	82	102	94
Value (in USD billions)	1,024	760	786	449	60
Average value (in USD)	17,471	10,839	9,562	4,413	645
Bloquetos de Cobrança					
Volume (in millions)	566	624	682	739	789
Value (in USD billions)	232	281	253	232	262
Average value (in USD)	410	450	371	314	332

Source: Banco Central do Brasil.

### 3.2.3 Credit Documents

DOCs (*documentos de crédito*) are used to make interbank credit payments (see Table 6). A client can issue a DOC from an ATM, home-banking, or Internet-banking station, up to a limit of R\$5,000. Now DOCs are cleared and settled electronically through the SILOC, a new settlement system operated by the CIP.

### 3.2.4 Electronic Express Transfers

TED (*transferência eletrônica disponível*) became available as part of the process of modernizing Brazil's payment system. TED is an express electronic funds transfer operation that can be settled through the STR, in real time, or through the SITRAF, a hybrid system operated by CIP, in same-day funds. In both cases, the funds must be available at the beneficiary's current account no later than the end of the same day the credit order is issued. The use of TED has soared since its implementation. Considering only those TEDs processed through the STR, monthly transactions on behalf of bank

customers increased from 1.4 million in January 2003 to 2.3 million by the end of that same year, representing 69 percent growth. Table 8 contains detailed data on the TEDs processed both through the STR and through the SITRAF.

**Table 8: Evolution of TED Usage**

	<i>TED Customers Payments</i>					
	<i>Total</i>	<i>Volume</i>		<i>Value (in USD millions)</i>		
		<i>CIP-Sitraf</i>	<i>STR</i>	<i>Total</i>	<i>CIP-Straf</i>	<i>STR</i>
Jan/2003	1,382,924	107,352	1,275,572	58,183	692	57,491
Feb/2003	1,398,213	366,759	1,031,454	51,846	4,889	46,957
Mar/2003	1,459,955	546,693	913,262	56,779	10,560	46,219
Apr/2003	1,658,817	753,361	905,456	70,932	17,752	53,180
May/2003	1,780,800	906,670	874,130	77,469	23,229	54,241
Jun/2003	1,748,953	945,737	803,216	73,467	24,367	49,100
Jul/2003	1,962,874	1,109,439	853,435	78,347	28,822	49,525
Aug/2003	1,895,429	1,079,841	815,588	78,459	26,124	43,335
Sep/2003	2,094,599	1,195,858	898,74	81,155	29,162	51,993
Oct/2003	2,195,721	1,323,427	872,29	86,316	31,944	54,372
Nov/2003	1,988,541	1,235,428	753,11	78,213	30,472	47,741
Dec/2003	2,343,604	1,493,786	849,82	97,683	36,657	61,026

*Source: Banco Central do Brasil.*

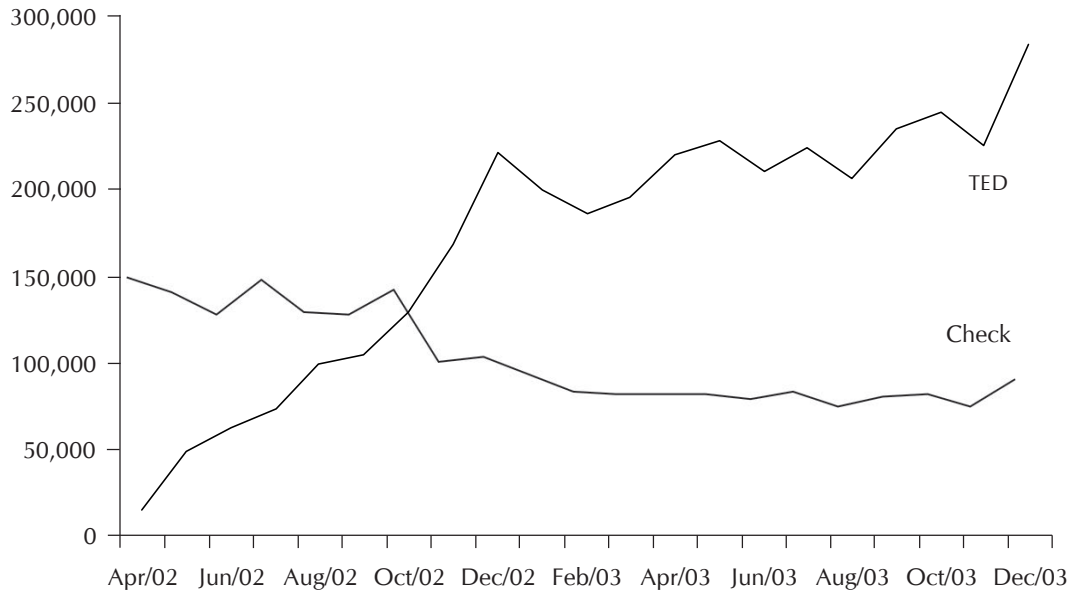
While the BCB has set no value limits for payments that go through the STR, banks usually take only payment orders of R\$5,000 or higher from their clients. This is one sign of the cooperative relationship between the banks and the BCB. In particular, the threshold prevents the STR from being flooded with numerous low-value payment messages. This threshold is exactly the same threshold that the BCB has established as the maximum value that can be transferred through the DOC. In this regard, in 2003 the total value of TEDs issued by bank customers (R\$2,669 billion) was already 160 percent higher than that of cheques (R\$1,027 billion, see Figure 4).

### 3.2.5 Direct Credits and Debits

Direct debit services in Brazil are only available at the intrabank level (that is, both the payer and the payee must hold accounts at the same bank). The commercial banks have made a series of efforts to increase customer awareness regarding the convenience of using direct debits to pay utility bills, which, as of December 2003, amounted to 627.8 million transactions worth R\$97.4 billion. In that same year, approximately 25 percent of public utility bills were paid using direct debits.

Direct debits are thus expected to increase significantly in Brazil in the upcoming years. The infrastructure that was created with the restructuring of the Brazilian payment system already makes it technologically feasible to develop a wide range of retail payment products.

**Figure 4: Use of TED versus Cheques**  
(value R\$ millions)



As with direct debits, direct credits are only available at the intrabank level. Direct credit is used for recurring payments, mainly those related to payments of wages, pensions, and tax refunds.

### 3.2.6 Payment Cards

#### 3.2.6.1 Credit Cards

Credit cards were first introduced in Brazil in 1956. It was only in the mid-1990s, however, especially after the Real Plan was launched, that this instrument grew in importance. The industry is now consolidated, and in 2000 it represented 42 percent of the credit card business in Latin American markets and 2.6 percent of the credit card business in the global market.

The main brands in Brazil are Amex, Diners Club, HiperCard, MasterCard, and Visa. The issuer segment of the industry has increasingly become a bank business. The main players in this area are Amex, Banco do Brasil, Bradesco, CrediCard, and HiperCard.

The number of credit cards issued increased from 23.4 million in December 1999 to 44 million in December 2003. The number of transactions increased from 553.2 million in 1999 to 1.08 billion in 2003. Finally, during the 1999–2003 period, while the volume of cheques cleared through the COMPE declined 14 percent, the volume of credit card transactions expanded 96 percent (see Table 9).

According to industry representatives, the potential for growth is considerable. Acquirers have sought new merchants, especially small businesses, outside large cities in less-served regions. The

**Table 9: Evolution of Credit Cards in Brazil**

Year	Number of cards (millions)	Change to previous year (%)	Number of transactions (millions)	Change to previous year (%)	Value of transactions (USD billions)	Change to previous year (%)	Average value of transactions (in USD)	Credit cards per 1,000 inhabitants
1999	23.4	-	553.2	-	19.6	-	35.4	142.9
2000	29.4	25.5	705.9	27.6	25.0	28.8	35.4	177.0
2001	35.4	20.3	825.0	16.9	23.5	20.6	28.5	205.2
2002	40.8	15.2	969.6	17.5	22.1	17.3	22.8	233.4
2003	44.0	8.0	1,083.5	11.8	25.1	19.2	23.2	249.0

Sources: Banco Central do Brasil, Instituto Brasileiro de Geografia e Estatística - IBGE and Credit companies.

**Table 10: Distribution of Affiliated Merchants by Region**

POS by region	1998	2003	1998-2003 % change
South	73.6	235.1	219.4
Southeast	292.4	922.6	215.5
North/Northeast	113.0	406.0	259.3
Centre-West	35.8	116.7	217.1
Total	514.8	1,680.4	226.0

Sources: Acquirers and Credicard.

number of affiliated merchants in the North/Northeast region has grown almost 260 percent, faster than the Southeast region between 1998 and 2003.

Since April 2002, the interbank settlement of credit card transactions was removed from the COMPE and moved to safer bilateral clearing arrangements. In line with BCB policy to make the COMPE a non-systemically important payment system by significantly reducing its turnover, two new retail clearinghouses were established to clear and settle credit card transactions. RedeCard and VisaNet, the exclusive acquirers for MasterCard and Visa brands in Brazil, turned themselves into clearinghouses to provide settlement services on a bilateral netting basis for the card brands they represent. Although not designated by the BCB as systemically important payment systems,<sup>12</sup> they guarantee with their own capital the timely completion of the daily settlement cycle in the event that the participant with the largest single settlement obligation is unable to settle.

### 3.2.6.2 Debit Cards

In Brazil the number of debit cards per thousand inhabitants grew more than twice between 1999 and 2003, while the number of transactions increased roughly six times due to an increase in the usage by cardholders.

<sup>12</sup> If a clearinghouse is designated as a systemically important payment system, under the Brazilian payment system law, it must become a central counterparty for the transactions it clears.



**Table 11: Debit Cards**

Year	Number of cards (millions)	Change to previous year (%)	Number of transactions (millions)	Change to previous year (%)	Value of transactions (USD billions)	Change to previous year (%)	Average value of transactions (in USD)	Credit cards per 1,000 inhabitants
1999	67.4	-	106.9	-	2.8	-	25.9	411.3
2000	85.5	26.7	205.8	92.5	5.0	80.2	24.3	514.4
2001	101.1	18.3	326.2	58.5	6.0	20.5	18.4	586.5
2002	114.2	13.0	451.3	38.4	6.7	11.6	14.9	654.1
2003	162.8	42.6	661.6	46.6	9.6	43.2	14.5	920.4

Sources: Banco Central do Brasil, Instituto Brasileiro de Geografia e Estatística - IBGE and Credit companies.

**Table 12: Electronic Banking and ATMs**

	1999	2000	2001	2002	2003
Accepting devices and transactions					
Number of networks	29	29	29	30	29
Number of terminals	86,170	97,539	111,370	129,913	137,354
with open access	22,569	31,764	43,171	49,813	51,887
with limited access	63,601	65,775	68,199	80,100	85,467
Volume of transactions (millions)	n.a.	n.a.	3,817	5,546	5,672
Value of transactions (USD billions)	n.a.	n.a.	183	212	231

Sources: Banco Central do Brasil, commercial banks and Tecban.

As of year-end 2003, nearly 162 million debit cards were in circulation and accepted by more than 1.4 million of affiliated merchants throughout the country (see Table 11). They operated under the same umbrella of major credit card brands: MasterCard and Visa. Banco24Horas has its own brands: Cheque Eletrônico and Cheque Eletronico.Com, the last being a debit card for e-commerce.

In Brazil, debit cards with a personal identification number offer online electronic checking services. They draw funds from the cardholder transaction account at the issuing bank. As a rule, the cardholder account is debited the same day the purchase occurs through EFTPOS networks. In 2003 the volume of transactions with debit cards was around 662 million, which represents nearly 30 percent of the volume of cheques. Nevertheless, at present, the volume of debit card transactions is growing much faster than that of cheques transactions.

### 3.2.6.3 ATMs

All of the major private banks in Brazil operate their own ATM network. Smaller banks usually share an ATM network in order to benefit from economies of scale.

As of year-end 2003, there were around 137,000 ATM devices, connected to 29 ATM proprietary networks (see Table 12). Through ATMs, banks offer a wide range of banking services such as cash

withdrawals, cheque printing, balance inquiries, statement requests, and payment transactions. In 2003 the number of cards with withdrawal functions—that allow access to ATM functions—was around 150 million. The volume of transactions increased around 50 percent between 2001 and 2003, numbering 5,672.4 million as of year-end 2003.

#### **3.2.6.4 Smart Cards and Prepaid Cards**

In Brazil, only a few banks issue smart cards to their customers. Two systems are currently being adopted: the SIBS and VISA Cash.

The VISA Cash system is an electronic purse based on the *Tarjeta Inteligente de Bancos y Cajas* (TIBC) operational system developed by Visa Spain. Visa owns the trademark and the licensing rights to use the system and is responsible for the interoperability, clearing, integrity of information, certification, and ratification of transactions, terminals, and cards used by the system. Once the system is started, Visa conducts the operation and clearing for the system using the same procedures adopted for its credit cards. There are 15 institutions issuing electronic money through Visa Cash in Brazil.

The SIBS system, from Portugal, is used only by one issuing bank in Brazil, which has acquired the rights of use and adapted the original technology to local needs, especially those regarding security. The most important change was the introduction of a password, which is required by the system whenever the loading exceeds a certain amount. Smart cards are loaded online, with money withdrawn from customers' current account. These operations can be carried out through either ATM terminals or the Internet. Customers without a current account follow a different procedure. Their cards are loaded through prepaid credit via ATM terminals.

Prepaid cards represent a very small portion of the total volume of payments. Most prepaid card mechanisms are used in the telecommunications sector and the subway.

#### **3.2.7 Home and Telephone Banking**

Several banks in Brazil offer home banking products such as personal computer banking and telephone banking services. The number of subscribers is growing rapidly, largely because banks generally do not charge customers for these services.

#### **3.2.8 Postal Instruments**

The mail service in Brazil is a state monopoly operated by ECT. Post offices traditionally have had a limited role in providing payment instruments (see Table 13). Two services are available—the *vale postal* (a payment order) and the collection of bills on behalf of third parties, especially public utilities.

These instruments are not widely used in the country despite the network of post office branches. The *vale postal* is not a sophisticated instrument. There are value caps for money transfers, and not

**Table 13: Payments with Postal Instruments**  
(in R\$ millions)

	1997	1998	1999	2000
Issuance of payment orders ("Vale Postal")	380.7	322.6	302.7	306.2
Payment of bills	3,808.0	3,276.2	4,195.7	3,088.2

Source: ECT - Empresa Brasileira de Correios e Telégrafos.

all post offices offer the service. Technological developments in the banking industry have made similar banking instruments much more attractive. In addition, the ECT, as an entity outside the financial sector, has not benefited from the economies of scale available to banks, such as having sophisticated clearance and settlement mechanisms or interbank money markets.

Both instruments reach a market niche of people who do not have access to banking services. In 2000, payment of bills through post offices represented merely 0.3 percent of payments made through the banking system.

In recent years, ECT has franchised post offices. In 2000, there were 1,500 of them. In 2002 ECT agreed to a joint venture with the largest private commercial bank in Brazil, Bradesco, to launch the Banco Postal. Under the agreement, Bradesco will be able to use ECT's branches all over the country to extend banking services to municipalities that are not yet reached by commercial banks (see section 4.5.1). Currently, Banco Postal has 5,482 branches.

### 3.3 NON-CASH GOVERNMENT PAYMENTS

#### 3.3.1 National Treasury Collections and Disbursements

In Brazil, commercial banks are highly involved in the process of collecting and disbursing government payments to and from individuals and corporations. The current system is characterized by heavy use of automation and very low use of cash. The Treasury maintains a centralized account (*Conta Única do Tesouro*) at the BCB, through which government payments and collections are settled.

In the past, Treasury payments and collections were not made directly from and to the BCB. Instead, they were generally handled by Banco do Brasil. With the adoption in 1987 of a new integrated system of financial administration of the funds of the federal government, known as the Integrated System for Financial Management (SIAFI), and the introduction of the centralized account in 1988, government payment and collection operations were significantly centralized and streamlined.

The accounting information flows through the SIAFI to more than 5,000 administrative units of the government linked to a computer network through which the budget allocations of the Treasury to the ministries are made. When these units need to make payments, they issue special banking orders through a branch of Banco do Brasil, where they keep their accounts. The consolidated information is passed by Banco do Brasil to the BCB. The BCB debits the *conta única do tesouro*

and credits the funds to Banco do Brasil, which remits the payments to the administrative units one day after it receives the funds. The one-day float represents Banco do Brasil's remuneration for the provision of this service.

On the collections side, taxpayers deposit their taxes along with a remittance form at the bank branch of their choice. The branches transfer, generally online, the information to the bank's main office. The bank may hold the funds for one day and keep the float, or it may hold the funds for two days and pay interest, usually the interbank rate, to the Treasury before remitting the collected funds electronically to the BCB and forwarding the information on collections to the Treasury's data-processing subsidiary, *Servico Federal de Processamento de Dados* (SERPRO). On receipt of the funds on day T + 2, the BCB notifies SERPRO for reconciliation purposes.

The payment system reform provided the National Treasury with a new set of tools for the real-time monitoring and management of its account within the BCB. The lags in tax collection have been shortened, and payments on behalf of the Treasury are reaching the beneficiary's account faster due to the elimination of unnecessary financial intermediation (see Table 14).

**Table 14: Public Sector Collections via the Banking System**  
(December 2003)

<i>Tax and Contributions</i>	<i>Volume (in millions)</i>	<i>Value (in R\$ billions)</i>
Federal Tax	73.1	256.4
State Tax <sup>(a)</sup>	148.7	128.6
City Tax <sup>(a)</sup>	138.2	19.6
INSS (Social Security)	90.5	80.2
FGTS (Time-in-Service Guarantee Funds)	39.9	24.9
DPVAT (mandatory car insurance)	27.8	1.4
Union Contribution	4.2	4.1
<b>Total</b>	<b>522.4</b>	<b>515.2</b>

Source: febraban.

<sup>(a)</sup> estimated.

### 3.3.2 Social Security Collections and Disbursements

All companies are required to deposit their social security withholdings of month M at the bank of their choice by the fifth working day of month M + 1. The collecting bank remits the deposited funds via the STR to the account of the Social Security Institute (INSS) at the Banco do Brasil. The collecting banks are remunerated for their services through the float between the time they receive the funds and the time funds are remitted to Banco do Brasil. Funds collected are used to pay social security recipients on a one-by-one basis and are generally not transferred into investment accounts; rather, they are maintained in liquid accounts at Banco do Brasil. In order for a bank to serve as a collector of social security funds, it must also provide the service of disbursing the funds to the beneficiaries.

When they become eligible for social security, individuals sign up for benefits at one of the local social security branch offices and receive their payments at a bank branch near their home. DATAPREV, a state-owned computer-processing company, processes the information on behalf of the INSS for all non-public servants and sends the information on individual payments in magnetic media to the banks. Public employees' benefits are processed separately. Based on the instructions of the INSS, the Banco do Brasil electronically transfers the funds to each disbursing bank according to the expected amount of benefits that social security recipients assigned to that bank withdraw on a particular day.

All social security recipients are assigned a date of the month by which the funds to which they are entitled will be available at the bank branch.<sup>13</sup> All recipients receive a plastic card authorizing them to withdraw social security funds deposited in their name at the assigned branch. Some banks allow recipients to make withdrawals at any branch. Some banks issue a magnetic card that allows beneficiaries to withdraw funds gradually throughout the month.

Funds transferred to a branch, but not collected, are transferred back to Banco do Brasil.

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<sup>13</sup> Payments are made during the first 10 days of each month.

## 4 PAYMENTS: INTERBANK EXCHANGE AND SETTLEMENT CIRCUITS

The BCB has successfully implemented a comprehensive reform of the payment system through a new legal, institutional, and technological framework.

Two elements of the Brazilian reform are notable, contributing to its breadth, scope, and complexity. First, the BCB conducted a comprehensive diagnostic study before defining the reform. The purpose of this study was to identify all forms of risk present in the system and, in particular, to identify and quantify the risks being incurred by the BCB. The study showed that, on an average day, the potential losses for the BCB in the various payment systems in which it was involved were as follows:<sup>14</sup>

- SELIC: R\$5.0 billion
- CETIP: R\$983 million
- COMPE: R\$4.5 billion
- PCAM (foreign exchange): R\$6.8 billion.

Second, the BCB consistently involved key stakeholders in the reform debate. The BCB's project team engaged in multiple meetings, workshops, and seminars with almost all players in the Brazilian financial market, including banks, other financial institutions, clearinghouses, and other regulators, among others. According to the BCB, these efforts generated widespread understanding and support for the new systems.

On April 22, 2002, the BCB launched the new Brazilian payment system, the *Sistema de Pagamentos Brasileiro* (SPB). The BCB now operates two real-time gross settlement systems: the STR for transfers of funds and the SELIC for transfers of ownership of federal government securities.

The SPB started with 150 banks and six private clearinghouses linked directly to the STR, although still clearing in deferred net settlement mode. COMPE, TecBan, and BM&F Foreign Exchange Clearinghouse began using the STR from the moment of its launch. The *Câmara Interbancária de Pagamentos* started its operations on December 6, 2002. At present, the CIP operates two settlement systems, SITRAF and SILOC, for large- and low-value funds transfers, respectively. RedeCard and VisaNet settle credit card transactions. Figure 5 depicts the new payment system.

### 4.1 OVERVIEW OF THE NEW SYSTEM

#### 4.1.1 Basic Principles of the New Brazilian Payments System

The Brazilian payment system operates under nine basic principles applicable to all participants:

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<sup>14</sup> Figures are based on the debit daily balances in the reserve accounts at the BCB for 1998

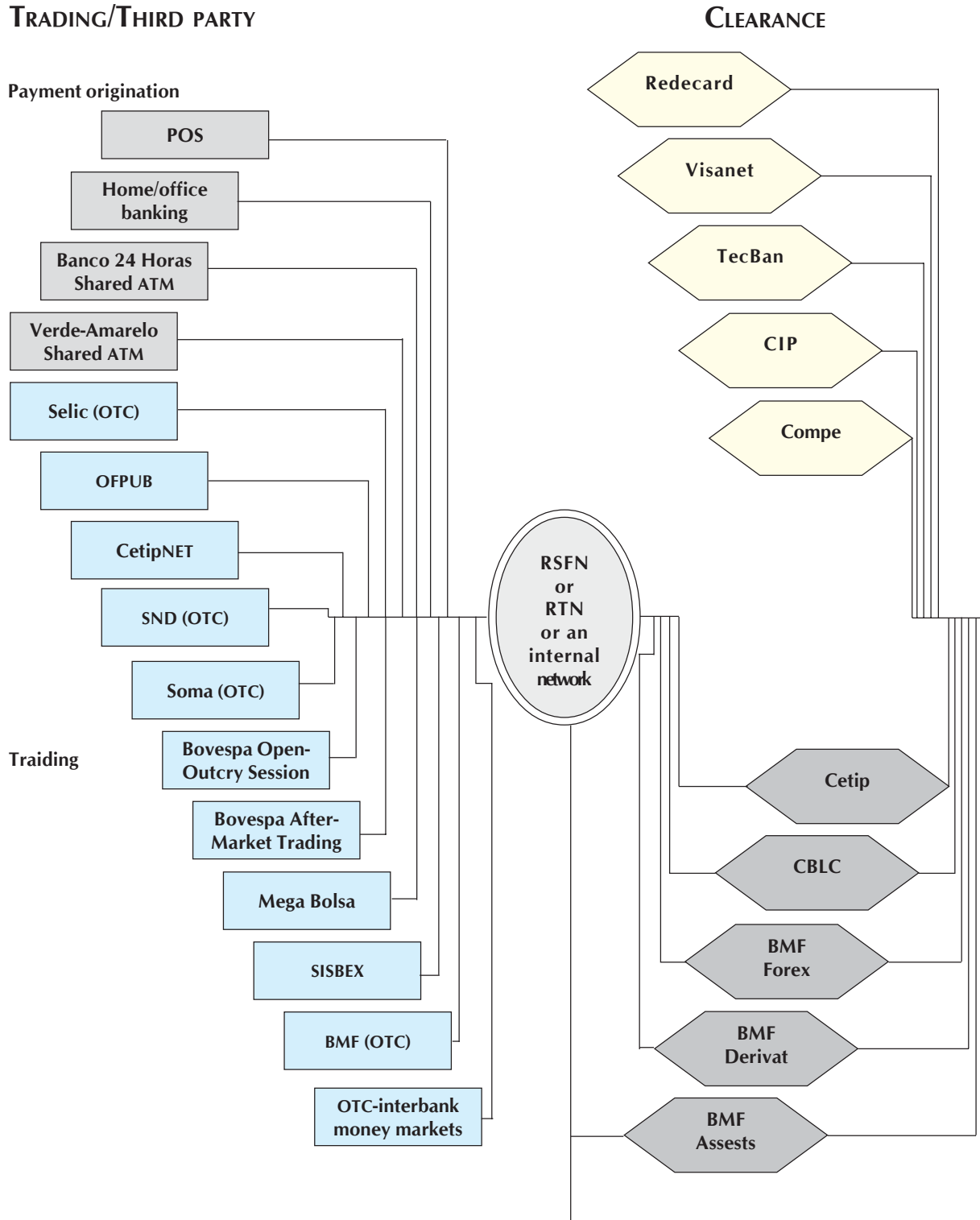
1. Deposit-taking institutions (commercial banks, universal banks with the capabilities of commercial banks, and federal savings and loans institutions) must hold reserve accounts, which are also settlement accounts, within the BCB. Investment banks also have the option of holding a reserve account provided they meet all technological requirements.
2. Entities operating systemically important payment and securities clearance and settlement systems must hold settlement accounts within the BCB, act as central counterparties, and guarantee the final settlement of the transactions they accept for clearance and settlement. In addition, net balances are settled in central bank money.
3. For settlement systems handling securities transactions or foreign exchange transactions, the principles of delivery versus payment or payment versus payment are to be applied under all circumstances.
4. Nobody but the account owner is allowed to make debits to its settlement account. This is even forbidden for the BCB itself.
5. The STR is the backbone of the system. It is the only channel through which a participant, including clearinghouses, can reach either its own account or third parties' accounts within the BCB.
6. There are no settlement account overdrafts at any time during the day.
7. Cash reserve requirements at the BCB can be used freely during the day for liquidity purposes.
8. The BCB provides the banks with a free, unlimited intraday liquidity facility by means of repo transactions backed by federal government securities. A haircut is applied to the collateral posted. Should an intraday repo not be paid by the end of the day, it will be converted automatically into an overnight repo and a penalty rate will apply.
9. The general model for settlement in central bank money is for the clearinghouses to receive funds from participants with a net debt position at some time during their operational cycle and then pay participants with a net credit position. To this end, each clearinghouse has a settlement window during STR operating hours (see Figure 5 and Table 15).

The implementation of these principles along with the changes in the legal framework and the institutional architecture brought about the reduction of systemic risk, a more appropriate sharing of the associated risks between the central bank and private market players, and the compliance of Brazil's systemically important payment systems with international standards and best practices.

#### **4.1.2 National Financial System Network**

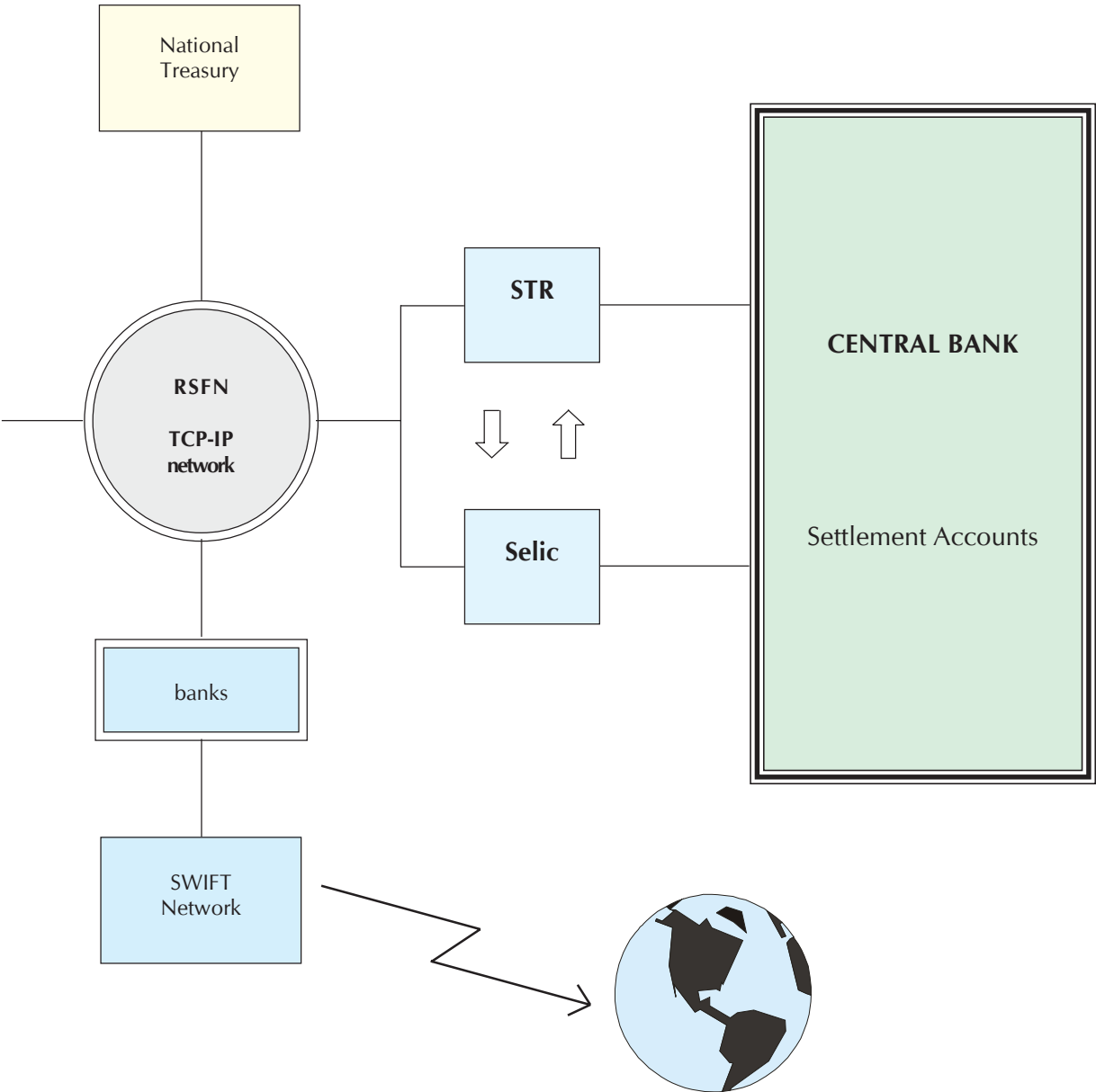
In the past, information related to payment systems was exchanged between the BCB and other participants (including clearinghouses) mostly through file transfers (file transfer protocol). The financial

Figure 5: Structure of Brazil's New Payment System





**FINAL SETTLEMENT**



**Table 15: STR Settlement Windows**

<i>Time</i>	<i>Clearance and Settlement System</i>	<i>Event description</i>
06:30	CIP - Sitrat	CIP informs banks their operational deposits for the day.
07:00	CIP - Siloc	1 <sup>st</sup> Settlement cycle CIP - Siloc informs participants' net settlement positions for the day.
07:30	CIP - Sitraf	Banks credit CIP's account at the Central Bank.
08:00	BM&F Foreign Exchange	BMF-FE informs participants' net settlement positions for the day.
08:00	Compe	Compe requests participants an additional deposit to perform the night settlement cycle.
08:00	CIP – Siloc	1 <sup>st</sup> Settlement cycle - Deadline for participants with net debt results to transfer funds to CIP – Siloc account at the Central Bank.
08:20	CIP – Siloc	1 <sup>st</sup> Settlement cycle: CIP – Siloc transfers funds to participants with net credit results.
08:30	Cetip	Begins RGTS operation.
08:30	Cetip	Cetip reports participants' preliminary net results to the Central Bank.
08:30	Compe	Deadline for participants with net debt results to transfer funds to the Compe night session.
09:00	Tecban	1 <sup>st</sup> Settlement cycle: reports participants' net results to the Central Bank.
09:00	Compe	Final settlement of Compe night session.
09:00	Compe's pre-funding	The Central Bank requests pre-funding from Compe's participants.
09:30	Compe's pre-funding	Deadline for pre-funding from Compe participants.
09:30	BM&F Derivatives	BMF-D reports participants' preliminary net results to the Central Bank.
09:40	Tecban	1 <sup>st</sup> Settlement cycle - Deadline for participants with net debt results to transfer funds to TecBan account at the Central Bank.
10:10	Tecban	1 <sup>st</sup> Settlement cycle - Tecban transfers funds to participants with net credit results.
11:35	Cetip	Cetip reports participants' net results to the Central Bank.
12:45	Cetip	Deadline for participants with net debt results to transfer funds to Cetip's account at the Central Bank.
13:00	Cetip	Cetip transfers funds to participants with net credit results.
13:05	BM&F Foreign Exchange	Deadline for participants with net debt results, either in reais or in foreign currency, to transfer funds to BMF-FE accounts.
14:05	BM&F Foreign Exchange	BMF-FE transfers funds to participants with net credit results, either in reais or in foreign currency.
14:15	BM&F Derivatives	BMF-D reports participants' net results to the Central Bank.
14:30	CBLC	CBLC reports participants' net results to the Central Bank.
14:50	BM&F Derivatives	Deadline for participants with net debt results to transfer funds to BMF-D account at the Central Bank.
15:00	BM&F Securities	BM&F Securities reports participants' net results to the Central Bank.
15:20	CIP – Siloc	2 <sup>nd</sup> Settlement cycle: CIP – Siloc informs participants' net settlement positions for the day.
15:25	BM&F Derivatives	BMF-D transfers funds to participants with net credit results.
15:30	CBLC	Deadline for participants with net debt results to transfer funds to CBLC's account at the Central Bank.
15:50	CIP – Siloc	2 <sup>nd</sup> Settlement cycle - Deadline for participants with net debt results to transfer funds to CIP – Siloc account at the Central Bank.

**Table 15: STR Settlement Windows**  
(continuation)

<i>Time</i>	<i>Clearance and Settlement System</i>	<i>Event description</i>
15:55	CBLC	CBLC transfers funds to participants with net credit results.
16:00	BM&F Securities	Deadline for participants with net debt results to transfer funds to BM&F Securities' account at the Central Bank.
16:10	Tecban	2 <sup>nd</sup> Settlement cycle: CIP – Siloc reports participants' net results to the Central Bank.
16:10	CIP – Siloc	2 <sup>nd</sup> Settlement cycle: CIP – Siloc transfers funds to participants with net credit results.
16:40	Tecban	2 <sup>nd</sup> Settlement cycle - Deadline for participants with net debt results to transfer funds to TecBan account at the Central Bank.
17:00	Compe	Compe request participants an additional deposit to perform the morning settlement cycle.
17:00	BM&F Securities	BM&F Securities transfers funds to participants with net credit results.
17:10	Tecban	2 <sup>nd</sup> Settlement cycle - Tecban transfers funds to participants with net credit results.
17:10	CIP - Sitraf	Complementary settlement cycle: CIP - Sitraf informs participants' net settlement positions for the day.
17:20	CIP - Sitraf	Complementary settlement cycle: Banks credit CIP - Sitraf's account at the Central Bank.
17:25	CIP - Sitraf	Complementary settlement cycle: CIP - Sitraf transfers funds to participants with net credit results.
17:30	Cetip	Closing time for RTGS transactions registering.
17:30	Compe	Deadline for participants with net debt results to transfer funds to Compe's account at the Central Bank - morning session.
17:45	Cetip	Deadline for participants with pending RTGS transactions to transfer funds to Cetip's account at the Central Bank.
18:00	Cetip	Closing time for RTGS transactions.
18:00	Compe	Final settlement of Compe morning session.

Source: Banco Central do Brasil.

transactions derived from the management of reserve requirements, rediscount operations, open-market transactions, and Treasury account entries were processed through the *Sistema de Informações Banco Central* (SISBACEN), the BCB's information system. Participants had to type in all the information required by these systems to SISBACEN's remote terminal located on the banks' premises, but completely isolated from their own internal systems.

Some of the principles envisaged for the reform of the Brazilian payment systems, such as real-time gross settlement fund transfer within the BCB and intraday liquidity management, were not consistent with the existing communications infrastructure. The BCB decided to create from scratch a communications network, the *Rede do Sistema Financeiro Nacional* (RSFN), to allow participants to safely exchange messages pertaining to all activities throughout the Brazilian payment system and to allow their computer systems to interact and exchange information in real time with minimum manual intervention.

To pursue this endeavor, the Network Working Group was created. This working group was chaired by the BCB and comprised representatives from the Treasury, the clearinghouses

and banking associations, and the Treasury. The Network Working Group had the following mandate:

- specify the new network's architecture, topology, and physical structure.
- define rules and standards for Internet protocol connections between the network service providers and participants.
- propose the best network solution regarding technology, scalability, security, contingency, and cost-benefit ratio.
- specify the technical requirements to be used in the process of choosing the network service provider.
- negotiate prices and conditions with the network service provider.
- homologate the two network service providers selected in the procurement process to set up the network.
- follow up, audit, and assess implementation of the network.

The network architecture had to support the real-time feature of most of the financial transactions envisaged in the new Brazilian payment system. Thus it had to achieve stringent requirements regarding availability, reliability, performance, security, and contingency. Based on those requirements, the Network Working Group defined stringent specifications with which any network service provider must comply, including redundancy in all segments of the network—that is, the backbone, physical interconnections, equipment, and last mile. In addition a service-level agreement between the network service provider and participants was enforced in a master contract (see Box 3).

### **Box 3: RSFN Service-Level Agreement**

- The Internet protocol network services must be available 24 hours a day, seven days a week. The network service provider must notify users seven days in advance in case an interruption is necessary.
- The network service provider should have redundant hardware and software to assure the service level stated below.
- Monthly availability:
  - a. 99.7 percent for the network backbone and links to the BCB. Individual failures are not to exceed 30 minutes (that is, the minimum time to recover, MTTR, including

dislocation, diagnosis, solution, and recovery). The minimum time between failures, MTBF, should be 30 days.

- b. 99.5 percent for financial institutions and other participants. MTTR = 180 minutes; MTBF = 30 days for each participant.
- Each network service provider is allowed to make up to six programmed interruptions in the provision of services. Each interruption will be used for maintenance purposes and should not overlap with that of the other network service provider. These interruptions should not exceed six hours and will not be counted as time of unavailability.
  - Round-trip time: less than 120 minutes.
  - Daily average missing packet rate at the backbone: less than 1 percent.
  - Call center's callback time: 95 percent of calls should be called back in less than 10 minutes. Rings before picking up the phone at the call center: 95 percent of calls should be picked up within four rings.
  - Non-compliance with the service-level agreement is subject to the penalties defined in the operational agreement contract.

Security aspects of the network were assigned to another special working group, the Security Working Group. Member institutions of this group were the same as those of the Network Working Group. These two groups cooperated very closely for two years.

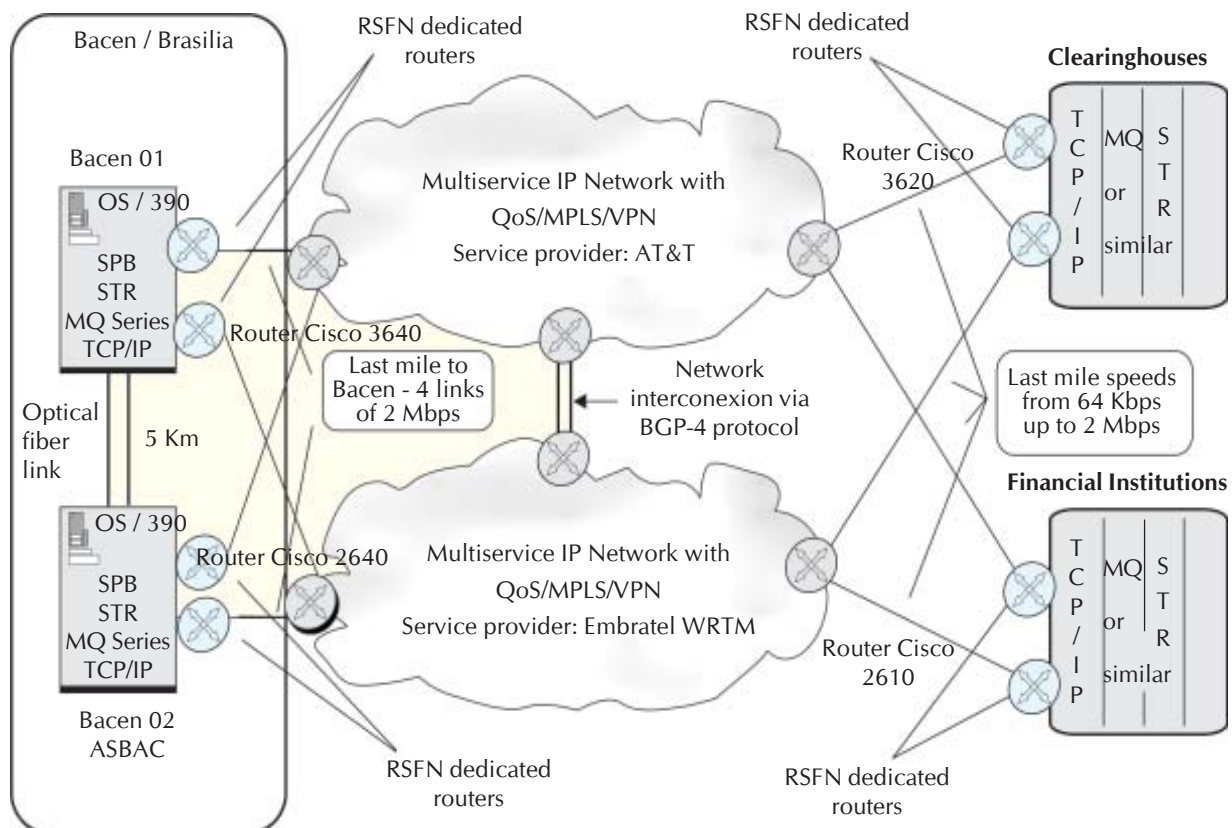
As far as information security is concerned, all contents of the network, except public information, are protected with asymmetric cryptography, and their origination can be certified by means of a digital signature. The RSFN operates as an Intranet for the entire financial system; therefore, outside users have no logical or physical channel through which to gain unauthorized access.

The messaging protocol was also built from scratch. A third working group, the Messages Working Group, was constituted with representatives from the financial sector to assess all information flows necessary to perform day-to-day operations throughout the payment system and subsidiary systems within the BCB (reserve requirements, rediscount) and the Treasury. This Working Group also chose the messaging protocol to be implemented. The decision to depart from reliable, well-established messaging protocols readily available in the market and, instead, to create a proprietary protocol intended to provide the system with a set of messages for carrying not only payment-related information but also broader transaction-related information. For instance, a member of the clearinghouse can use messages not only to pay for his net debt position within the clearinghouse but also to inquire about his current operational limit or to pledge additional collateral. Messages can also be used to handle various working relationships between the BCB and commercial banks, such as intraday credit and reserve requirement maintenance.

The outcome was a network based on the transmission control protocol-Internet protocol (TCP-IP), fully compatible with Internet concepts, tools, and applications.<sup>15</sup> The network is ready to convey new services in the future such as “voice over IP” (phone calls among participants using the network) and direct interconnection between financial institutions, among others.

Under the new framework, all banks, clearinghouses, the National Treasury, and the BCB are interlinked and operate straight-through processes by means of a proprietary messaging protocol and the RSFN (see Figure 6).

**Figure 6: RSFN Network Architecture**



Source: Banco Centro do Brasil.

The three working groups established during the reform process eventually were recognized by the BCB as permanent consultative bodies for the Brazilian payment system in their respective areas. Further governance arrangements for the RSFN are still lacking.

<sup>15</sup> For example, client-server applications, Web interfaces, and electronic mail.

## **4.2 MAIN LOW-VALUE PAYMENT TRANSFER SYSTEMS**

### **4.2.1 Clearance of Cheques and Other Documents**

The COMPE is a multilateral net settlement system for cheques and other payment documents. It provides cheque-clearing services all over the country. Since 1997, electronic clearance has accounted for practically all of the documents cleared. In 2001, through 15 local clearinghouses (known as SIRC) and the national system, the COMPE cleared, on average, 13.4 million documents or R\$17.2 billion every day. Settlement is made against banks' reserve accounts at the BCB on T + 1.

The COMPE is regulated by the BCB. The rules are consolidated in the Manual of Norms and Instructions, and changes are made through the issuance of directives by the BCB's Department of Banking Operations and Payments Systems (DEBAN). Banco do Brasil operates the COMPE's regional and national clearinghouses. The COMPE is also responsible for elaborating operational rules and maintaining the system.

All commercial banks, multiple banks with commercial operations, and savings banks participate in the COMPE. Banco do Brasil has powers to authorize participation and representation in the clearinghouse, to maintain registers and controls by the clearinghouse, to publish the necessary procedures and routines for carrying out its duties, as well as to provide information to the BCB and the system's members.

The BCB has set up a Consultative Group for Clearing Matters (the COMPE Group), made up of representatives of the BCB/DEBAN (observer), the Banco do Brasil (coordinator), banking associations,<sup>16</sup> and market participants designated by these associations, up to a total of seven representatives.<sup>17</sup> The tasks of the COMPE Group include consulting on questions relating to the service when requested by the DEBAN or the executive body, forwarding to these entities its suggestions for improving the system, and drafting internal regulations.

#### **4.2.1.1 Clearance and Settlement Process**

Cheque formats, basic features, and processing are standardized across the country. All cheques contain magnetic ink character recognition (MICR) encoding. Cheque truncation has not yet been implemented in Brazil, although there is an ongoing project to develop this procedure, and some bilateral truncation arrangements are already in place.

COMPE participants hold reserve accounts at the BCB, which are linked to another account (the "linked account") created for the financial settlement of interbank obligations arising from the COMPE. This account receives deposits through fund transfers ordered by the account holders through the STR, using a specific message in the SPB message catalog.

<sup>16</sup> Associação Brasileira dos Bancos Comerciais, Associação Brasileira de Bancos Internacionais, ASBACE, and Fenaban/Febraban.

<sup>17</sup> One is chosen from small institutions, three from medium-size institutions, and three from large institutions.



The COMPE holds two daily sessions for the exchange and return of documents:

- daylight exchange, which basically covers cheques up to a limit established by the BCB (currently R\$299.99) that are accepted by the banking network during the previous business day; these cheques are settled by T + 1 at the level of the participants
- night exchange, which covers cheques for individual amounts above the R\$299.99 limit and *bloquetos de cobrança* received in the banking network during the same business day (T); after the nightly clearing session and prior to the respective settlement of the multilateral balances (on T + 1), a special adjustment session is held to correct any errors discovered in the nightly session.

Transactions are settled with the exclusive use of funds deposited in the linked account; settlement is irrevocable and unconditional when the central bank makes the corresponding transfer of funds from the linked account to the reserve accounts via the STR.

As there are no safeguards to guarantee settlement, if a participant does not have sufficient funds to settle its obligations, the multilateral positions are unwound, and the relevant institution is excluded from the settlement process. The participants that are not excluded must make new transfers to the reserve account balances, which are recalculated within 10 minutes of the previous time limit. The process of exclusion and recalculation is repeated at successive 10-minute intervals until the amount available in the linked accounts of all the account holders is sufficient to close the settlement cycle. The timetable for settlement may also be postponed.

Finally, the BCB sets a maximum delay for the banks to make funds available to clients.

#### **4.2.1.2 Risk Management Mechanisms**

The COMPE is characterized by a high level of operational reliability and has tested contingency arrangements that guarantee business continuity. The Banco do Brasil maintains a main processing center in São Paulo and a secondary site in Rio de Janeiro, both working in hot standby mode.

Additionally, to mitigate the systemic importance of the COMPE, a pre-deposit for cheques<sup>18</sup> with an individual value of R\$5,000 or more was introduced. This deposit, which does not earn interest, must be made in cash by 9:30 a.m. on each business day through entries made by the participant through the STR to COMPE's account. Failure to make the deposit by the pre-established time makes the institution eligible for exclusion from COMPE's clearing sessions for the day at the discretion of the BCB, which informs the participants in a specific message by 10:00 a.m. on the same day. In May 2003, with the pre-deposit mechanism in full force (see Box 4), total settlement throughput at the COMPE averaged R\$7.8 billion a day. In March 2002, the figure was R\$16.8 billion.

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<sup>18</sup> Pre-deposit applied to DOC as well as when this credit transfer was settled through the COMPE (DOC now is settled through the SILOC).



#### **Box 4: Non-Interest-Bearing Compulsory Deposit on Cheques and DOCs**

Along with the restructuring of the Brazilian payment system, the BCB introduced a “reserve requirement–like” mechanism to induce the migration of payments cleared and settled at the COMPE of amounts equal to or higher than R\$5,000 to the new, safer payment system (that is, the STR or the SITRAF).

The mechanism is based on a non-interest-bearing, compulsory deposit that commercial banks have to make by 9:30 a.m. every day at the BCB in order to qualify for participation in the daily COMPE clearing sessions. The amount to be deposited by each bank is based on a fortnightly average of daily total value of cheques drawn against the bank plus the amount of DOCs issued by it. For this calculation, only cheques and DOCs with a face value of at least R\$5,000 are considered. This threshold was obtained by using COMPE data to simulate defaulting events and their possible systemic effects.

The phase-in period of this policy took three months, during which participants had a decreasing exemption from the deposit requirements, starting from 80 percent for cheques and 50 percent for DOCs in November 2002, to 20 and 3 percent, respectively, from February 2003 on.

As intended, this compulsory deposit created an economic incentive for banks to offer alternative payment products and services. As of May 2003, all major banks and some of the smaller ones had already made available real-time electronic interbank funds transfer services to their customers. The extent to which banks will be able to expand these services to reach the points of sale, pushing cheques into full obsolescence by allowing customers to make safe and cost-effective paperless payments for goods and services regardless of which bank holds their account, remains to be seen.

#### **4.2.2 Deferred Settlement System for Interbank Credit Orders**

The *Sistema de Liquidação Diferida de Ordens de Crédito Interbancárias* (SILOC) is a multilateral net settlement system that settles interbank obligations related to DOCs (see section 3.2.3.1). The system is operated by the CIP and went live in February 2004. All deposit-taking institutions have access to the SILOC.

The CIP, which was created in July 2001 and effectively began its operations on December 6, 2002, along with the SITRAF (see section 4.3.2), constitutes an important component of Brazil’s payment system. The CIP is governed by its bylaws and the regulations applicable to clearinghouses.

##### **4.2.2.1 Clearance and Settlement Process**

Banks on behalf of their clients issue DOCs, and the related electronic registers are sent to the CIP through the COMPE infrastructure. The SILOC holds two daily settlement sessions: the DOCs issued on the day before (T-1) are usually settled in the morning session, which ends at 8:20 a.m., while returned items are usually settled in the afternoon session, which ends at 4:10 p.m.

The CIP informs participants of the multilateral balances through electronic means by 5:10 a.m. for the morning session and by 1:05 p.m. for the second session. The transfer of funds from participants with a debt position to CIP and from CIP to participants with a credit position is carried out through the STR. For each session, final settlement occurs when the BCB posts the multilateral balances in the participants' reserve accounts.

#### **4.2.2.2 Risk Management Mechanisms**

The SILOC is not regarded as systemically important, and credit transfers through DOC are limited to R\$5,000 per order. Unwind is used if a participant is excluded before the settlement is completed.

### **4.3 LARGE-VALUE PAYMENT TRANSFER SYSTEMS**

#### **4.3.1 Reserve Transfer System**

The STR, which is owned and operated by the BCB and was implemented on April 22, 2002, is a real-time gross settlement system (see Box 5). Participants make transfers using standardized messages in the RSFN. Since all participants have to be connected to the network, they can send or receive messages on a real-time basis. The whole network system was developed in such a way as to foster straight-through processing (STP) among participants.

#### **Box 5: Launch of the Reform (The "Big Bang")**

On April 22, 2002, the Banco Central do Brasil launched the new Brazilian payment system (*Sistema de Pagamentos Brasileiro*, SPB). The new system started with 150 banks and six private clearinghouses operating in deferred net settlement mode. The BCB operates two real-time gross settlement systems: the STR for funds and the SELIC for federal government securities. During the first day of operation under the new framework, only four banks operated under contingency conditions (secured Internet, fax, or private telephone line) due to a system failure or communication breakdown with the BCB. One of the clearinghouses operated under contingency procedures within the operations settlement period, and another one postponed its settlement period for one hour. Although the standard operational period for STR, SELIC, and rediscount operations (intraday credit) ranges from 6:30 a.m. to 6:30 p.m., the closing time for the first day was delayed until 11 p.m. in order to solve some minor operational problems.

The BCB and the banks agreed to smooth the transition to the new system by establishing a threshold for third-party payments to be processed in the system in the first weeks of operations (transactions equal to or above R\$5 million). The funds transfer turnover was USD 22.1 billion for a total of 5,100 processed messages. The small volume on that day can be explained partially by the conservative behavior of market participants toward the new payment system. The market comments ranged from "success" to "a calm day," with no major failure or problem identified. Considering the extent of the changes, in both the technological and business environment, the BCB believes that financial markets responded quite positively. In retrospect, the launch of the new payment system was successful, and its implementation was managed smoothly in the first months of operations.

#### **4.3.1.1 Rules and Procedures**

The STR rules and procedures are intended to define fully and clearly the main rights and responsibilities of all involved parties, including the BCB, as well as to address all the details relative to operation of the system.

Participants can monitor in real time whether or not expected transfers have occurred and, at their own discretion, can control with their counterparty the reasons for the eventual failure of the transfer. In addition, participants have the right to issue and receive fund transfer orders, to cancel orders that have not yet been settled, and to be informed about the balance in their reserve account during the day and about the status of an issued order. In return, participants must ensure, to the best of their ability, the safety and proper functioning of the STR and promptly inform the BCB of any misuse of the system.

Rules to remedy mistakes made by a sending bank, by the BCB, and by the system itself have been envisaged in such a way as to assure legal finality. Even in case of errors, it is not possible to unwind transactions. STR participants are aware of this rule, and, if an error occurs, they can agree to perform a reverse transaction in order to balance the mistaken transfer. It is not possible for the receiving participant to reject a payment.

According to STR rules, payment to the receiving participant is final and irrevocable once the receiving participant's reserve account has been credited. Payment orders are processed immediately following the BCB's receipt of a transfer message. The STR system includes a confirmation message, which is sent both to the receiving and to the sending bank as long as the proper procedures are executed.

Payment orders are accepted as long as security procedures are met, messages conform to the proper format, and the reserve accounts have enough balances. Should a bank have a smaller balance in its reserve account than what is needed for a transfer to be made, the message enters a pending status and is queued. At the end of day, pending transactions are canceled.

STR participants receive information electronically about STR operational issues, including notification of extended operating hours and operational outages. The STR rules and procedures also set out decision and notification procedures for handling abnormal situations. The staff dedicated to STR monitoring is trained to perform all related functions.

#### **4.3.1.2 Operating Hours**

The STR's operating hours extend from 6:30 a.m. to 6:30 p.m. Besides bank-to-bank payments processed directly on a real-time gross settlement basis, the STR also settles the final balances of several payments, securities, foreign exchange, and derivatives clearinghouses.

The arrangement in this last regard is that clearinghouses are assigned a settlement window, that is, a time frame during which their operational settlement cycle in central bank money should be

concluded (table 15). Settlement windows are chosen by the BCB considering the STR timetable and aggregate liquidity concerns throughout the day. They are split into two successive time brackets. By the end of the first time bracket, all participants with a net debt position should have sent a credit order to the clearinghouse's account; otherwise default procedures are triggered. On ordinary days, however, once all deposits are made, the clearinghouse dispatches credit orders at a specified time to the STR in favor of all participants with a net credit position. Clients' funds must be transferred by 5:30 p.m.

#### **4.3.1.3 Risk Control Measures**

STR is a real-time gross settlement system in which no lag occurs between the acceptance and the finality of a payment order. Therefore, if one participant becomes bankrupt, credit risk is isolated in the institutions that granted credit to the failed counterparty.

Liquidity shortages and, hence, liquidity risk are addressed in the STR with intraday credit lines granted by the BCB through intraday repo operations (also known as rediscount-linked operations) collateralized with federal government bonds, through a real-time link with the SELIC, the settlement system for government securities. These repos are offered at no additional cost and are limited in size only by the amount of eligible assets banks are able to offer.

In addition, institutions subject to reserve requirements can use such reserves for intraday settlement purposes. At the end of the day, minimum daily reserve requirements have to be reconstituted or financial penalties are charged. Given that the sum of federal government bonds available to back these operations and reserve requirements amounted to USD 66 billion on July 2004 and BCB simulations found that intraday liquidity requirements were lower than that amount, at the moment the system seems sufficiently liquid.

The BCB bears no principal risks because all intraday credit is fully collateralized and intraday overdrafts are not permitted. The BCB may incur replacement cost risk should the agreed intraday repurchase not occur; for this reason, the BCB applies a haircut to the price of the repo transaction.

The pricing structure of the BCB credit lines is designed to discourage borrowers from failing to repay them by the end of the STR's operating day.<sup>19</sup> Intraday liquidity is granted at no financial cost, while the rate charged on overnight overdrafts is well above the market rate (that is, the market rate plus 600 basis points). All credit lines are granted at the discretion of the BCB, which does not have an explicit commitment to provide liquidity to the system or its participants, even in abnormal situations.

The reserve account balances of banks are monitored in real time by means of an Account Balance Monitoring System. The BCB operates a monitoring center for intraday liquidity flows and settlements. Participants also have access to this real-time information on payments processed and their settlement account balances.

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<sup>19</sup> Circular 3,153, of September 22, 2002, defines the rules for converting intraday repo transactions not honored by the closing of the STR into overnight repo transactions.

Centralized queuing arrangements are in place in the STR. System participants have access to their outgoing pending transactions on a real-time basis. Information about incoming pending transactions is not made available. The main queuing algorithm used is first in, first out, allowing for priority, which ranges from A (highest) to D (lowest). An optimization routine is envisaged to prevent gridlock and is started up at the BCB's discretion.

#### **4.3.1.4 Operational Reliability and Business Continuity**

The BCB has implemented a formal business continuity plan that consists of two stages. The first one considers a failure that prevents participants from accessing the STR's main computer center. In this situation, the backup site is immediately started up, and operations are completely resumed in no more than one hour. The second one considers the possibility of a complete STR outage. To cover this, the system counts on six monitoring centers, which are located in five different geographic areas. During the outage, the monitoring centers are expected to make telephone connections with the participants to assure business continuity. The contingency plan targets business continuity in a secure way to avoid losses among participants. The contingency plan must be tested and fully documented at least once a year.

Each institution participates as a sole user, digitally certified. A special public key infrastructure supported by three certification authorities was established in Brazil to certify each participant. At the application level, each message is digitally signed and subject to asymmetric-key cryptography. There is a common protocol for security on all messages that go throughout the MQ queues. The computer-based systems and related data communication networks are secure, reliable, and subject to independent audit by security specialists once a year. Moreover, the processing of individual transactions can be traced on an end-to-end-basis.

The need for separate functions in data processing has been considered. There are three separate environments: the first one for development and internal testing, with its own databases and free access for programmers and analysts; the second one for quality assurance, with its own databases and access for all participants, but no access for programmers and analysts; the third one for production, which uses real data. In the development and quality assurance environments, it is possible to isolate the various software components, on behalf of capacity planning, software maintenance, legal compliance, and other validation issues.

Regarding system reliability, there are two independent and internally redundant TCP/IP backbones (provided by AT&T and Embratel) using multi-protocol label switching (MPLS) technology and border gateway protocol (BGP) routing policies, which guarantee 99.8 percent up time for the whole system and redundant last-mile connections for all institutions connected; all service providers of the system—central bank, clearinghouses, and connection providers—must have fault- and disaster-tolerant sites such as backup sites and data replication. All irregular incidents are logged, reported, and investigated on a regular basis. All necessary aspects of computer-based systems are well documented. Business requirements are discussed fully and described in a common language, well understood by both information technology and banking personnel.

Regarding system architecture, software components are described in data dictionaries and flow charts. Program source codes are documented extensively in order to facilitate future maintenance and understanding. Infrastructure components are described in specific documentation, such as security and network manuals.

Appropriate backup facilities have been implemented as a result of the payment system reform. A backup site data-processing center, which replicates all characteristics of the main center, has been built 7 kilometers away from the main processing center. Both sites have independent operational systems.

#### **4.3.1.5 Pricing Policies**

The STR pricing policy is publicly available to users and to the public. The policy aims at full cost recovery: fees should cover all operating costs, both fixed and variable. Imputed costs also are considered.

The STR pricing policy is particularly relevant, as there is another system for same-day interbank funds transfers, the SITRAF. Although not a perfect substitute for the STR, the SITRAF offers similar services and is less demanding on liquidity.

The STR price schedule is R\$0.62 for each immediate transfer sent and received. Early transfers (before 8.00 a.m.) are charged a lower fee (R\$0.31 on either party). Offline participants incur a costly surcharge to initiate a funds transfer. The surcharge reflects the total costs of handling offline transfers and aims to promote efficiency.

Participants access a monthly statement of messages, both ordered and received, and are charged on the first day of each month for the amount corresponding to the messages it entered into (at either end) during the previous month.

#### **4.3.1.6 Access Criteria**

According to Law 4,595 of 1964, deposit-taking institutions are required to maintain a reserve account at the BCB. The National Treasury also has a settlement account at the BCB. Rules governing the reserve accounts cover the legal power of a contractual agreement as well as the conditions for access to the STR.

Systemically important payment and settlement systems are also required to have a settlement account at the BCB. The purpose of these accounts is to transfer the net balances of institutions that clear and settle under the sponsorship of such clearinghouses and, thus, must end every day with a zero balance.

An institution holding a reserve or a settlement account at the BCB and the BCB itself must participate in the STR. Participation of the National Treasury is discretionary. Investment banks



and clearinghouses that are not considered systemically important have the option of opening a settlement account at the BCB and, thus, becoming STR participants. Non-bank financial institutions are not allowed to have either reserve or settlement accounts.

Formal exclusion and exit rules do exist in the STR. An institution may ask the BCB to terminate its reserve account through a written request. On the occurrence of certain events, especially related to a banking crisis and bankruptcy procedures, the BCB is obliged to close the corresponding reserve account. In extreme cases, the BCB retains the right to prevent an institution from using the STR. Rules have been drafted in such a way as to facilitate a participant's orderly exit from the STR. The BCB's unit responsible for payment system oversight has a subunit dedicated to controlling both the access to and the termination of reserve accounts.

If an institution is not eligible to hold a reserve account at the BCB, it may have indirect access to the STR. Participants have to pay a monthly fixed connection fee to use the RSFN directly. The RSFN network fee is supposed to be charged at a fair cost even to small participants. A direct participant may charge a fee to allow an indirect participant to use the STR.

#### **4.3.1.7 Governance Arrangements**

The STR is owned and managed by the BCB. The operation and management of the STR are subject to the oversight of the BCB's board of directors, which is the main body governing the STR. Its day-to-day running is performed by the Department of Banking Operations and Payment Systems (DEBAN) through a special division created specifically for this purpose.

Although the participants are not represented directly on the managing bodies, the BCB takes into account the views of all involved parties before taking a decision on any relevant changes or measures. In fact, most of the decisions taken so far have been made on the basis of a consensus.

Even after launching the new system, the BCB has been meeting regularly with top representatives from the financial sector to discuss issues relevant to the revolution of the payment system. This discussion group might evolve into a formal Payments System Council.

#### **4.3.2 Funds Transfer System**

The SITRAF is a hybrid settlement system, meaning that both real-time, deferred mode as well as net and gross procedures are all present in its scheme. The system is operated by the CIP and started operations on December 6, 2002. Through the SITRAF, banks exchange electronic payment messages, so-called TED (see section 3.2.3.2). The CIP has signed a contract with the CETIP, another clearinghouse for securities, to manage its operating system. The SITRAF was designed following the model of the new CHIPS in the United States.

When participants send messages through the RSFN, they generate payment obligations that are cleared and settled in a multilateral and deferred manner directly in CIP's settlement account in the STR. However, the CIP also has mechanisms that enable payments to be processed in real time. If

sufficient balances are available in the account, the payment can be processed right away by the clearinghouse and immediately affects the accounts of the involved institutions within the CIP.

#### **4.3.2.1 Rules, Procedures, and Operating Hours**

To receive and send payment messages through the SITRAF, the participant must have an initial deposit each day corresponding to the minimum amount required by the CIP, determined in accordance with the participant's payments profile and its category (for example, wholesale or retail bank). The deposit should be made in the CIP-SITRAF's settlement account at the BCB no later than 30 minutes after SITRAF's opening (6:30 a.m.). Through the STR, the BCB informs the CIP of the amounts deposited by each bank. These amounts act as the initial credit in each bank's account with the CIP. In the course of the day, banks may make additional transfers to either make payments possible in the event of an insufficient balance or to accelerate the processing of their payments.

The CIP-SITRAF's settlement account has a zero balance at the end of the day. Thus there are two types of messages between banks and the CIP through the STR: the sending of deposits (compulsory or additional) from banks to the CIP-SITRAF's settlement account or the return by the CIP of the remaining balance on each bank's account at the end of the settlement cycle.

The multilateral balances calculated cannot be negative—that is, messages that produce negative balances are queued. The account balance of an institution operating on SITRAF is also subject to an upper limit, whose objective is to optimize the use of liquidity. When a participant's balance reaches its maximum limit, credit messages for this participant are transferred to the queue instead of being executed in its favor. In this case, queuing takes place until the participant sends payment messages sufficient to reduce its balance to an amount below the maximum limit. The upper limit of the account balance is communicated each day to the participant and remains fixed until the end of the day. Payments in a queue may be canceled or rejected.

The SITRAF's payment cycle is defined as the period between its opening for business and the last settlement of the net multilateral position of all banks by the BCB. It involves the main and complementary cycles. The main cycle is made up of three periods chronologically related to the compulsory initial deposit, sending of messages, and financial settlement.

Payments sent are classified by amount: small, medium, or large. When messages enter the system, a payment is processed gross when the issuing bank's balance so permits or on a bilateral net basis when another payment instruction involves the same banks but in the opposite direction and with similar amounts. The gross method is used in the case of transactions involving small amounts, avoiding an accumulation of messages in the pending queue, thereby reducing execution time for multilateral clearing. Bilateral clearing offers a second attempt to process small payments or, in the case of large or medium-size amounts, as soon as they enter the system in order to save funds deposited in the participant's account. Payment messages that have not been processed through any of these methods enter the pending queue for multilateral clearing, in which all possible payments are approved provided the balances of the banks involved remain positive. Payments that are not approved may return to the pending queue and wait for the multilateral clearing process to be triggered again.



In order to process the greatest number of messages possible, processing of queued messages must comply with criteria such as the selection of processing method (gross, bilateral net, or multilateral net), references chosen by remitting banks, and the chronological order in which messages are entered.<sup>20</sup> The CIP is able to adapt the system to changes in the profile of bank payments, altering the parameters used in its operations, including the initial obligatory deposit, the bank balance limit, and the classification of the payment by amount. Approved payment messages are final and therefore irrevocable.

Obligations are carried out through debits and credits in the payer's and payee's current accounts with SITRAF. If some payment orders are still pending, a complementary cycle begins. A time limit is given for the banks to cancel the pending messages or to make immediate supplementary deposits corresponding to the gross amount pending. At the end of the time limit, multilateral clearing is again attempted for pending messages, and the proceeds are transferred via the STR to the reserve accounts. The interval for CIP's complementary cycle consists of a period of 25 minutes beginning at 5:00 p.m. (last time for receiving messages) and lasting until 5:25 p.m. (when the complementary cycle closes).

Once this process has been concluded, the balance on the CIP's settlement account with the BCB should always be zero. Banks that fail to make the deposit for the complementary cycle have their pending messages rejected by the CIP and may be excluded from the following operating day and subjected to other penalties.

#### **4.3.2.2 Operational Reliability and Business Continuity**

The SITRAF's backup site operates in hot standby and can be put in full operation in less than two hours if problems arise in the main site. As any other payment system regarded as systemically important in Brazil, the SITRAF's availability to the participants in a period of a year should be at least 99.8 percent. The system's contingency plan is tested at least once a year.

#### **4.3.2.3 Pricing Policies**

SITRAF's pricing policies aim to achieve full cost recovery. The fees are similar to those charged in the STR environment.

#### **4.3.2.4 Access and Governance**

SITRAF participants are the financial institutions that hold reserve accounts at the BCB and have been admitted to participate in the CIP. Prerequisites for participation include connection to the RSFN and compliance with the conditions laid down in the SITRAF's operational regulations. CIP's capital subscription is required as well.

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<sup>20</sup> Article 28 of SITRAF's regulation also states that remitting banks should program the sending of payment messages in such a way as to ensure that at least 70 percent of the volume expected for the whole main cycle will effectively be remitted during the first two-thirds of the period. Repeated failure to comply with this provision makes banks subject to penalties imposed by the clearinghouse.

Thirteen bank representatives participate in the board of governors, the CIP's supreme body, which counts on four advisory committees (accountability and budget; services and products; risk; and technology).

### **4.3.3 The BM&F's Foreign Exchange Clearinghouse**

The *Bolsa de Mercadorias & Futuros* (BM&F) has established a clearinghouse for foreign exchange transactions, the *Clearing de Câmbio*. At present, the system handles foreign exchange transactions in Real versus USD, and eventually it will also handle Real versus euro and Real versus yen. All Brazilian banks authorized to operate in the foreign exchange market are allowed to participate in the system.

The system comprises three subsystems or tiers that, through a guarantee provided by the clearinghouse, protect participants from principal and replacement cost risks to varying degrees (for example, principal risk only, principal risk plus replacement cost risk, and so forth).

#### **4.3.3.1 Legal and Regulatory Framework**

According to Law 4,595, the BCB establishes and enforces provisions for the foreign exchange market supported by legislation and by CMN rules and regulations. Among several other duties, the BCB (1) is the depository of official reserves of gold and foreign currency, (2) authorizes banks to carry out foreign exchange transactions, and (3) acts to ensure the regular functioning of the foreign exchange market. BCB's Circular 1,815 of September 17, 1990, addresses the procedures for carrying out interbank foreign exchange transactions.

The BM&F Foreign Exchange Clearinghouse was developed in accordance with the guidelines set out by the BCB and BM&F's own bylaws, which state that the "BM&F purposes are to register, clear, and settle by physical delivery and cash settlement the trades executed on its trading floor and/or registered in any of its trading, registration, clearing, and settlement systems by means of an in-house department or an organization constituted for that purpose."

#### **4.3.3.2 Understanding and Managing Financial Risks**

The rules and procedures of the system are comprehensive, detailed, and readily available to participants and the general public. A manual presents clearly all aspects of the system. The rulebook is divided into 13 chapters, which cover definitions, clearinghouse activities, participants, transaction registration, analysis and acceptance, transaction contracting, clearance, settlement, safeguards, fees and costs, penalties, and general provisions. The document also includes an operational manual, a risk management manual, and a manual for all aspects related to operational reliability and business continuity.

Participants can register in the system foreign exchange transactions to be traded directly between them, with the intermediation of brokers, or through other foreign exchange trading systems authorized by the BCB and by the clearinghouse. Pursuant to the rules and regulations issued by

the BCB, after the trade participants must register their transactions through the SISBACEN, the BCB's information system.

In the analysis stage, the clearinghouse revises the data, terms and conditions, and the characteristics of each transaction. Special attention is given to the risk considerations of the correspondent banks. At this stage, the clearinghouse decides whether or not it will become a central counterparty. The system assesses the transaction by comparing it with the parameters predefined by the clearinghouse in accordance with the dynamics of the foreign exchange market and of its participants. The two parties in the transaction establish the settlement date, which can be one or two business days after the trade.

The settlement process works as follows:

- The system determines the multilateral net settlement obligations.
- Net funds in Reais must be paid through the STR by crediting the settlement account of the clearinghouse no later than 1:05 p.m.
- Net U.S. dollar funds must be credited by the sellers to the correspondent bank account indicated by the clearinghouse.
- At 2:05 p.m., the clearinghouse issues all payment orders in Reais directly to the STR accounts of net sellers and in foreign currency to the accounts held at the correspondent banks by net buyers.
- The final phase, which ends at 3:30 p.m., is designed to settle all payments that, for whatever reason, were not processed during the normal clearing session.

Net U.S. dollar balances are settled through correspondent accounts held by the clearinghouse with foreign banks in New York. If both the participant with a net credit position and the clearinghouse hold an account with the same correspondent bank abroad, balances in U.S. dollars are settled through book entries. Otherwise, settlement is made through a Fedwire transfer.

To assure the cash settlement of transactions carried out through its systems, the clearinghouse uses the following safeguards:

Protection against principal risk:

1. Every transaction for which the clearinghouse becomes the contracting party is subject to the payment versus payment principle. The clearing cycle is based on deferred net settlement, in both foreign and domestic currency, reducing the amount of funds to be transferred and, hence, the liquidity risk. Payment versus payment is possible because transactions are bilateral agreements.

2. Operational limits are set for participants in order to restrict net balances in both currencies to the participants' real capacity. Operational limits are calculated by the clearinghouse using a rating analysis of participants and their past behavior in the foreign exchange market.

Protection against market risk:

1. exchange rate fluctuation in a default situation: The clearinghouse has at its disposal the collateral requested through a margin call for each transaction. Margins are calculated according to a model developed by the system.
2. exchange rates contracted out of market parameters: If the proposed foreign exchange transactions fall outside the parameters defined by the clearinghouse, they are accepted by the system only after collateral has been posted.
3. losses in foreign exchange transactions for same-day settlement: For each transaction registered with an opposite sign by one participant for same-day settlement, the clearinghouse simulates the resulting balances in both currencies to verify if the participant is trading with a loss. In this case, the system requires a prior deposit of collateral equivalent to the loss.

The clearinghouse also has access to credit lines provided by the correspondent banks for the purchase and sale of foreign currency. Furthermore, some settlement funds have been established within the system for handling crisis situations:

1. participation fund: the initial deposit from each participant, which is made up of individual shares and varies from participant to participant
2. operational fund (R\$50 million): designed to cover losses arising from operational, administrative, or functional failures in the clearinghouse management process
3. segregated capital (R\$10 million): a segregated portion of the BM&F's equity for the sole purpose of guaranteeing the fulfillment of the obligations under the responsibility of the foreign exchange clearinghouse.

The system has several procedures and safeguards in place for handling problems that arise in the settlement cycle. In case of a default of a foreign exchange buyer, the participant is temporarily excluded from the system. The transactions that were already registered for a settlement date after the default remain in the system and are settled. The clearinghouse uses the foreign currency funds not delivered to the defaulting party to obtain the Reais needed to pay the other participant.

Should an adverse exchange rate fluctuation occur, the difference is covered as follows:

1. The collateral previously deposited by the defaulting party for that particular transaction is used following the risk control procedures of the clearinghouse (that is, the "defaulter pays" rule).

2. The collateral deposited by the defaulting party in the General Fund or any other collateral available at the clearinghouse does not cover the entire open position.
3. If this is still not enough, the difference is absorbed by the non-defaulting participant. Repos are made if the participant's default is considered temporary and of an operational nature.

A similar procedure is activated when a party selling a foreign currency defaults.

#### **4.3.3.3 Operational Reliability and Business Continuity**

The measures to ensure security and operational reliability of the BM&F systems are comprehensive and effective. The security structure is divided into three segments:

1. physical, covering all measures to ensure the availability of equipment as well as all controls implemented to ensure that only authorized personnel have access to the facilities.
2. administrative, that is, the set of resources needed by the security structure management, defining roles and responsibilities as well as processes aimed at business continuity.
3. logistical, that is, the strategy created to control network load, connections, and authorized access and to ensure the integrity and availability of information.

The technology centers are equipped with redundant contingency systems for power supply, with short interruptions being fed by UPS units and long ones by a set of generators.

The information technology structure is distributed in two technology centers (CT1 and CT2) in two different locations in São Paulo. They are sufficiently distant so that the likelihood of both being affected by a catastrophic event is minimal. Applications are balanced or placed under contingency so that, in the event that one system is completely unavailable, the other can take over. Inside the same center, there is network equipment redundancy. Communication between the two centers is performed through a network structure provided by the telecommunications company at high speed, with contingency arrangements.

All procedures are documented in manuals. In particular, a security team knows all the services and protocols that travel through the network. In addition to that, the BM&F promotes activities to heighten the awareness of all employees of the issues related to operational reliability.

The system centralizes logs in the security operational center in order to ease data analysis and problem identification. Sophisticated anti-virus measures are in place as well as state-of-the-art network device control systems. Secure and redundant communication links are in place, and all messages comply with the specifications provided by the BCB to ensure integrity, legality, confidentiality, availability, and acceptance.

The BM&F continuity plan is comprehensive and detailed. It covers recovery strategies for storage, network, servers, infrastructure, and so forth. Monitoring and operational contingency plans and

emergency plans are well documented. Regular training and maintenance procedures are in place, and there is constant coordination with public authorities and the central bank on operational and security matters.

#### **4.3.3.4 Access and Governance**

Participation in the system is restricted to institutions that, by being authorized by the BCB to trade or to intermediate trades in the foreign exchange market, are duly registered and authorized to use the clearinghouse. Participants in the clearinghouse are grouped as (a) member participants (institutions that hold BM&F equity) and (b) nonmember participants. In particular, they are:

- banks authorized to trade foreign exchange.
- brokers authorized to intermediate foreign exchange transactions.
- BM&F members authorized to intermediate foreign exchange transactions in electronic and outcry systems approved by the BCB.

The application process begins by filling out a specific form published in a BM&F circular letter, which is also made available by electronic means. The authorization process includes the definition of operational limits and the technical validation of the institution's systems. The institution must then deposit its share in the participation fund. At the end of the process, a BM&F Foreign Exchange Clearinghouse authorization certificate is issued, and the institution's name is published in a BM&F circular letter as a participant authorized to use the system. Under the section on penalties, the rulebook clearly regulates the exclusion of a participant.

The *clearing de câmbio* is integrated with BM&F's administrative structure. In practice, it consists of two specialized departments, one to monitor and resolve issues related to foreign exchange registration and contracting and one to monitor and resolve issues related to foreign exchange payment and settlement. The director of the Foreign Exchange Clearinghouse, who reports to the BM&F chief executive officer, manages the system.

Formal and detailed governance arrangements do exist in case of crises of any nature. In addition, chapter VI of the BM&F bylaws establishes deliberative committees and advisory committees as the exchange's auxiliary administrative bodies. In particular, the Deliberative Committee for Foreign Exchange Matters was created to address issues concerning foreign exchange transactions registered in the system. The committee comprises the BM&F chief executive officer, two members of the clearinghouse, and 10 banks; it deliberates on any modifications of the clearinghouse rulebook and on the costs of the services to be rendered. Any change that could alter the risk exposure of the clearinghouse will have to be approved by the BM&F board of governors. Moreover, pursuant to BCB regulations for clearinghouses, any change in the rules and regulations must be approved by the BCB prior to implementation.

In July 2000 the BM&F created the Advisory Committee for Foreign Exchange Matters, which at the beginning worked with the technical staff to develop the systems of the clearinghouse. After the launch of the system, the committee was restructured to assist the BM&F in the daily operations of



the system as well. The committee comprises 13 bank representatives and meets whenever necessary to discuss and analyze all relevant questions involving the foreign exchange transactions that are registered, cleared, and settled in the system. The proposals of the committee are submitted to the BM&F board of governors.

#### **4.4 CROSS-BORDER PAYMENT SETTLEMENT SYSTEMS**

The BCB is a member of the Latin American Association for Integration (*Asociación Latinoamericana de Integración*, ALADI), a system for the clearing and settlement of multilateral cross-border payments related to the intraregional trade of 12 countries: Argentina, Brazil, Bolivia, Chile, Colombia, Dominican Republic, Ecuador, Mexico, Paraguay, Peru, Uruguay, and Venezuela. In 1965, the central bank of these countries subscribed to the Reciprocal Payments and Credits Agreement with the basic objective of reducing the cross-border transfer of foreign currencies among themselves. Through this agreement, members offer system participants the guarantees of convertibility, transferability, and reimbursement.

Under the ALADI system, the central banks of member countries accept payment documents associated with intraregional trade, mainly those related to credit letters denominated in U.S. dollars. The central bank of the country where the export originated deposits funds, on behalf of the central bank of the importing country, in the commercial bank participating in the foreign trade transaction. Each country's central bank also authorizes its financial institutions to send commercial transactions directly through ALADI as authorized institutions.

These transactions result in net accrued positions in U.S. dollars among central banks. Every four months, the Operations Center, located in the central bank of Peru, makes a cutoff of multilateral balances among central banks through the Automated System Supporting the ALADI Reciprocal Payments and Credit Agreement (*Sistema Computarizado de Apoyo al Convenio de Pagos y Créditos Recíprocos ALADI*, SICAP/ALADI). Funds are settled in the Federal Reserve Bank of New York, the correspondent bank of all ALADI member central banks.

The SICAP/ALADI allows automation of the information regarding ALADI transactions as well as other transactions related to the reciprocal relationships among member central banks. It also provides members with information on debits, credits, balances, number and interest calculations, extraordinary settlements, multilateral use of risk margins, and authorized institutions, for both the current period and historical information.

During the 1960s, nearly a third of all intraregional foreign trade payments were cleared and settled through ALADI. In these years, only some of the member countries were export oriented, and the ALADI agreement enabled a more efficient use of international reserves. At the end of the 1970s, this figure increased to nearly 75 percent of total payments, and it reached its maximum during the 1980s, with approximately 90 percent. However, during the 1990s, the portion of international foreign trade payments channeled through the ALADI decreased significantly, reaching only 16.6 percent in 1997. This situation is due in part to the availability of new and more convenient financing methods and to the increase in the stock of international reserves in many of the region's central banks.

Cross-border fund transfers outside the scope of ALADI are usually made through correspondent banks, and SWIFT is generally used for this purpose. Some arrangements, involving mainly federal government-owned financial institutions, are being implemented in order to facilitate remittances from Brazilians residing in other countries and to make these transfers less expensive to the senders.

## **4.5 MAJOR PROJECTS AND POLICIES BEING IMPLEMENTED**

### **4.5.1 Banco Postal**

The largest private commercial bank in Brazil—Bradesco—won the concession to offer banking services in partnership with ECT, the postal service. The new entity has been denominated Banco Postal. The service was launched in March 2002, when some 1,750 municipalities were without banking services in Brazil. At present, the Banco Postal serves about 1,675 municipalities.

Banco Postal is likely to play a key role in expanding the population's access to banking and payment services.

### **4.5.2 Conta Eletrônica's CAIXA AQUI**

In December 2002, the Caixa Econômica Federal—the second largest public financial institution in Brazil—launched an electronic current account (CAIXA AQUI account) designed to meet the needs of low-income people with no access to banking services. According to Caixa Econômica, 25 million households fall under this category; 2 million accounts have already been opened.

CAIXA AQUI accounts are tariff-free (subject to restrictions) and can only be accessed through electronic cards. In order to facilitate the process of opening new accounts, no minimum initial deposit is required. Customers not only can make withdrawals from the 2,000 branches of CAIXA throughout the country but also can use CAIXA's associated networks: 9,000 lottery houses (*casas lotéricas*) and 2,108 bank correspondents (*correspondentes bancários*).

### **4.5.3 CrediAmigo Microfinance Program**

This is another initiative to make banking services available to less-affluent portions of Brazil's population. Banco do Nordeste, a regional state-owned bank, has been developing a microfinance program, CrediAmigo, since 1997. Brazil has long been considered one of the world's great untapped microfinance markets. Because of the country's large population, relatively high poverty rate, and open economy, it has the largest concentration of microenterprises in Latin America. Of more than 9 million microenterprises estimated to exist in the country, at least 2 million are located in the Northeast region.

CrediAmigo is among the top microfinance institutions in Latin America in terms of geographic penetration, number of clients, and depth of outreach. As of July 2004, the program had more than 150,000 active clients in 358 municipalities throughout the Northeast region of Brazil. The average outstanding loan balance was R\$591, less than 8 percent of Brazil's GDP per capita. Only 2.5 percent of its loans are past due, using a strict 30-day nonperforming accounting method for loans.



## 5 SECURITIES, MARKET STRUCTURE AND TRADING INSTRUMENTS

### INSTRUMENTS

#### 5.1 FORMS OF SECURITIES

All securities traded in the financial markets are held in dematerialized form, and all transfers are handled by electronic book entries.

#### 5.2 TYPES OF SECURITIES

Securities can be divided in three groups: debt instruments, equities, and securitization of receivables. Securities issued by the federal government are the most liquid instruments in the market. These securities include, among others, the *Letra Financeira do Tesouro* (Treasury financial letter), the *Letra do Tesouro Nacional* (National Treasury letter), and the *Nota do Tesouro Nacional* (National Treasury note), along with some public debt certificates, agrarian reform bond certificates, and privatization certificates.

Other relevant securities in the Brazilian financial markets are the following:

- equities.
- BDRs – Brazilian depositary receipts, which are securities issued by foreign companies with a view to raising funds for proposed projects.
- debenture-backed securities.
- mortgage-backed securities (*letras hipotecárias*).
- CDB – bank certificates of deposit.
- RDB – bank deposit receipts.
- DI – interbank certificates of deposit.
- FIF and FIC – investment fund quotas.
- FMIA and FACs – stock mutual fund quotas.
- export notes.

- debentures.
- commercial paper and / promissory notes (*nota promissória*).
- bills of exchange (*letra de câmbio*).
- CRIs – real estate certificate receivables.

### **5.3 SECURITIES IDENTIFICATION CODE**

The BOVESPA is the Brazilian numbering agency, the only institution authorized to assign International Securities Industry Numbering (ISIN) codes for securities in Brazil. All depositories use ISIN codes, and all securities have ISIN codes attached. Some of them, however, including government securities, use this code as a secondary identification code because, by tradition, these securities used a more entrenched coding system in the past. In the medium term, though, ISIN codes should prevail as the only identification system for securities in Brazil.

### **5.4 TRANSFER OF OWNERSHIP**

Bearer securities were prohibited in Brazil in 1990. Since then, central securities depositories have developed fungible depository services for nominative securities. The service is based on the fiduciary transfer of ownership to the central securities depository solely for depository purposes, without the securities being added to the depository's assets. Ownership is thus transferred by means of book entries once a trade is considered irrevocable.

Issuers have access to updated information on their creditors or shareholders. In the case of equities, for instance, the fiduciary transfer of ownership allows a company listed on an organized exchange to maintain the complete list of shareholders on its books under a single name (the depository's).

### **5.5 PLEDGE OF SECURITIES AS COLLATERAL**

The general framework for collateral management is based on securities settlement systems holding collateral correspondent accounts within other central securities depositories. That is, every securities settlement system holds a collateral account with a central securities depository for the securities that the securities settlement system chooses to accept as collateral. Requests for deposits, transfers, and withdrawals of assets are made through a collateral control system. Depending on the nature of the asset to be pledged as collateral, any movement must be preceded by a transfer instruction to the appropriate custodian institution:

- Federal government securities to be pledged must be transferred to the securities settlement system collateral account held at the SELIC.
- Private sector securities to be pledged must be transferred to the securities settlement system's collateral account held at the CETIP.

- Equities to be pledged must be transferred to the securities settlement system's collateral account held at the CBLC.
- Gold certificates to be pledged must be transferred to the securities settlement system's account with the BM&F.
- Securities traded on the international markets to be pledged must be transferred to the securities settlement system's collateral accounts held at the Depositary Trust Company and Clearing Corporation, EUROCLEAR, or CLEARSTREAM, depending on each case.

In practice, though, market participants collateralize their trades mainly with federal government securities. All securities pledged must be marked-to-market on an intraday basis, adjusted to liquidity conditions, and subject to diversification criteria.

Law 10,214 secures collateral pledged in securities settlement systems by isolating them from insolvency, intervention, or bankruptcy regimes of the participant. Moreover, assets pledged as collateral by a participant as well as any other asset in the process of clearance and settlement will be used to redeem the settlement obligations under that particular clearinghouse.

### 5.5.1 Repurchase Agreements

Under Brazilian law, the two legs of a repo transaction (*operações compromissadas*) are regarded as two separate transactions linked by a formal agreement between the two parties. Therefore, a repo transaction splits itself into a spot outright sale associated with a term outright repurchase. As Brazilian law prohibits financial institutions from borrowing from one another,<sup>21</sup> repos are the main instrument through which participants in the interbank money market can level their positions.

The price of the underlying securities is generally lower than the market price to make up for price fluctuations, adding extra protection against market risk. Market participants generally take the benchmark price for securities from the so-called "PU da 550."<sup>22</sup> The original owner of the securities traded in a repo remains as the beneficial owner up to the maturity date and, thus, remains eligible to receive interest payments on the securities. The counterparty retains the legal ownership of the security.

## 5.6 TREATMENT OF LOST, STOLEN, OR DESTROYED SECURITIES

All securities in the Brazilian market are dematerialized.

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<sup>21</sup> Article 10 of Law 4,595.

<sup>22</sup> The unitary price (PU) is the present value of central bank and treasury-issued securities, obtained by discounting the value on the maturity date by a market-based interest rate plus a haircut. The number 550 refers to the number of the BCB regulation that first set out the methodology for calculating the benchmark. "PU da 550" is the price used by the BCB when it engages in repurchase agreements.

## 5.7 LEGAL MATTERS CONCERNING CUSTODY

In Brazil all entities that provide custody services are regarded as financial institutions and are supervised by the BCB or the CVM, depending on the entity. These include, among others, commercial banks, universal banks, investment banks, and brokers.

In the environment of the central securities depositories, client assets can be registered in the name of the custody institution (an omnibus account is used) or of the clients individually, depending on the depository. In any case, the clients' assets form a separate corpus of property not regarded as belonging to the custodian at all, even in the case of a bankrupt institution.

## MARKET STRUCTURE AND TRADING SYSTEMS

### 5.8 PRIMARY MARKET

Federal government securities are the main primary issuances in Brazil. BCB is responsible for auctions of government securities. According to the CVM's 2003 annual report, the amount of primary issues registered dropped significantly in 2003, compared with previous years. The report suggests that movements in the exchange and public debt markets contributed to that decline. Also the reduction in economic activity in the early months of 2003 helps to explain the strong reduction in primary issues. Debenture issues decreased 66 percent in 2003, after remaining stable from 2001 to 2002 (see Table 16).

**Table 16: Securities Issuances 1999-2003**  
(in R\$ million)

Securities	1999		2000		2001		2002		2003	
	Volume <sup>(a)</sup>	Value	Volume <sup>(a)</sup>	Value	Volume <sup>(a)</sup>	Value	Volume <sup>(a)</sup>	Value	Volume <sup>(a)</sup>	Value
Stocks	10	2,749	6	1,410	6	1,335	6	1,100	1	80
Bonds	3	0	1	0	0	0	0	0	0	0
BDR	1	2	3	0	0	0	0	0	0	0
CTEE	0	0	1	372	1	200	1	250	1	320
CAV	107	142	93	111	109	131	96	112	162	200
CRI	2	13	5	172	13	223	10	200	17	288
CIC	4	35	3	456	4	262	1	2	0	0
Debentures	38	6,676	42	8,748	41	15,162	27	15,400	17	5,282
DR Abroad	12	0	31	0	8	0	15	0	1	0
Promissory Notes	65	8,044	44	7,591	31	5,266	20	3,876	12	2,128
FIF Quotas	15	232	31	129	22	512	43	1,059	8	281
Warrants	1	5	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>258</b>	<b>17,899</b>	<b>260</b>	<b>42,814</b>	<b>235</b>	<b>23,109</b>	<b>219</b>	<b>21,998</b>	<b>219</b>	<b>9,552</b>

Source: CVM.

<sup>(a)</sup> Registration volume of primary issues of securities.

### 5.8.1 Federal Government Securities

The SELIC manages a process called the Formal Electronic Public Offer for Government Securities, which is carried out through an electronic sealed-bid auction system. Only financial institutions are allowed to participate on a direct basis. Direct participants can place up to five proposals. In the bid evaluation, the BCB establishes the cutoff price, which is applied to all winning bids (those with prices equal to or higher than the cutoff price).

The National Treasury, in order to enlarge the market for government securities, has implemented a program named Direct Treasury (*Tesouro Direto*), which aims to facilitate the ability of individuals to buy and sell directly government securities through the Internet.

### 5.8.2 Corporate and Other Government Securities

The CETIP provides electronic primary auctions for these securities. Several types of primary placements and auctions are supported, such as Dutch and the Closed Envelope. Electronic auctions have been held for the National Treasury Department and the Federal Savings and Loan Bank, involving, among others, federal public debt certificates, credits originating from anticipated revenues (states and municipalities), mortgage notes, and real estate credit bills.

### 5.8.3 Equities

Primary equities are issued through the BOVESPA. There are currently more than 800 publicly held companies. Private and public sector corporations, governments, or private companies that meet the registration requirements of the CVM to sell and offer securities to the public become eligible to issue equity shares using the trading infrastructure of the BOVESPA.

Corporations can count on the market expertise and financial leverage of underwriters to place their stocks on the market. In Brazil, underwriters may or may not assume the risks of bringing the issue to market by guaranteeing that the issuer will receive a certain price when the offering is sold. Guaranteed price underwriting in Brazil is called *subscrição firme*.

## 5.9 SECONDARY MARKET

The secondary market for government securities is big and very liquid. This is, however, not the case for equities and debt securities issued by the private sector. In the latter case, market liquidity has been adversely affected by taxation, fragmentation, concentration, and continued migration of large issuers to the main international markets. Liquidity is also hampered by a high degree of fragmentation, a high concentration of corporate ownership, and a low proportion of the total equity base traded in the market (the free float).

## 5.10 STOCK EXCHANGE TRADING

### 5.10.1 BOVESPA

BOVESPA is the major stock exchange of Brazil, located in the city of São Paulo. Recently, the regional stock exchanges in Brazil merged their trading activities under the leadership of BOVESPA

**Table 17: General Trading Summary of the BOVESPA**

<i>Markets</i>	<i>Number of trades</i>	<i>Volume (thousand)</i>	<i>Value (R\$ thousand)</i>
Round Lot	524,878	529,804,229	17,879,669
Stocks of Cos. Under Reorganization	128	70,255	148
Others	79	4,380	134
<b>Cash Market - Round Lot</b>	<b>525,085</b>	<b>529,878,864</b>	<b>17,879,951</b>
Rights and Receipts	34	1,077	817
Imobiliary Funds	16	28	20
Investments Certific/Other Securities	2,734	4,983,500	58,626
Bonds (Private)	707	941	2,388
Call Options Index Exercise	81	26	498,100
Put Options Index Exercise	17	7	159,700
Call Options Exercise	2,293	16,454,306	624,717
Put Options Exercise	41	368,413	315,849
Auction	32	339,631	54
Finor Auction	27	72,115	5,396
Bovespa Fix	16	12	45,794
Odd-Lot Market	73,386	570,798	61,304
Cash Market - Total	604,469	552,669,724	19,652,721
Forward Market	10,652	33,690,862	673,363
Call Index Options	346	69	74,287
Put index options	104	15	7,564
Call Options	439,625	1,769,989,820	1,686,134
Put Options Exercise	61	104,766	31,366
Options Market	440,136	1,770,094,670	1,799,352
<b>Total</b>	<b>1,055,257</b>	<b>2,356,455,257</b>	<b>22,125,437</b>
<b>Total - EL</b>	<b>1,052,602</b>	<b>2,344,354,164</b>	<b>21,268,441</b>
<b>Total - AF</b>	<b>7,584</b>	<b>3,046,037</b>	<b>58,495</b>
<b>Total - N1</b>	<b>181,820</b>	<b>93,015,501</b>	<b>5,122,641</b>
<b>Total - N2</b>	<b>50,442</b>	<b>848,258</b>	<b>785,087</b>
<b>Total - NM</b>	<b>14,056</b>	<b>863,701</b>	<b>429,308</b>
Ibovespa Portfolio Participation	452,571	474,981,102	15,084,963
IEE Portfolio Participation	59,545	40,822,048	1,100,929
IVBX2 Portfolio Participation	243,835	265,903,360	5,321,527
IBrX Portfolio Participation	502,405	511,450,208	16,559,371
ITEL Portfolio Participation	161,818	360,551,846	4,981,448
IBrX 50 Portfolio Participation	443,046	432,084,967	15,513,876
IGC Portfolio Participation	192,334	90,345,362	5,814,911

to create a single Brazilian stock market on a nationwide level, with a single, trading, custody, and settlement system (see Table 17).

There are three trading channels in the BOVESPA: mega bolsa, open-outcry session, and after-market trading session. Regardless of the channel used, equities trades are always intermediated by a broker. Table 18 presents the market capitalization of the BOVESPA Index.

**Table 18: Market Capitalization of the BOVESPA Index**  
(as of December 2003)

<i>Index</i>	<i>R\$ Billion</i>	<i>US\$ Billion</i>	<i>Part.(%)</i>
Bovespa Index	493,63	170,85	72,95
IBrX 50	493,53	170,82	72,93
IBrX Brasil	557,15	192,84	82,33
IVBX2 -Valor Bovespa Index - 2nd Tier	192,69	66,69	28,48
ITEL - Telecommunication Sector Index	91,18	31,56	13,47
IEE - Electric Power Index	51,66	17,88	7,63
IGC - Special Corporate Governance Stock Index	229,71	79,51	33,95
<b>Total BOVESPA</b>	<b>676,71</b>	<b>234,22</b>	

*Source: Bovespa.*

#### **5.10.1.1 Mega Bolsa**

Mega Bolsa is an electronic trading system through which stocks from all listed companies on the cash, forward, and options markets can be traded. It operates daily on a continuous session from 10:00 a.m. to 5:00 p.m. (Brasilia time).

#### **5.10.1.2 Open-Outcry Session**

The investor gives buy or sell orders to his broker, who, in turn, forwards that information to a trader on the trading floor, who outcries his bid or ask proposal. If it is met by counterparty on the trading floor, then the transaction is matched. Open-outcry sessions extend from 10:00 a.m. to 4:45 p.m., with a lunch recess from 1:00 p.m. to 2:00 p.m.

#### **5.10.1.3 After-Market Trading Session**

After-market trading allows for the electronic trading of equities during the night shift. Total daily orders are limited to R\$100,000 per investor, and prices should not exceed the closing price by more than  $\pm 2$  percentage points. It operates from 5:30 p.m. to 7:00 p.m.

### **5.10.2 BM&F**

#### **5.10.2.1 Trading Channels**

Contracts are traded through an electronic platform (the Global Trade System) and, in case of some products, on the floor as well. Few contracts are traded exclusively on the floor. Swaps and flexible



option contracts, traded over-the-counter, can also be registered in the BM&F for clearing and settlement purposes (3.6 percent of the volume in 2003; see Table 19).

**Table 19: BM&F – Traded Volume during 2003**

<i>Market / Contract</i>	<i>US\$ million</i>	<i>% of the segment</i>	<i>% of the total</i>
<b>Exchange traded contracts<sup>(a)</sup></b>	<b>3,886,437.1</b>	<b>100.0</b>	<b>96.4</b>
Interbank deposit futures	1,729,563.4	44.5	42.9
ID x U.S. Dollar spread futures	34,518.5	0.9	0.9
FRA ID x U.S. Dollar spread futures	1,122,316.2	28.9	27.8
Bovespa index futures	98,974.7	2.6	2.4
U.S. Dollar futures	846,640.8	21.8	21.0
Other exchange traded contracts	54,423.5	1.4	1.3
<b>OTC traded contracts</b>	<b>145,829.9</b>	<b>100.0</b>	<b>3.6</b>
Interest rate swap	15,150.4	10.4	0.4
Interest rate x exchange rate swap	57,679.2	39.6	1.4
Interest rate x price index swap	6,954.6	4.8	0.2
Flexible U.S. Dollar call options	25,407.7	17.4	0.6
Flexible U.S. Dollar put options	22,055.2	15.1	0.5
Flexible Bovespa index call options	16,393.8	11.2	0.4
Other OTC traded contracts	2,189.0	1.5	0.1
<b>Grand total</b>	<b>4,032,267.0</b>	<b>100.0</b>	<b>100.0</b>

Source: BM&F.

<sup>(a)</sup> For a sample of contracts.

### 5.10.2.2 Main Contracts

The complex of contracts based on interest rate, which includes the interbank deposit and the local U.S. dollar interest rate market, is the main segment and accounted for 69.2 percent of trading volume during 2003. The U.S. dollar futures market is the principal foreign currency instrument, totaling 16.8 million contracts in 2003, with a volume of US\$ 846.6 billion.

### 5.10.2.3 Trading Hours

Trading hours depend on the type of contract, as shown in Table 20.

## 5.11 OVER-THE-COUNTER MARKET

### 5.11.1 SOMA

SOMA is a BOVESPA affiliate. It manages the alternative investments market in Brazil by means of an electronic trading system (Somatrader) directed to offers made by market makers and associated financial institutions.

**Table 20: BM&F – Trading Hours for a Sample of Contracts**

Contract	Opening		Break	Closing	After market
	GTS	Floor			
<b>Futures</b>					
ID x U.S. Dollar spread	9:00	-	-	16:00	16:45/18:00
ID x IGPM spread	9:00	-	-	16:00	16:45/18:00
1-day interbank deposit	9:00	10:00	13:00/14:30	16:00	16:45/18:00
U.S. Dollar	9:00	10:00	13:00/14:30	16:00	16:45/18:00
Mini U.S. Dollar	9:00	-	-	16:00	16:45/18:00
Bovespa index	9:00	10:00	13:00/14:00	17:00	17:15/18:00
Anhydrous alcohol	9:00	14:00	-	14:45	15:45/18:00
Arabica coffee	9:00	9:45	-	15:30	16:00/18:00
Corn	9:00	11:00	-	11:45	12:45/18:00
Sugar	9:00	11:00	-	15:00	15:45/18:00
<b>Options</b>					
1-day interbank deposit volatility	-	10:15	-	16:00	-
U.S. Dollar	9:00	-	-	16:00	-
U.S. Dollar volatility	-	10:15	-	16:00	-
Gold (250 g)	9:00	-	-	16:45	-
<b>Options on futures</b>					
Sugar	9:00	-	-	15:00	-
Arabica coffee	9:00	-	-	17:00	-
1-day interbank deposit	9:00	-	-	16:00	-
<b>Forward</b>					
Gold (250g)	-	10:30	13:00/14:30	16:45	-
Mini ID x U.S. Dollar swap with reset	9:00	-	-	16:00	-
<b>Spot</b>					
Arabica coffee	9:00	10:45	-	15:00	-
Gold (250g)	9:00	-	-	16:45	17:00/18:00

Source: BM&F.

### 5.11.2 CETIP

CETIPNET is the CETIP's Electronic Trading System. It is a screen-based, user-friendly electronic portal for trading government and private securities. It also processes many types of auctions for fixed-income securities. CETIPNET is a real-time Web application based on an internationally tested trading platform, which was adapted to the peculiarities of the Brazilian market. Closed trades are automatically matched, checked for business rules, processed, and sent for same-day settlement without any further inputs.

The CETIP also registers OTC trades made directly by participants, usually by telephone. Trade registration requires double entry by buyer and seller. Registered transactions are matched and checked for compliance with business rules; they are only accepted if the assets involved are freely available in the custody account of the seller (no short sales are allowed).

### **5.11.3 SELIC**

The SELIC registers OTC trades made by participants, who may use the messaging system to connect to SELIC's mainframe computer or resort to a remote SELIC terminal.

## **5.12 RECENT TRENDS IN THE MARKET**

### **5.12.1 Home Broker**

Home Broker is a system that allows the investor to automate his relationship with his brokerage firm by using a personal computer linked with the Internet, much like the home banking systems being offered by banks. In other words, Home Broker technology offers the stock market investor ways to substitute most of the need for telephone contact.

To this end, the BOVESPA has provided its members with the basic conditions to develop solutions for implementing their own Home Broker on the Internet. These solutions, in turn, are interconnected with BOVESPA's systems.

Home Broker was created in March 1999 and has been growing since then. Its annual trading value exceeded R\$10 billion in 2003, a 152 percent growth in comparison with 2002.

### **5.12.2 Novo Mercado**

The *Novo Mercado* (the New Market) is a listing segment designed for trading shares issued by companies that voluntarily undertake corporate governance practices and disclosure requirements even more stringent than those already required by Brazilian laws.

Applicant companies to the *Novo Mercado* should comply with a series of corporate rules, known generically as "good practices of corporate governance," that are more rigid than those required by the current legislation in Brazil. These rules, consolidated in the listing regulation, increase shareholders' rights and enhance the quality of information commonly provided by companies. Additionally, a Market Arbitration Panel is a safe, fast, and specialized alternative for resolving conflicts between investors and issuers.

The main innovation of the *Novo Mercado* is that nonvoting shares may not be issued. However, there are other important differences:

- the holding of public share offerings through mechanisms that favor capital dispersion and broader retail access.

- maintenance of a minimum free float equivalent to 25 percent of total equity.
- extension to all shareholders of the same conditions provided to majority shareholders in the transfer of the controlling stake (that is, tag-along rights).
- establishment of a single one-year mandate for the entire board of directors.
- availability of the annual balance sheet under the generally accepted accounting principles of the United States or International Accounting Standards.
- obligation to hold a tender offer by the economic value criteria should a decision be taken to de-list from the Novo Mercado
- adherence to disclosure rules on the negotiation of assets issued by the company in the name of the controlling shareholders or the company's management.
- a contract signed between BOVESPA and the company, with the participation of the comptrollers and the management, which ensures the company's acceptance to the *Novo Mercado*, enabling its entrance in this segment.

## 6 SECURITIES CLEARANCE AND SETTLEMENT CIRCUITS

### 6.1 ORGANIZATIONS AND INSTITUTIONS

#### 6.1.1 Brazilian Clearinghouse for Settlement and Custody

The *Câmara Brasileira de Liquidação e Custódia* (CBLC), a subsidiary of the BOVESPA, is the central securities depository for equities and some equities derivatives and the clearinghouse for the securities transactions made at the BOVESPA. Recently, it incorporated CLC, the former clearinghouse of the Rio de Janeiro stock exchange.

#### 6.1.2 Clearinghouse for Custody and Settlement

The *Câmara de Custódia e de Liquidação* (CETIP) is a nonprofit private organization whose major owners are banks and brokers or dealers, either individually or through the ANDIMA, which holds a controlling stake. Its major participants are commercial and universal banks, savings and loan banks, investment banks, brokers or dealers, institutional and foreign investors, development banks, mortgage companies, leasing corporations, exchanges, insurance companies, and commodity brokers.

The CETIP is the central securities depository and settlement system for some private debt securities, securities issued by state-owned companies, special-purpose public securities, and swaps. It provides same-day settlement in central bank money for all trades it processes. The system also registers borrowing and lending of reserves between financial institutions through repurchase agreements in which the borrower issues certificates of deposit as well as state and municipal bonds.

#### 6.1.3 Special System for Settlement and Custody

The BCB operates the SELIC, which is the central depository for securities issued by the federal government. The SELIC settles transactions under a delivery versus payment model 1 according to the BIS classification.<sup>23</sup> Its overall management is shared with ANDIMA.

#### 6.1.4 Brazilian Mercantile and Futures Exchange

The BM&F operates the Derivatives Clearinghouse (*Câmara de Derivativos*) and the Securities Clearinghouse (*Câmara de Ativos*). The Securities Clearinghouse started operations recently, and at present it clears and settles government securities only. Related activities are performed through BM&F departments.

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<sup>23</sup> Committee on Payment and Settlement Systems of the Central Banks of the Group of Ten Countries, "Delivery-versus-Payment in Securities Settlement Systems" (Basel, Bank for International Settlements, September 1992).

## **6.2 SECURITIES CLEARANCE AND SETTLEMENT PROCESS**

### **6.2.1 Securities Trades at the BOVESPA**

In compliance with the new requisites for systemically important payment systems established by the BCB, the CBLC recently moved from a delivery versus payment model 2 to a delivery versus payment model 3. It settles both the securities and cash legs on a net basis. Settlement of the cash leg is in central bank money.

The CBLC coordinates the delivery versus payment through a link between the settlement accounts in the STR and the CBLC depository. This link ensures that the delivery of the securities occurs if, and only if, the payment has occurred and vice versa. The transfers are simultaneous, with same-day finality.

The CBLC acts as a central counterparty to its clearing members for all securities settled through its systems. The CBLC becomes the central counterparty basically at the time of execution. Trades are channeled into the settlement systems in real time and, once they have been tested against acceptance parameters, are automatically reported to clearing members. As of trade reporting, CBLC becomes the central settlement agent. The time lag between executing and reporting a trade is a few minutes.

The final net cash obligations of the clearing agents are calculated and reported at 2:30 p.m. If a participant is acting as a buyer, it pays the CBLC through its settlement bank, although the funds are transferred in central bank money because the CBLC holds a settlement account at the BCB. Payments to the CBLC can be made until 3:30 p.m. Settlement occurs at 3:55 p.m., when the securities are irrevocably transferred from the CBLC's own account to the accounts of the buyers in the same depository.

If a participant is acting as a seller, the securities must be delivered to the CBLC's securities account until 10:00 a.m. on the settlement date. At the moment of settlement, the CBLC transfers the funds from its settlement account at the BCB to the seller via the seller's settlement bank.

#### **6.2.1.1 Risk Management Mechanisms and Guarantee Schemes**

The CBLC's board establishes operating limits for each market where there is future settlement, applicable to both the total positions outstanding and the naked positions for each market, investor, and intermediary. The objective of these limits is to avoid situations such as the excessive concentration of contracts and positions by investors and intermediaries, which might jeopardize the regular and orderly functioning of the markets managed by the CBLC. These procedures are in accordance with CVM Instruction Number 283 of July 10, 1998.

The CBLC also stipulates operational limits for each clearing agent based on an analysis of the clearing agent's financial and economic standing and can be altered at CBLC's sole discretion. The limit set for each clearing agent must be allocated to its clients (brokerage houses and qualified clients). These sub-allocations must be reported to the CBLC.

For these purposes, the CBLC acquired the Risk Watch risk management software, which at present is operational and provides clearing members with complete information on risk.

The CBLC also marks-to-market daily the collateral<sup>24</sup> required to cover investor liabilities (that is, the operational limits) in markets with either future settlement or securities lending to ensure that settlement can take place within the given terms. For this purpose, the CBLC uses the Clearing Members: Theoretical Intermarket Margin System (CM-TIMS), a risk management system developed by the Chicago Options Clearing Corporation. The original model of CM-TIMS has been adapted to the features of the Brazilian market.

The CM-TIMS establishes the amount of the margin to be provided by CBLC's clearing agents in accordance with the risk they incur on the positions held by investors under their responsibility. The assets that are accepted to cover margin calls are cash, government securities, gold certificates, equities listed and traded on the stock exchanges, private sector securities, securities traded on the international markets, and bank letters of guarantee, among others. All assets accepted as collateral are also subject to diversification criteria, including limits per investor, limits per issuer, and limits on total CBLC exposure.

Once these margins are calculated, the CM-TIMS sends this information to the guarantee system, which checks the availability of the investor's assets to meet the necessary margin. Should available assets be insufficient, additional margin is required. The guarantee system is fully automatic.

The CBLC also has a settlement fund based on the "survivors pay" principle. The participants in the fund are the clearing members and the CBLC itself. Contributions are calculated based on the risk exposure of their positions. The CBLC calculates the clearing members' risk exposure, stressing the full portfolio (positions in derivatives, operations to be settled, and collateral deposited to cover the risk exposure) at a 99 percent confidence level. Clearing member contributions and the size of the fund are revised every month. The minimum size is estimated to be R\$100 million.

If a clearing member defaults, the assets available to meet losses incurred by the CBLC are applied in the following order:

1. margin collateral lodged by the defaulting clearing member
2. defaulting clearing member's contribution to the settlement fund
3. CBLC's contribution to the settlement fund
4. other clearing members' contribution to the settlement fund
5. CBLC's own net worth.

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<sup>24</sup> With a 95 percent confidence level.



The CBLC is audited periodically using a three-tier system as follows: (a) auditing conducted by the system itself, (b) internal auditing, and (c) external auditing conducted by an independent firm of international reputation substituted every four years.

Finally, the CBLC has a formalized and comprehensive contingency plan, approved by the BCB, which includes the availability of two processing sites. The backup site guarantees business continuity in all circumstances. Its main functionalities are the following: (a) duplicate mainframes and servers in both sites, (b) network linking each CBLC participant with both sites through different providers of communication services, (c) real-time communication between the main site and the backup site, through optical fiber (hot site backup), (d) different energy stations for each site, (e) several levels of access and password control, (f) secrecy of information through data encryption, and (g) full protection against intruders with intruder detection systems and firewalls. The time for recovery is less than 1 hour. According to the BCB's requirements, this system has to be tested at least once a year.

Currently, the CBLC's system processes a peak of 40,000 settlement operations each day, but the full capacity of the system is 120,000 operations a day.

## 6.2.2 Securities Trades at the CETIP

Participants in the CETIP hold individual accounts with full segregation of assets (see Table 21).

**Table 21: Main Securities in Custody at the CETIP**

	<i>June 30, 2003 in US\$ billions</i>
Swaps	71.2
Investment Fund Quotas	38.4
CDB	30.6
DI	21.8
Debenture	15.9
Treasury Financial Certificate	6
Privatization Currency	5.3
Non Deliverable Forward	3.6

*Source: Cetip.*

The CETIP provides same-day settlement in central bank money for all trades it processes. Transactions at the CETIP may be settled under one of the following categories:

- real-time gross settlement in the STR or by book transfers (that is, money transfers between participants' accounts in a single settling bank) for all primary or secondary market transactions.
- multilateral netting for primary market transactions that involve issuer risk (issuance of assets, redemptions, and payment of events).

- bilateral netting for OTC derivatives transactions (settlement at the STR or by book transfer).

The CETIP is not a central counterparty, as the vast majority of the transactions are settled under real-time gross settlement mode.

### 6.2.3 Securities Trades at the SELIC

As a result of the launch of the new central bank payment system, SELIC is now able to settle all transactions in real time on a gross basis (that is, according to model 1 of delivery versus payment). SELIC maintains a direct link with the STR, which processes the cash leg of the securities transaction.

Financial institutions that hold reserve accounts at the BCB participate in the SELIC as settlement agents. All other institutions, which are considered indirect participants as far as the settlement process is concerned, have to indicate, for each operation, the settlement bank of their choice. Settlement banks set a bilateral operational limit on indirect participants.

The SELIC accepts transactions from 6:30 a.m. to 6:30 p.m. The closing time can be postponed at the discretion of the BCB. At the moment of settlement, the system first verifies the existence of the underlying securities and blocks them in the custodian account of the seller until the settlement process is completed. After the blocking, the SELIC immediately orders the transfer of funds to the STR. When the buyer is an indirect participant, the SELIC first verifies whether the amount of the transaction falls within the bilateral limit assigned by the settlement bank.

If sufficient funds are held in the reserve account to be debited, the transaction is finalized at the two ends (securities in the SELIC and funds in the STR). Otherwise, the STR rejects the transaction and informs the SELIC to cancel the operation.

To optimize the use of securities, some associations of operations are permitted. In these cases, although settlement is processed operation by operation, net balances are considered when checking for available securities and funds. For example, once a group of transactions has been identified, the SELIC first blocks the securities. Then, wherever applicable, it checks that the limit opened in favor of institutions not holding bank reserve accounts involved in the group of transactions (considering the net financial proceeds) is being observed. With these conditions satisfied, the SELIC sends the transactions to the STR for settlement of the cash leg, transaction by transaction, indicating that it is part of a group of transactions as well as the respective net financial proceeds to be entered in the reserve account of the settlement bank. If the balance on the bank reserve account of any settling bank is insufficient or pending entries in the STR are at the same level of priority, all transactions in the group of transactions identified by the SELIC are rejected. If the balances on the reserve accounts are sufficient for the debits ordered, the transactions are settled in the STR one by one, simultaneously, and the SELIC makes the respective entries in the custody positions.

To deal with shortages of securities, a queuing mechanism is in place. In general, the system allows queuing of the transaction only in the case of insufficient securities. Apart from specific circumstances

indicated by the central bank, operations are allowed to stay in the queue for a maximum of 30 minutes, with the time limit of 12:30 p.m. After this time, insufficiency of securities implies immediate rejection of the transaction from the SELIC system.

Each seller may have a (pending) queue for each security it trades. Exceptions to this rule are the public offerings and rediscount transactions, which may remain pending until 5:00 p.m. and 6.30 p.m., respectively. Optimization algorithms of pending items are in place.

#### **6.2.4 Securities Trades at the BM&F Securities Clearinghouse**

At present, the BM&F Securities Clearinghouse settles transactions with government bonds only, although it intends to settle other securities in the future. As part of the BM&F, the clearinghouse is subject to the same governance arrangements, and access is granted to those that fulfill the requirements stated in Brazilian law, the rules and resolutions enacted by the CMN and the BCB, and the BM&F's own bylaws.

The clearinghouse settles transactions made in its electronic trading platform, the SISBEX system. This system allows for anonymous trading as well as for the registration of transactions performed in the OTC market, providing greater transparency and an improved process of price formation. Eligible transactions include spot transactions, forward transactions, repurchase agreements, and securities lending transactions. Given the existence of a structured T+0 lending market, which considerably reduces the risk of settlement failure, short selling is allowed for some securities.

##### **6.2.4.1 Risk Management Mechanisms and Guarantee Schemes**

The Securities Clearinghouse operates within risk management mechanisms designed by BM&F's Risks Committee, which is responsible for decisions regarding risk management systems, stress scenarios for margin calculation purposes, concentration and leverage limits, and related subjects.

The settlement process is based on a delivery versus payment model in which securities and funds are settled on a net basis and finality is achieved during the settlement window that occurs at the end of every trading day. Lending transactions are the only exception to this rule, being settled in real time.

Other tools to manage credit risk include leverage limits, credit scoring, and admission criteria for clearing members and other direct settlement participants. The Internal Risk Committee also sets up a forum in which to assess participants' creditworthiness and overall leverage.

The market risk of each participant is calculated on a real-time basis by the clearinghouse's risk management system. This system calculates the market value of each participant's joint portfolio of transactions and collateral under current market conditions (mark-to-market) and under a set of stress scenarios defined by the Risk Committee. A negative market value in any of the stress scenarios results in margin calls to make up for the additional market risk in the worst-case scenario.

Liquidity risk management also plays a key role in the clearinghouse's risk management process. Thus concentration limits and previously committed liquidity facilities are set in order to avoid liquidity problems due to settlement failures.

Finally, operational risk management policies include a comprehensive set of controls and procedures to minimize the probability of human error. All computer systems are replicated in a contingency site and updated in real time in order to avoid disruptions in the settlement process. Moreover, all vital systems, including the risk management system, were developed internally.

### **6.3 SECURITIES LENDING**

The CBLC offers a Securities Lending Program (called BTC), which became available in 1997 for equities. At present, the service is available both for equities and for government bonds (see Table 22).

Through this service, the CBLC participants can place their bids and offers for borrowing and lending securities as well as register securities lending operations agreed bilaterally. Automated securities lending for all securities is mandatory and integrated in the settlement process. The CBLC acts as a central counterparty for all securities lending contracts.

Assets eligible for a securities loan transaction must be deposited with the CBLC Fungible Custody Service and be free of liens or encumbrances that impede their circulation.

Access to the service is gained by way of an electronic system, and the borrower pays a fee to the lender, along with emoluments for the CBLC. The fee is freely negotiable between the parties. All of the dividends or earnings associated with the security belong to the original owner.

Borrowers must deposit a margin with the CBLC through their clearing agent. The amount of the margin is equal to the updated value of the securities plus a percentage. The amount of the margin is monitored daily and recomposed, if necessary, according to the form and time frame established by the CBLC.

The securities are released only after the borrower has deposited the necessary margin and the transactions have been authorized by the BTC. Fees and costs are debited from the borrower and credited to the lender on the first day following the end of the loan operation.

The BM&F Securities Clearinghouse is expected to implement its securities lending program soon.

### **6.4 DERIVATIVES CLEARANCE AND SETTLEMENT**

#### **6.4.1 BM&F Derivatives Clearinghouse**

The Brazilian financial derivatives market has an array of derivatives whose underlying instruments are equities, equities indexes, interest rates, currency exchange rates, and flexible-rate sovereign

Table 22: BTC Open Positions

Company	Type	Number of Securities (x1000)	Value in R\$ thousand	Company	Type	Number of Securities (x1000)	Value in R\$ thousand
ACESITA	PN	797,300	1,124	ITAUSA	PN	4,838	11,611
AMBEV	PN	14,890	8,939	KLABIN S/A	PN	174	497
ARACRUZ	PNB	1,814	12,027	LIGHT	ON	4,310	112
BRASIL	ON	999,600	14,334	P.ACUCAR-	PN	594,200	29,454
BRADESCO	ON	1,013,301	9,262	PETROBRAS	ON	339	20,827
BRADESCO	PN	6,360,583	71,620	PETROBRAS	PN	893	51,352
BRADESPAR	ON	10,000	6	POLIALDEN	PN	3,020	1,178
BRADESPAR	PN	1,259,680	831	NET	PN	14,881	5,059
BRASKEM	PNA	9,760	4,202	MARCOPOLO	PN	205	708
BRASIL TELEC	PN	1,069,400	13,817	IPIRANGA	PN	29,702	323
BRASIL T PAR	ON	46,610	749	SABESP	ON	64,870	7,488
BRASIL T PAR	PN	2,520,512	53,662	SADIA S/A	PN	680	1,081
CESP	PN	15,000	111	SUZANO	PN	25	203
COMGAS	PNA	9,520	676	TRACTEBEL	ON	26,600	205
CELESC	PNB	894	420	TELE CTR	PN	144,700	812
CEMIG	ON	5,000	109	TELE CL SUL	ON	126,400	260
CEMIG	PN	121,386	3,324	TELE CL SUL	PN	734,400	1,704
CONFAB	PN	110	517	TELE LEST CL	PN	288,300	124
COPEL	ON	20,000	130	TELESP	ON	3,600	84
COPE	PNB	1,465,600	12,516	TELESP	PN	21,422	670
CRT CELULAR	PNA	4,023	1,480	TELEMAR NL	PNA	281,150	11,614
SOUZA CRUZ	ON	174	3,886	TELEMIG	PN	1,049,502	3,230
SID NACIONAL	ON	186,949	14,023	TELENORD	PN	2,813,200	6,555
SID TUBARAO	PN	139,312	7,821	TELEMAR	ON	307,932	7,778
COTEMINAS	PN	7,360	1,442	TELEMAR	PN	7,711,322	262,262
EMBRATEL PAR	ON	215,396	1,501	TRAN	PN	368,582	2,820
EMBRATEL PAR	PN	10,461,435	65,698	TELE	PN	23,010	131
ELETROBRAS	ON	175,500	3,894	TELESP CL	PN	16,092,425	74,508
ELETROBRAS	PNB	2,808,693	67,914	UNIBANCO	ON	19,700	1,588
ELETROPAULO	PN	29,754	754	UNIBANCO	PN	25,900	1,166
EMBRAER	ON	71	784	USIMINAS	PNA	455	7,312
EMBRAER	PN	503	6,961	VALE R DOCE	ON	114	10,413
GERDAU	PN	112	3,765	VALE R DOCE	PNA	599	50,876
GLOBEX	PN	5	44	V C P	PN	90,900	11,422
ITAUBANCO	PN	131,817	26,153	<b>Total</b>			<b>999,924</b>

Source: Bovespa.

**Table 23: Summary of a Typical Trading Day at the BM&F**

Mercado/Commodity	Trading volume	Financial volume	
		in (R\$)	in (USD)
<b>Floor trading - 10/07/2004</b>			
Index	36,94	2,680,901,625	940,073,506
Interest Rates	351,48	40,077,987,405	14,053,575,778
Foreign Currency Rates	76,615	10,914,960,812	3,827,393,510
Agricultural	2,613	62,289,784	21,866,812
<b>Floor trading subtotal</b>	<b>467,648</b>	<b>53,736,139,626</b>	<b>18,842,909,606</b>
<b>Electronic trading system (GTS) - 10/07/2004</b>			
Gold	82	780,835	273,804
Index	2,35	168,928,800	59,235,851
Interest Rates	105,077	10,398,955,611	3,646,453,332
Foreign Currency Rates	38,54	2,418,057,825	847,905,823
Sovereign Debt Instruments	531	103,597,267	36,326,975
Agricultural	683	12,654,267	4,439,450
<b>GTS subtotal</b>	<b>147,263</b>	<b>13,102,974,605</b>	<b>4,594,635,235</b>
<b>OTC market - 10/07/2004</b>			
Swaps	8,302	415,062,847	145,544,165
Flexible options	5,179	627,532,951	220,048,022
<b>OTC subtotal</b>	<b>13,481</b>	<b>1,042,595,798</b>	<b>365,592,187</b>
<b>Mini contracts - 10/07/2004</b>			
Index	13,702	98,814,316	34,649,806
Foreign Currency Rates	2,217	31,857,085	11,170,869
<b>Mini contracts subtotal</b>	<b>15,919</b>	<b>130,671,401</b>	<b>45,820,675</b>
<b>GRAND TOTAL WITH MINI CONTRACTS</b>	<b>644,311</b>	<b>68,012,381,430</b>	<b>23,848,957,703</b>
<b>GRAND TOTAL WITHOUT MINI CONTRACTS</b>	<b>628,392</b>	<b>67,881,710,029</b>	<b>23,803,137,028</b>

Source: BM&F websites.

debt (see Table 23). Most of Brazil's financial derivatives are futures. These financial futures trade primarily on the BM&F. However, options based on corporate securities are traded on the BOVESPA. Derivatives contracts are cleared within the BM&F by an in-house department, the Derivatives Clearinghouse or *Câmara de Derivativos*.

The BM&F used to guarantee settlement for its participants prior to the launch of the Brazilian payment system reform and, since April 22, 2002, has been settling its net balances on the STR. The BM&F Derivatives Clearinghouse is a central counterparty and becomes liable for the defaulter's positions with the clearing members that have honored their commitments. In this environment, the clearing members must maintain the minimum net working capital established by the Clearing Division of the BM&F. On the operational side, they must post collateral into a clearing fund and comply with the limits imposed by the exchange to reduce leverage risk.

Trades are matched electronically on a locked-in basis. In particular, after the trade has been registered—carried out in the trading sessions (either open-outcry or electronic) or over-the-counter—the risk-management system checks that the clearing member is within its limit. After the transactions

have been registered and accepted, clearing begins at the level of the constituents: commodity brokers and clearing members (night processing on T + 0). Reports are issued on the trade stating the amounts that will form part of the pre-netting. On receipt of these reports, the clearinghouse starts the process of financial settlement (on D + 0).

#### **6.4.1.1 Risk Management Mechanisms**

The Risk Coverage System is a system of limits and guarantee margins that the BM&F uses to manage settlement risks at the derivatives clearinghouse. This system is divided into two phases.

The first phase (T + 0) is monitoring, in almost real time and on a net basis, the consolidated portfolios of the clearing members, which are subject to intraday limits calculated on the assumption that all the risk being undertaken, including new positions opened during the day, have already been collateralized. In practice, the consolidated portfolios of the clearing members are divided into subaccounts, each of which groups together the positions of the same commodities broker registered by the same clearing member. The limits are monitored in relation to the consolidated portfolios of each one of the subaccounts, taking into account the collateral deposited in their favor. The clearing members distribute the “mutualized” risk limit and the additional guarantees among the commodity brokers for them to settle.

In the first phase, the clearing members’ risk is covered by a combination of individual collateral postings (defaulters pay) and joint postings, partly based on its guarantor funds (survivors pay), using a stress test model of the portfolio’s present value and another one of the portfolio’s cash flow if the assets, mainly swaps and flexible options, are to be carried until maturity.

In the second phase (T + 1), the risk of the portfolios is calculated on a gross basis depending on each constituent’s individual portfolios, and the BM&F notifies the brokers of the amounts of the guarantee margins that their clients must deposit. The margins relating to T + 0 transactions are only deposited on the morning of T + 1, as the brokers specify their clients only after the market has closed. The clearinghouse is entitled to alter the scenarios used in calculating guarantee margins at any time. In addition, it may make calls for additional margins from a limited group of participants.

The clearinghouse controls and manages its own exposure to market risks and the credit risk of the deposited collateral. The clearinghouse has a full system for monitoring market risk based on a statistical model of value at risk applicable at various levels (for example, clearing member, broker, client, group of clients acting together, and class of contracts). The system produces back-testing graphs based on comparisons of the gains and losses of derivatives portfolios with the value at risk calculated on the previous day. Collateral postings are marked-to-market every day, a system of haircuts is applied, and maximum limits are placed on the issuance of private guarantees.

In addition to these mechanisms, there is also a delivery versus payment system for the physical delivery of a commodity.



In the event of a default on the obligations assumed in the clearing, the guarantees are executed in the following order:

1. those of the debtor
2. those provided by third parties
3. those provided by intermediaries (brokers)
4. those provided by clearing members acting as registrars.

In the event that such guarantees are insufficient, the BM&F uses the funds and other safeguard mechanisms it has created.

## **6.5 INTERNATIONAL LINKS AMONG CLEARANCE AND SETTLEMENT INSTITUTIONS**

The CBLC has a pledge account at the Depository Trust Company and Clearing Corporation and accounts in CLEARSTREAM and EUROCLEAR. These are used mainly by foreign investors, which can choose from these alternatives to collateralize their positions in the derivatives market and in the securities lending program. The CBLC is quite conservative in accepting foreign securities as collateral, and eligible securities are basically government bonds and bills issued by the government of the United States.

The link between the CBLC and the SCLV, a Spanish central securities depository, is related to custody infrastructure to support the *Mercado de Valores Latino Americano* (Latibex), a system for trading Brazilian and other Latin American equities in Spain. Foreign institutions are permitted to keep their securities at the CBLC through local custodians acting as participants. As direct participants in the CBLC depository service, local custodians are fully responsible for all movements instructed in the custody.

## 7 THE ROLE OF THE CENTRAL BANK IN CLEARANCE AND SETTLEMENT SYSTEMS

### 7.1 SETTLEMENT

The reserve accounts and the settlement accounts at the BCB are the principal means through which large-value payments are transferred among financial intermediaries and other account holders at the BCB.

Deposit-taking institutions hold reserve accounts for reserve requirement purposes, and these accounts are used for settlement purposes as well. Other institutions, like the National Treasury and eight clearinghouses, hold settlement accounts. These settlement accounts are usually funded during the day and, by the end of the day, go back to a zero balance.

#### 7.1.1 Use of Reserve Requirements for Payment Purposes

Reserve requirements and other compulsory deposits can be used during the operating day for payment purposes. Besides reserve requirements on demand deposits, four other compulsory deposits in cash are imposed on deposit-taking institutions (see Table 24). These funds can be transferred easily to the reserve account, where they can be used intraday for payment purposes. As of July 2004, the average amount of the aggregate of all these deposits was approximately R\$90 billion.

**Table 24: Deposits of Financial Institutions at the BCB**  
(in R\$ Billion)

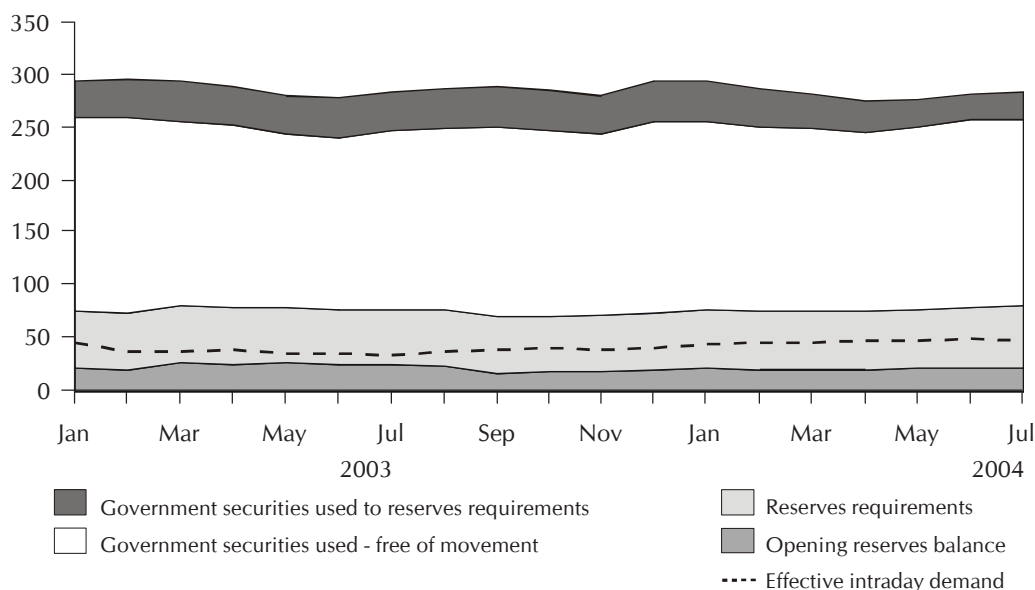
Banking reserves - Demand Deposits	30,6
Banking quasi-reserves - Savings Deposits	29,7
Banking quasi-reserves - Time Deposits	25,6
Banking quasi-reserves - Additional Requirements	29,1
Earmarked deposits - SBPE funds (housing finance)	0,4
Sundry Accounts	0,2
(Collection in Federal Public Securities)	-25,6
<b>Total</b>	<b>90,0</b>

*Source: Banco Central do Brasil.*

A second-level source of liquidity can be used even overnight. High reserve requirements on demand deposits (45 percent), together with a 20 percentage point difference between the average balance during the maintenance period and the daily minimum balance, provide an aggregate overnight liquidity cushion of about R\$6 billion.

A third-level source of liquidity derives from the use of reserve requirements that are invested in securities. Securities can be easily rediscounted intraday with the BCB at no cost, provided

**Figure 7: Source of Intraday Liquidity**  
(in R\$ billions)



they return to the BCB by the end of the day. This provides an extra intraday liquidity of R\$25 billion.

Thus the total liquidity available intraday is estimated to be more than R\$250 billion. According to the BCB's assessments in this regard, in aggregate the system has sufficient liquidity to effect its payments.

## 7.2 THE OVERSIGHT FUNCTION OF THE BCB

The BCB is currently restructuring the oversight of its payment system. Law 10,214 and CMN regulations have significantly improved the oversight authority of the BCB, providing it with sufficient legal powers to carry out its oversight function effectively.

Specifically, by design, the BCB role as a provider of payment services is confined to management of the STR (the real-time gross settlement system) and the SELIC (the central depository for government securities). The BCB oversees a multiplicity of organized payment arrangements, such as clearinghouses, and its role as overseer of other retail systems has expanded.

### 7.2.1 Objectives and Policies

The Payment System Law clearly defines the major objectives for the BCB's payment system. The BCB's role, objectives, and policies with respect to the payment system have been publicly disclosed through policy statements. In fact, during the major reform process, the BCB was very transparent and held public hearings for each document it intended to issue.

In this regard, the BCB has issued general regulations setting minimum requirements for the risk control mechanisms of clearinghouses. The CMN's Resolution 2,882 strictly follows the Core Principles for Systemically Important Payment Systems, except for Principle VI, which is placed in Circular 3,057. The resolution also includes the delivery versus payment principle for securities settlement and expands on the objectives of payment system oversight.

Circular 3,060 empowers the BCB to offer a funds transfer mechanism operating under a real-time gross settlement mode and to rule the functioning of banks' reserve account. Publicly disclosed policy statements and technical notes were made available at the BCB Web site long before they were enforced through regulations. Policy statements cover issues such as operational characteristics of banks' reserve accounts, the STR system, intraday and overnight repo transactions and rediscount operations, and the SELIC, among others. Technical notes also contain key policy decisions like the real-time monitoring of banks' reserve account, prohibition of overdrafts at the reserve account, interest-free intraday credit, the requirement that financial institutions authorize all debits on their reserve account, and so forth.

As far as technological and operational infrastructure is concerned, a set of documents related to the messaging framework, operational issues, and security was elaborated and is available on the BCB Web site. It includes message manuals, message catalogues, message models, technical reports on security and networks, as well as presentations on the operational, security, and network models and the SELIC model.

### **7.2.2 Cooperation with Other Authorities**

Law 10,214 frames the cooperation between the BCB and the CVM in payment system matters. A memorandum of understanding signed on July 5, 2002, sets forth the framework for the exchange of information and previous consultations between the BCB and the CVM concerning issues related to entities involved in the settlement of financial assets. This memorandum of understanding is available on the BCB's Web site.

The BCB aims to cooperate with other central banks, other foreign authorities, and international organizations.

## **7.3 MONETARY POLICY AND PAYMENT SYSTEMS**

An inflation-targeting regime was introduced in 1999 as a guide for monetary policy. Under this framework, the overnight interest rate (that is, the SELIC rate) is the operating target of monetary policy, defined by the COPOM, while the target for annual inflation measured by the IPCA, a consumer price index, is set by the CMN. The BCB is responsible for meeting the inflation targets.

Financial transactions performed throughout the financial system converge to the market of bank reserves. The BCB uses its instruments to influence the market of reserves and, by this means, the level of the basic short-term interest rates. More specifically, the operational objective of the BCB is to keep the trajectory of the SELIC rate, an overnight market-based interest rate, as close as possible

to the target established by the COPOM. In order to modify the liquidity in the market for bank reserves, the BCB uses three instruments: rediscounts and open-market operations, which affect the supply of bank reserves, and reserve requirements, which stabilize the demand for reserves in the short term and, thus, its predictability.

### 7.3.1 Demand for Reserves

The relevant component of the demand for reserves is the level of reserve requirements defined by the BCB. The reserve requirement on demand deposits is currently set at 45 percent.<sup>25</sup> As mentioned before, besides the reserve requirements on demand deposits, there are five other compulsory deposits over banks' liabilities and even over some banks' assets.

Considering that deposits at the BCB are not remunerated, banks tend to keep them as low as possible. However, the management of bank reserves also considers the liquidity risk arising from the maintenance of a less-than-optimum level of reserves. During the maintenance period, banks must pursue a two-week average balance not less than the reserve requirement and a daily minimum balance of 80 percent of the reserve requirement.

As overdrafts in reserve accounts are prohibited in Brazil, cash flow deficiencies are financed either through the market or with the BCB. Both charge penalty rates, except for intraday rediscount operations with the BCB.

### 7.3.2 Supply of Reserves

In Brazil, as in any other country, the central bank generally does not have total control over the supply of bank reserves. This so-called autonomous or exogenous variation is generated by changes in the supply of the following elements:

- Net foreign assets: As exchange policy maker and manager of international reserves, the BCB buys and sells foreign currencies in the domestic market, affecting the reserve accounts of its counterparties.
- National Treasury deposits and withdrawals: The daily movement of the account that the National Treasury holds with the BCB, its financial agent, provokes oscillations in the level of bank reserves.<sup>26</sup>
- Money in circulation: The predisposition of the population to hold cash reduces the supply of available bank reserves in the system.

---

<sup>25</sup> This percentage came into force in early August 2003 after the BCB announced a reduction from the previous level of 60 percent.

<sup>26</sup> Regarding government borrowing from the BCB, the Brazilian constitution prohibits direct or indirect financing.

Regarding endogenous variations in the level of bank reserves (for example, central bank loans to financial intermediaries), the recent changes in the legal framework and the establishment of risk protection mechanisms at all levels of the payment chain have largely insulated the BCB and the implementation of monetary policy from disturbances originating in the payment system. The scope of central bank intervention has returned to the classic definition of “lender of last resort.”

An unlimited, cost-free intraday liquidity facility through repurchase agreements with federal securities was nevertheless introduced to meet the higher intraday demand for reserves associated with real-time gross settlement. Penalties are charged in the liquidity facilities of overnight or longer maturities to isolate the implementation of monetary policy from spillover effects. Other BCB liquidity facilities of longer maturities are also based on repurchase agreements with haircuts, which virtually eliminates credit risks for the central bank (see Box 6).

### Box 6: BCB’s Liquidity Facilities: Operational Types, Maturities, and Costs

#### Operational types

- *repurchase agreements*: Securities eligible for repurchase agreements in the context of a liquidity facility are federal government securities and other credits or credit rights. The purchase price is defined according to BCB criteria, considering, inter alia, the present and market values, the credit risk, the maturity date, the liquidity, and the nominal volatility of the security. Only federal securities are accepted for intraday and overnight repos.
- *rediscounts*: Eligible assets are securities and credit rights that have been discounted at the financial institution.

#### Maturities and costs

- *intraday at no cost*
- *overnight at the SELIC rate plus 600 basis points*
- *up to 15 working days, extendable up to 45 working days, at the SELIC rate plus 400 basis points*
- *up to 90 days, extendable up to 180 days, at the SELIC rate plus 200 basis points.*

The framework for open-market operations has also been changed. First, the SELIC was turned into a real-time gross settlement system for securities, and monetary policy transactions are now settled instantaneously. In addition, starting in February 2003, the BCB can also interfere in the money market by performing, at its discretion, the so-called *operações de nivelamento*,<sup>27</sup> whereby the

<sup>27</sup> The *operações de nivelamento* should not be confused with the informal auctions (go-arounds) that the open-market operations desk performs as part of the BCB’s overall monetary policy management to offset liquidity fluctuations generated by central bank cash flow.

BCB's open-market operations desk announces to all market participants that it is ready to take or offer unrestricted amounts of reserves through overnight repurchase or reverse repurchase agreements at specified penalty rates. These operations target those banks that have not been able to level their reserve positions in the market during the day and, when made available by the BCB, are often performed at the end of the day, when the secondary market of reserves is about to close.

#### **7.4 THE ROLE OF THE CENTRAL BANK IN CROSS-BORDER PAYMENTS**

The BCB is a member country of ALADI, a system for the clearing and settlement of multilateral cross-border payments that involves 12 Latin American countries (see Section 4.4).

#### **7.5 PRICING POLICIES**

The BCB's pricing policy toward the STR is based on full cost recovery. Basically, the amount of the fee is the value that equals the present value of costs already incurred and expected costs and revenues.

Pricing is also used to address other policy objectives. For example, in credit transfer orders, the payer and the beneficiary pay the same fee. Also, in order to stimulate the early input of payment messages and smooth the flow of payments throughout the day, payment orders issued between 6:30 a.m. and to 8:00 a.m. are eligible for a 50 percent discount over the basic tariff, which is R\$0.62.

There are also special tariffs for payment messages sent through contingency procedures. In case a participant is facing technical difficulties that prevent it from sending payment messages, the BCB may activate the contingency mechanisms after receiving a formal request from the participant. The contingency mechanism can be activated totally or partially. Under partial contingency procedures (PCP), the participant requests the central bank to issue payment messages on its behalf. This facility is available only for a restricted set of messages. Under full contingency procedures (FCP), participants are enabled by the BCB to use the Internet as a contingent network.

The tariffs under contingency procedures are very expensive so as to create an incentive for participants to develop reliable systems. Under partial contingency procedures, each message costs R\$3,000, while under full contingency procedures, participants are charged the regular price for individual messages, but there is a minimum daily fee of R\$6,000.

The central bank has opted so far not to interfere in the pricing policies of private payment service providers, except by curbing price discrimination between participants or the use of tariffs to restrict access.

The RSFN network-pricing policy is based on the data throughput (from 64 Kbps to 2 Mbps) contracted by each participant, regardless of the effective use of the network. In other words, participants pay for a fixed capacity, even if they do not use it.



## **8 SUPERVISION OF SECURITIES CLEARANCE AND SETTLEMENT SYSTEMS**

### **8.1 SECURITIES REGULATOR SUPERVISORY AND STATUTORY RESPONSIBILITIES**

There are three regulators of the Brazilian securities market: the BCB, the CMN, and the CVM.

The BCB is responsible for granting licenses to market intermediaries and for prudential regulation and supervision of these activities. Also, as part of its payment system duties, the BCB is responsible for overseeing clearing and settlement arrangements that can be considered systemically important, such as the operations of the CBLC, CETIP, SELIC, and BM&F Securities Clearinghouse. By law and by regulation, the BCB is strongly committed to applying the international standards to the systems it operates as well as to those it does not operate.

Currently, the BCB has the power to request from any system participant all information deemed relevant to its oversight activities and to collect data from payment and settlement systems through onsite inspections. Application of sanctions has been deeply discussed and probably will be introduced as an enforcement regime of fines and other penalties. Nevertheless, moral suasion is regarded as the most effective tool for the BCB.

By contrast, the CVM is responsible for the regulation and supervision of trading practices and trading systems, the regulation of broker-dealer firms, and the examination of self-regulatory organizations such as exchanges (for example, BOVESPA) and securities clearinghouses. Effective as of March 1, 2002, the CVM was also granted responsibility for authorizing and supervising all types of pooled investment vehicles.

In practice, the CVM supervises self-regulatory organizations via limited inspections under their law.

### **8.2 SELF-REGULATORY ORGANIZATIONS SUPERVISORY AND STATUTORY RESPONSIBILITY**

The Brazilian stock and futures exchanges, over-the-counter stock market associations, and clearinghouses have a mutual status, and, for this reason, they are considered as self-regulatory organizations under Brazilian law.

#### **8.2.1 Stock Exchanges**

The stock exchanges are empowered to issue operational and disciplinary regulations and to establish the requirements for market players to become members of the exchange. The stock exchanges must ensure that the market functions smoothly and that conditions of equality, security, and fair play exist. In this respect, the stock exchanges must create codes of conduct that stock exchange officials and firms must comply with as well as control procedures to verify the fulfillment of all laws and regulatory dispositions by brokers.

## **8.2.2 Central Securities Depositories**

The central securities depositories must oversee that their depositors comply with their operating rules and market regulations. Central securities depositories should assess the fulfillment by direct depositors of the operational and other rules approved by them. Likewise, they must adopt measures and establish adequate mechanisms to ensure that the transactions made through them do not become a vehicle for any kind of criminal offense or fraud.

## APPENDIX: STATISTICS TABLES

The first series (A) are payment and securities clearance and settlement statistics in Brazil. These tables have been prepared following the Standard Methodology for Country Tables developed by the WHF's Core Team. This Methodology is available at the WHF's web site: [www.whpaymentsforum.org](http://www.whpaymentsforum.org). The second series (B) are more general statistics of the financial system.

Starting 2002, the Working Group on Payment System Issues of Latin America and the Caribbean (WGPS-LAC), has been working on a document on Comparative Statistical Tables on Payments and Securities Clearance and Settlement Systems for the Region's countries. For this document, the statistical tables of individual countries are being updated periodically and may be reviewed at the WHF's web site.

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**Table A1: Basic Statistical Data\***

	1999	2000	2001	2002	2003
Population (in thousands)	167,910	170,143	172,386	174,633	176,871
GDP (in USD million)	536,554	602,207	509,797	459,379	493,348
GDP per capita (in USD)	3,195	3,539	2,957	2,631	2,789
Interbank Exchange Rate vs. USD					
Year end	1.7890	1.9554	2.3204	3.5333	2.8892
Year average	1.8158	1.8295	2.3522	2.9309	3.0715

Source: Banco Central do Brasil and IBGE.

**Table A2: Settlement Media Used by Non-banks**  
(in USD million, year-end)

	1999	2000	2001	2002	2003
Total Notes and Coins issued	16,679	16,689	16,234	14,132	17,778
<i>held by the public</i>	14,506	14,647	14,061	11,986	14,905
Transferable deposits in local currency	20,567	23,377	22,013	18,536	23,046
<i>Households</i>	n.a.	n.a.	n.a.	n.a.	n.a.
<i>Business sector</i>	n.a.	n.a.	n.a.	n.a.	n.a.
<i>Others</i>	n.a.	n.a.	n.a.	n.a.	n.a.
Narrow money supply M1	35,072	38,024	36,074	30,523	37,951
Transferable deposits in foreign currency					
<i>Broad Monetary Aggregate (M4)</i>	308,045	333,483	325,884	228,546	332,293

Source: Banco Central do Brasil.

\* The following conventions for notation are used throughout the Statistical Appendix: "n.a." indicates data that are not available; "... " stands for data that are not applicable; "neg" indicates where data are very small relative to other relevant data in the table concerned.

**Table A3: Settlement Media Used by Credit/Deposit Taking Institutions**  
(in USD million, year-end)

	1999	2000	2001	2002	2003
Required reserves at the Central Bank <sup>(a)</sup>					
<i>In domestic currency</i>	25,346	22,361	27,852	33,768	43,465
<i>In foreign currency</i>	...	...	...	...	...
Of which, usable for settlement <sup>(b)</sup>					
<i>In domestic currency</i>	22,476	18,912	18,099	23,789	26,872
<i>In foreign currency</i>	...	...	...	...	...
Excess reserves at the Central Bank					
<i>In domestic currency</i>	neg	neg	neg	neg	neg
<i>In foreign currency</i>	...	...	...	...	...
Institutions' borrowing from Central Bank	20,006	20,444	10,300	1,130	288
Transferable deposits at other entities	...	...	...	...	...

Source: Banco Central do Brasil.

<sup>(a)</sup> Cash and public bonds.

<sup>(b)</sup> Correspond to reserves account balances. Subject to previous procedures, other balances can be used as well.

**Table A4: Institutional Framework**  
(end of 2000)

	Number of institutions	Number of branches	Number of current accounts	Value of accounts (USD million)
Central Bank	1	9	145	7,565 <sup>(c)</sup>
Commercial banks <sup>(a)</sup>	164	16.8 <sup>(b)</sup>	86,983,508	25,075 <sup>(c)</sup>
of which:				
<i>Public banks</i>	14	6.8 <sup>(b)</sup>	36,498,912	11,858 <sup>(c)</sup>
<i>Private banks</i>	150	10 <sup>(b)</sup>	35,072,212	8,884 <sup>(c)</sup>
Foreign banks	62	3.3 <sup>(b)</sup>	15,412,384	4,333 <sup>(c)</sup>
Non-banking financial institutions <sup>(d)</sup>	1,987	n.a	n.a	n.a
Postal Office	1	12 <sup>(b)</sup>	...	...

Source: Banco Central do Brasil.

<sup>(a)</sup> Includes commercial banks, universal banks with commercial activities and Caixa Econômica Federal.

<sup>(b)</sup> In thousands.

<sup>(c)</sup> USD Million.

<sup>(d)</sup> Following International Monetary Fund (IMF)'s definition.

**Table A5: Bank Notes and Coins**  
(in USD million, year-end)

	1999	2000	2001	2002	2003
Total currency issued	16,678.6	16,688.7	16,233.8	14,131.6	17,777.9
Total notes issued	16,204.7	16,237.4	15,830.4	13,831.6	17,355.7
of which:					
BRL 100	624.1	629.7	592.1	586.6	631.4
BRL 50	11,288.5	11,420.1	11,353.6	9,816.7	12,282.7
BRL 20 <sup>(a)</sup>				476.2	1,007.8
BRL 10	3,371.6	3,294.2	3,089.5	2,292.4	2,664.0
BRL 5	563.8	518.1	455.8	332.3	388.1
BRL 2 <sup>(b)</sup>			14.2	79.8	136.5
BRL 1	356.7	375.2	325.2	247.5	245.1
Total coins issued	473.9	451.3	403.4	300.0	422.2
Notes and coins held by banks	2,172.8	2,041.6	2,172.5	2,145.2	2,872.6
Notes and coins circulating outside banks	14,505.8	14,647.1	14,061.3	11,986.4	14,905.3

Source: Banco Central do Brasil.

<sup>(a)</sup> These banknotes were first issued in 2002.

<sup>(b)</sup> These banknotes were first issued in 2001.

**Table A6: Cash Dispensers, ATMs, and EFTPOS Terminals**  
(year-end)

	1999	2000	2001	2002	2003
Cash dispensers and ATMs					
Number of networks	29	29	29	30	29
National <sup>(a)</sup>	14	14	17	18	16
Regional	15	15	12	12	13
Number of terminals (in thousands)	85.8	97.1	110.7	129.9	137.4
Volume of transactions (in millions)	1,379.3	2,708.6	3,817.1	4,546.3	5,672.4
Value of transactions (in USD million)	62,515.5	114,464.6	182,611.6	211,557.6	230,998.8
EFTPOS					
Number of networks	7	7	7	6	6
Debit cards	3	3	3	3	3
Credit cards	4	4	4	3	3
Number of terminals (in thousands) <sup>(b)</sup>	278.3	349.8	480.7	628.3	874.9

Sources: Commercial banks, debit and credit card operators.

<sup>(a)</sup> Considers as "national" those networks that operate in at least 2/3 of the Brazilian States.

<sup>(b)</sup> Data are estimated and preliminary.



**Table A7: Number of Payment Cards in Circulation**  
(in millions, year-end)

	1999	2000	2001	2002	2003
Cards with a cash function (in thousands)	73,268.6	92,322.7	107,879.9	121,128.7	149,150
Cards with a debit/credit function (in thousands)					
of which:					
Debit cards (in thousands)	74,374.9	81,151.1	91,665.6	106,060.6	162,784.8
Credit cards (in thousands)	23,432.1	29,400.1	35,376.6	40,761.2	44,035.7
Cards with a cheque-guarantee function	n.a	n.a	n.a	n.a	n.a
Retailer and fidelity cards	n.a	n.a	n.a	n.a	n.a
Stored-value cards (in thousands)	0.1	1.0	1.6	9.1	70.7

Sources: Commercial banks, debit and credit card operators.

**Table A8: Indicators of Use of Various Cashless Payment Instruments**  
(volume of transactions, in millions)

	1999	2000	2001	2002	2003
Cheques issued <sup>(a)</sup>					
in local currency	2,612.1	2,637.5	2,600.3	2,397.3	2,246.4
in foreign currency	...	...	...	...	...
Payment cards					
debit	106.9	205.8	326.2	451.3	661.6
credit	553.2	705.9	825.0	969.6	1,083.5
stored-value (in thousands)	n.a	n.a	n.a	n.a	n.a
Paper-based credit transfers					
customer initiated	...	...	...	...	...
interbank / large value	...	...	...	...	...
Paperless credit transfers					
customer initiated <sup>(b) 2/</sup>	624.2	694.5	763.7	844.7	904.9
interbank / large value <sup>(c)</sup>	...	...	...	1.2	13.5
Direct Debits	219.5	322.5	385.8	438.2	627.8
E-money	n.a	n.a	n.a	n.a	n.a

Sources: Banco Central do Brasil, commercial banks, debit and credit card operators and ABECS.

<sup>(a)</sup> Excludes "on us" cheques.

<sup>(b)</sup> Correspond to DOCs, "bloquetos de cobrança" and TED issued by customers.

<sup>(c)</sup> Correspond to STR and CIP payments (2002), excluded TED issued by customers.

**Table A9: Indicators of Use of Various Cashless Payment Instruments**  
(value of transactions, in USD billion)

	1999	2000	2001	2002	2003
Cheques issued <sup>(a)</sup>					
<i>in local currency</i>	958.8	987.0	801.4	571.6	355.7
<i>in foreign currency</i>	...	...	...	...	...
Payment cards					
<i>debit</i>	2.8	5.0	6.0	6.7	9.6
<i>credit</i>	18.6	24.0	23.5	22.1	25.1
<i>stored-value</i>	n.a	n.a	n.a	n.a	n.a
Paper-based credit transfers					
<i>customer initiated</i>	...	...	...	...	...
<i>interbank / large value</i>	...	...	...	...	...
Paperless credit transfers					
<i>customer initiated</i> <sup>(b)</sup>	1,255.8	1,041.3	1,039.5	1,000.3	1,200.2
<i>interbank / large value</i> <sup>(c)</sup>	...	...	...	11,245.0	12,708.0
<i>Direct Debits (in USD million)</i>	24.0	29.8	30.5	26.3	31.7
E-money	n.a	n.a	n.a	n.a	n.a

Sources: Banco Central do Brasil, commercial banks, debit and credit card operators and ABECS.

<sup>(a)</sup> Excludes "on us" cheques.

<sup>(b)</sup> Correspond to DOCs, "bloquetos de cobrança" and TED issued by customers.

<sup>(c)</sup> Correspond to STR and CIP payments (2002), excluded TED issued by customers.

**Table A10: Payment Instructions Handled by Selected Interbank Transfers Systems**  
(volume of transactions, in millions)

	1999	2000	2001	2002	2003
STR					
<i>In domestic currency</i>	...	...	...	5.3	13.2
<i>In foreign currency</i>	...	...	...	...	...
COMPE					
<i>In domestic currency</i>	3,236.3	3,332.0	3,364.1	3,238.0	3,129.3
<i>In foreign currency</i>	...	...	...	...	...
CIP - Sitraf					
<i>In domestic currency</i>	...	...	...	neg	11.3
<i>In foreign currency</i>	...	...	...	...	...

Source: Banco Central do Brasil.

**Table A11: Payment Instructions Handled by Selected Interbank Transfers Systems**

(value of transactions, in USD billion)

	1999	2000	2001	2002	2003
STR					
<i>In domestic currency</i>	...	...	...	11,555.1	13,334.4
<i>In foreign currency</i>	...	...	...	...	...
COMPE					
<i>In domestic currency</i>	2,215.6	2,029.2	1,842.6	1,252.9	678.0
<i>In foreign currency</i>	...	...	...	...	...
CIP - Sitraf					
<i>In domestic currency</i>	...	...	...	0.2	265.7
<i>In foreign currency</i>	...	...	...	...	...

Source: Banco Central do Brasil.

**Table A12: Securities and Accounts Registered in Central Securities Depositories**

	1999	2000	2001	2002	2003
SELIC					
Number of securities registered (in millions)	12,163	11,688	9,475	7,087	5,477
Number of participants	2,481	3,058	3,789	4,510	4,961
Number of accounts <sup>(a)</sup>	11,552	11,640	15,376	21,122	22,101
Number of foreign investors	n.a	n.a	n.a	n.a	188
CETIP					
Number of securities registered	175,969	170,819	192,492	250,114	286,390
Number of participants	2,545	3,145	3,703	4,524	4,682
Number of accounts <sup>(a)</sup>	n.a	n.a	n.a	6,805	7,182
Number of foreign investors	...	8	7	19	20
CBLC					
Number of securities registered (in billions)	6,674	12,534	12,689	10,209	10,131
Number of participants	257	331	315	278	251
Number of accounts <sup>(b)</sup>	56,968	89,225	92,946	101,352	106,600
Number of foreign investors	1,925	1,883	1,852	2,246	2,470

Source: Banco Central do Brasil and settlement service providers.

<sup>(a)</sup> Each participant has its own account and some participants have more than one account (free movement and special movement accounts).

<sup>(b)</sup> CBLC maintains accounts at customer level.

**Table A13: Securities Holdings in Central Securities Depositories**  
(in USD million)

	1999	2000	2001	2002	2003
SELIC					
Government Securities	325,580.0	399,395.2	458,501.2	234,120.7	338,646.8
CETIP <sup>(a)</sup>	114,896	126,617	120,031	96,762	178,260
Corporate Bonds	87,968	103,660	102,831	84,860	163,809
Government Securities	26,928	22,957	17,200	11,902	14,451
CBLC <sup>(a)</sup>	74,215	105,926	84,466	59,735	112,272
Stocks	74,215	105,926	84,210	59,196	111,509
Corporate Bonds	n.a	n.a	256	539	764

Source: Banco Central do Brasil.

<sup>(a)</sup> Does not include derivatives contracts.

**Table A14: Transfer Instructions Handled by Securities Settlement Systems**  
(volume of transactions, in millions)

	1999	2000	2001	2002	2003
SELIC					
Government Securities	1,250.16	1,700.54	1,901.41	2,146.56	2,209.01
CETIP <sup>(a)</sup>	1.24	1.15	1.27	1.39	2.21
Corporate Bonds	1.18	1.10	1.24	1.34	1.47
Government Securities	0.06	0.05	0.04	0.05	0.74
CBLC <sup>(a)</sup>	3.91	5.56	6.58	6.98	6.98
Stocks	3.91	5.56	6.58	6.98	6.98
Corporate Bonds	...	...	...	neg	neg

Source: Banco Central do Brasil and settlement service providers.

<sup>(a)</sup> Does not include derivatives contracts.

**Table A15: Transfer Instructions Handled by Securities Settlement Systems**  
(value of transactions, in USD billion)

	1999	2000	2001	2002	2003
SELIC					
Government Securities	27,604.4	29,331.2	37,579.9	38,335.4	41,986.1
CETIP <sup>(a)</sup>	7,293	3,708	2,966	2,487	1,256
Corporate Bonds	5,551	3,336	2,937	2,467	826
Government Securities	1,742	373	28	20	431
CBLC <sup>(a)</sup>	73	140	171	79	67
Stocks	73	101	64	47	67
Corporate Bonds	...	...	neg	neg	neg
Government Securities	n.a	38	107	32	n.a

Source: Banco Central do Brasil and settlement service providers.

<sup>(a)</sup> Does not include derivatives contracts.

**Table A16: Participation in SWIFT by Domestic Institutions**

	1999	2000	2001	2002	2003
Domestic SWIFT users	n.a.	85	88	87	85
<i>Of which:</i>					
<i>Members</i>	34	33	32	28	28
<i>Sub members</i>	n.a.	27	28	27	25
<i>Participants</i>	n.a.	25	28	32	32
<i>Memo:</i>					
SWIFT users worldwide	6,991	7,294	7,457	7,600	7,644
<i>Of which:</i>					
<i>Members</i>	2,230	2,307	2,265	2,217	2,322
<i>Sub members</i>	2,825	3,038	3,143	3,129	3,094
<i>Participants</i>	1,936	1,949	2,049	2,254	2,228

Source: SWIFT.

**Table A17: SWIFT Message Flows To / From Domestic Users**

	1999	2000	2001	2002	2003
Total messages sent	2,981,718	3,312,411	3,289,574	3,504,009	3,659,652
<i>Of which:</i>					
<i>Category I</i>	1,132,022	1,278,714	1,299,259	1,221,737	1,308,198
<i>Category II</i>	549,802	552,483	520,351	469,927	438,979
Total messages received	3,572,838	3,731,859	3,857,542	4,059,573	4,435,866
<i>Of which:</i>					
<i>Category I</i>	1,134,846	1,137,342	1,220,090	1,296,307	1,443,178
<i>Category II</i>	154,561	147,455	155,907	184,799	227,009
<i>Memo: Global SWIFT traffic</i>	1,015,105,357	1,298,668,103	1,533,906,047	1,817,443,994	2,047,564,360

Source: SWIFT.

**Table B1: Number of Financial Institutions**

	1999	2000	2001	2002	2003
Deposit-taking institutions, from which:					
Multiple or universal banks with commercial bank capabilities	150	145	132	121	16
Commercial Banks <sup>(c)</sup>	25	28	28	23	23
Savings banks	1	1	1	1	1
Credit cooperatives	1,183	1,235	1,333	1,374	1,399
Non-bank financial institutions, from which:					
Multiple or universal banks without commercial banks' capabilities	18	18	21	22	24
Investment banks	21	19	20	23	21
Development Banks	5	5	4	4	4
Consumer finance companies	41	42	39	46	45
Mortgage companies <sup>(a)</sup>	19	18	18	18	18
Other financial intermediaries, from which:					
Brokers/dealers <sup>(b)</sup>	416	398	374	351	334
Mutual investment funds	1,578	1,994	2,222	2,586	2,598
Leasing companies	79	77	71	65	57

Source: Banco Central do Brasil.

<sup>(a)</sup> Includes Associações de Poupança e Empréstimo e Sociedades de Crédito Imobiliário.

<sup>(b)</sup> Includes Sociedades Corretoras de Títulos e Valores Mobiliários, Sociedades Distribuidoras de Títulos e Valores Mobiliários e Corretoras de Câmbio.

<sup>(c)</sup> Includes branches of foreign banks.

**Table B2: Number of Chequing, Savings and Time Deposits Accounts**  
(year-end, in millions)

	1999	2000	2001	2002	2003
Checking accounts	48.9	55.8	63.2	45.6	45.9
Savings accounts	41.6	45.8	51.2	58.2	62.4
Time Deposits	n.a	n.a	n.a	n.a	n.a

Source: Banco Central do Brasil.

**Table B3: Assets**  
(year end, in R\$ million)

	1999	2000	2001	2002	2003
Deposit money banks - Total assets	527,015	588,465	704,830	845,404	921,828
Deposit money banks - Foreign assets	29,960	31,035	38,331	44,851	55,563
Other banking institutions - Total assets	105,261	125,105	138,082	182,743	195,323
Other banking institutions - Foreign assets	117	404	353	812	1,237
Non-banking financial institutions - Total assets	24,022	24,228	23,698	20,637	20,858
Non-banking financial institutions - Foreign assets	104	118	18	37	30

Source: Banco Central do Brasil.

**Table B4: Deposits**  
(year end, in R\$ million)

	1999	2000	2001	2002	2003
Demand deposits	36,794	45,712	51,079	65,495	66,584
Time deposits	94,722	89,936	107,609	137,559	144,242
Savings deposits	110,732	111,744	118,701	139,642	143,057

Source: Banco Central do Brasil.

**Table B5: Equity**  
(year-end, in R\$ million)

	1999	2000	2001	2002	2003
Deposit money banks	132,225	133,957	163,177	192,426	227,773
Other banking institutions	20,936	22,515	65,269	81,988	89,044
Non-banking financial institutions	16,465	16,750	20,005	22,588	23,038

Source: Banco Central do Brasil.

**Table B6: Loans**  
(year-end, in R\$ million)

	1999	2000	2001	2002	2003
<i>Total credit to businesses</i>	70,107	102,622	124,165	136,261	136,126
Capital financing	15,123	16,542	22,110	29,501	32,920
Current account overdraft financing	10,264	15,008	19,860	20,247	21,926
Stock finance	1,159	2,201	3,594	4,277	4,695
Vendor	4,548	6,470	6,802	7,852	7,877
Hot money	689	583	462	609	535
Discount operations	3,998	6,137	6,659	6,520	7,714
Mortgage	-	2,676	786	678	551
ACC (anticipation on exports receivables)	14,429	17,305	20,648	25,007	25,764
Export notes	215	204	75	243	186
Others	19,682	24,564	29,148	29,384	25,811
<i>Total credit individuals</i>	17,127	51,336	69,941	76,165	88,099
Current account overdraft financing	5,067	6,517	8,141	8,545	8,919
Personal credit	9,534	16,381	23,233	24,553	30,494
Credit card financing	-	2,802	3,391	4,839	6,475
Mortgage	-	3,103	1,903	1,780	1,381
Consumer finance	5,294	18,919	28,495	31,512	35,331
Others	2,526	3,614	4,777	4,937	5,498
Total credit	87,234	153,958	194,106	212,426	224,225

Source: Banco Central do Brasil.



**Table B7: Issuances in International Markets**  
(in USD thousand)

	1999	2000	2001	2002	2003
<b>Euro Bonds</b>					
Euro Bond 2001	606,000	565,123	0	0	0
Euro Bond 2002	808,000	753,497	711,475	0	0
Euro Bond 2003	505,000	470,936	444,672	497,999	0
Euro Bond 2004	505,000	470,936	444,672	513,285	619,130
Euro Bond 2005	-	706,403	1,111,680	1,296,830	1,564,250
Euro Bond 2006	707,000	659,310	622,541	720,694	869,309
Euro Bond 2007	-	706,403	667,008	785,640	947,648
Euro Bond 2009	-	-	-	523,760	631,765
Euro Bond 2010	-	706,403	667,008	785,640	947,648
Euro Bond 2011	-	-	889,344	1,047,520	1,263,530
Euroaira 2017	390,442	364,050	343,725	405,730	489,395
DM 2007	515,384	480,580	453,749	535,588	646,033
DM 2008	386,538	360,435	340,312	401,691	484,524
<b>Global Bonds</b>					
Global 2001	750,000	750,000	0	0	0
Global 2004	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000
Global 2005	-	-	1,000,000	1,000,000	1,000,000
Global 2006	-	-	1,500,000	1,500,000	1,500,000
Global 2007	-	1,000,000	1,500,000	1,500,000	1,500,000
Global 2008	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Global 2008-A	-	-	-	1,250,000	1,250,000
Global 2009	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Global 2010	-	-	-	1,000,000	1,000,000
Global 2010-B	-	-	-	-	1,500,000
Global 2011	-	-	-	-	1,250,000
Global 2012	-	-	-	1,250,000	1,250,000
Global 2013	-	-	-	-	1,250,000
Global 2020	-	1,000,000	1,000,000	1,000,000	1,000,000
Global 2024	-	-	2,150,000	2,150,000	2,150,000
Global 2024-B	-	-	-	-	824.702
Global 2027	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000
Global 2030	-	1,600,000	1,600,000	1,600,000	1,600,000
Global 2040	-	5,157,311	5,157,311	5,157,311	5,157,311
<b>Samurai Bonds</b>					
Samurai 2001	292,195	261,579	0	0	0
Samurai 2003	-	523,158	457,050	504,756	0
Samurai 2003-A	-	-	1,523,500	1,682,520	0
Samurai 2006	-	523,158	457,050	504,756	559,836
Samurai 2007	-	-	609,400	673,008	746,448
<b>Outros</b>					
Eurolibra 2007	242,612	224,348	218,090	241,727	269,055
Paralelo Florim 2002	182,964	170,609	161,084	0	0
Paralelo Franco 2002	153,669	143,292	135,292	0	0
Paralelo Xelim 2002	146,509	136,615	128,988	0	0
<b>Total</b>	<b>15,941,313</b>	<b>27,486,146</b>	<b>34,045,952</b>	<b>38,280,457</b>	<b>42,022,586</b>

Source: Ministério da Fazenda.

Note: Maturity date is indicated in the name of the security.

## LIST OF ABBREVIATIONS

ABBC	<i>Associação Brasileira dos Bancos Comerciais</i> (Brazilian Commercial Banks Association)
ABBI	<i>Associação Brasileira de Bancos Internacionais</i> (Brazilian International Banks Association)
ALADI	<i>Asociación Latinoamericana de Integración</i> (Latin American Association of Integration)
ANDIMA	<i>Associação Nacional das Instituições do Mercado Financeiro</i> (National Association of Financial Market Institutions)
ASBACE	<i>Associação Brasileira de Bancos Estaduais</i>
ATM	Automated Teller Machine
BB	<i>Banco do Brasil S.A.</i>
BCB	<i>Banco Central do Brasil</i> (Central Bank of Brazil)
BIS	Bank for International Settlements
BGP	Border Gateway Protocol
BM&F	<i>Bolsa de Mercadorias e Futuros</i> (Futures and Commodities Exchange)
CBLC	<i>Companhia Brasileira de Liquidação e Custódia</i> (Brazilian Settlement and Custody Corporation)
CEMLA	Centre for Latin American Monetary Studies
CETIP	<i>Central de Custódia e Liquidação</i> (Custody and Settlement Central)
CMN	<i>Conselho Monetário Nacional</i> (National Monetary Council)
COAF	Council for the Control of Financial Activities
COMOC	<i>Comissão Técnica da Moeda e do Crédito</i> (Monetary and Credit Technical Committee)
COMPE	<i>Centralizadora da Compensação de Cheques e Outros Papéis</i> (Clearinghouse for Checks and Credit Transfers)
COPOM	<i>Comitê de Política Monetária</i> (Monetary Policy Committee)
CPMF	<i>Contribuição provisória sobre movimentação financeira</i> (Financial Transactions Tax)
CPSS	Committee on Payment and Settlement Systems
CVM	<i>Comissão de Valores Mobiliários</i> (Securities Commission)
DOC	<i>Documento de crédito</i> (credit document)
ECT	<i>Empresa Brasileira de Correios e Telégrafos</i> (Brazilian postal service)
EFTPOS	Electronic funds transfer at the point of sale
FATF	Financial Action Task Force
FEBRABAN	<i>Federação Brasileira de Bancos</i> (Brazilian Banking Federation)

FGC	<i>Fundo Garantidor de Créditos</i> (Credit Guarantee Fund)
FSAP	Financial Sector Assessment Program
GDP	Gross Domestic Product
ISIN	International Securities Industry Numbering
MICR	Magnetic Ink Character Recognition
MPLS	Multi-protocol Label Switching
MTBF	Minimum Time Between Failures
MTRR	Minimum Time To Recover
OTC	Over the Counter
PROER	Program of Incentives for the Restructuring and Strengthening of the National Financial System
PROES	Program for the Restructuring of the State-Owned Financial System
RSFN	<i>Rede do Sistema Financeiro Nacional</i> (Financial System Network)
SELIC	<i>Sistema Especial de Liquidação e de Custódia</i> (Special System for Settlement and Custody)
SERPRO	<i>Serviço Federal de Processamento de Dados</i> (Federal Service of Data Processing)
SICAP/ALADI	<i>Sistema Computarizado de Apoio al Convenio de Pagos y Créditos Recíprocos ALADI</i> (Automated System Supporting the ALADI Reciprocal Payments and Credit Agreement)
SILOC	<i>Sistema de Liquidação Diferida de Ordens de Crédito Interbancárias</i> (Interbank Credit Orders Deferred Settlement Systems)
SISBACEN	<i>Sistema de Informações Banco Central</i> (Central Bank Information System)
SITRAF	<i>Sistema de Transferência de Fundos</i> (Funds Transfer System)
SPB	<i>Sistema de Pagamentos Brasileiro</i> (Brazilian Payments System)
STR	<i>Sistema de Transferência de Reservas</i> (Reserves Transfer System)
SUSEP	<i>Superintendência de Seguros Privados</i> (Superintendence of Private Insurance)
SWIFT	Society for Worldwide Interbank Financial Telecommunications
TCP-IP	Transmission Control Protocol-Internet Protocol
Tecban	<i>Tecnología Bancária</i> (Banking Technology)
TED	<i>Transferência Eletrônica Disponível</i> (Express Electronic Transfer)
URV	<i>Unidade Real de Valor</i> (Real Unit of Value)
WHF	Western Hemisphere Payments and Securities Settlement Forum

## GLOSSARY

In January 2001, the Committee on Payment and Settlement Systems (CPSS) of the Bank for International Settlements (BIS) published a combined glossary for payments and securities clearance and settlement terms. The Glossary can be found on the BIS web site: [www.bis.org](http://www.bis.org). The Western Hemisphere Payments and Securities Clearance and Settlement Forum (WHF), on the basis of the glossary produced by the CPSS, also produced a uniform glossary of terms in Spanish and in Portuguese in order to avoid unnecessary proliferation of terminology and definitions. The latter can be found at the WHF's web site: [www.whpaymentsforum.org](http://www.whpaymentsforum.org).

Below are some terms not mentioned in that Glossary and/or that are peculiar to the Brazilian context:

- Bloquetos de cobrança:* documents used to pay bills in Brazil. A customer receiving a bloqueto de cobrança takes it to a bank and pays in cash or writes a check to authorize payment through his account. Alternatively, the customer can input the bar-coded numbers at a home-banking station. Banks charge the payee an interbank fee to use them. They are cleared and settled electronically and in some cases the physical item is truncated at the collecting bank.
- Correspondentes bancários:* according to CMN Resolutions 1764 and 1865, banks can extend the provision of banking services such as tax collection or payment of public utilities through a wider network by celebrating service agreements with small businesses such as pharmacies and grocery stores.
- Medida Provisória:* piece of law that can be issued by the President of the Republic. It used to be considered applicable by default, that is, even in the absence of a specific Congressional vote of acceptance. In several instances such pieces of law were rolled over for several successive years before being approved by Congress and converted into law. In 2002, the Congress restrained presidential legislative powers by making Provisional Acts really provisional. Although they continue to be enforceable immediately after issuance, they are now automatically revoked if not approved by the Congress within 60 days from the date of issuance.
- SELIC Rate:* basic interest rate reflecting transactions in the secondary market for government securities. It is the target rate in the current monetary policy framework. It is the weighed average of overnight inter-bank operations with reserves. The calculation comprises go-around, repurchase and reverse repurchase agreements. It reflects the cost of reserves in the interbank market.

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