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# **CURRENCY AND COIN MANAGEMENT: A COMPARISON OF AMERICAN AND BRAZILIAN MODELS**

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## **I – Introduction**

### **1.1. Objectives of this paper**

Despite predictions of a “cashless society” relying on electronic payments, the public demand for currency continues to grow. Debit cards used for purchases and transaction records could greatly reduce the need for cash, but paper currency still has the advantage of privacy.

In Brazil, the currency management services and the issue of banknotes and coins, in the conditions and quantities authorized by the National Monetary Council (CMN), are specific responsibilities of the Central Bank of Brazil (BCB). This charge is executed by the Currency Management Department (Mecir), located in Rio de Janeiro City and in other nine branches in the main Brazilian cities.

Considering the change that the Brazilian State has been passing through in order to meet the society’s demands for a more efficient and less expensive public administration, Mecir has faced the necessity of reforming its organizational structure and operational routines. This reform should take into consideration the possibility of transferring to the private sector some processes and activities that nowadays are executed by government agents.

On implementing such a transformation, BCB’s managers should observe other country examples. Thus, the author of this Minerva Program final paper will attempt to compare the organizational structure and the operational routines of currency management in the US and in Brazil. This comparison can very useful since USA and Brazil have a lot of similarities. As can be observed in table 1, both are large countries with large population, but at the same time present quite different economic development:

**Table 1 – Comparison: USA x Brazil**

	USA	Brazil
Area (sq km)	9,631,418	8,511,965
Area (world ranking)	3 <sup>rd</sup>	5 <sup>th</sup>
Population (est. July 2004)	293,027,571	184,101,109
Population (est. July 2004 – world ranking)	3 <sup>rd</sup>	5 <sup>th</sup>
GDP (US\$ – Purchasing Power Parity – 2003 est.)	10.99 trillion	1.375 trillion
Income per capita (US\$ – Purchasing Power Parity – 2003 est.)	37,800	7,600

Source: US Central Intelligence Agency – CIA

## **1.2. A brief view of US and Brazilian currency and coin**

In the USA since 1914, Federal Reserve Notes, which comprise more than 99 percent of today's paper money, have been issued by Federal Reserve Banks as direct obligations of the Federal Reserve System. Federal Reserve Notes were issued in denominations ranging from \$1 to \$10,000: \$1, \$2, \$5, \$10, \$20, \$50, \$100, \$500, \$1,000, \$5,000 and \$10,000. The \$100 note has been the largest denomination printed since 1946, and in 1969 all notes greater than \$100 were retired because of declining demand.

Regarding US coins, nowadays there are six denominations that circulate for daily use in commerce: the Lincoln Cent, the Jefferson Nickel, the Roosevelt Dime, the 50 State Quarters, the Kennedy Half Dollar, and the Golden Dollar.

The following tables exhibit the volume and value of US currency in circulation from 1994 to 2003, by each denomination (includes Federal Reserve notes, U.S. notes, and currency no longer issued):

**Table 2 – Volume of US Currency in circulation – 1994/2003**  
(billions of notes, as of December 31 of each year)

<b>Year</b>	<b>\$1</b>	<b>\$2</b>	<b>\$5</b>	<b>\$10</b>	<b>\$20</b>	<b>\$50</b>	<b>\$100</b>	<b>\$500 to \$10,000</b>	<b>Total</b>
<b>1994</b>	6.11	0.50	1.47	1.38	4.02	0.88	2.29	0.0005	16.65
<b>1995</b>	6.34	0.52	1.51	1.41	4.21	0.93	2.42	0.0005	17.33
<b>1996</b>	6.56	0.54	1.55	1.43	4.36	0.97	2.61	0.0005	18.03
<b>1997</b>	6.72	0.56	1.57	1.42	4.40	0.96	2.92	0.0005	18.55
<b>1998</b>	6.97	0.58	1.61	1.43	4.54	1.01	3.20	0.0005	19.34
<b>1999</b>	7.54	0.60	1.80	1.62	5.80	1.29	3.86	0.0005	22.52
<b>2000</b>	7.65	0.62	1.77	1.45	4.93	1.10	3.78	0.0005	21.31
<b>2001</b>	7.79	0.63	1.83	1.47	5.05	1.14	4.21	0.0005	22.12
<b>2002</b>	7.98	0.65	1.88	1.49	5.19	1.17	4.59	0.0005	22.95
<b>2003</b>	8.24	0.67	1.94	1.51	5.39	1.20	4.88	0.0005	23.84

Source: Federal Reserve Board

**Table 3 – US Currency in circulation – 1994/2003**  
(billions of dollars, as of December 31 of each year)

<b>Year</b>	<b>\$1</b>	<b>\$2</b>	<b>\$5</b>	<b>\$10</b>	<b>\$20</b>	<b>\$50</b>	<b>\$100</b>	<b>\$500 to \$10,000</b>	<b>Total</b>
<b>1994</b>	6.11	1.00	7.34	13.82	80.47	43.90	229.09	0.32	382.04
<b>1995</b>	6.34	1.04	7.53	14.14	84.15	46.40	241.54	0.32	401.47
<b>1996</b>	6.56	1.09	7.76	14.26	87.13	48.56	261.41	0.32	427.09
<b>1997</b>	6.72	1.13	7.85	14.20	87.95	48.24	291.58	0.32	457.99
<b>1998</b>	6.97	1.16	8.05	14.26	90.86	50.45	320.09	0.32	492.17
<b>1999</b>	7.54	1.20	9.00	16.20	116.07	64.68	386.16	0.32	601.17
<b>2000</b>	7.65	1.24	8.85	14.54	98.61	55.05	377.69	0.31	563.95
<b>2001</b>	7.79	1.27	9.15	14.69	100.93	57.03	421.08	0.31	612.25
<b>2002</b>	7.98	1.31	9.40	14.89	103.72	58.46	458.68	0.31	654.76
<b>2003</b>	8.24	1.35	9.71	15.14	107.77	59.94	487.77	0.31	690.24

Source: Federal Reserve Board

The design of Federal Reserve Notes and US coins has changed little over the years. It is important to note the record of currency stability which it represents. In Brazil, however, such stability could not be observed so far. During the XXth Century Brazilian economy experienced very high inflation levels, which resulted in a lot of economic plans to reduce them and a sequence of different monetary units, such as “mil-réis”, “cruzeiro”, “cruzeiro novo”, “cruzado”, “cruzado novo”, “cruzeiro real” and, finally, “real”.

On July 1<sup>st</sup>, 1994, Brazil implemented the last and most successful of its economic stabilization programs– the “Real Plan” – and established “real” as the currency unit, divided into 100 *centavos*, which equaled to 2,750 *cruzeiros reais*, the former unit. A new series of banknotes – 1, 5, 10, 50 and 100 reais denominations – and coins – 1, 5, 10, 25, 50 *centavos* and 1 real – was issued then, which remains in circulation today. <sup>1</sup> Since 1998, Brazil has been in the process of slowly phasing out the old Real coins – issued from 1994 to the beginning of 1998 – in favor of a new set with new designs, and in 2001 and 2002 two new banknotes denominations were introduced – 2 and 20 *reais*, respectively.

To celebrate the 500<sup>th</sup> anniversary of Brazil’s discovery in 2000, BCB introduced a new 10-*reais* banknote series, made of polymer. This plastic material is wide-spread used in some Asian and Oceanian countries and is considered to be much more durable than traditional cotton paper. Nowadays 10-*reais* polymer and cotton paper banknotes circulate together.

Tables 4 and 5 show the increase of Brazilian currency in circulation during the period from 1994 to 2003:

**Table 4 – Volume of Brazilian Currency in circulation – 1994/2003**  
(millions of notes, as of December 31 of each year)

<b>Year</b>	<b>R\$ 1</b>	<b>R\$ 2</b>	<b>R\$ 5</b>	<b>R\$ 10</b>	<b>R\$ 20</b>	<b>R\$ 50</b>	<b>R\$ 100</b>	<b>Total</b>
<b>1994</b>	283.78	-	248.10	386.72	-	69,16	7.12	994.88
<b>1995</b>	310.03	-	170.66	411.47	-	137,14	10.08	1,039.37
<b>1996</b>	405.24	-	168.95	420.88	-	201.87	9.74	1,206.68
<b>1997</b>	464.83	-	149.66	449.78	-	258.53	8.99	1,331.79
<b>1998</b>	495.33	-	153.55	513.12	-	319.39	10.25	1,491.63
<b>1999</b>	638.08	-	201.73	603.18	-	403.90	11.17	1,858.06
<b>2000</b>	733.76	-	202.61	555.45	-	446.62	12.31	1,950.76
<b>2001</b>	754.59	16.46	211.52	716.90	-	526.90	13.74	2,240.10
<b>2002</b>	874.58	140.94	234.83	809.99	84.13	693.71	20.72	2,858.91
<b>2003</b>	708.08	197.13	224.29	769.68	145.59	709.75	18.24	2,772.75

Source: Central Bank of Brazil

<sup>1</sup> Actually, one-real coins issued in 1994 (made of stainless steel only) were replaced by new one-real coins

**Table 5 – Brazilian Currency in circulation – 1994/2003**  
(billions of *reais*, as of December 31 of each year)

<b>Year</b>	<b>R\$ 1</b>	<b>R\$ 2</b>	<b>R\$ 5</b>	<b>R\$ 10</b>	<b>R\$ 20</b>	<b>R\$ 50</b>	<b>R\$ 100</b>	<b>Total</b>
<b>1994</b>	0.28	-	1.24	3.87	-	3.46	0.71	9.56
<b>1995</b>	0.31	-	0.85	4.11	-	6.86	1.01	13.14
<b>1996</b>	0.41	-	0.84	4.21	-	10.09	0.97	16.53
<b>1997</b>	0.46	-	0.75	4.50	-	12.93	0.90	19.54
<b>1998</b>	0.50	-	0.77	5.13	-	15.97	1.02	23.39
<b>1999</b>	0.64	-	1.01	6.03	-	20.20	1.12	28.99
<b>2000</b>	0.73	-	1.01	5.55	-	22.33	1.23	30.86
<b>2001</b>	0.75	0.03	1.06	7.17	-	26.34	1.37	36.73
<b>2002</b>	0.87	0.28	1.17	8.10	1.68	34.69	2.07	48.87
<b>2003</b>	0.71	0.39	1.12	7.70	2.91	35.49	1.82	50.14

Source: Central Bank of Brazil

Comparing data on tables 1, 2 and 4, it can be observed in the end of 2003 there were about 81 Federal Reserve notes for each American; at the same time, there were only 15 Real notes for each Brazilian. It must be considered, however, that US currency has the peculiarity of circulating abroad<sup>2</sup>, since some residents of foreign countries hold dollars as a store of value, while others use it as medium of exchange.

## **II – The currency and coin services structures in the USA and in Brazil**

### **2.1. The US currency management structure**

#### **2.1.1. The legal basis**

The Constitution of the United States had previously appointed that the US Congress “shall have power to coin money, [and] regulate the value thereof...” (Article I, Section 8). In 1792, the US Congress enacted the Coinage Act, establishing the US Mint “for the purpose of a national coinage” (Section I).

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issued from 1998 on (made of stainless steel and bronze-plated steel).

<sup>2</sup> It is believed that two thirds of US currency circulates outside the USA (Source: US Embassy in Brasilia)



In 1913, US Congress passed the *Federal Reserve Act*, aimed at resolving some long-standing money and banking problems which had led to bank failures, business bankruptcies, and general economic contractions. The Act created the Federal Reserve System as the nation's central bank to regulate the flow of money and credit for economic stability and growth, and mandated an elastic currency that would expand and contract based on public demand.

### **2.1.2. The Federal Reserve (Fed) and the Reserve Banks**

As a central bank, Fed is responsible for issuing, distributing, processing and accounting for Federal Reserve notes and coins in the United States and abroad. Today the Fed is spread throughout the US and consists of:

- ? the Board of Governors, which is the center of authority and decision making. It is located in Washington, DC and must contain no more than seven people selected by the President of the US and confirmed by the US Senate. They are chosen for a 14-year term, with each one expiring on January 31<sup>st</sup> of each even-numbered year. The Board Chairman and Vice-Chairman are appointed by the President of the US among the seven members and confirmed by the Senate, both for a four-year term. The Board of Governors is supported by a 1,700 people staff;
- ? the Federal Open Market Committee (FOMC) – in addition to the seven members of the Board of Governors, this committee is composed by the President of the Federal Reserve Bank of New York, and the Presidents of four other Federal Reserve Banks serving on a rotating basis. The FOMC's task is to set monetary policies regarding the open market operations, the growth of the monetary aggregates and the operations undertaken directly by the Federal Reserve in foreign exchange markets;

- ? twelve district Federal Reserve Banks, which operate within each district. The respective headquarters are located in the following cities: Boston, MA; New York, NY; Philadelphia, PA; Cleveland, OH; Richmond, VA; Atlanta, GA; Chicago, IL; St. Louis, MO; Minneapolis, MN; Kansas City, KS; Dallas, TX; and San Francisco, CA. Among the services offered to depository institutions operating within their districts are (1) wire transfers of funds between banks and other depository institutions; (2) safe-keeping of securities owned by banks and their customers; (3) issuing new securities from the US Treasury and selected other federal agencies; (4) making short-term loans to banks and other depository institutions through the "discount window"; (5) maintaining and dispensing supplies of currency and coin; (6) clearing and collecting checks and other cash items moving between cities; (7) providing information to keep bankers and the public informed about regulation changes and other issues regarding the welfare of their institutions; and (8) supervising member banks and holding companies;
- ? twenty-five FED district bank's branches, which help the respective district bank to perform their tasks. There are branches in Buffalo, NY; Cincinnati, OH; Pittsburgh, PA; Baltimore, MD; Charlotte, NC; Birmingham, AL; Jacksonville, FL; Miami, FL; Nashville, TN; New Orleans, LA; Detroit, MI; Little Rock, AR; Louisville, KY; Memphis, TN; Helena, MT; Denver, CO; Oklahoma City, OK; Omaha, NE; El Paso, TX; Houston, TX; San Antonio, TX; Los Angeles, CA; Portland, OR; Salt Lake City, UT; and Seattle, WA.

This structure is almost the same established in 1913, when such system was created. The only innovation was a new cash processing office in Phoenix, AZ, set by the Federal Reserve Bank of San Francisco.

Excepting the Pittsburg branch, which is only a storage center, all the Federal Reserve Banks cash offices execute the basic currency management functions: they provide the bank system for banknote and coin orders and deposits; they process currency; and, they destroy unfit banknotes.

In order to make cash procedures and routines uniform, the Federal Reserve System established the Federal Reserve's Cash Product Office (CPO), located in San Francisco, which oversees the centralized management of currency and coin. The CPO coordinates the distribution of currency and coin from the producers (the US Mint and the Bureau of Engraving and Printing) to the Reserve Banks and acts as liaison among them. The CPO also monitors System-level inventories and coordinates the redistribution of currency and coin inventories between the Reserve Banks.

As mentioned before, it is believed that the major part of US currency is abroad. Fed evaluations leads to the conclusion that this quantity corresponds to two thirds of the US current currency nominal value, although it equals to only 20% of the number of pieces. Since 1996 the Fed have been establishing Extended Custodial Inventory – ECI's facilities to facilitate the introduction of new-design U.S. currency to the international community, to recirculate fit bank notes in overseas markets, and to strengthen the information on foreign use and counterfeiting of U.S. currency. The ECI program allows selected depository institutions to hold currency in their vaults but to carry the inventory on the books of the Federal Reserve. There are ECI's facilities in Europe and Asia. In 2000, an ECI facility was established in Buenos Aires, Argentina, but the site was closed in February 2002 because of unpredictable economic and political conditions and loss of convertibility of Argentine *peso* to US dollar.

“The ECI program serves as a means to facilitate the international distribution of U.S. banknotes, permit the repatriation of old design banknotes, promote the recirculation of fit new-design currency, and strengthen U.S. information gathering capabilities on the international use of U.S. currency and sources of U.S. banknote counterfeiting abroad. ECI facilities function as overseas cash depots operated by private sector commercial banks. These banks hold currency for the New York Fed on a custodial basis.”<sup>3</sup>

### **2.1.3. The US Department of The Treasury**

The US Department of the Treasury is the primary federal agency responsible for the economic and financial prosperity and security of the United States, and as such is responsible for a wide range of activities including advising the President on economic and financial issues, promoting the President’s growth agenda, and enhancing corporate governance in financial institutions.

Two of the Treasury divisions, the US Mint and the Bureau of Engraving and Printing – BEP, are responsible for the US money printing and coinage. US banknotes are printed by the Bureau of Engraving and Printing – BEP, which has facilities in Washington, DC, and in Fort Worth, TX.

On the other hand, coin is produced by the Bureau of the Mint facilities, located in Philadelphia, PA, Denver, CO, West Point, NY, and San Francisco, CA, and a bullion depository in Fort Knox, KY. Of the four minting facilities operated by the United States Mint only Denver and Philadelphia manufacture the coins circulated for daily use in commerce.

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<sup>3</sup> Testimony of Thomas C. Baxter, Jr., Federal Reserve Bank of New York Executive Vice President and General Counsel, before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, Executive Vice President and General Counsel. May 20<sup>th</sup> 2004

#### 2.1.4. US Secret Service

The Secret Service was established as a law enforcement agency in 1865 to investigate the counterfeiting of U.S. currency. Today its primary investigative mission is to safeguard the payment and financial systems of the United States. This has been historically accomplished through the enforcement of the counterfeiting statutes to preserve the integrity of United States currency, coin and financial obligations.

#### 2.1.5. US currency and coin management budget

In 2003 currency and coin management cost \$884 million dollars for the Fed. The following table exhibits how much it has expended in this issue in the last ten years:

**Table 6 – Federal Reserve expenses for currency and coin management – 1994/2003**

<b>Year</b>	<b>New currency (*)</b>	<b>Cash operations (**)</b>	<b>Total</b>
<b>1994</b>	368.23	232.80	601.03
<b>1995</b>	373.16	259.61	632.77
<b>1996</b>	403.00	279.00	682.00
<b>1997</b>	367.50	283.15	650.65
<b>1998</b>	408.00	292.61	700.61
<b>1999</b>	487.00	311.28	798.28
<b>2000</b>	456.00	328.59	784.59
<b>2001</b>	343.54	355.45	698.99
<b>2002</b>	430.46	371.74	802.20
<b>2003</b>	496.90	387.39	884.29

(\*) includes printing, transportation, and destruction of mutilated currency (in millions of dollars)

(\*\*) includes coin wrapping, transportation, verification, destruction, paying, receiving, and processing (in millions of dollars)

Source: Federal Reserve Board

It can be observed that Federal Reserve expenditures for currency and coin management have increased 47.13% from 1994 to 2003. Most of that increase has to be with coin operations – 66.40% in nine years' time, 5.86% at average – which have exhibit more regular rates than Fed expenditures for currency.

## **2.2. The Brazilian currency management structure**

Federal Law 4,595 issued on December 31<sup>st</sup> 1964 structured the Brazilian national financial system and created the National Monetary Council (CMN) and the Central Bank of Brazil (BCB).

The National Monetary Council (CMN) is the principal deliberative organization of the National Financial System. The CMN has the responsibility of: setting general guidelines for monetary, foreign exchange and credit policies; regulating creation, functioning and supervision of financial institutions; and monitoring the instruments of monetary and foreign exchange policies. Nowadays, the CMN is composed of the Minister of Finance, who serves as the President, the Minister of Planning and Budget and the President of the Central Bank of Brazil (BCB). The BCB acts as secretary for the CMN.

Law 4,595 establishes that the BCB has the specific responsibility of issuing banknotes and coins, in the conditions and quantities authorized by the CMN, and executing the currency management services, among others. This charge is executed by one of the 28 BCB departments, the Currency Management Department, located in Rio de Janeiro, RJ, and by its branches in the national capital (Brasília, DF), and in eight main state capitals: São Paulo, SP; Belo Horizonte, MG; Porto Alegre, RS; Curitiba, PR; Recife, PE; Salvador, BA; Fortaleza, CE; and Belém, PA.

According to the information provided on the BCB homepage on the Internet, the functions of the Currency Management Department – Mecir are the following: satisfy the society's demand for banknotes and coins; process banknotes and coins; set the regulation on currency management; and, plan, control and monitor currency management operations.

In other words, the most important function of the Currency Management Department – Mecir is to distribute banknotes and coins produced by Brazil's Mint – CMB throughout the country. It executes this function by making deposits in, and withdrawals from the commercial banks. Another of Mecir's charge is to process banknotes and coins, so that the unfit and unauthentic ones can be taken out from circulation. Mecir and the Brazilian Mint – CMB work together to develop new coins and banknotes projects, increasing security features in order to avoid counterfeiting. Courses and lectures promoted by Mecir offer the society an opportunity to know its money better.

Nowadays, all of Brazilian banknotes and coins are produced by the Brazilian Mint (CMB), a state-owned company founded by the Portuguese Colonial Government in 1694, and located in Rio de Janeiro, RJ. Besides money, the Brazilian Mint produces postage stamps, passports, government titles, ID cards and so on.

Central Bank of Brazil attends the public demand for money by banknote and coin deposits and orders done by the Brazilian commercial banks. The new money acquired from the CMB is distributed by the ten regional branches all over the country. That service is provided by Banco do Brasil S.A., a commercial bank controlled by the Federal Government, in the cities where there is not any BCB branch. In December 2002 Banco do Brasil S.A. had 3,164 branches, in Brasília and all Brazilian states.<sup>4</sup>

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<sup>4</sup> Source: Central Bank of Brazil

In 2003, BCB's currency and coin management expenditure reached R\$277 million (US\$ 95.9 million), as shown in table 7. It represents an increase of 27.7 percent over the previous year. About 80% of all that expenditure is related to currency and coin acquisition.

**Table 7 – BCB's expenditures for currency and coin management – 2002/2003 (millions of reais)**

	<b>2002</b>	<b>2003</b>
Banknote aquisition	93.24	104.47
Coin aquisition	78.30	115.68
Cash storage	20.52	23.92
Cash distribution	12.08	12.80
Currency processing	12.43	13.24
Unfit currency destruction	0.19	0.23
Currency Management issues publicizing	-	6.64
Other expenses	0.18	0.07
<b>Total</b>	<b>216.95</b>	<b>277.05</b>

Source: Central Bank of Brazil

On December 31<sup>st</sup>, 2003, 339 public servants worked at the ten Mecir offices. Most of them are to retire by five years' time. As hiring public servants in Brazil depends on long official examination processes, it is possible that, instead of replacing such workers, procedures that nowadays are executed by Mecir, such as distributing and processing currency, will be outsourced to commercial banks, which will hold currency for the Central Bank on custodial basis.



### III – Currency and coin management issues

#### 3.1. Currency and coin production

As quoted beforehand, in the United States Federal Reserve Banks acquire currency and coins directly from two US Department of Treasury divisions – the Bureau of Engraving and Printing – BEP, and the US Mint. Just like in Brazil, in the USA there is a public monopoly in supplying the monetary authority with money.

Each year, the Federal Reserve Board determines new currency demand and submits a print order to the BEP, which represents the estimate of the amount of currency that the public will demand in the upcoming year and reflects estimated changes in currency usage and destruction rates of unfit currency. Banknotes are ordered by the Board of Governors, and not by each of the Federal Reserve Banks, and the costs are allocated to the system as a whole. Table 8 exhibits the volume and value of notes printed each year by the BEP, from 1994 to 2003:

**Table 8 - The volume and value of notes printed each year by the Bureau of Engraving and Printing (in billions of notes and dollars) – 1994/2003**

<b>Year</b>	<b>Volume of Notes Printed</b>	<b>Value of Notes Printed</b>
<b>1994</b>	9.3	\$128.8
<b>1995</b>	10.0	\$148.2
<b>1996</b>	9.4	\$194.6
<b>1997</b>	9.6	\$142.2
<b>1998</b>	9.2	\$163.3
<b>1999</b>	10.8	\$285.5
<b>2000</b>	9.0	\$67.5
<b>2001</b>	8.2	\$50.2
<b>2002</b>	7.4	\$123.3
<b>2003</b>	8.1	\$123.9

Source: Federal Reserve Board

It can be observed a dramatic increase of orders in 1999 and a decrease in the following years. That is due to the preventive steps taken in advance of the so-called “Millennium Bug”, since in 1999 the Federal Reserve Banks adopted contingency plans to attend the public’s precautionary demand for cash. As the century date passed without incident, the public returned much of the currency to depositary institutions, which, in its turn, returned excess currency to the Reserve Banks.

Prices paid by the Federal Reserve Banks for the banknotes they acquire are negotiated with the BEP based on production costs. That means that the seignorage, that is, the amount of real purchasing power that is extracted from the public by printing money, belongs to the Federal Reserve Banks. Federal Reserve notes are liabilities on the Federal Reserve’s balance sheet. The asset counterpart to the Federal Reserve Banks liability takes the form of securities of the U.S. Treasury and government-approved enterprises. According to the information provided by the Federal Reserve, each notebank costs about \$0.04, regardless of denomination.

The Federal Reserve has a more limited role in coin operations than it has in currency operations. The US Mint determines annual coin production and monitors Federal Reserve coin inventories weekly to identify trends in coin demand. To help the US Mint plan for future production, the Reserve Banks provide the Mint with projected monthly coin orders for each fiscal year. A coin is an asset on the balance sheet of the Federal Reserve and is a direct obligation of US Treasury. As an asset, the Federal Reserve buys coin from the Mint at face value, and not at production cost.

In Brazil, according to Federal Law 5,895 issued in 1973, the Brazilian Mint – CMB has the monopoly of producing national currency. Since then, there was only one exception: in 1994, when Brazilian currency changed and all “Cruzeiro Real” banknotes and coins were totally substituted for “Real” ones in a couple of months (“Real Plan”), Federal Law 8,891 authorized the Central Bank to acquire them from three foreign suppliers (Giesecke & Devrient – Germany, Thomas De La Rue – England, and François Charles Oberthur – France).

Central Bank of Brazil pays CMB based on its production costs. Differently from the USA, that is true not only for banknotes but also for coins. According to the information provided by the BCB, in 2003 Mecir acquired 1,2 billion bills and paid R\$104 millions for them (see table 7), which means an average cost of R\$0,09 each one (US\$ 0,03)<sup>5</sup>. Concerning to coins, as they have several sizes and are made of different raw materials accordingly to each denomination, their production costs vary, so that each piece costs from R\$0.08 (US\$0.03) to R\$0.18 (US\$0.06). That implies that, with regard to 1 and 5 *centavos* denominations, the production cost is greater than the coin face value.

The Brazilian Mint’s monopoly results in some negative effects on the Brazilian currency management. Most of the CMB inputs are supplied by monopoly companies located in Brazil, which reduces the possibility of negotiating prices. Besides, as a state-owned company, CMB has been facing problems with investment limits<sup>6</sup>, which represents a smaller production capacity and an obstacle to fulfill Mecir’s orders. Other faced problems have to do with CMB labor: it is considered to be very specific, and, according to the Federal Law, CMB workers can be hired only after a long official examination process.

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<sup>5</sup> Considering the Central Bank of Brazil’s exchange rate for 12/31/2003: R\$2.8892 per each US dollar

<sup>6</sup> Public investments in Brazil have been passing through severe restriction. As Brazilian economy remains highly indebted, the federal government raised the fiscal primary surplus target for 2004 to 4.5% of GDP

Monthly acquisitions from the Brazilian Mint are calculated based on annual necessities. To measure those necessities, the following issues are taken into consideration: payment system increase; unfit currency replacement; and currency safety stocks replacement. Besides, although there is greater demand for money in some months and smaller in others, Central Bank orders take into consideration the limited monthly production capacity of the Brazilian Mint.

### **3.2. Currency distribution**

In the USA, the Federal Reserve Banks distribute currency and coin to depository institutions to meet the public's need for cash. During periods of heavy cash demand, such as the Christmas season, institutions obtain larger amounts of cash from the Federal Reserve Banks. When public demand for cash is light – as after the holiday season, for example – institutions deposit excess cash with the Reserve Banks, for credit to their reserve accounts.

To obtain cash service directly from the Fed, a financial institution must observe three requirements described at the Federal Reserve's Operating Circular # 2<sup>7</sup>, such as: it must have an account on the books of a Federal Reserve Bank; it must have access to the communications systems designated by the Fed; and, it must have arranged armored carrier transportation for the cash or use the U.S. Postal Service.

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<sup>7</sup> The Operating Circular # 2 contains the provisions that apply to Institution's cash and food coupon transactions with a Federal Reserve Bank

Considering those requirements, most medium and large-sized financial institutions – about 10,300 of the 19,000 banks, saving and loans, and credit unions in the USA – maintain reserve accounts at one of the Federal Reserve Banks, and they pay for the cash they get from the Fed by having those accounts debited. The remaining 8,700 depository institutions obtain currency and coin from correspondent banks rather than directly from a Federal Reserve Bank. This service provided by correspondent banks is generally charged.

According to the information on Federal Reserve Board's homepage on the Internet, nowadays Federal Reserve notes make up more than 99 per cent of all US currency in circulation; the remainder includes United States notes, national bank notes, and silver certificates<sup>8</sup>, all of which remain legal tender.

Currency transportation from the BEP facilities to the Federal Reserve Banks vaults' is paid by the BEP, and that expenditure is included in the currency production costs paid by the Federal Reserve System.

The procedures for putting US coin into circulation are similar to those for currency: the US Mint ships coin to the Federal Reserve Banks and they supply banks that need coin to meet the public's demand. In addition to the cash offices, the Federal Reserve Banks also use 116 coin terminals to manage the Federal Reserve's coin volume.

The US Mint has created the "Direct Mint Shipment Program", by which some large banks can receive coins directly from its facilities in Philadelphia and Denver, just registering such operations in the systems designated by the Fed. Transportation costs, in that case, are paid by the depository institutions.

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<sup>8</sup> United States notes and national bank notes are the currency introduced in the XIXth Century, before the creation of the Federal Reserve System; silver certificates were issued up to the 1960's

Still concerning coin distribution, authorized armored carriers can store and distribute coins through financial institutions and retailers (such as Wal-Mart, for example), without depositing and taking them from the Federal Reserve Banks. This service is provided by armored carriers at free costs to the Fed, since it is of their own interest for optimizing logistic costs. For keeping money in custody for Federal Reserve Banks, authorized armored carriers are regularly audited by them.

In Brazil, all currency and coin produced by the Brazilian Mint – CMB are taken to Mecir Head Office in Rio de Janeiro. One part of this money is kept in Mecir's vaults in Rio de Janeiro and the other one is distributed to all the other nine branches. Mecir contracts air companies and uses its own trucks to transport money throughout the country. All those transportation costs are in charge of Central Bank of Brazil.

The financial institutions take and deposit currency in any of the ten Mecir offices at free costs. However, in the cities and towns where there are not any Mecir offices, Banco do Brasil S.A. assumes the cash responsibilities of the Central Bank. In those places, Banco do Brasil S.A. has the custody of Central Bank's money storages. As Banco do Brasil S.A. has a wide-spread network of branches – more than 3,000 in almost all Brazilian cities and towns – that means a lot of transportation and storage costs. For that, Banco do Brasil S.A. is allowed to charge financial institutions when they take or deposit money in its branches.

From 2002 on, Mecir has been delivering cash directly to Banco do Brasil S.A. branches located in some cities where there is not a BCB office, such as smaller capitals. According to a study done by BCB, this delivery represents a cost reduction to the system as a whole.

Unlike the US Federal Reserve Banks, the Central Bank of Brazil does not accept coin deposits. Once in circulation, a Brazilian *real* coin will never come back to the monetary authority, unless when there is a series recall, such as it happened in 2003 and 2004 for one-real coins issued in 1994 (made of stainless steel only).

Currency distribution in Brazil can be considered satisfactory, since there are no currency shortage cases to be mentioned. Regarding coin, however, public complaints about coin shortage in some parts of the country have been experienced. This problem has been attacked by Mecir, which has put in circulation millions of new pieces every year, as shown in table 9. One aspect to Brazilian culture to be mentioned is that public is used to hoarding coins at home, instead of spending it in the commerce. To change this habit, BCB has launched a campaign to encourage people to use coin.

**Table 9 – Volume of Brazilian Coin in circulation – 1994/2003 – by each denomination**

(millions of pieces, as of December 31 of each year)

<b>Year</b>	<b>R\$ 0.01</b>	<b>R\$ 0.05</b>	<b>R\$ 0.10</b>	<b>R\$ 0.25</b>	<b>R\$ 0.50</b>	<b>R\$ 1.00</b>	<b>Total</b>
<b>1994</b>	841	642	586	155	336	178	2,738
<b>1995</b>	1,133	883	835	270	420	210	3,752
<b>1996</b>	1,371	1,013	1,021	316	402	215	4,337
<b>1997</b>	1,730	1,157	1,200	369	424	215	5,094
<b>1998</b>	2,062	1,267	1,311	433	457	226	5,756
<b>1999</b>	2,261	1,417	1,484	491	495	235	6,383
<b>2000</b>	2,368	1,457	1,562	527	521	237	6,672
<b>2001</b>	2,570	1,625	1,709	609	536	237	7,286
<b>2002</b>	2,755	1,788	1,862	714	621	267	8,007
<b>2003</b>	2,979	2,018	2,090	816	735	308	8,946

Source: Central Bank of Brazil

### 3.3. Currency processing

When a depository institution deposits excess and unfit currency (notes that are not suitable for further circulation because of its physical condition, such as torn, dirty, limp, worn or defaced) with a Federal Reserve Bank, the Federal Reserve Bank stores the currency in secure vaults until it is verified, note by note, on high-speed processing equipment, at an average rate of 70,000 notes per hour. For this procedure, Fed adopts a “first in-first out” basis. During the piece-verification process, deposited currency is counted, suspected counterfeit notes are identified, and unfit notes are destroyed. The fit currency eventually makes their way back into circulation when banks order currency from a Federal Reserve Bank. Incorrect denominations and suspected counterfeits are rejected, and, if necessary, the depositing bank’s account is debited or credited. Concerning to suspected counterfeit, Federal Reserve Banks’ employees inspect the note by hand and forward them to the US Secret Service.

Table 10 exhibits the quantities of banknotes processed at Reserve Banks in the period from 1994 to 2003:

**Table 10 – Notes processed at Reserve Banks – 1994/2003 – by each denomination (millions of pieces)**

<b>Year</b>	<b>\$1</b>	<b>\$2</b>	<b>\$5</b>	<b>\$10</b>	<b>\$20</b>	<b>\$50</b>	<b>\$100</b>	<b>Total</b>
<b>1994</b>	7,169	9	2,004	2,341	8,502	789	955	21,768
<b>1995</b>	7,990	10	1,974	2,299	8,641	726	951	22,591
<b>1996</b>	8,123	12	1,994	2,345	9,154	796	1,129	23,551
<b>1997</b>	8,131	14	2,036	2,348	10,014	979	1,083	24,605
<b>1998</b>	9,190	13	2,077	2,386	10,724	874	1,075	26,341
<b>1999</b>	10,527	14	2,093	2,386	11,913	977	1,123	29,032
<b>2000</b>	10,265	15	2,321	2,378	13,678	1,232	1,617	31,506
<b>2001</b>	12,334	17	2,349	2,238	14,095	1,168	1,540	33,740
<b>2002</b>	11,931	18	2,421	2,197	14,805	1,209	1,627	34,208
<b>2003</b>	12,021	20	2,465	2,171	15,195	1,224	1,737	34,832

Source: Federal Reserve



Nowadays processing machine maintenance is outsourced to Giesecke & Devrient, an international technology group specialized in banknote printing and security paper production and banknote processing systems. Processing machines in the Federal Reserve Banks, however, are operated by their own employees.

Coin deposits are weighed by electronic scales that are located at Federal Reserve offices and also at armored carrier facilities throughout the USA. Unlike currency, there is no need to sort the coins for fitness since they are damaged very rarely.

In Brazil, Mecir adopts the same processing procedures relating to currency. Differently from the USA, however, processing machines are operated by employees of an outsourced company, De La Rue Cash Systems, under the supervision of Central Bank's servants.

Nowadays, there are 32 processing machines located at the ten Mecir facilities, which are considered to be depreciated. Statistics show that in 2003 1,754 millions of banknotes were processed by them. The average quantity they process is 48,641 banknotes per hour, inferior to the average rate performed by the Federal Reserve Banks' machines.

Regarding coin processing in Brazil, this routine does not exist since Mecir does not accept coin for deposit.

### 3.4. Currency destruction

Federal Reserve Banks do not accept for deposit mutilated currency or coin.<sup>9</sup> They should be delivered directly to the BEP and the US Mint, respectively. Unfit currency and uncurrent coin, however, is accepted to be destroyed. The authorization to destroy currency was given to the Federal Reserve Banks by the Department of the Treasury in 1966. After processed by the high-speed machines, unfit currency is headed to one end of it, where stainless steel blades crosscut the notes into confetti-like shreds. All shreds are sent by vacuum tube to a disposal area, from where they have different destinations according to the Federal Reserve Bank. The Fed of New York, for instance, mixes and compresses them into briquettes and disposes in landfills. Others sell shredded currency to businesses under Treasury rules or turn the shreds into stationery products under a contract with the private stationery company that makes the high-quality cotton paper on which currency is printed.

As shown in table 11, Federal Reserve notes life varies according to its denomination. For example, a \$1 bill, which gets the greatest use, remains in circulation an average of 18 months; a \$50 and a \$100 bill each last about nine years.

**Table 11 – Average life expectancy of US currency– in years**

<b>Denomination</b>	<b>Life expectancy (years)</b>
\$ 1	1.5
\$ 5	2
\$ 10	3
\$ 20	4
\$ 50	9
\$ 100	9

Source: Federal Reserve Bank of New York

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<sup>9</sup> Operating Circular # 2, item 4.1.

In Brazil, unfit currency was used to being incinerated in the Mecir’s furnaces a few years ago. Environmental concerns have changed procedures for currency destruction, which nowadays are basically the same as in the USA. The shredded currency has been kept stored, and up to now it has not been decided how it will be disposed.

Concerning Brazilian currency life expectancy, the most recent study on this issue, dated of 1999/2000, showed that it has a comparatively much lesser lifetime:

**Table 12 – Average life expectancy of Brazilian currency – in months and years**

<b>Denomination</b>	<b>Life expectancy (months)</b>	<b>Life expectancy (years)</b>
\$ 1	13.1	1.1
\$ 5	12.9	1.1
\$ 10	22.9	1.9
\$ 50	24.8	2.1
\$ 100	33.3	2.8

Source: Central Bank of Brazil

There are no available data on 2 and 20-*reais* banknotes lifetime, since they were introduced only in 2001 and 2002, respectively. Regarding 10-*reais* polymer banknotes, studies the studies on it have not come to a conclusion yet. Besides, due to raw material suppliers commercial interests, this subject has not been publicized.

The Brazilian Mint has evaluated coin life expectancy and concluded that Brazilian coins can last up to 15 or even 30 years, depending on the material they were made of – stainless steel or copper and nickel. In the USA, according to information provided by the Fed, the average life of a coin is estimated to be thirty years.

### 3.5. Fees

Until 1998 each Federal Reserve Bank had its own Cash Service Fee Schedule, which was heading to an inconvenient disequilibrium in cash distribution, since financial institutions always looked forward the less expensive fees. In 1998, the Federal Reserve System introduced the Uniform Cash Access Policy – UCAP – to initiate greater uniformity in the level of cash access provided throughout the Federal Reserve System. UCAP aims to reduce the number of small orders and deposits, and so streamline Federal Reserve Banks cash offices procedures, such as currency processing.

This policy provides for a base level of free currency access to all depositary institutions, but restricts the number of offices served and the frequency of access. Depositary institutions offices that meet minimum volume thresholds are able to obtain more frequent free access and fees are charged for additional access beyond the free service level. This policy applies only to currency deposits and orders, and does not include coin ones.

In Brazil, BCB does not charge depositary institutions any fee for cash services. However, as mentioned before, Banco do Brasil S.A. is allowed to charge other financial institutions when it plays BCB's role for cash service, in order to compensate its costs. In that case, this fee is calculated based on a percentage of 0.16% *ad valorem* of each deposit or order.

### **3.6. Counterfeiting Activity**

Monetary authorities should pay careful attention to counterfeiting, since it can represent a huge threat to currency reliability and economic stability. Besides being a crime, that represents losses to the public, counterfeiting can have the aim of destabilizing states and demoralize their societies.

For instance, during the American Revolution, the British counterfeited U.S. currency in such large amounts that the Continental currency soon became worthless. During the American Civil War, the Yankees and Confederates ran their printing presses overtime to falsify and debase each other's money. It is believed that, by that time, one-third to one-half of the currency in circulation was counterfeit.

In 1865 the United States Secret Service was established to suppress the wide-spread counterfeiting of US nation's currency and to take enforcement measures. It has exclusive jurisdiction for investigations involving the counterfeiting of United States obligations and securities. Today the Secret Service remains committed to the mission of combating counterfeiting by working with state and local law enforcement agencies, as well as foreign law enforcement agencies, and it maintains a working relationship with the Bureau of Engraving and Printing – BEP and the Federal Reserve System.

According to information provided by the Federal Reserve Bank of Atlanta, the amount of counterfeit in circulation in the US is very small – only 3/100ths of 1 percent of total currency. About 75 percent of all known counterfeit currency is seized before it reaches the public.

Tables 13 and 14 expose, respectively, the quantity and percentage of counterfeits detected at the Reserve Banks from 1994 to 2003:

**Table 13 – Counterfeit detected at Reserve Banks – 1994/2003 – by denomination (pieces)**

<b>Year</b>	<b>\$1</b>	<b>\$2</b>	<b>\$5</b>	<b>\$10</b>	<b>\$20</b>	<b>\$50</b>	<b>\$100</b>	<b>Total</b>
<b>1994</b>	1,145	2	6,312	62,906	54,873	4,724	58,167	188,129
<b>1995</b>	1,726	14	3,593	37,001	57,371	5,456	69,257	174,418
<b>1996</b>	5,192	11	2,454	18,775	46,580	5,940	68,339	147,291
<b>1997</b>	5,105	10	6,330	17,050	66,230	12,206	72,185	179,116
<b>1998</b>	8,127	22	16,274	25,695	84,760	10,180	63,248	208,306
<b>1999</b>	10,516	10	14,399	34,568	88,068	7,176	58,145	212,882
<b>2000</b>	8,954	11	13,994	37,466	85,654	6,375	64,556	217,010
<b>2001</b>	9,701	11	12,225	31,078	74,705	5,334	74,007	207,061
<b>2002</b>	8,880	20	10,066	25,395	69,705	6,125	49,996	170,187
<b>2003</b>	11,930	18	11,707	27,201	74,122	5,856	43,163	173,997

Source: Federal Reserve

**Table 14 – Counterfeits detected at Reserve Banks – 1994/2003 – by denomination (percentage)**

<b>Year</b>	<b>\$1</b>	<b>\$2</b>	<b>\$5</b>	<b>\$10</b>	<b>\$20</b>	<b>\$50</b>	<b>\$100</b>	<b>Total</b>
<b>1994</b>	0.00002%	0.00002%	0.00032%	0.00269%	0.00065%	0.00060%	0.00609%	0.00086%
<b>1995</b>	0.00002%	0.00014%	0.00018%	0.00161%	0.00066%	0.00075%	0.00728%	0.00077%
<b>1996</b>	0.00006%	0.00009%	0.00012%	0.00080%	0.00051%	0.00075%	0.00606%	0.00063%
<b>1997</b>	0.00006%	0.00007%	0.00031%	0.00073%	0.00066%	0.00125%	0.00666%	0.00073%
<b>1998</b>	0.00009%	0.00016%	0.00078%	0.00108%	0.00079%	0.00116%	0.00588%	0.00079%
<b>1999</b>	0.00010%	0.00007%	0.00069%	0.00145%	0.00074%	0.00073%	0.00518%	0.00073%
<b>2000</b>	0.00009%	0.00007%	0.00060%	0.00158%	0.00063%	0.00052%	0.00399%	0.00069%
<b>2001</b>	0.00008%	0.00007%	0.00052%	0.00139%	0.00053%	0.00046%	0.00481%	0.00061%
<b>2002</b>	0.00007%	0.00011%	0.00042%	0.00116%	0.00047%	0.00051%	0.00307%	0.00050%
<b>2003</b>	0.00010%	0.00009%	0.00047%	0.00125%	0.00049%	0.00048%	0.00248%	0.00050%

Source: Federal Reserve

Tables 13 and 14 show that Federal Reserve Banks have experienced a decrease of dollar counterfeiting activity these years, in absolute and relative numbers, especially regarding \$100-bill. That happens in spite of the ease and speed with which large quantities of counterfeit currency can be produced using modern photographic and printing equipment.

Also in Brazil, statistics on counterfeits apprehended by authorities in 2001 and 2002 does not reveal an increase in counterfeiting levels. As shown in table 15, although there was an increase in absolute numbers from 2001 to 2002, the percentage has decreased – since the number of banknotes in circulation has grown up.

**Table 15 – Apprehended Counterfeits in Brazil – 2001 and 2002**

Denomination	2001		2002	
	Quantity of pieces	% <sup>10</sup>	Quantity of pieces	%
<b>R\$1</b>	336	0.00004%	405	0.00005%
<b>R\$2</b>	-	0.00000%	722	0.00051%
<b>R\$5</b>	30,322	0.01434%	30,659	0.01306%
<b>R\$10 – cotton paper</b>	196,834	0.03815%	187,477	0.03108%
<b>R\$10 – polymer</b>	6,995	0.00348%	1,072	0.00052%
<b>\$20</b>	-	0.00000%	10,116	0.01202%
<b>R\$50</b>	143,513	0.02724%	180,530	0.02602%
<b>R\$100</b>	1,995	0.01452%	1,821	0.00879%
<b>Total</b>	379,995	0.01696%	412,802	0.01444%

Source: Central Bank of Brazil

Another peculiarity that can be observed is that, instead of greater denomination notes as it happens to US dollars, counterfeiters in Brazil prefer to reproduce R\$10-notes. As *real* banknotes are comparatively hold more as medium of exchange and less as store of value, it is plausible that this peculiarity is due to the fact that lower denomination counterfeits are easier to be put into circulation in commerce.

<sup>10</sup> This percentage was obtained by dividing the number of apprehended counterfeits by the quantity of banknotes in circulation on Dec. 31<sup>st</sup> of each year (see table 4)

Although it is not possible to get to a definite conclusion on comparing American and Brazilian situations just based on the data above, numbers on table 14 show that counterfeiting levels in Brazil are significant. That does not happened in the hyperinflation years, when it did not worth to produce counterfeit that would lose its “value” before it could be distributed. Nowadays, however, as inflation levels in Brazil are under control, things have changed.

Although in Brazil Mecir has the authority to identify counterfeited pieces, investigations on counterfeiting activities are on charge of the Federal Police Department, an agency under the Ministry of Justice.

### **3.7. New currency series**

As technology advances and copiers, printers, electronic digital scanners, color work stations, and computers become more sophisticated, more advanced security features have been added to deter counterfeiting. Two of these advanced features – an embedded security thread and microprinting – were first added in series 1990 notes. These two features and a number of additional ones were incorporated into a series of completely redesigned Federal Reserve notes that the US Treasury began issuing in 1996. These modified notes were introduced in order of decreasing denomination – the \$100 bill appeared in 1996, the \$50 bill in 1997, the \$20 bill in 1998, and the \$10 and \$5 bills in 2000.

This process is continuous. The Federal Reserve and the Department of the Treasury are committed to continuous improvements in currency design and expect to introduce series every seven to ten years. In the last two years, new \$20 and \$50 bills were introduced, and a new \$100 bill is to appear. The most noticeable difference in this new design is the subtle introduction of background colors, which makes it more complex for potential counterfeiters.



Redesigned and existing notes circulate at the same time. As older notes wear out, and as new-designed currency is available, the new notes naturally replace the older ones. All US currency, however, retains its full value as the United States has never recalled any of its currency.

In Brazil, the series of Real banknotes dates of 1994. Since then some small changes have done to discourage counterfeiting. Specialists have detected some inconveniences in 1994-series, such as the fact of all denominations have the same basic design. But, it can not be forgotten that it was introduced in an emergency situation –“the Real Plan” implementation.

Nowadays BCB and CMB are working together to introduce a new series of Real in 2005 or 2006. It is taken into consideration the possibility of adopting polymer as raw material for all banknotes, as Australia and New Zealand have done. The final decision, however, will be taken by the National Monetary Council (CMN).

### **3.8. Public education on currency redesign**

Since over the past years US currency has incorporated more complex security features, it has become necessary to make public informed about them. The new designs have features that an informed public can easily recognize (so-called “first level” features), medium-securities features that retailers and other cash handlers can use to authenticate currency (“second level”), and high-security features that only the Federal Reserve and the Secret Service can identify (“third level”).

For the new series design, the Department of the Treasury developed and distributed educational material throughout the United States and the world. The goal of the educational material was to inform users of US currency about the design changes to facilitate a smooth transition to the redesigned currency. Furthermore, the campaign explained the reasons for the redesign, familiarized cash handlers and users with the new features, and assured foreign users that there would be adequate suppliers of the redesigned currency and that previous designs would remain legal tender.

Such public education program can be considered essential to reduce counterfeiting activities, since the more public knows about money, the more difficult it is to circulate counterfeited currency. In Brazil, BCB has also developed a similar program on publicizing genuine currency features. Besides, Mecir officials take part in a permanent training program on counterfeiting prevention for cash handlers. In 2003 BCB spent R\$6.64 millions in these publicizing campaigns.

#### **IV – Conclusion**

Considering this paper limitations, it is possible to conclude as a result of this analysis that, although the currency and coin management organizational structures in Brazil and in the USA are different, procedures adopted in both countries have many similarities.

However, at least four weaknesses in the Brazilian model have risen after this comparison:

- ? the currency and coin supplier in Brazil is a state-owned monopolistic company; although in the USA currency and coin are also produced by US government, in Brazil this monopoly's negative effects are more noticeable;
- ? counterfeiting activity in Brazil is significant;
- ? Brazilian currency life expectancy is much lesser than it is in the USA;
- ? processing machines' capacity in Brazil is relatively reduced.

As Brazil is a developing country which has adopted severe economic policies to diminish public debt, money for public investments is scarce nowadays. In order to face the weaknesses mentioned above, the Brazilian government should take into consideration the possibility of attracting the private sector to operate in currency and coin services.

Without neglecting national strategic issues, it is possible to re-study the necessity of having CMB's monopoly in supplying money. It is clear that the advantages of competition in this case will result in more efficiency, that is, better product quality to the public and lower costs to the monetary authority. As observed, nowadays new currency and coin acquisitions represents about 80 percent of Mecir's budget.

More efficiency is needed in currency production to increase currency life expectancy and safety features at lower costs. Nevertheless, the better option for discouraging potential counterfeiters, besides publicizing safety features to the public, especially cash handlers, is increasing those safety features.

Regarding currency processing, Central Bank of Brazil has already been developing studies for gradually transferring such procedures to the commercial banks. In order to control them, auditing procedures should be created.

Finally, programs such as the US Mint's "Direct Mint Shipment Program", by which authorized armored carriers store and distribute coin to financial institutions and retailers, can be adopted by Brazilians as an example of private sector participation in cash services.

As mentioned before, this paper has limitations. To adopt such recommendations, however, the Central Bank of Brazil and the Brazilian Government should develop deeper studies to measure their convenience and the cost-benefit relation of each of them.

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- ? Federal Reserve Bank of Boston – [www.bos.frb.gov](http://www.bos.frb.gov)
- ? Federal Reserve Bank of New York – [www.newyorkfed.org](http://www.newyorkfed.org)
- ? Federal Reserve Bank of Philadelphia – [www.philadelphiafed.org](http://www.philadelphiafed.org)
- ? Federal Reserve Bank of Cleveland – [www.clevelandfed.org](http://www.clevelandfed.org)
- ? Federal Reserve Bank of Richmond – [www.rich.frb.org](http://www.rich.frb.org)
- ? Federal Reserve Bank of Atlanta – [www.frbatlanta.org](http://www.frbatlanta.org)
- ? Federal Reserve Bank of Chicago – [www.chicagofed.org](http://www.chicagofed.org)
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- ? Federal Reserve Bank of Kansas City – [www.kansascityfed.org](http://www.kansascityfed.org)
- ? Federal Reserve Bank of Dallas – [www.dallasfed.org](http://www.dallasfed.org)
- ? Federal Reserve Bank of San Francisco – [www.frbsf.org](http://www.frbsf.org)
- ? US Department of the Treasury - [www.ustreas.gov](http://www.ustreas.gov)
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