The End of Monetary Restatement and its Impact on Profitability and in the Capital Adequacy of Banks in Brazil

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Abstract

The main target of this paper is to demonstrate that inflation effects must not be ignored, even in low inflation environments, when the profitability and capital adequacy of banks in Brazil are analyzed.

Based on conceptual framework of monetary restatement, which is no longer legally admitted since 1995 in Brazil, the following hypotheses were formulated: i) the profitability ratios stemming from the so-called "legal financial statements" are significantly higher than those adjusted by inflation effects, and ii) Basel index also computed based on "legal financial statements" is significantly smaller than that adjusted by inflation effects.

For an empirical investigation of the problem, a sample of the 50 major commercial banks, ranked by total assets for the period 1996-2002, was selected, and the monetary restatement technique was used.

This technique was developed by Brazilian academics, through the utilization of General Price Index – Internal Availability (GPI-IA) on monthly bases. To verify whether the distortions were significant, hypotheses were statistically tested. The analysis of results allowed us to reject the null hypothesis between the means of legal and restated ratios, with a level of significance of 1%, for all the years within the analyzed period.

It was still evidenced that, even with an inflation of only 1.71% in 1998, the differences found could be considered statistically significant, and therefore, relevant enough for the decision making process. The research hypotheses being confirmed, it was proved that the inflation effects must be considered when analyzing the profitability and capital adequacy of banks in Brazil.

Finally, it was concluded that the minimum questioning that every user of accounting information must raise refers to the possibility of taking wrong decisions, based on the analysis of ratios taken from financial statements not adjusted by inflation.

Key words: monetary restatement, banks, profitability, capital adequacy.

Introduction

The evaluation of the financial and economic performance of a company tries to identify, through an analysis of financial statements, basically the reflex of decisions made by the administration regarding the capital structure, liquidity and profitability. Profitability ratios express the attractiveness of investments.

For the analysis of bank profitability, the most common ratios include Return on Assets (ROA) and Return on Equity (ROE). In a general manner, banks show a high dependence on third party resources, allowing a high capacity of leverage. Paradoxically, the main tool of protection against risks on a financial institution is capital.

Corroborating the principle of capital adequacy to weighted risk assets, in 1988, Basel Committee defined a basic system of capital requirements, applying a target standard ratio for the financial institutions, called Basel Index or Coefficient. In 1994, Brazil adopted these principles.

Besides the knowledge of the banking sector specificities, the validity of profitability analysis and capital adequacy of banks depends, fundamentally, on the quality of accounting information. The concept of quality must not be restricted to the accuracy of registered values or to the volume of available data, but it must, principally, be related to an appropriate measure of income and capital.

After the extinction of monetary restatement, in Brazil, in 1995, the corporate results computed according the legislation in force are changed, because they are based on values from dates with different purchase power.

Thus, it raises the question of the impact of inflationary environment on the results and capital of banks. Taking into consideration the restated historical cost, two methodologies for recognition of inflation effects on financial statements in Brazil may be used: the "one line approach" to Monetary Restatement (from here on referred to as CMB, after its definition in the Portuguese language) and the full recognition method of Monetary Restatement (from now on referred to as CMI).

Due to the cap limit of investment in the so called "permanent assets" required by Central Bank of Brazil due to prudential regulation reasons, the legal net income of the banks should turn out to be smaller than the net income computed in accordance with legal requirements, and the restated values of permanent assets and of shareholders´ equity will be higher than those coming from the use of the legal requirements. This happens because banks tend to have monetary assets, which generate losses under inflation, higher than their monetary liabilities, which generate inflation gains.

Taking these effects into consideration, the following hypotheses of research were stated: i) legal profitability ratios are significantly higher than those adjusted by inflation effects, and ii) Basel legally computed index (without inflation recognition) is significantly smaller than the index adjusted by inflation effects.

Our target is to prove that inflation effects must be considered, even in low inflation environments, when analyzing the profitability and capital adequacy of banks in Brazil. To understand the hypotheses, we present a review of conceptual and theoretical foundations regarding monetary restatement. Later, we will describe the methodology used for the empirical research and, finally, we will present the results of the statistical tests and final conclusions.

Monetary Restatement

In this part, we will see the following aspects: succinct history of monetary restatement in Brazil, basic concepts, restatement techniques and the problem of choosing the price index.

Brief History[1]

The problem of monetary restatement has always been present in the evolution of currency. The contribution of accounting research to the theme occurred in the beginning of the 20th century, in Europe. But, in 1961, the work of Edwards & Bell[2] represented a landmark in terms of measurement technique related to the theory of current cost. The above-mentioned work constitutes the basis for the development of CMI in Brazil.

The inflationary process in Brazil began in the 20s, basically due to the industrialization policy and the excess of money supply. Until the final of the 30s, there was not any restatement mechanism in place of any kind. From the beginning of the 40s to the beginning of the 60s, fixed assets revaluations were optional and dependent upon income tax regulations. The year of 1964 became known as the official year of monetary restatement, due to Law 4.506/64, which required a mandatory restatement of permanent assets, partially solving the distortions caused by inflation.

In 1966, Professor Iudícibus[3] thesis represented a keystone for the development of monetary restatement. Outside the academic environment, the main contribution came from Law 6.404/76 which, besides introducing several improvements related to financial statements of companies in Brazil, turned mandatory the annual monetary restatement of permanent assets, and of shareholders' equity determining the recognition of the difference between those monetary restatements in an income statement account. This Law greatly enhanced previous imperfections, reflecting adjustments of general price levels of all revenue and expense accounts, including gains and losses on monetary items, which should ultimately restate the net income or loss in each reporting year.

In 1979, the thesis of Professor Martins[4] represented another relevant contribution to the enhancement of monetary restatement techniques. Inasmuch as the good acceptance by part of the market of Law 6404/76, the high inflation rates of the 80s were greatly harmful to the interpretation of the effects of the CMB previous technique, causing distortions in the computation of restated net income and equity. Thus, in 1987, CVM – the Brazilian equivalent to the USA's SEC - Securities and Exchange Commission, turned mandatory integral monetary restatement. Such CMI methodology, in summary, resulted in the restatement of each non-monetary item of balance sheet, eliminating the residual net charge or credit of monetary restatement in the statement of income. In this way, it was possible to more adequately report the economic and financial situation of the company at any time.

In 1989 the United States Organization (UNO), through its ISAR group, recognized the technical quality of the CMI methodology. The International Accounting Standards Committee IASC (present IASB) informally recognized, in the same year, that the Brazilian model was the most advanced until then. Furthermore, CVM instituted, in 1991, a new concept for selecting the restatement coefficient, the Accounting Monetary Unit (AMU), free from manipulation by official restatement indexes.

In 1994, the pressure to overcome inflation became more stressed, and after economy being referred in two currencies, Law number 9.249/95 prohibited the utilization of any monetary restatement system. This was viewed as a complement to the process of deregulation of the economy indexing, consolidating the "Plano Real". One of the consequences to the companies was a larger payment of income tax than that which was effectively due[5].

In spite of Law 9249/95, the Brazilian Federal Accounting Council (CFC) issued, in 2001, its Resolution number 900, which limited the application of the principle of monetary updating only when the inflation accumulated in three consecutive years is of 100% or more. In terms of regulation or mandatory requirements, everything returned to the way it was in 1964, i.e., to ground zero.

One of the main implications, from then on, was the reduction of the importance of inflation in terms of corporate finance. However, there are still doubts regarding the effects of elimination of recognizing inflation both in results and in capital structure of companies, and several studies keep being made to demonstrate its importance and usefulness.

Santos (2000) demonstrated, through a research involving for 221 companies, that the elimination of the inflation accounting in Brazil was a mistake that resulted in the risk that business companies, experimenting actual losses, ultimately distribute dividends based on fictitious (unadjusted) profits.

Martins (2002) explained, through hypothetical examples, that even with a 5% inflation rate a year, the effects on capital invested by shareholders and, mainly, on net income, are relevant. The author concluded that Resolution CFC number 900/01, which limited the application of the principle of monetary restatement was a mistake.

Salotti (2002) concluded that capital structure and profitability ratios of 11 companies, which spontaneously prepared and reported restated financial statements in fiscal year 2000, showed significant differences regarding the ratios coming from official financial statements.

Gabriel, Assaf Neto, and Corrar (2003) concluded that the legal ROE of banks in Brazil was significantly higher than that restated by effects of inflation in the period 1996-2001. For an empirical research, data from the "Better and Bigger Companies", according to the Exame magazine, were used and statistical tests of differences in average were done.

Basic Concepts

To understand the impact of inflation on the companies' income and capital, we must first comprehend the concepts of income and capital, as well as the interdependence existing between both. The economic concept of wealth variation, also related to preserving capital, serves as a starting point for understanding the income concept.

Hicks (1974) states that a person's income is what he can consume during the week and still expect to be as well off at the end of the week as he was at the beginning.

Edwards & Bell (1961) stated that Hicks´ income concept is more appealing among the economists and added that is usually interpreted as the actual consumption during the period plus the excess of how well off the individual thinks he is at the end of period over how well off he thought he was at the beginning of the period.

Regarding capital, we know that, in its broader sense, it is about the concept of equity. Hendriksen and Van Breda (1999) present several approaches to this issue (ownership, entity, residual equity**,** business enterprise, theory of funds), concluding that there is not only one correct way which gives a complete basis for explaining. Nevertheless, Iudícibus (2000) points out that the theory of entity prevails in most cases.

The fundamental equation of the Entity Theory is given by: Assets = Liabilities + Equity. From this point of view, the organization existence is completely apart from that of its partners, and net income is expressed in terms of equity variation**,** excluding new capital increases and payment of dividends.

So, we can infer that, in the absence of price variations, income includes the increase of shareholders´ equity, excluding new capital increases and payments of dividends. But, if there are price variations, we must consider their effects to preserve the concept mentioned by Hicks and by other economists, who implicitly confirm that income must be measured in real terms. The notion of capital, from the point of view of preserving wealth, requires an evaluation of the company as a whole or, in other words, considering specific assets and liabilities at the end of each period.

Income earned according to historical cost does not consider the effects of inflation. The income based on restated historical cost just restates the historical values in terms of purchasing power from a chosen base date, measured by general price indexes.

Income based on current cost considers current market value to price the economic events, and tries to reproduce the reposition values, without considering the variations of the purchasing power, measured by general price indexes. Yet, income

based on restated current cost considers, at the same time, the variations of the average purchasing power, measured by general price indexes, and variations of specific prices from financial statement items.

Szuster (1985) states that, according to the monetary concept of capital maintenance, the investor seeks to preserve and increase the monetary value of his investment, without considering the form and quality of the assets utilized by the company. Under the optics of physical maintenance of capital, the same author admits that the company assets are quantified in terms of its capacity of operation, and that there will only be a profit when assets are superior to its replacement value necessary to assure the same level of activity.

We can conclude that restated historical cost is based on the approach of preserving the capital in terms of general purchasing power, and the concept of current cost is based on the focus of physical preservation. The restated current cost comprises the physical and monetary maintenance of capital.

Iudícibus (1998) considers restated current cost as a more rigid form of facing the problem of restating financial statements, pointing out, however, to the difficulty of a generalized use. As the pure current cost concept does not take into consideration the general price index variations, the author concludes that the practical choice falls into restated historical cost.

Restating Techniques

Based on restated historical cost, there are two techniques for recognizing the effects of inflation on financial statements: Monetary Restatement (CMB) and the Full Method (CMI). To a better comprehension, we must previously understand the concepts of monetary and non-monetary items.

The monetary assets are the rights to a fixed amount of monetary unit, representing general purchasing power (even with change in price, the items do not change). The non-monetary assets are items whose prices can vary along the time, in the presence of inflation, representing a pre-fixed level of purchasing power. On the other side of the balance sheet, monetary liabilities represent obligations of a fixed amount in a certain moment in the future, regardless of price variations. The non-monetary liabilities represent obligations to give a predetermined quantity of goods or services, or an equivalent level. Inflation is helpful for debtors and harmful to creditors, because monetary liabilities generate inflationary gains and monetary assets generate losses, as it will be seen in an example hereafter.

CMB consists in a simplified method of recognizing inflationary effects in financial statements, applying a general price index to restate the values of permanent assets and shareholders´ equity (non-monetary items). The restated counterparts of each one of the accounts of permanent assets and equity, besides those subject to monetary restatement allowed by law, must be registered in an account named "Monetary Restatement Result", whose balance is transfered to the income statement as expenses, if debtor, or as earnings, if creditor. Such technique, indirectly, considers the effects of inflation registered in just one line item in income statement, representing the net difference between gains in monetary liabilities, losses in monetary assets and the monetary restatement not applied to earnings and expenses during the fiscal year.

According to Law 6.404/76, the legal structure of permanent assets is: investments, property, plant and equipments (fixed assets), and long term deferred charges. The main accounts in equity are: authorized capital, capital reserve, revaluation reserve, earnings reserve, retained earnings, and treasury shares shown as a reduction of equity. To suitably restate the two groups, companies must keep a minimum accounting control, so it will be possible to individually relate each transaction with its account and formation date, as well as asset disposals, their historical costs, eventual revaluations, etc. Such analytic control is important, to permit the necessary adjustments, concerning mainly the recognition of depreciation/amortization expenses and assets disposals.

Restatements are usually carried out in a monthly basis, but it is also possible to work them out through daily or average indexes. Net income, after recognizing the monetary restatement result, corresponds exactly to the difference between final equity and the initial, duly restated for the constant purchasing power basis. Therefore, it can be noted that this procedure complies with the above-mentioned economic concepts of income and of maintenance of monetary capital.

Despite the difficulty, by some users, in understanding the meaning of monetary restatement registered according to the "one line method" (CMB), it consists in a partial form to prepare balance sheets and statements monetarily restated, because some components of the financial statement remain within the original values.

In the Full Approach (CMI) Brazilian technique, the effects of inflation are recognized in each and all components of the financial statements, utilizing a general price index and reporting their related final balances in terms of constant purchasing power capacity.

According to Iudícibus et al (2000), the aim of CMI is to produce statements in only one

currency for all balance sheet items, besides explaining the effects of inflation on each account in the income statement. In the author's opinion, the main enhancements introduced by Instruction CVM number 191/92 were:

- ✓ To present effects of inflation in all elements of financial statements;
- ✓ To restate final balances of non-monetary items (as inventories and pre-paid expenses) which were not considered by company law; and
- ✓ To include the present value adjustments on receivables and payables.

When we eliminated restatement systematics in just one account, a greater refinement was obtained, regarding the measuring of income statement items. Although it is possible to conciliate the results of the two techniques, CMI is more analytical and has a more informative power.

To make the comprehension of the two techniques[6] easier, in a broader sense, we have the following hypothetical example: Bank X presented the following company financial statements:

Balance Sheet - CMI ($)		
Assets	**T_0**	**T_1**
Loans Receivable	800.000	900.000
Permanent Assets	200.000	220.000
Total	**1.000.000**	**1.120.000**
Liabilities and Shareholder's Equity		
Demand Deposits	600.000	600.000
Shareholder's Equity		
Capital	400.000	440.000
Retained Earnings	-	80.000
Total	**1.000.000**	**1.120.000**

Income Statement T1 ($)	
Interest Revenue	100.000
Inflationary Loss on Loans Receivable	(80.000)
Actual Interest Revenue	20.000
Inflationary Gains on Demand Deposits	60.000
Monetary Restatement Result	-
Restated Net Income - CMI	**80.000**

Considering that inflation on period T1, measured by general price index, was of 10%, we have the following financial statements according to CMB:

Balance Sheet - CMB ($)		
Assets	**T_0**	**T_1**
Loans Receivable	800.000	900.000
Permanent Assets	200.000	220.000
Total	**1.000.000**	**1.120.000**
Liabilities and Shareholder's Equity		
Demand Deposits	600.000	600.000
Shareholder's Equity		
Capital	400.000	440.000
Retained Earnings	-	80.000
Total	**1.000.000**	**1.120.000**

Income Statement T1 ($)	
Interest Revenue	100.000
Monetary Restatement Result	(20.000)
Restated Net Income - CMB	**80.000**

First, we must restate the initial balance of permanent assets, totaling $200.000 \cdot 1{,}1 = 220.000$, and that of shareholder's equity totaling $400.000 \cdot 1{,}1 = 440.000$. The net debit balance of the monetary restatement comes from the differential of restatement counterparts between permanent assets and equity, totaling $20.000 - 40.000 = 20.000D$.

The restated net income of $ 80,000 was obtained after the recognition of debit balance from monetary restatement, decreasing the amount of the nominal interest revenue from loans receivable.

According to the concept of income, based on the variation between final and initial restated equity, we have the same amount, i.e., $520.000 - 440.000 = 80.000$.

For a better understanding of the meaning of monetary restatement result account, we have the following financial statements, found according to CMI:

Balance Sheet - CMI ($)		
Assets	T_0	T_1
Loans Receivable	800.000	900.000
Permanent Assets	200.000	220.000
Total	**1.000.000**	**1.120.000**
Liabilities and Shareholder's Equity		
Demand Deposits	600.000	600.000
Shareholder's Equity		
Capital	400.000	440.000
Retained Earnings	-	80.000
Total	**1.000.000**	**1.120.000**

Income Statement T1 ($)	
Interest Revenue	100.000
Inflationary Loss on Loans Receivable	(80.000)
Actual Interest Revenue	20.000
Inflationary Gains on Demand Deposits	60.000
Monetary Restatement Result	-
Restated Net Income - CMI	**80.000**

We can see that the restated net income of $ 80.000 is identical to that from CMB and the reasoning of equity variations is also perfectly applied to this technique. The main differential refers to the presentation of monetary restatement result in an analytical form, directly linking the inflation effects to the respective items.

The loans receivable, in the amount of $ 800.000, registered in T_0, should present a restated balance in the amount of $ 880.000 in T_1. As this is a monetary asset, we must recognize the inflationary loss of the monetary asset directly with the generated income. Thus, an income of $ 100.000, adjusted by inflation effects, becomes only $ 20.000.

On the other hand, demand deposits registered in liabilities should represent a restated balance in the amount of $ 660.000, had they been subject to indexation. As they are pure monetary liabilities, we must recognize the related inflation gain in the income statement of the reporting period, in the amount of $ 60,000.

Therefore, we can conclude that the result of $ (20.000), registered by CMB represents a loss with monetary assets (loans receivable) in the amount of $ (80.000) and a gain with monetary liabilities (demand deposits) in the amount of $ 60,000. The CMB simplified technique reached the same final result of CMI. Nevertheless, we wish to emphasize its limitation for not disclosing, in an analytical form, the inflation effects.

The Choice of Index

On the preceding item, the question of using specific indexes when adopting current cost and general indexes for monetary restatement was explained. The aim of this paper concerns just general price indexes. Therefore, it comes along the problem of choosing an adequate index for financial statement monetary restatements.

The official indexes used for monetary restatement were questioned along their history, due to the fact that they are not exempt from the introduction of bias by the government. Thus, several authors recommend the use of indexes from entities that are not influenced by government; such indexes must be representative of the general price variations in economy[7].

The major consensus, for financial statements monetary restatement purposes, refers to the use of indexes selected by Getulio Vargas Foundations (FGV), mainly its General Price Index – Internal Availability (GPI-IA). GPI-IA is structured to detect the general price fluctuations in order to reflect, in the best possible way, the variations of currency purchasing power. It is used both in National Accounts, as deflator of GDP and in the indexation of different financial operations. Its computation comprises the weighted average of three other indexes, with different weights. Prices are collected between the first and thirtieth day of the reference month.

General Price Index of Market (GPI-M) is methodologically based on the GPI-A structure. The main difference verified concerns the period of data collecting, between the 21st of the previous month and the 20th day of the reference month.

Chart 1 presents the evolution of FGV's selected indexes for the period 1996-2002.

Chart 1 – General price indexes.

INDEXES	1996	1997	1998	1999	2000	2001	2002	ACCUM.
GPI-IA	9,34%	7,49%	1,71%	19,99%	9,81%	10,40%	26,41%	119,77%
GPI-M	9,19%	7,74%	1,79%	20,10%	9,95%	10,38%	25,30%	118,69%

Source: Central Bank of Brazil.

It can be found that both indexes presented almost the same accumulated values, and any of them can be used for monetary restatement of financial statements.

Monetary restatement effects on profitability and capital adequacy of banks in Brazil

Famá (1980) stated that inflation causes intense repercussion to any investment, because besides having to select an adequate return, it is also necessary to evaluate the increase which must be required from that return, so one can recover the portion lost with devaluation of currency purchasing power.

According to Iudícibus (1998), the impact of currency purchasing power fluctuations is too large, in Brazil and in many other countries, to be neglected in Accountancy and in financial statement analysis. The horizontal and vertical analysis in inflationary environment, besides not offering comparative basis, prevents the actual performance evaluation, but the major distortions are found on profitability ratios.

Thus, we are aware of the necessity of a better understanding of inflationary effects impact on income and equity of the banks, as well as on profitability and capital adequacy, given the importance of these aspects for the analysis of financial institutions.

The most common profitability ratios applied to banking activity comprise Return on Assets (ROA) and Return on Equity (ROE). ROA is a measure that expresses the efficiency of assets profitability to the total investment. Regarding banks, we use net income as numerator and total assets as denominator. ROE is one of the main profitability measures, expressing the global results earned by the management of own and third party resources, in shareholder's benefit. Net income is used as numerator and equity as denominator.

As an indicator of capital adequacy, i.e., covering risks with own capital, we have Basel Index, comprising an internationally defined concept of Basel Committee, which recommends the minimum relation of 8% between Capital Base (CAB) – and weighted risks expressed by – Minimum Level of Capital (MLC).

In Brazil, the minimum relation required for financial institutions is given by F factor, which is of 11% at present. Basel index is computed by: CAB*100 / (MLC / F factor). CAB is obtained through the addition of equity capital and some hybrid debt capital instruments, used according current regulations, comprises: a) Weighted Risk Assets (WRA), multiplied by F factor; b) risk of swap operations; c) market risk (interest rate and foreign exchange risks) [8].

Besides Basel index, Central Bank of Brazil also requires compliance with a cap on Permanent Assets, which in essence concerns the preservation of an adequate capital structure to the financial activity. The maximum percentage of application of resources in permanent assets, in relation to the equity of financial institutions, was of 90% in 1996, gradually decreasing to the limit of 50% required from 2002 on [9].

Due to the cap limit of investment in the permanent assets, when applying monetary restatement on bank financial statements, it results in a decrease of net income in the reporting period. This happens because banks are supposed to have monetary assets, subject to losses from variations on general price index, larger than monetary liabilities, thus generating inflationary gains.

Taking into consideration capital structure of financial institutions in Brazil, and the application of CMB[10], the profitability ratios restated by the inflationary effects will be smaller than those calculated based on legal values, once the restated net income decreases (numerator) and the denominators increase both for ROE (restated equity) and for ROA (restated total assets).

The trend of restated Basel index is the reverse. This occurs because restated CAB is larger (numerator) due to equity restatement; and the increase of weighted risk assets (one of the denominator components) resulting from permanent assets restatement, is proportionally smaller than the increase in numerator.

To calculate restated CAB, we use the equity capital restatement, keeping the Tier II values constant. Due to the impossibility of obtaining internal data concerning the calculus of swap and market risk, concomitantly with CMB limitation, the adjustment of MLC considers the restatement of WRA, only when it refers to permanent assets accounts.

Restated CAB represents the concept of monetary capital maintenance. It is worth to remember that, in practice, it is very hard to obtain physical assets (formed through current costs). So, equity in constant currency comprises the differential between assets and liabilities formed in different dates, but adjusted by the effects of a general price index variation.

Chart 2 – Monetary restatement effects on profitability and on Basel's index of banks in Brazil.

Ratio	Formula	Monetary restatement effects	Restated Ratio
ROE	$\frac{\text{Net Income}}{\text{Equity}}$	✓ Decrease in net income ✓ Increase in equity	Decrease
ROA	$\frac{\text{Net Income}}{\text{Assets}}$	✓ Decrease in net income ✓ Increase in assets	Decrease
BASEL	$\frac{\text{CAB}}{\left(\frac{\text{MLC}}{\text{F Factor}}\right)} \cdot 100$	✓ Increase in capital base ✓ Little increase in minimum level of capital	Increase

Chart 2 presents a summary of the inflation effects, when following CMB directions, both on profitability ratios and Basel's index.

Research Methodology

Based on theoretical concepts for monetary restatements, the following hypotheses were stated: i) the profitability ratios stemming from the so-called "legal financial statements" are significantly higher than those adjusted by inflation effects, and ii) Basel index also computed based on "legal financial statements" is significantly smaller than that adjusted by inflation effects.

Although the conceptual logics used to formulate the hypotheses is reasonable for understanding the recognition of inflation effects on ratios, this is not enough to verify if the differences are relevant, i.e., if there is a loss in the decision making process, to the extent that the corresponding values, computed according to corporate law, may be statistically different from those which represent a better approximation of Brazilian reality.

To solve the stated problem, this paper used an empirical-analytical approach, through the adoption of statistical method.

Sampling Plan and Data Collecting

The selected sample comprised the 50 major commercial banks, ranked by total assets.

Banks include both independent institutions and conglomerate organizations (which consolidate their financial statements).

This choice is due to the fact that banks with a commercial portfolio stated higher relevance in relation to total assets of Brazilian banking system.

Due to the end of monetary restatement requirement since December 1995 on, the test period comprised the years from 1996 to 2002.

As the ranking varies each year, it was focused on selected banks based on their December 2002 position.

Besides Brazilian banks, foreign private banks and private banks with foreign participation that have branches in the country are also included, following the stated order.

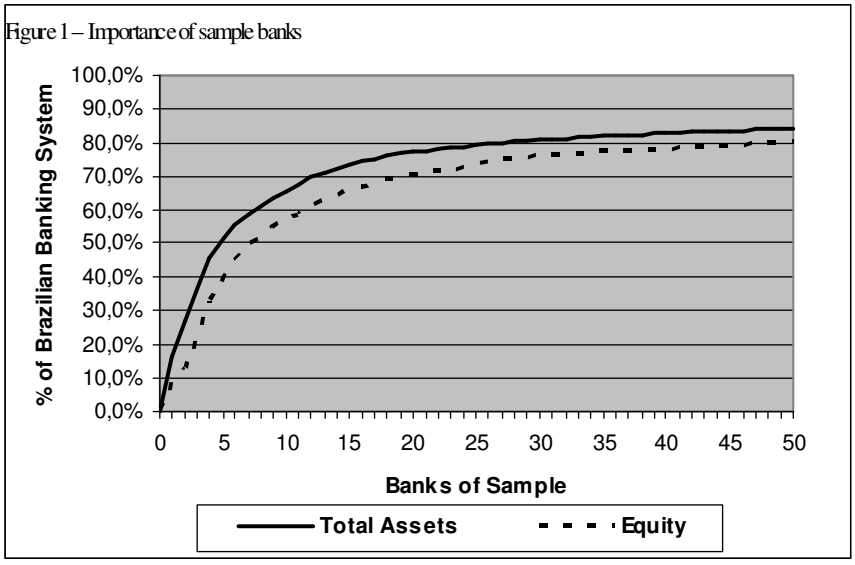
Representativity of the 50 major commercial banks in relation to total assets of banking system was of 84% in December 2002.

Regarding total equity, the sample represented 80%. Figure 1 presents the importance of the sample related to the whole banking system.

Although the 12 major commercial banks represent about 70% of banking system total assets, precautions were taken to select the 50 larger ones, because the greater the number of elements shown in the sample, the smaller the probability of errors when making the tests of hypotheses.

This reduces the fact of not being stated a standard error, and any standard deviation estimated of population that would determine the sample size, which could be

Figure 1 – Importance of sample banks



representative of the universe of banks in Brazil (137 in December 2002) [11].

Financial statements of banks are published every June and December each year. For the purposes of this research, around 3,500 monthly trial balance and 700 semiannual statements, made available by Central Bank of Brazil [12] were handled.

Variables Definition

Variables are constitutive elements of tests of hypotheses. The operational definition is that which indicates how the phenomenon is measured. This part of the chapter explains the assumptions and criteria used to compute the monetary restatements, as well as the computation of profitability ratios and Basel index (variables).

To restate financial statements of the banks pertaining to the sample, the simplified technique of Monetary Restatement (CMB) was used, through the utilization of General Price Index - Internal Availability (GPI-IA). Restated balances of permanent assets and equity accounts were calculated in monthly bases. It was also considered that these variations occur on the last day of the month, restating them only from the following month, when the balance of the respective account is incorporated.

Permanent assets are formed by the following Cosif [13] accounts: 21000003 – investments; 22000002 fixed assets; 23000001 lease fixed assets; and 24000000 – deferred. Restated permanent assets (RPA) result from the addition of these monetary restated accounts by inflation effects, as shown below.

To restate investments in subsidiaries, one should consider the effects of any provisions, equity accounting results and investments valued at cost, in order to verify the actual monthly increase or decrease. But, as it is impossible to identify all these values through Cosif's structure and it can also not be obtained the restated financial statements from the subsidiaries, it was calculated in the following way:

$$RINV_t = RINV_{t-1} \cdot \left(1 + \frac{P_t}{P_{t-1}}\right) + \left(INV_t - INV_{t-1}\right)$$

Where:

RINV = restated investment balance.
P = general price index.
INV = legal investment balance Cosif's 21000003 account.
t –1 = initial month.
t = following month.

Regarding fixed assets, the effects of depreciation expenses were considered first to obtain the nominal variations of the period:

$$VFXA_t = FXA_t - \left(FXA_{t-1} + DEP_t\right)$$

Where:

VFXA = legal fixed assets variation.
FXA = legal fixed assets balance, Cosif's account 22000002.
DEP = legal fixed assets depreciation expenses, registered in Cosif's account 81820003.

Thus, if VFXA was higher than 0 (zero) it was considered a new acquisition, on the contrary, a disposal. It was not made any restatement of the acquisitions during the month for addition. When disposals, they were restated by using the First-In, First-Out (FIFO) method:

$$RVFXA_t = VFXA_{t-1} \cdot \left(1 + P^*\right)$$

Where:

RVFX = restated disposals of fixed assets.

P * = in the case that the accumulated disposals, until the related month was smaller that the net balance, in December 1995, the disposals were restated by the inflation ratio from December 1995 to the month being considered. When this condition was not fulfilled, inflation since the acquisition month has been used (subsequent to December 1995), proportionally to the values formed in different moments, until the month when such variation was observed.

Besides the restatement of disposals, depreciation expenses were also adjusted (RDEP), as follows:

$$RDEP_t = RFXA_{t-1} \cdot \left(\frac{DEP_t}{FXA_{t-1}}\right)$$

Due to the impossibility of identifying the depreciation synthetic depreciation expense account to the related assets subject to depreciation, the ratio between monthly expenses and the respective fixed assets cost of the previous period was calculated (initially based on legal values) and then it was multiplied by the restated cost.

Thus, restated fixed assets cost is obtained through restating the initial balance by the variation of the monthly inflation variation, added to the balance variation during the period (acquisition or restated disposal) and by the restated depreciation, in accordance to the formula below:

$$RFXA_t = RFXA_{t-1} \cdot \left(1 + \frac{P_t}{P_{t-1}}\right) + RVFXA_t + RDEP_t$$

For the other groups of permanent assets, the adopted procedures utilized in this research are similar to those applied to the fixed assets**.** It is only necessary to substitute in the above formulae the respective Cosif's accounts[14].

Considering monthly variations of the equity accounts, their restatement was calculated in a direct manner. Relating to the disposals, no adjustments were made, because, with the exception of net income, they come from accounts of the same group and, when there is income distribution, the amounts are already stated in currency of purchasing power at the end of the reporting period.

$$REQ_t = REQ_{t-1} \cdot \left(1 + \frac{P_t}{P_{t-1}}\right) + (EQ_t - EQ_{t-1})$$

Where:

REQ = restated equity.
EQ = book balance of equity, according to the legal requirements, Cosif's 60000002 account.

The banks restate the semiannual financial statements, and the results of the first semester are incorporated to shareholders´ equity in June 30, when t = 6. Therefore, restated equity must be calculated at the end of the first semester as follow:

$$REQ_t = REQ_{t-1} \cdot \left(1 + \frac{P_t}{P_{t-1}}\right) + (EQ_t - EQ_{t-1}) + MRM$$

Where:

MRM = monetary restatement result.

The method is similar for the end of the second semester, when t = 12.

The result of monetary restatement is formed by the difference between permanent assets and equity, restated by inflation, added to the difference

$$MRM = \sum_{k1}^{6} \left[(RPA_{t-1} - REQ_{t-1}) \cdot \frac{P_t}{P_{t-1}} + (RDEP_t - DEP_t) + (RVFXA_t - VFXA_t) \right]$$

of depreciation expenses and to the disposals of permanent assets, as shown in the formula below:

The result of monetary restatement of the semester comprises the addition of the results of each of its months. The methodology is similar for the end of the second semester.

Net income is computed after deducting the provision for income tax and the social contribution tax, and disregarding any expense related to interest on own capital (JSCP)[15]. Conceptually, the best form for understanding the calculus of restated income is through the variation between final and initial restated equity, as shown in the formula below:

$$RNI_{t12} = REQ_{t12} - EQ_{t0} \cdot \frac{P_{t12}}{P_{t0}} - \sum_{k1}^{12} \left(VEQ_{tk} \cdot \frac{P_{t12}}{P_{tk}} \right)$$

Where:

RNI = net income restated for t12 currency.
VEQ = equity variation, except that from net income.
t_0 = initial moment of the period.
t_{12} = final moment of the period.
t_k = each month of the period.

Regarding the computation of the profitability ratio, a practical and very important question refers to the denominators. As net income is added to equity and formed along the year, ROE computation exclusively based on initial or final equity balances is incorrect. Thus, some authors suggest the utilization of average values for denominators, in order to catch the dynamic effect of net income in relation to the statical effects of assets and equity. However, the main deficiencies in using the average refer to the non-linear behavior of income and capital variations along the year.

According to Martins (1993), the variations on equity, except that of net income itself, must be computed proportionally to the time they affected the result and after being restated too. The author presents the following formula, used in this paper, for the computation of restated ROE:

$$RROE = \frac{RNI_{t12} = REQ_{t12} - EQ_{t0} \cdot \frac{P_{t12}}{P_{t0}} - \sum_{k1}^{12} \left(VEQ_{tk} \cdot \frac{P_{t12}}{P_{tk}} \right)}{EQ_{t0} \cdot \frac{P_{t12}}{P_{t0}} + \sum_{k1}^{12} \left(VEQ_{tk} \cdot \frac{P_{t12}}{P_{tk}} \cdot \frac{t_{12} - t_k}{t_{12} - t_0} \right)}$$

Where:

RROE = return on equity restated by inflation effects.
RNI = restated net income for t_{12} currency.
REQ = restated equity.
P = general price index.
VEQ = equity variation computed in accordance with legal requirements, except that of net income itself.

According to the formula above, it is implicitly presumed that variations occur on the last day of the month. Thus, if we exclude the results of the period for calculating average restated equity, and if we consider that the average is calculated based only on balances until November, we reach to the same amount computed according to the most complete formula.

After introducing the formula for ROE Restated by inflation effects, the computation of the Legal ratio becomes easier, because there is not any restatement for net income (NI) and equity (EQ), as shown in the formula below:

$$ROE = \frac{NI_{t12}}{EQ_{t0} + \sum_{k1}^{12} \left(VEQ_{tk} \cdot \frac{t_{12} - t_k}{t_{12} - t_0} \right)}$$

To obtain ROA, the reasoning is similar, but with some specificities. It is known that in the assets side must only the accounts that are part of permanent assets must be restated, so, it is not possible to apply the same previous formula, through which monthly variations were completely restated. Therefore, to calculate the restatement of average assets, the restated balances until November will be used.

Besides, to keep uniformity with the procedure adopted for restatement of equity, it must be excluded from assets the effects of the results of the period.

$$RROA = \frac{RNI_{t12}}{\frac{\sum_{k0}^{11}\left(RASSET_{tk} \cdot \frac{P_{12}}{P_{tk}}\right)}{11}}$$

Where:

RROA = return on assets restated by inflation effects.
RASSET = total assets restated by inflation effects (restated permanent assets plus monetary assets), excluding the effects of net income for the period.

Once the Restated ROA by inflation effects is understood, the calculation of the Legal ratio becomes easier, because there is not any restatement for net income and assets:

$$ROA = \frac{NI_{t12}}{\frac{\sum_{k0}^{11}(ASSET_{tk})}{11}}$$

Restated Basel index by inflation effects was calculated as follows:

$$RBASEL = \frac{RCAB_{t12} \cdot 100}{\left(\frac{RMLC_{t12}}{F\,Factor}\right)}$$

Where:

F Factor = 0,11 according to Central Bank of Brazil rules.
RCAB = restated capital base. Represents the addition of restated equity and other accounts that do not belong to equity capital, registered in Tier II capital accounts (not subject to monetary restatement). It is obtained through the following formula:

$$RCAB = REQ_{t12} + \text{Tier II accounts}_{t12}$$

RMLC = restated minimum level of capital. From weighted risk assets, only the 100% weight was altered, due to the restatement of permanent assets accounts. The other weights do not present accounts subject to monetary restatement. Maintaining the swap and market risk values constant, MLC is restated through the following formula:

$$RMLC = FFactor \cdot RWRA_{t12} + Swap_{t12} + Câmbio_{t12} + \Pr e_{t12}$$

Where:
RWRA = weighted risk assets + differential between restated and legal accounts from permanent assets.

Legal Basel index was calculated as previously demonstrated, without considering inflation effects on capital base and minimum level of capital. After obtaining legal and restated indexes, in annual bases, as well as their respective differences, statistical tests for analyzing data were applied.

Statistical Tests

In order to verify if the distortions caused by recognizing inflation effects on profitability ratios and Basel index were significant, hypotheses tests were applied. The main target of these tests is to validate or reject a hypothesis (statements on populational value parameters) through the results of the sample.

The decisions involving statistic tests of hypotheses contain a certain risk level. A type I error was used, (probability to reject H_0 when real), level of significance α = 1%. Therefore, there is 99% probability that the difference between the ratio means is not a consequence of just the sampling variability, when the null hypothesis is rejected.

The paired-samples t Test procedure compares the means of two variables for a single group. This test focus on the evaluation of the effect of some "treatment" in an expected variable, utilizing each element as its own control, so all variables may be matched, except the focused one. Monetary restatement was evaluated for each profitability and Basel index, using the legal values distribution as a sample and the same distribution, but with restated values, as related sample, once the last value "suffered" monetary restatement effects.

Bussab e Morettin (1987) described the test formulation similarly to the comparison of the two independent sample means (A and B), but now we have two matched observations formed by pairs (A_1, B_1), (A_2, B_2), (An, Bn). Defining $D = A - B$ variable, we have D_1, D_2, D_N samples. Supposing that D follows a normal distribution, with $\overline{D}$ mean and standard deviation S_D, the statistical test is calculated as follows:

$$t_{teste} = \frac{\overline{D} - \mu_D}{\frac{S_D}{\sqrt{n}}}$$

Where:

μ_D = mean difference hypothesis, 0 (zero).
$\frac{S_D}{\sqrt{n}}$ = standard deviation of sampling distribution.

The parametric tests comprise observation of parameter (premises). The main premise of paired-samples t Test is that the distribution of differences between means is normal. To verify this assumption, Kolmogorov-Smirnov test was applied.

According to the test formulation, described by Siegel (1956), the null hypothesis considers that the sample was the result from specific

theoretical distribution, i.e., it is expected that the differences between distribution of accumulated frequency of a random sample of N observations, $F_o(X)$, and distribution of theoretical accumulated frequency under H_0, $F_e(X)$, be small and within the limit of randomic errors. This test focus on the major absolute difference, $|F_e(X) - F_o(X)|$, called Maximum Deviation (MD).

For decision making concerning the acceptance or rejection of the null hypothesis we simply make the evaluation of "P-Value", which represents the calculated area of distribution after the statistic based test, indicating the probability of occurring more extreme statistical values than those observed. If this is higher than α, H_0 is accepted; otherwise H_0 is rejected.

We also wish to emphasize that before applying the tests, observations which are out of the expected dimensions were excluded – the outliers. To detect them, the normal score (Z_1) was calculated, and those in absolute value (module) higher than three were disregarded.

In parametric test of paired samples the distribution t of Student and one-tailed test were considered. Considering A = Legal ROA or Legal ROE and B= Restated ROA or Restated ROE, there are the following profitability hypotheses:

H_0: $\mu_A = \mu_B \rightarrow \mu_A - \mu_B = \mu_D = 0$.
H_1: $\mu_A > \mu_B \rightarrow \mu_A - \mu_B = \mu_D > 0$.

To formulate Basel index hypothesis, A= Legal Basel index and B = Restated Basel index were considered:

H_0: $\mu_A = \mu_B \rightarrow \mu_A - \mu_B = \mu_D = 0$.
H_1: $\mu_A < \mu_B \rightarrow \mu_A - \mu_B = \mu_D < 0$.

For the application of normality test, a Kolmogorov-Smirnov test for one sample, and two-tailed test with an α = 1% were used. Considering *D* = *A-B*, being A = ROA, ROE or Legal Basel index, and B = ROA, ROE or Restated Basel index by inflation effects, respectively, there are the following hypotheses:

H_0: D follows a normal distribution.
H_1: D does not follow a normal distribution.

Analysis of Results

Chart 3 shows the main results of tests done by using the Statistical Package of Social Science (SPSS) software, version 10.0.

Considering the results of paired-samples t Test both of profitability ratios and Basel index, we can see that, for all the years within the analyzed period, P-value was smaller than α, allowing the rejection of null hypothesis. As 0 (zero) is not within Confidence Interval (CI), we can reach the same conclusion.

Considering the results of normality test, we can se that P-value was higher than α for all the years within the analyzed period, allowing acceptance of the hypothesis that *D* follows a normal distribution and validating the results of the parametric test.

Based on results of tests for ROA and ROE, we can confirm the first hypothesis of the research, i.e., legally based profitability ratios of banks in Brazil are significantly higher than those adjusted by inflation effects.

Chart 3 – Statistical test results.

ROA		Paired-Samples t Test				Normality Test	
Year		P-Value	CI		Decision	P-Value	Decision
1996	0	1,36E-08	0,0027	0,0062	H_0 Rejected	0,7158	H_0 Accepted
1997	0	2,69E-11	0,0026	0,005	H_0 Rejected	0,6907	H_0 Accepted
1998	0	4,18E-14	0,0011	0,0019	H_0 Rejected	0,6215	H_0 Accepted
1999	0	1,29E-08	0,0051	0,012	H_0 Rejected	0,9418	H_0 Accepted
2000	0	6,85E-12	0,0057	0,0107	H_0 Rejected	0,2117	H_0 Accepted
2001	0	3,50E-13	0,0063	0,0111	H_0 Rejected	0,2963	H_0 Accepted
2002	0	4,46E-13	0,0134	0,0238	H_0 Rejected	0,6212	H_0 Accepted

ROE		Paired-Samples t Test				Normality Test	
Year		P-Value	CI		Decision	P-Value	Decision
1996	0	8,47E-13	0,0298	0,0521	H_0 Rejected	0,7968	H_0 Accepted
1997	0	3,15E-19	0,0365	0,0527	H_0 Rejected	0,1085	H_0 Accepted
1998	0	7,84E-10	0,0171	0,0361	H_0 Rejected	0,0528	H_0 Accepted
1999	0	6,60E-08	0,0637	0,1613	H_0 Rejected	0,4229	H_0 Accepted
2000	0	7,13E-25	0,086	0,1127	H_0 Rejected	0,2778	H_0 Accepted
2001	0	2,49E-24	0,0877	0,1164	H_0 Rejected	0,2484	H_0 Accepted
2002	0	6,51E-24	0,1781	0,238	H_0 Rejected	0,4908	H_0 Accepted

BASILÉI		Paired-Samples t Test				Normality Test	
Year		P-Value	CI		Decision	P-Value	Decision
1996	0	9,44E-12	-0,769	-0,418	H_0 Rejected	0,9473	H_0 Accepted
1997	0	9,78E-13	-1,238	-0,698	H_0 Rejected	0,5071	H_0 Accepted
1998	0	1,96E-10	-1,374	-0,678	H_0 Rejected	0,2208	H_0 Accepted
1999	0	1,21E-13	-2,897	-1,667	H_0 Rejected	0,29	H_0 Accepted
2000	0	5,79E-14	-2,796	-1,629	H_0 Rejected	0,6109	H_0 Accepted
2001	0	8,65E-14	-2,603	-1,507	H_0 Rejected	0,3479	H_0 Accepted
2002	0	3,43E-13	-3,772	-2,138	H_0 Rejected	0,4984	H_0 Accepted

Figures 2 and 3 show the behavior of average profitability ratios, during the analyzed period.

Figure 2 – Average Return on Assets (ROA).

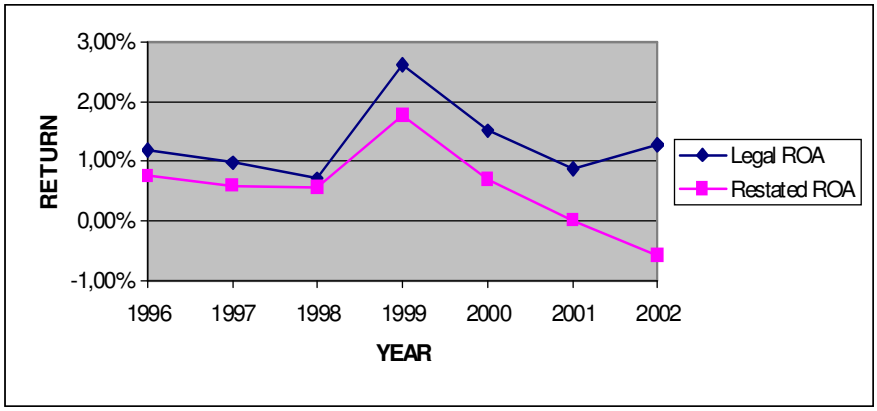
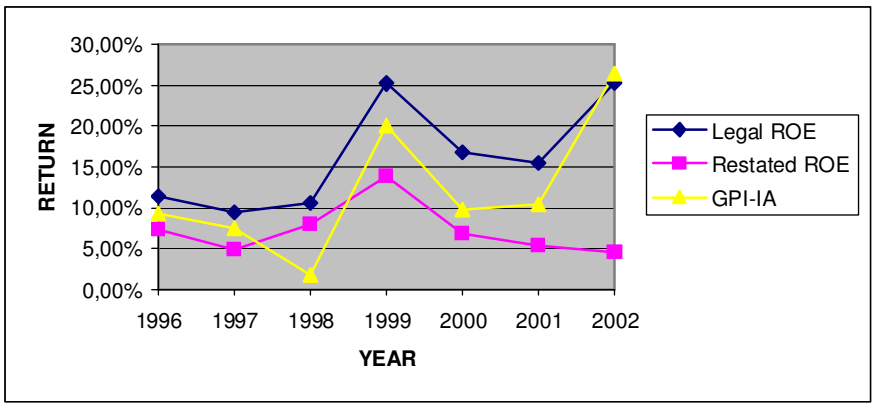


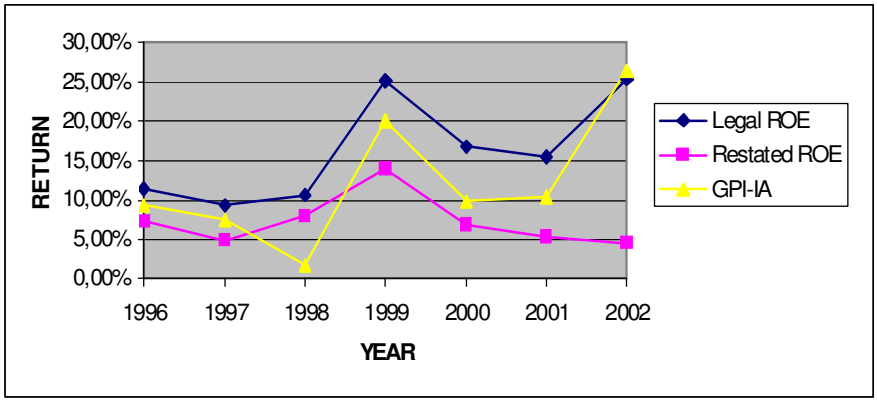
Figure 3 – Average Return on Equity (ROE).



When inflation increases, its cumulative effects, together with the gradual reduction of the caps of investment in permanent assets caused a larger distortion on profitability indexes.

Based on the results of Basel index, it was confirmed the second research hypothesis, i.e., legal Basel index of banks in Brazil is significantly smaller than that adjusted by inflation effects. Figure 4 shows the behavior of average Basel index during the analyzed period.

Figure 4 –Average Basel Index.



Regarding Basel index, a final comment must be made. The implementation of the New Basle Capital Accord aims to introduce enhancements in the computation of the minimum capital requirement, besides increasing market discipline by establishing a series of aspects related to public disclosure. This way, it should be noted that not taking into consideration the inflation effects impairs the proposed enhancements.

Therefore, when the research hypotheses are validated as they were in this study, it is proved that inflation effects cannot be ignored, even in reduced inflation rates environment, when analyzing profitability and capital adequacy of the banks in Brazil. We also found out that even with an inflation of only 1.71% in 1998, the resulting differences were considered statistically relevant.

It is also possible to state that banks are reporting nominal profitability higher than the actual ones and that there is a larger coverage of risks for the restated equity. Considering a risk-return relation, this statement is reasonable, because if actual profitability is smaller, consequently it must exist larger risks coverage, represented by Restated Basel index.

Conclusions

The validity of the analysis of profitability and capital adequacy depends on an appropriate measure of income and capital. Among the ways of measuring assets, at entry values, and consequently of income, the restated historical cost is based on monetary concept of capital maintenance in terms of general purchasing power. Based on this approach, there are two methodologies, developed in Brazil, to calculate the monetary restatement of financial statements: the "one line approach" of Monetary Restatement (CMB) and the Full or Total Approach (CMI).

There is a consensus in literature about technical and informative superiority of the last one. However, it must be emphasized that through the simplified form, it is obtained a good approximation for the recognition of the inflation effects in all balance sheet items, if just permanent assets and equity are restated.

After the extinction of the compulsory monetary restatement in 1995, in Brazil, net income and equity in financial statements became expressed in values formed in different moments (with different purchasing power), impairing the quality of accounting information. Confirming the research hypotheses, it was proved that inflation effects must be considered when analyzing profitability and capital adequacy in banks of Brazil.

Finally, we can conclude that the minimum questioning that every user of accounting information must raise refers to the possibility of taking wrong decisions, based on the analysis of ratios taken from non-restated financial statements.

However, it must be remembered that financial decisions are hardly taken based on assumptions, as in the exact sciences. This way, regardless of how well quantified are the parameters of applied human sciences, they are constituted, at most, of reasonable approximations of reality, such reality being represented by an environment where there are price variations.

Still, there must be a better understanding about the relevance of monetarily restated financial statements and how this must be incorporated in the expectations and preferences of users of accounting information.

Bibliography

ASSAF NETO, Alexandre. *Finanças corporativas e valor.* São Paulo: Atlas, 2003.

_____. *Estrutura e análise de balanços: um enfoque econômico-financeiro, comércio e serviços, indústrias, bancos comerciais e múltiplos*. 4 ed. São Paulo: Atlas, 1998.

BARBIERI, Geraldo, SANTOS, Ariovaldo dos. Fim da correção monetária de balanços e início da taxa de juros de longo prazo (TJLP) sobre o capital próprio - alguns de seus principais efeitos. *Informações Objetivas.* Temática Contábil. São Paulo, n.16, p.152 - 163, 1996.

BASLE COMMITTEE ON BANKING SUPERVISION. Overview of the new Basle capital accord. BIS, April, 2003. Disponível em <http://www.bis.org/publ/bcbsca02.pdf>. Acesso em: 25 out. 2003.

_____. International convergence of capital measurement and capital standards. BIS, July 1988. Disponível em <http://www.bis.org/publ/bcbs04A.pdf>. Acesso em: 27 out. 2003.

BERNARDO, Mauro Santo, TACHIBANA, Wilson, MARTIN, Nilton Cano. The evolution of monetary correction in Brazil and its effects in the financial statement from 1929 to 2000. *Accounting History International Conference*, 2001 Osaka.

BUSSAB, Wilton O., MORETTIN, Pedro A. *Estatística básica*. 4 ed. São Paulo: Atual, 1987.

DOUPNICK, Timothy S., MARTINS, Eliseu, BARBIERI, Geraldo. Innovations in Brazilian inflation accounting. *International Journal of Accounting*. London, v.30, n.4 , p.302-17, 1995.

EDWARDS, Edgar O., BELL, Philip W. *Theory and measurement of business income*. Berkeley: University of California, 1961.

FAMÁ, Rubens. *Retorno sobre o investimento: sua utilização no Brasil, face à inflacao e à evolução da legislação sobre a correção monetária nos demonstrativos financeiros*. Dissertation of Master of Science presented to the School of Economy, Administration and Accounting of University of Sao Paulo. Sao Paulo, 1980.

FIPECAFI. *Aprendendo contabilidade em moeda constante*. São Paulo: Atlas, 1995.

GABRIEL, Fabiano, ASSAF NETO, Alexandre, CORRAR, Luiz João. O impacto do fim da correção monetária no retorno sobre o patrimônio líquido dos bancos brasileiros. In: 3º BRAZILIAN MEETING OF FINANCE, University of Sao Paulo, July, 2003.

HENDRIKSEN, Eldon S., VAN BREDA, Michael F. *Teoria da contabilidade*. São Paulo: Atlas, 1999.

HICKS, John Richard. *Value and capital: an inquiry into some fundamental principles of economic theory*. Oxford : Clarendon Press, 1974.

IUDÍCIBUS, Sérgio de. *Teoria da contabilidade*. 6 ed. São Paulo: Atlas, 2000.

_____. *Análise de Balanços: análise da liquidez e do endividamento, análise do giro, rentabilidade e alavancagem financeira*. 7 ed. São Paulo: Atlas, 1998.

_____. *Contribuição à teoria dos ajustamentos contábeis*. Thesis of Doctorate presented to the School of Economy, Administration and Accounting of University of Sao Paulo. Sao Paulo, 1966.

MARTINS, Eliseu. A posição do Conselho Federal de Contabilidade com relação à atualização monetária dos balanços: decepção!, parte 1e 2. *Informações Objetivas.* Temática Contábil e Balanços, São Paulo, v.36, n.15 e 16, p.1-6, 2002.

_____. *Aspectos da alavancagem financeira e do lucro no Brasil*. Thesis presented to the School of Economy, Administration and Accounting of University of Sao Paulo. Sao Paulo, 1980.

_____. *Análise da correção monetária das demonstrações financeiras*. São Paulo: Atlas, 1980.

REED, Edward W., GILL, Edward K. *Bancos comerciais e múltiplos*. São Paulo: Makron Books do Brasil, 1994.

RODRIGUES, Raimundo Nonato. *O acordo da Basiléia: um estudo da adequação de capital nas instituições financeiras brasileiras*. Dissertation of Master of Science presented to the School of Economy, Administration and Accounting of University of Sao Paulo. Sao Paulo, 1998.

ROSS, Stephen A., WESTERFIELD, Randolph W., JAFFE, Jeffrey F. *Administração financeira*. São Paulo: Atlas, 1995.

SALOTTI, Bruno Meirelles. O fim da correção monetária integral e seu impacto em alguns índices de análise de balanços. In: 2º USP ACCOUNTING SEMINARY, Sao Paulo, October, 2002.

SANTOS, Ariovaldo dos. Efeitos da inflação? Olhem bem os balanços do Banco do Brasil e do Banco do Nordeste. *Informações Objetivas*. Temática Contábil e Balanços, São Paulo, v. 34, n. 1, p. 1-6, jan. 2000.

SAUNDERS, Anthony. *Administração de instituições financeiras.* São Paulo: Atlas, 2000.

SIEGEL, Sidney. *Nonparametric statistics: for the behavioral sciences.* New York: McGraw-Hill, 1956.

SZUSTER, Natan. *Análise do lucro passível de distribuição: uma abordagem reconhecendo a manutenção do capital da empresa.* Thesis of Doctorate presented to the School of Economy, Administration and Accounting of University of Sao Paulo. Sao Paulo, 1985.

WOELFEL, Charles J. *The handbook of bank accounting: understanding and applying standards and regulations*. Chicago: Bankers Pub. Co, 1993.