

# **PROCYCLICALITY OF THE BANKING SYSTEM: THE PRUDENTIAL AND ACCOUNTING FRAMEWORK OF THE PROCYCLICALITY OF BANK BALANCE SHEET**

**Ghada El Khoury**

University of Liège

HEC- Faculty of Business Administration

4000 Liège

Belgium

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e-mail: g.khoury@ulg.ac.be

telephone : +32 494 195739

## **Abstract**

*This article discusses the debate on the pro-cyclicality of finance and the movement of capital and credit which results from it. It describes the relationship between regulation and stability of the financial system and shows the potential impact of regulation on the behaviour of lending and the succession of financial crisis. More fundamentally, it would be subject to analyze the dynamics of capital under the new Basel II accord and observe its pro-cyclical effects through various types of instruments. However, it cannot be ignored that monetary policy is at the heart of discussions on measures to promote price stability in the economy. We examine the transmission mechanisms of monetary policy on the economy and its impact on the behaviour of capital and credit. We study the subsequent implementation rules for accounting standards associated to bank balance sheet and subsequently their cyclical effects. Furthermore, we examine the consequences of accounting standards on the supply of credit and capital. Finally, possible measurements and solutions are formulated to limit the effects of dynamic behaviour of credit and bank capital.*

**Keywords:** *procyclicality; accounting standard; monetary policy; prudential regulation*

**JEL codes:** *E32; E52; G01; G38; M41*

## 1. Introduction

The past decade has been characterised by numerous financial crisis. Any turbulence affecting the wellbeing of financial sector needs to be reviewed and integrated into the banking regulation. As a result, this increases the role of prudential regulation of banks. Hence, prudential regulation is important as it aims to increase the stability of the banking sector. It is largely inspired by the Basel Accord which dictates the standard in banking regulations. The objective of this accord is to make regulatory capital<sup>1</sup> more risk-sensitive which can amplify business cycle fluctuations. Despite its positive effects on the supervision of banks, Basel II has been criticized for its procyclical effects which in turn have generated much debate in the contemporary literatures. The procyclicality is very complex in nature and depends on several factors. However, it is important to focus on the scope of regulatory capital which results from the Basel accord and international accounting standards.

Most of the existing literatures on the consequences of Basel II tend to focus on its quantitative aspect. The macro-economic consequences related to the issue of procyclicality are uncommon. Hence, we attempt to examine this subject in this paper. We analyze the linkages between the regulation of equity and financial stability. This paper also analyzes the problem of procyclicality resulting from both prudential and accounting frameworks.

We begin this paper by an analysis of the objectives and effects of the regulation. Then, we talk about the relationship between regulation and financial crisis of the nineties (1990 and 1991) and the recent subprime crisis (2007-2008). Then we discuss and develop the concept of the procyclicality from prudential point of view. We examine the elements of the Basel agreements that mitigate or exacerbate the procyclicality. Given the importance of liquidity as evidenced in the recent crises, we also examine the effects of monetary policy adopted by central banks and its impact on the amplification of the cyclicity of the banks.

We extend our analysis to the accounting framework of the procyclicality and the prudential impact of the new accounting standards, particularly the influence of accounting standards on the behaviour of credit institutions and financial stability. Finally, solutions are proposed to limit the effects of such dynamic on the bank behaviour.

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<sup>1</sup>Regulatory capital is defined by regulators. It is the ratio which equals to regulatory equity (numerator) to risk-weighted assets (denominator). It must be at least equal to 8%.

## **2. The regulation on equity and financial stability**

In contrast to other liabilities, capital can be used to absorb the potential losses of a bank. Thus, the regulatory capital shows a certain level of resilience and protects banks against insolvency. The choice on the level of bank capital is not new. Its origin dates back to as early as 1958 in the work of Modigliani and Miller. Their work has been challenged by theories of "transaction costs" and "information asymmetry" that apply to the banking sector (Stiglitz and Weiss (1981 and 1992), Myers and Majluf (1984); Howe and Shilling (1988), Gorton and Winton (2002).

The relationship between regulation and financial stability can be derived by an estimation of risks and equity requirement of the banks. The regulations have two main objectives, a micro prudential supervision which reduces the risk of bankruptcy (idiosyncratic shock) (Borio, 2003), and macro prudential supervision which reduces the negative consequences of the evolutions in the banking system. Thus, the examination of the systemic risks of the economy is the purpose of the macro-economic approach (BIS, 2002, p.145). The equity along with their microeconomic features has two main functions that fall within the macro level. These functions avoid systemic risk, improve financial stability, and mitigate competitive inequalities between banks<sup>2</sup> (BIS 1988, p.2). However, the macroeconomic requirements are not adequately addressed in the regulatory arrangements and prudential supervision.

## **3. The impact of regulation on the credit supply and financial crisis**

### ***3.1 The behaviour of credit supply***

There is a much debate on the impact of equity on the credit supply of the banks. Berger and Udell (1994) state the less influential role of equity on the credit supply, whereas Sherives and Dahl (1995) state it otherwise.

During the early 1990, most of the countries changed their credit policies as a result of a contraction in bank loans supply. This might also be linked to the entry of Basel I (Roche, JC, 2008). This has engendered the recession of 1990 and 1991, during which there was deterioration in the quality of portfolios, increased provisions and the reduction of the regulatory capital. Banks facing difficulty to increase their capital, reduced their credit supply

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<sup>2</sup> Cited by BIS in 1988 Tartari, D., 2002. «De la régulation en matière des capitaux propres du système bancaire », Thesis submitted to the Faculty of Economics and Social Sciences at the University of Freiburg (Switzerland).

(the denominator of the ratio), to maintain the solvency ratio to its desired level. This provoked procyclical behaviour of the regulatory constraint of banks which was further fuelled by insufficient capital.

The effects of regulation are asymmetrical. In an unregulated environment, the exogenous shock reduces the capital and the credit supply in an identical manner (Tartari, D., 2002). In addition, Tartari adds that in a regulated environment which is under-funded, an exogenous shock amplifies its effects and leads to a fall in credit supply greater than that of equity. It is clear that without regulation, procyclicality could be excessive<sup>3</sup>. In contrast, the capital constraint in the new agreement leads to an amplification of economic cycles overtime which subsequently leads to an increase in the procyclicality.

The amplification is a direct consequence of the capital constraint imposed on banks. The reduction in the credit supply is essentially due to the existence of regulatory capital. This constraint further accentuates the economic recession. This idea is consistent with the process of "financial accelerator" analyzed by Ben Bernanke<sup>4</sup>. As Basel II accord is applied, it is interesting to observe the adverse effects of regulatory capital on credit supply and the subsequent deterioration of the economic cycle by the creation of capital crunch.

The credit crisis of the nineties emerged following the implementation of Basel I. The "credit crunch" during that recession was due to insufficient capital. The solution was to raise capital to a level well beyond the amount imposed by the regulator. Thereafter, the banking sector has developed its risk assessment techniques and models of economic capital in a more rigorous regulatory framework in the form of Basel II. However, we witnessed another major crisis in 2007 even with the implementation of Basel II in its preliminary phase. The phenomenon of credit crunch has taken another form and was triggered by other factors including poor risk management. This was mainly due to a greater sensitivity of capital to risk and the potentially procyclical nature of internal and external rating which is a major element of the new accord. In addition, the deregulation of capital market and the massive use of structured financial products (collateralized debt obligations, mortgages at risk) led to the bankruptcy of organizations such as Lehman Brothers and Bear Stearns. Other factors that monetary authorities often ignore are the macroeconomic imbalances which cause decrease in

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<sup>3</sup> Speech by Pierre Duguay, Deputy Governor of the Bank of Canada, Toronto, January 2009.

<sup>4</sup> President of the Federal Reserve, The Financial Accelerator in a Quantitative Business Cycle Framework, B. Bernanke, M. Gertler and S. Gilchrist and in Handbook of Macroeconomics, Taylor and Woodford (eds), Amsterdam, 2000.

interest rates and favour an increase in asset prices, creating a spiral of debt and inflation of assets (Adrian and Shin, 2008).

### **3.2 *Financial crises***

The history of financial crises (Herstatt in Germany in 1974, Ambrosiano in Italy in 1982, Barings in UK in 1985, BCCI in Luxembourg in 1991, Credit Lyonnais in France in 1992 and recently the case of Société Générale in 2008) has its origin in the fragility of the banking system, lack of control exercised by the authorities and excessive risk-taking by the banks. Risk-taking has been manifested by easy access to credit (subprime credit card, mortgage).

In other words, a combination of low interest rates, expansion of money and credit and higher asset prices, accompanied by large financial imbalances, has led to the financial crisis (Clerc, L., 2008). In addition, the lack of transparency of the participants (off-balance sheet registration), the development of tax havens (fiscal paradise), offshore companies and speculative markets have caused financial crises as well.

In summary, the causes of these financial crises are due to the high expectations of investors, lack of appropriate publications and conflict of interest. This can lead to acceleration in falling prices, which consequently leads to a wave of asset disposals and causes a liquidity problem.

All these upheavals have led to a decline in market value of certain mortgage loans (mortgage-backed securities-MBS), resulting in a growing demand for banks' equity. Thus, the ailing of Long Term Capital Management (LTCM) in 1998 and the crisis in risky mortgage loans in 2007/2008 related to "subprime" debt in the United States, led to major disturbances on the financial sector, and especially the banking sector. This also led to a review of the prudential supervision on the hedge funds sector and the foundations of securitization.

Following the financial crises that have shaken some emerging countries in the second half of the nineties and the recent financial crisis in the United States and European countries, there has been an upgrade in legislation and market regulation funds to universal standards. The objectives of this were to enhance efficiency and maintain financial stability and growth (Deiss, J., 2005). Furthermore, this also led to better banking supervision and monitoring of the impact of leverage and the regular intervention of central banks to restore financial stability.

#### 4. The procyclicality of finance: a phenomenon that repeats decade after decade

The theory on behavioural finance addresses the psychological aspects and their impact on financial markets and analysis of market anomalies. This theory differs from the classical theory based on efficient market assumption, as it advocates a certain degree of market efficiency. This is proved by the existence of certain moments of Krach and bubbles. However, both these theories agree on the procyclical behaviour of risk taking (Boyer, Dehove and Plihon, 2004).

The subject of procyclicality is not new. Thornton and Wicksell were the first authors who wrote on the cyclical process of the economy. Their theories are consistent with the Austrian business cycle theory, written by Ludwig von Mises in 1916 and developed by Hayek in 1931. According to these authors, the discrepancy between the actual rate in the short term and its natural level explains the direction taken by the economic cycle. This difference is due to lower currency exchange rate used by banks, following a flexible policy from the central bank. This lower rate induces inflationary pressures, and also the actual rate for the short term will not correspond to its natural value (equilibrium).

In equilibrium, in the absence of inflationary pressures, the actual rate in the short term denoted by  $r^*$  is equal to its natural level of equilibrium of the economy denoted by  $t_n^*$ .

$$(i - \pi)^* = r^* = t_n^* \quad (1)$$

Where  $i$  is the nominal rate offered in the market for the funds that can be loaned,  $\pi$  is the growth rate of the current inflation and  $r^*$  is the real rate for the short-term and  $t_n^*$  is its natural level of equilibrium.

However, the presence of inflationary tension implies a discrepancy between the real rate in the short term and its natural value (equilibrium).

$$i_t - \pi_t = r_t \Rightarrow r_t \neq t_n^* \quad (2)$$

The Austrian business cycle theory states that the business cycle is the source of excessive credit creation, which is often the result of the decisions made by banks. This

excessive credit creation was described by Wicksell as a cumulative process that leads to a level of credit beyond the real resources of the economy. This process is fuelled by interest rates which are below the rate of expected profits, leading to a runaway credit growth and increased speculation, inflation of asset prices, lower provisions and a decrease in the spread.

This process results in an increase of overall risk and information asymmetry. This was evident during the euphoric phase and boom where the risk was underestimated. In contrast, during the slowdown, the risk was overestimated, official rates rise, capital requirements increase, while its costs are higher. The weakness of the debtors is unveiled and a lack of confidence triggers panic. Thus, liquidity and solvency crisis are combined and are mutually dependent. This causes greater probability of financial instability that can lead to systemic risk which creates procyclical effect on the real economy. This is how the procyclicality of credit evolves.

Fundamentally, the procyclicality originates as a result of positive trend in the real economy during which agents take higher risks without being aware of it. Here, risk premium follow a downward trend. However, during Stock Market crash, risk premium increases and risks are reassessed and are usually overestimated (Boyer, Dehove and Plihon, 2004). An example is the subprime crisis of August 2007 which was characterised by the ease on obtaining credit by non-creditworthy people. This led to a critical situation with severe credit crunch. As a result, there was a desperate need for liquidity and there was huge loss because of the downgrade of the ratings assigned to assets. This mechanism certainly leads to a recession, and leads us to observe an implicit procyclical character, when it is necessary to be contra-cyclical.

#### ***4.1 The cyclical process of the Basel Accord***

It should be noted that procyclicality is not a criticism specific to Basel II. This phenomenon applies for other rigid prudential standards, for example, the implementation of the standard of 3% for the budget deficit. (Van Nguyen, 2003).

In its definition, the procyclicality of Basel Accord is the result of the amplification of the economic cycle by the solvency ratio. This means that in times of recession, regulatory capital requirement increases, requiring banks to bear on the one hand, a cost of resizing the loan portfolio for a better management, and on the other hand, a strong tightening in the credit supply for enterprises (credit crunch). Similarly, the regulatory capital declines during periods of expansion. This movement in regulatory capital contributes negatively to the

availability of liquidity during periods when it is very useful (Mc Neil, Frey and Embrechts, 2005).

As we already mentioned above (section 3.1), any regulation in principle could increase or decrease the procyclicality. So what are the factors under the Basel Accord which can mitigate or exacerbate the procyclicality?

A first opinion considers that the new agreement increases the procyclicality but the sizes of its effects remain unclear. The procyclicality is higher for Basel II than Basel I. For example, the regulatory arbitrage under Basel I led the banks to less stringent capital standards. Therefore, fluctuations in capital are higher for the new agreement.

A second opinion issued by the Basel Committee on Banking Supervision states that if the banks are adequately capitalized, and risks are well measured and managed, the financial system should be more stable, less procyclical and more able to withstand periods of financial stress (Caruana, J. et Narain, A., 2008).

A third view is called "neutrality view". It states that despite the procyclicality of Pillar 1 of Basel II, the role of Pillar 2 should not be ignored because here credit policies are geared more towards economic capital compared to regulatory capital. Hence, the regulatory capital should not be affected as the economic capital is not affected as well. Moreover, the integration of the stress test scenarios with pillar 2 aims to study the capital measurement sensitivity to changes in economic environment or events affecting market liquidity.

#### ***4.2 The weaknesses of the Basel Accord - fuelling a cyclical process***

The new agreement is more comprehensive. Despite its greater sensitivity to risk measurement, it does not provide an adequate measure of risk, due to several reasons; particularly it neglects the importance of the diversification which can be gained by rewarding credits to developing countries. The internal ratings approach (IRB) under the new Basel II accord, discouraged international banks to grant credits to developing countries, which experienced an overestimation of risk from the part of developed countries. Thus, they have ignored the positive effect of diversification that can be used to their benefit in terms of risk reduction (Markowitz, 1959) and economic capital requirement. However, the benefits of diversification have been recognized explicitly by the Basel agreements on capital requirements relative to the trading portfolio (the Basel Committee, 1996). In this context, Crouhy, Galai and Mark (2001) also mention about the correlation between the different components of the portfolio.



The sharp decline in capital flow negatively affects the growth of the developing countries. This may also cause an increased cost of financing and a greater procyclicality. The internal approach under the new Basel Accord increases the procyclicality in both developing and developed countries. Developing countries become more fragile and vulnerable to strong cyclical fluctuations and developed countries are threatened by the risk of non-diversification. In this regard, Mc Neil, Frey and Embrechts (2005) state that: "If risk is properly dispersed, shocks to the overall economic systems will be better absorbed and less likely to create cascading failures that could threaten financial stability". Similarly, a poor diversification across countries increases the economic shocks caused by the financial system (Rochet, JC, 2008).

However, the Basel Accord does not benefit from diversification by combining the capital requirements for credit and market risk. Some aspects of default risk in the trading portfolio should be diversified against other risks in the same portfolio (BCBS, 2007). So the new Basel Accord increases systemic risk because it ignores diversification.

Basel Accord offers an advantage to accounting and regulatory aspects of Structured Credit Vehicles (SCVs). Thus, a high leverage has been incorporated into the structured products which operates without a capital cushion (capital buffer) and in turn receives a guaranteed liquidity. Similarly, a large portion of these loans are non-compliant and provides no maturity.

During the deterioration in economic conditions, the liquidity risk, the concentration risk and the credit risk have been poorly assessed and evaluated by the banks. In other words, non-proportional growth between the increase of assets (the volume of activities) and investment in documentation led to a crisis which was particularly manifested by a liquidity crisis. It was a consequence of the rapid contraction in the asset value and this led to a deflationary recession. This shows that the Basel Accord focuses more on capital adequacy while it ignores the importance of liquidity. The showdown of these events has led some economists to question the issue of liquidity and similarly to find ways to prevent banks from having liquid liabilities and illiquid assets (Eichengreen, 2008). Also, the major cause of the recent subprime crisis of 2008 was the unexpected conversion of liquid assets into illiquid assets. Thus, it is important to define more elaborately and classify the assets in different categories even though they are already classified as liquid assets to prevent the severe risk that movement of assets can have.

In addition, the management function of the banks were not proactive enough and furthermore risk taking decision by the management did not accurately address the long term risk as they assumed they had continued access to liquidity (FSF, 2008). The consequences of the recession will be more severe if the management of the bank is not efficient. Hence, the management of the banks is very important and needs to be thoroughly examined and monitored over time.

Another very important issue is the method of banks ratings and its influence on the procyclicality of their ratings system issued by external rating agencies. The use of credit ratings to determine regulatory capital leads to an important transformation in the ways banks are regulated (Benford and Nier, 2007).

The advanced tools and procedures used by financial institutions to transfer some undesirable credit risk lead to redistribution of risks. This exacerbates financial instability and systemic crisis. The resolution of the Basel Committee have played an important role by providing more comprehensive regulations covering the three important issues namely, the minimum capital requirements, the supervisory review process and internal control and also market discipline. Although Basel II now monitors the banking system thoroughly, it still hasn't adequately addressed the issue of systemic risk associated with the transfer of risk to less supervised players. This is considered as one of the major pitfall of Basel II.

## **5. The transmission of monetary policy by central banks and its impact on the real economy**

Monetary policy is the major debate on measures to promote price stability in the economy, which is one of the main long-term goals of a Central Bank. Monetary policy adopted by central banks has evolved in numerous ways throughout its history. Before 1980, the major objective of central banks was to maintain full employment. This was often achieved at the expense of price stability (inflation). However, this has very high economic and social implications. During eighties and nineties, the objective of monetary policy adopted by central banks was aimed more towards achieving price stability. This period was characterised by remarkably low inflation. The monetary policy of current time is more geared towards achieving price stability while maintaining economic growth. The conduct of monetary policy to reduce the unemployment rate without accelerating inflation becomes

more complex as the Philips curve<sup>5</sup> flattens out. Thus, monetary policy has become more complex with increased competition and monetary aggregates that are more difficult to interpret.

Many economists attribute the cyclical fluctuations to a monetary cause. There is a direct relationship between monetary policy and the behaviour of bank capital. The lendings of banks show an immediate response to a change in monetary policy and this response gets stronger under the Basel II accord. A monetary policy expansion often tends to relax the constraints of banks capital and stimulate the credit supply which leads to an improvement in the balance sheet conditions and the credit quality of borrowers. This can cause the equity and credit quality of companies to decline significantly. The theory of financial crises due to the asymmetry of information stated by Mishkin (1991, 1994), shows the effects of the conduct of monetary policy in periods of financial tension. A tight monetary policy can play an important role in triggering financial crises. A contraction in monetary policy leads to higher interest rates reduces lending and further causes a decline in economic activity (Mishkin, 1996). Similarly, the urgency of depositors to withdraw their funds tightens the deposits of banks and encourages them to increase their reserves (Friedman and Schwartz, 1963 in Mishkin, 1996). However, the banks response to such situation depends on their level of capitalization. In this situation, the more capitalized banks are, the less their credit supply changes and they are likely to react in a less procyclical manner (Flannery, 1989, Genot and Pyle, 1991).

Recent crises have shown the central role of liquidity in the monetary system. However, the management and control of liquidity are essential functions of the Central Bank. So the actions of central banks determine the liquidity of the monetary system. The adoption of an expansionary and flexible monetary policy, by using a very low official market rate, results in an abundance of money and funding sources, and also raises prices of all assets. These new source of funding, resulting from modern financial instruments (securitization and credit derivatives) have allowed banks to "rotate" their balance sheets faster. This was the result of the movement of banks from an "originate to hold" model, to an "originate to distribute" model. The latter model allows banks to sell loans they have already granted, free up regulatory capital which leaves more capital to grant new loans and to increase their net assets.

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<sup>5</sup> The Phillips curve is a historical inverse relation between the rate of unemployment and the rate of inflation in an economy, stated by William Phillips in 1958.

So insufficiently prudent monetary policy adopted by central banks leads to abundant source of funding, hence, resulting in excess liquidity. It is recommended for central banks to consider monetary aggregates and credit expansion, asset prices, global imbalances, the exchange rate movements, the changes in potential growth, financial innovation in addition to inflation.

## **6. The accounting framework of the procyclicality**

### ***6.1 Interference between Basel accord and IAS accounting standards***

The requirements of the Basel Committee are based on the prudential regulation, conservatism and specific to the banking sector. On the other hand, the accounting standards are based on transparency and give the fair value of financial assets and liabilities in order to meet the investor's requirement. The design and measurement of banks capital adequacy differentiates the accounting standards IAS from Basel agreements. The aim of accounting is to bring accounting value of equity closer to its market value, whereas the Basel Accords strives to improve the sustainability and adequacy of bank capital, while ensuring their ability to absorb possible losses (Colmant et al., 2005).

The major differences between the accounting standards IAS and Basel agreements are embodied in their mission objectives. The former applies to shareholders and the latter is designed to protect creditors. Another difference is that accounting standards only works on "realised losses", while Basel II primarily takes into account the "unexpected losses". Several authors have stated that the single provisioning of realised losses excluding those that are planned but not yet recorded, increases reserves amounts during recession, consequently amplifying the financial cycle. This leads us to question whether the IAS / IFRS are appropriate to the banking sector, conservative and prudent, and if whether they increase the procyclicality of banks equity? It is therefore essential to study the accounting rules in regards to provisioning, assessment and calculation of equity, to analyze the accounting framework of the procyclicality of bank balance sheet.

### ***6.2 Convergences and divergences between the accounting and prudential rules***

#### **6.2.1 Provisioning mode**

The definition of the provision is similar in both prudential and accounting frameworks. Provision is defined as the registration of the decline in value of an asset or the

increase in value of a liability. However, the amount of the provision and the date when it is recorded are still subject of debate between the accounting and prudential supervision.

The international standard IAS 37 on liabilities defines provision as an obligation to a third party. The key principle established by the Standard is that a provision should be recognised only when there is a liability i.e. a present obligation resulting from past events. Planned future expenditure, even where authorised by the board of directors or equivalent governing body, is excluded from recognition. This definition brings an end to the practice of cyclical or general provisions with an objective to achieve a smooth result and reinforce the principle of interdependence of the exercises. Thus, the accounting treatment generally encourages ex-post behaviour of the constitution of provisions and excludes those intended to cover future operating expenses.

The accounting treatment of provisions is often procyclical, because of the delay in the consideration of credit risk and losses. During expansion, financial institutions register risk premium as profits where as they should be set as provisions (Caruana and Pazarbasioglu, 2008). During recession, the amount of provisions in the balance sheets of banks increases as a result of increased credit during the earlier phase of expansion. This increase in provision reduces earnings and negatively affects the supply of credit. This creates a vicious circle (Jaudoin, 2001) and involves a phenomenon of accentuation. However, it should be noted that credit risk is initiated as soon as loan is granted instead of labelling it as a risk at actual time of default. Thus, the appropriate actions of banks at its preliminary phase enable them to better incorporate the cost of these losses in their credit terms (Jaudoin, 2001).

On the other hand, the prudential supervision establishes provisions to cover expected losses before they appear. The concept of dynamic provisioning is the recognition of risk at the time of its appearance. A mode of provisioning sans expected losses during an expansion leads to the procyclical behaviour which has been already explained.

### **6.2.2 Assessment mode**

Accounting Standard IAS 39 reports the current price of transactions at its fair value. This is more relevant than the historical approach. However, some authors argue that when there is shortage of liquidity, historical cost accounting is better than the valuation at market value (Allen and Carietti, 2008). But it is still subject to criticism because it does not reflect the depreciation resulting from the deterioration of the present value of anticipated future income. In addition, the historical value remains insensitive to the signals dictated by prices

(Noyer, 2008). In contrast, the current market price gives a more accurate risk profile of firms (Plantin, Sapra and Shin, 2008). The fair value consists of all the risks that market allocates to assets including credit and liquidity risk (Caruana and Pazarbasioglu, 2008). However, erroneous valuation of risk distorts the risk premium and leads to a liquidity problem.

The development of 'originate to distribute' model causes an increase in the part of balance sheet that is evaluated at market prices (Clerc, 2008). A direct link is observed between the fair value accounting and regulatory capital of banks, as the changes in fair values are recorded in the income statement or directly in the equity of banks. This intensifies volatility and further amplifies the procyclicality of bank's assets. This leads us to believe that accounting standards are not neutral.

The market value estimation is preferable for short-term, liquid and lower rank assets. However, the bank's assets constitutes of long-term, illiquid and highly ranked assets (Plantin, Sapra and Shin, 2008). Hence, the banking sector needs to pay more attention to accounting standards and procyclicality of the fair value. By definition, market -based estimation is based on market prices, which requires the allocation of market value for financial instruments (Noyer, 2008). But in an imperfect world, this fundamental condition for the proper functioning of the concept of 'marking to market' may not be respected and thus leads to an artificial increase in the volatility of financial results.

Plantin, Sapra and Shin (2008) in Rochet, JC (2008) show that during a crisis, the sale of assets is triggered by desperate need for liquidity. In this scenario, the market values of these assets are determined based on liquidity and they no longer reflect their principal value or fair market value (Noyer 2008). In another words, asset prices are determined by the total cash available in the market and does not reflect its ability to fulfill the future commitments, or insolvency (Carietti and Allen, 2008). Market prices will be disconnected from its principal values (Giles and Tett, 2008). In such a situation, the liquidity problem becomes artificially solvency problem. This increase in volatility based on market prices fluctuations does not reflect the economic volatility of the underlying banking operations (Colmant et al., 2005).

This shows that the performance of the valuation framework based on the market has limits. Because there is no set of criteria for determining market as active or whether price is observable, and further due to lack of harmonization in accounting standards, banks were free to choose the method of valuation and the time of its implementation (Noyer, 2008). In this

context, the subprime crisis of 2008 showed the importance of harmonization within the framework of IFRS and U.S. GAAP relative to the transfer of assets between accounting categories, and in particular to the transfer of assets between banking and trading portfolio (Banziger, 2008). The marked to market method is applied for liquid and active market, whereas this method is not applicable to illiquid and inactive market. Thus, this phenomenon needs to be noted and special methods should be devised for these markets.

### **6.2.3 The calculation of equity**

Basel agreements and IAS accounting standards have major debate on the definition of equity. The data reliability which is acquired from complete information is essential for measuring the risks, results and capital adequacy of banks under prudential regulation. The transition to an accounting report based on IAS affects the accounting data used for the calculation of prudential capital and prudential ratios, consequently leading banks to experience artificial volatility. Thus, several authors have thoroughly examined prudential reprocessing concerning accounting equity that credit institutions must perform to determine prudential equity.

The definition of regulatory capital is based on the character of permanence and availability to quickly absorb the losses. The introduction of new accounting principles in the calculation of equity does not always respond to the above qualities. The fair value measurement of equity shows that some elements belong to accounting equity but not to prudential equity. Indeed, considering unrealized gains in the valuation of portfolios available for sale attributed to uncovered risks symmetrically increases the assets and equity value. This in turn generates greater volatility that does not accurately reflect the financial position of the bank.

These unrealized gains attributed to the uncovered risks are not compatible with the prudential principle and should be reprocessed prudentially.

## **7. Measures and possible solutions to reduce the density of the procyclicality**

Several options have been considered by several authors and most recently by the FSF in 2008 to reduce the density of the procyclicality of regulatory capital. This is aimed at increasing the efficiency and the resilience of the system along with the process of market discipline and innovation which are essential for the better functioning of the financial system.

The method of calculating capital requirements plays a significant role in explaining the procyclical movement of bank balance sheet. Point in Time (PIT) system used for calculating the instantaneous probability of default increases the procyclicality of capital ratios. One way to deal with this cyclical effect is that banks increase capital in good times to ensure capital adequacy in the most adverse circumstances (Caruana and Narain, 2008). In contrast, using the method of Through the Cycle (TTC), calculation of the probability of default is less flexible over time and gives a more constant average of the credit quality portfolio. Thus, it helps to reduce the volatility of bank capital. (Saurin and Trucharte (2006) in (Rochet, JC, 2008).

Several studies have already shown that the regulatory capital under Basel II is more sensitive to economic circumstances. In this context, the levels of excess capital are required to be increased to manage the risks faced by banks. This is more justified by the fact that the methods used in general to increase capital, namely the issuance of new capital and securitization are difficult to implement during an economic recession. This leads banks to reduce their credit supply and maturity of loans that have already been processed (Benford and Nier, 2007). Moreover, it seems essential to link the prudential standards to variations, and not at the level of credit or asset prices.

In regards to the redefinition of regulatory capital, the introduction of capital beyond the minimum required (buffer), reduces the procyclicality during a recession. One of the methods that work in a counter-cyclical way is to strengthen the supervision of leverage of investment banks. Moreover, it is necessary to increase the provisions for risks and strengthen capital requirements during euphoria and reduce them during a slowdown. In other words, it is important to improvise the methods for assessing the quality of claim portfolio by increasing the credit risk during an expansion and reducing it during a recession.

Establishing a positive relationship between capital requirements and the size of the institution lead to offset the moral hazard associated with the status of “too big to fail” and procyclicality. Moreover, this helps to reduce the degree of procyclicality by giving each institution its marginal contribution to systemic risk.

The method of provisioning is also of great importance in interpreting the behaviour of bank balance sheet. Thus, setting up a pre-provisioning for risk instead of late provision helps to reduce the volatility of income and equity. Thereafter, the volatility of bank balance sheet slows down and is reflected in a contra-cyclical manner.



Diversification has positive effect as it gives an accurate measurement of risk, and reduces the procyclicality of regulatory capital over time. For example, the liquidation of assets by a bank during a crisis impacts the balance sheet of another bank holding the same asset (Kashiap et al., 2008). In this context, diversification reduces the dynamics of liquidation phenomenon. Moreover, it allows the most diversified financial institutions to cope in an increasingly competitive environment and increase the resilience and stability of banks, particularly the bigger ones.

Stress test is another measure that can reduce the procyclicality. Catarineu-Rabell, Jackson and Tsomocos (2003) have advocated the need of stress test to reduce the potential cyclical effects of Basel II. It is very important to observe the results of stress test on vulnerability of banks through the changes in the business cycle. Thus, stress simulation must be executed to determine the impact of changes on loss and profit accounts. It is important to conduct a scenario analysis, in addition to VaR approach to obtain the maximum assessment of losses occurring during a crises period. Different risks factors can be a subject of stress, for example, the interest rate scenarios, the propagation of credit, currency exchange rates and stock prices (Crouhy et al., 2001). Thus, it is important to study the specific characteristics of bank portfolios by choosing the best test scenario that causes the banks portfolio to be more vulnerable in a very volatile situation.

In addition to the regulation of capital based on risk, fair value accounting may also be a source of procyclicality. The procyclical factors in accounting have been previously explained in our paper. The International Accounting Standards Board (IASB) recently introduced measures aimed at improving the publication of financial instruments for the periods when the market is not active anymore. Among these measures, the inputs used in measuring fair value needs to be more carefully explained and evaluated as they may be sensitive to special factors which are not always observable. Similarly, another measure is to interpret the method of determining the factors included in the evaluation of the financial instrument and the effects that any change these factors may produce. This undoubtedly leads to greater transparency in the measurement of fair value and helps investors to assess these factors better.

Despite the criticism on the credibility of the fair value and its impact on the procyclicality of financial markets, this method has proved to be the best for providing relevant and reliable information. One of it major advantage is that the accounting rule of fair value is determined by reference to external data and is not influenced by the organisation

itself. This helps to reduce the asymmetry of information and achieve greater transparency. This also contributes to better control of management and reduces the agency problem which in turn serves the investors interests. However, it is necessary to improve the accounting standards of fair value. This can be achieved through two mechanisms namely, valuation reserves and dynamic provisioning. The purpose of static and dynamic provisions is to rectify cyclical tendencies of provisions and further stabilize the profitability of the banks.

## **8. Conclusion**

In conclusion, it is not possible to find definite answers to the issues of the procyclicality of the banking system. Overall, it appears that inefficient monetary policy accompanied with the shortcomings of the Basel agreements and accounting standards related to financial instruments has led to the procyclicality of bank balance sheet while boosting the stakeholder's behaviour in the financial market. The Basle Accord often encourages excessive risk-taking, inefficient management of liquidity risk and does not sufficiently regulate the activities exposed to high risk. The expansionary monetary policy adopted by central banks has adverse effects on the economy by creating excess liquidity. The accounting standards demonstrate the inconsistency in methods between the financial institutions in an inactive situation where market prices no longer exist.

It is expected that the new system will ultimately, be less cyclical at macroeconomic level through modifications and improvements in regulatory, monitoring and accounting bodies. Regulatory arrangements especially those related to the Basel Accord should improve the behaviours of regulatory capital. It is necessary that banks increase their capital requirements for off-balance sheet exposures to strengthen their capital base. Moreover, it is important that banks remain vigilant on their credit supply standings and pay particular attention to liquidity requirements by treating equally both the coefficient of solvency and that of liquidity as prudential ratios. On the other hand, revisiting fundamental principles by creating more simple products can be an answer to this deadlock and consequently lead to a greater market discipline.

It is important that central banks continue their endeavours on more cautious and less expansionary monetary policy. It is also important that an efficient monitoring system is set up and furthermore the aggregates of the economy, including the growth in assets, price, etc are controlled regularly. Similarly, a clear definition on the ultimate objectives of central

banks promotes transparency and stability of the financial sector. In addition, we suggest a more appropriate economic development of rating agencies and supervisory systems.

It should be noted that the method of marking to market is the most appropriate and credible. However, this method has recently shown some weaknesses in its implementation. We think it is necessary to ameliorate the fair value in order to increase the reliability, relevance and comparability of information. This may involve the review of valuation rules for illiquid products and unification of valorisation methods by the banks in case the market moves from an active and liquid to inactive and illiquid situation. Moreover, it is necessary to improve the fair value through two mechanisms of valuation reserves and dynamic provisioning. Finally, in order to cope with any shortcomings of accounting standards and practices of valorisation, the International Auditing and Assurance Standards Board (IAASB) has strengthened the recommendations on the audit of fair value (IAS audit 540) (Clerc, 2008).

The Bank of International Settlements (BIS) and the Basel Committee should be consulted more than before and there must be greater cooperation between major international and national regulatory authorities of financial centres. Thus a collaboration between the Basel Committee on Banking Supervision (BCBS), the International Accounting Standards Board (IASB), the Bank for International Settlements (BIS), International Monetary Fund (IMF) and national authority regulation of major financial centres should be established and strengthened.

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