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causes, consequences and response

Panayiotis P. Athanasoglou  
Ioannis Daniilidis

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BANK OF GREECE  
Economic Research Department – Special Studies Division  
21, E. Venizelos Avenue  
GR-102 50 Athens  
Tel: +30210-320 3610  
Fax: +30210-320 2432

[www.bankofgreece.gr](http://www.bankofgreece.gr)

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# PROCYCLICALITY IN THE BANKING INDUSTRY: CAUSES, CONSEQUENCES AND RESPONSE

Panayiotis P. Athanasoglou  
Bank of Greece

Ioannis Daniilidis  
Bank of Greece

## Abstract

Procyclicality is an inherent feature of the real and especially the financial sector of an economy, which has been highlighted by the recent crisis. Due to procyclicality, banks are transformed from mitigation mechanisms to amplifiers of changes in economic activity potentially affecting financial stability. The causes of procyclicality can be attributed to market imperfections and deviations from the efficient market hypothesis, while other factors -including Basel II and accounting standards- may have exacerbated it. To attenuate procyclicality, a number of suggestions have been made in the form of rules and discretion and are presented according to the factors they aim to alleviate. Some of the suggestions have been adopted under the Basel III framework, including the countercyclical capital buffer. Although these Basel III proposals seem able to address the procyclicality issue, they will lead to higher minimum capital adequacy ratios, which are expected to increase lending costs and the provision of loans by banks, and reduce economic activity. However, the cost of the new proposals is expected to be lower than the estimated cost of financial crisis.

*Keywords:* Banking, procyclicality, demand and supply of loans, capital requirements, BasII and III

*JEK Classification:* C33, G21, G28

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## Correspondence:

Panayiotis P. Athanasoglou  
Bank of Greece  
El. Venizelou, 21, 102 50  
Athens, Greece  
Tel.: +30-210-3202449  
e-mail: [panathanasoglou@bankofgreece.gr](mailto:panathanasoglou@bankofgreece.gr)



## **1. Introduction**

The long history of economic and financial crises shows that procyclicality is an inherent feature of the real and especially the financial sector of an economy. In particular, the recent crisis has been characterized by intense procyclicality of the banking sector and its link with the real sector in a mutually reinforcing manner that may lead to a vicious circle.

The main feature of procyclicality is an underestimation or overestimation of the risks to which the banking sector is exposed, which leads to relatively high growth during the upward phase of the cycle, while downturns are characterised by strong risk aversion, that constrain the supply of loans due to banks' concerns about loan portfolio quality and the probability of default. Thus, the banking industry changes from an effective mechanism for allocating funds to a mechanism that exacerbates cyclical fluctuations, hindering the efficient allocation of resources in the economy and adversely affecting credit growth and financial stability.

The literature, both theoretical and empirical, has attempted to explain this behaviour. Keynes (1936) and later Minsky (1982) argue that the way in which financial markets function is erratic, because they are based largely on developments which are surrounded by uncertainty and are usually characterized by asymmetric behaviour. In general, factors contributing to the banking industry's procyclicality are economic policy, the economic and financial environment and the regulatory framework of banks (e.g. Caprio, 2010 and Hardouvelis, 2010). Factors such as Basel I and II, accounting rules, credit rating agencies' reports and the use of similar risk management systems have been criticized for they did not help to control procyclicality in the banking sector, but instead reinforced it (Kashyap and Stein, 2004, Jokipii and Milne, 2008 and Enria et al., 2004). More precisely, these studies found that capital requirements may lead to procyclical behaviour, reducing the supply of loans by banks particularly in times of recession, when liquidity in the real sector of the economy is usually limited. Since many companies have no alternative funding source, the reduced supply of loans leads to a significant decline in economic activity. Even by the end of 2008, the G-20 agreed on the need to deal with the procyclicality issue and called upon the IMF, the Financial Stability Board and the Basel

Committee to find ways to alleviate it. Note that the new proposals of Basel III include countercyclical capital buffers, which imply that the regulators do attempt to alleviate the procyclical behaviour of Basel II. However, while there is broad agreement on the causes and effects of procyclicality, little progress has been made in finding ways to mitigate it. Prudential regulation, monetary and fiscal policies seem to be a powerful tool in this respect.

The purpose of this paper is to study banking sector procyclicality. We explore the issues of the concept and the different definitions of the term "procyclicality" and clarify the main causes that make procyclicality inherent to the financial sector and the factors that exacerbate or mitigate it. We analyze the procyclical supply of and demand for bank loans and their relationship to economic activity (financial accelerator), as well as the interaction of economic and regulatory capital. We discuss the procyclical behaviour of Basel II and accounting rules and its implications. We also review a variety of proposals that address the procyclicality issue as far as Basel II, accounting rules, leverage and liquidity are concerned. Finally, we present the proposals of Basel III and their estimated effects on economic activity, the cost of borrowing and private sector financing.

This paper aims at a comprehensive, exploratory and possibly concise, although not exhaustive, overview of the existing literature on procyclicality, exploring some aspects of the procyclicality that have not been addressed until recently in the relevant literature. The paper focuses on the following main directions: Firstly, it classifies and presents comprehensively existing knowledge on several aspects of procyclicality, especially those concerning its causes, its consequences and the proposals to mitigate it. Secondly, it clarifies the relevant concepts, which are referred to in the literature, but are not adequately explained and therefore may not be used by all researchers in the same way. Thirdly, it critically examines the propositions concerning the banking sector's procyclicality issue.

However, some issues are deliberately not elaborated in this paper. For example, the findings presented are based on studies concerning a variety of countries, but the differences across countries are not always explained. Likewise, the role of public debt

markets and credit default swaps are not dealt with, while the effect of corporate governance on compensation schemes is only narrowly explained.

The paper is structured as follows: In Section 2, we define the concept of banking sector procyclicality. In Section 3, we analyze the procyclical demand and supply of loans and the role of the financial accelerator. In Section 4, we show the relationship between procyclicality and profitability. In Sections 5 and 6, we discuss the consequences and causes of procyclicality, respectively. The causes of procyclicality are further divided into those that make procyclicality inherent to the financial system and those that enhance or mitigate it. In Sections 7 and 8, we consider the contribution of Basel II and accounting standards to the increase in banking sector procyclicality. The international literature has presented a number of proposals to mitigate procyclicality, some of which are referred to in Section 9. In Section 10, we set out the decisions reached by the Basel Committee in September 2010, concerning procyclicality in the banking sector, and the potential impact of these decisions. Finally, in Section 11 we report the main findings of this study.

## **2. Procyclicality in the banking sector: concept and definition**

It is widely acknowledged that bank lending is cyclical, i.e. banks respond to changing economic activity<sup>1</sup>. Specifically, during downturns, banks limit credit supply. At the same time, during such phases, demand for new credit is weak, because there are limited alternative investment proposals with positive net present values (Berlin, 2009). In other words, a simultaneous decline in both the supply and the demand for credit can be observed. In a severe crisis like the recent one, the decline in the supply of loans, at least initially, is greater than the decrease in demand, as loan applications for investments with positive net present value tend to be rejected following a significant increase in the risk premium, reflecting increased risk aversion.

Procyclicality can be alternatively defined as:

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<sup>1</sup> See Gambera (2000) for American, Salas and Saurina (2002) for Spanish and Pain (2003) for British banks.

- The reinforcing interaction within the financial sector and between the financial sector and the real economy, leading to unsustainable economic growth during in upturns and deep recession<sup>2</sup> in downturns (BIS, 2010 and Clement, 2010).
- The tendency of banks to significantly ease their lending standards in the upturns and stiffen them in downturns<sup>3</sup>.
- All banking practices that reinforce the current phase of the economic cycle.
- The mechanism by which the business cycle, the financial cycle and the cycle of risk-taking behaviour represented by fluctuations in asset prices move simultaneously in the same direction (Nijathawon, 2009). These three cycles are mutually-reinforcing and interact with each other.

Procyclicality of credit standards is associated with the banks' assets, capital adequacy and capital structure, willingness to take risks, profitability, as well as other factors such as risk assessment and risk management practices and the functioning of money markets.

### 3. Procyclicality in the demand and the supply of bank loans

Several studies have examined the behaviour of loan demand and supply during various phases of the economic cycle. The behaviour of **loan demand** on the part of firms has been examined by Jimenez et al. (2007), who find that during recession firms have higher financial needs<sup>4</sup>. Moreover, Jimenez et al. (2010) and Albetrazzi and

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<sup>2</sup> This is the definition of procyclicality from the macroprudential supervisor's point of view. Macroprudential supervision considers the change in risk over the economic cycle, and how risks are distributed within the financial system.

<sup>3</sup> The change in bank credit standards is associated with the credit risk. This risk is overstated (understated) in the downward (upward) phase of the cycle and therefore the interest margin charged is higher (lower) than would result given the "actual" level of risk that this loan incorporates. In particular, during the downward phase of the cycle, rising interest rates (due to the increased risk premium) may cause the net present value of an investment to negative and lead to the rejection of the loan requested. ECB (2009c) notes that the tightening of bank credit standards for loans from mid-2007 onwards is mainly depicted in a rise in interest rate margins.

<sup>4</sup> The study found that companies a year before their bankruptcy increase their (median) rate of use of their credit lines to 71% versus 43% for firms that did not go bankrupt. As bankruptcies tend to increase when GDP falls, it is likely that part of the increased use of credit lines can be attributed to firms that went bankrupt afterwards.

Marchetti (2010) have found for Spain and Italy respectively, that during tight economic and monetary conditions, firms with a weak financial position may not be able to have access to adequate bank credit. This fact may be enhanced by a “flight to quality” tendency by banks (see Albetrazzi and Marchetti, 2010 and Bernanke et al., 1996), but may also be attenuated because of “evergreening<sup>5</sup>” strategies - especially by smaller banks (Albetrazzi and Marchetti, 2010) and by relationship lending (Puri et al., 2010).

Borrowers’ cash flows and net worth (the latter can be used as collateral) tend to decline during worsening economic conditions, elevating their probability of default and consequently their premium of external finance, and their ability to have access to credit is hampered. This leads to a reduction in spending, investment and output, creating an accelerating feedback loop between the level of economic activity and credit institutions. The opposite occurs during improving economic conditions. Bernanke et al. (1989) name this loop as the financial accelerator, which refers to the fact that even relatively small shocks to the economy may be amplified by endogenous changes in credit market conditions and lead to the propagation of the business cycle (see Kiyotaki and Moore, 1997, Bernanke et al., 1998 and Bernanke, 2007). The financial accelerator is rationalized theoretically within the asymmetric information and principal – agent theory framework (i.e. market frictions). An implication of this framework is that borrowers with relatively high agency costs are expected to be more severely hit by worsening economic conditions and be forced to reduce their economic activities more than other borrowers, since they will face more difficulties in accessing credit (flight to quality, Bernanke et al., 1996). Christiano et al. (2010) add to the financial accelerator analysis a “Fisher deflation” effect, which interacts with the former and exacerbates the business cycle reaction, when the price level and output move in the same direction.

Loan supply is determined by a number of factors, most important of which are bank capital, economic activity and the level of competition. As regards procyclicality, the contribution of bank capital<sup>6</sup> and economic activity are of particular importance.

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<sup>5</sup> I.e. lending more money to firms in distress so that the latter do not default.

<sup>6</sup> It refers both to economic as well as regulatory capital. Regarding the former, it has been found that banks actively manage their capital structure (Gropp and Heider, 2009 and Berger et al., 2008), while Berrospide and Edge (2010) have the opposite view. Regarding regulatory capital, a number of studies in various countries have shown that capital adequacy rules tend to restrict

Changes in a bank's capital may cause changes in its loan supply, even if there is no change in the net present value of these loans. This fact is reported by a number of empirical studies such as Bernanke and Lown (1991) and Furfine (2000) for U.S. banks<sup>7</sup>, and Jimenez et al. (2010), Albetrazzi and Marchetti (2010) and Puri et al. (2010) for Spanish, Italian and German banks, respectively<sup>8</sup>. As regards capital buffers<sup>9</sup> Marcucci and Quagliariello (2008) report that Italian banks reduced their loan supply during the period 1990-2004, because their capital buffers dropped, which negatively affected GDP, while the findings for UK banks are similar (Francis and Osborne, 2009).

Moreover, it has been found that bank credit standards<sup>10</sup> are influenced by the economic cycle. Specifically:

- In the U.S.<sup>11</sup>, banks change their bank credit standards depending on the current phase of the economic cycle, even after taking into account loan demand. Similar findings apply to European banks for the 2003-2009 period (Hempell and Sorensen, 2010).
- High GDP growth is accompanied by softer bank credit standards, increased loan amounts and maturities (ECB, 2009a), as well as by reduced collateral requirements (Jimenez and Saurina, 2006).

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bank lending (Bernanke and Lown, 1991, Berger and Udell, 1994, Peek and Rosengren, 1995). An exception to this is Bikker and Hu, 2001 (see also Sections 6.2 and 9.2.1).

<sup>7</sup> Berrospide and Edge (2010) find that U.S. banks' level of capital affects private sector financing, to a lesser extent than economic activity and banks' risk appetite.

<sup>8</sup> Jimenez et al. (2010), Albetrazzi and Marchetti (2010) and Puri et al. (2010) concluded that low capital combined with low liquidity reduces loan supply during a period of falling economic activity. However, during expansion, banks with lower capital and liquidity ratios are more likely to approve a loan (Jimenez et al., 2010).

<sup>9</sup> The capital buffer is defined as the difference between a bank's total risk-adjusted capital and its minimum capital requirements.

<sup>10</sup> Changes in bank lending standards during the economic cycle are reflected in total financing, the cost of borrowing (loan interest rate and other charges, Asea and Blomberg, 1998, Bliss and Kaufman, 2002, Jimenez and Saurina, 2006, Capiello et al., 2010 and Bernanke and Lown, 1991), the amount of collateral required (Jimenez and Saurina, 2006 and Section 6.2.2 for the analysis concerning the role of collateral in banking industry procyclicality) and maturity (Gordy and Howells, 2006).

<sup>11</sup> This is a survey, conducted by the Federal Reserve, about the credit practices of large banks, reported in Berger et al. (2008) and Hardouvelis (2010).

- In Greece, the decline in GDP during the last quarter of 2009 was accompanied by more stringent bank credit standards and higher rejection rates for SMEs, despite a steady business loan demand (Bank of Greece, 2010b).

Regarding the relationship between loan supply and economic activity, it has been shown that loan supply is an important determinant of economic activity (e.g. Bernanke and Gertler, 1989, Kiyotaki and Moore, 1997 and Diamond and Rajan, 2005). However, it is not easy to explain the procyclicality of bank loans, since this may reflect changes in both loan supply and demand. Kashyap et al. (1993) find that in the U.S. during the 1964-1989 period, the loan supply decline contributed to the GDP decline. On the other hand, there are indications that the decline in economic activity during the 1980-2009 period in the G-7 reflected falling loan demand rather than supply (De Nicolo and Lucchetta, 2010). The effect of loan supply on economic activity depends on various factors such as the size of the interest rate increase and the proportion of economic activity financed by banks<sup>12</sup> (Bernanke and Lown, 1991). For this reason, the effect of capital on bank supply is much higher for countries where bank lending is more important for economic activity than in the U.S. (Berrospide and Edge, 2010).

## 4. Profitability and procyclicality

The empirical literature has shown that bank profitability is characterized by procyclical behaviour. Economic activity affects interest income (through loan supply to the private sector, Jimenez et al., 2009) and provisions (through the quality of banks' assets<sup>13</sup>). Structural factors (e.g. the level of competition, customer-bank relationship, capital market development etc.) are important determinants of profitability over the business cycle. Therefore, it is interesting to know if the structure of the financial system contributes to the procyclicality. Demirguc-Kunt and Huizinga (2000) and Bikker and Hu

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<sup>12</sup> For example, in the U.S. (where the total bank loans to the private sector to GDP ratio stood at 63% in 2007) during the period 1965-2004 the amount and cost of bank financing did not have a substantial impact on economic activity (Driscoll, 2004). In contrast, for the euro area (where the relevant figure is much higher), Capiello et al. (2010) found that during the period 1999-2008 loan supply had a positive impact on economic activity.

<sup>13</sup> See Bikker and Metzmakers (2005) and Lucas and Saurina (2002).

(2001) found a positive relationship between GDP and bank profitability, although the variables used (GDP growth and per capita income) are not good proxies of the cycle. Athanasoglou et al. (2008), using deviations from the trend in real GDP of Greece for the period 1985-2001, concluded that the cycle affects Greek banks' profitability, even after taking into account factors that are directly associated with it, such as losses from bad debts, provisions to cover credit risk and market structure.

Banks profitability's procyclicality can be explained (Athanasoglou et al., 2008) by the following factors:

In periods of GDP growth, bank loan demand grows, which leads to an increase in bank profits. Furthermore, GDP growth usually leads to higher stock market prices, which also affects positively banks' profitability, due to increased transaction fee income and capital gains. Finally, banks may, depending on competitive conditions, increase their interest rate margins.

Conversely, profitability declines during recessions, due to increased provisions and bad debts and reduced loan demand and supply. In addition, if the cause of a recession is a financial crisis like the recent one, then banks may face higher funding costs due to increased systemic risk.

Procyclicality of a bank's profitability is transmitted through the bank capital channel, mainly because of the borrowers' inability to meet their debt obligations. Specifically, when the economy is in recession, banks' profits decline, and if a capital increase by issuing new shares is not feasible, banks may be forced to reduce their lending in order to maintain their capital adequacy. This reduction of lending leads to a further decline in economic activity.

## **5. The impact of procyclicality**

Procyclicality in banking is in the limelight due to this industry's significant influence on economic activity and its role in the transmission mechanism of monetary policy. Additionally, procyclicality affects banks' profitability and consequently banks' capital adequacy ratios, which in turn can threaten the solvency of banking institutions

and therefore financial stability. In particular, procyclicality can cause significant problems to the efficient functioning of banks<sup>14</sup> in the following areas:

- In transforming the banking system from a mitigation mechanism to a reinforcing mechanism of the economic cycle. The banking system should provide a safety net to enterprises and households, in order to mitigate volatility in economic activity. However, as noted above, due to procyclicality, banks usually finance risky investments with marginally positive or even negative net present value in the upturns, while they do the opposite in the downturns. In that way, the banking system, rather than compensating for swings in economic activity over the cycle, makes them even more intense.
- Proper allocation of resources. Specifically, during the upward phase of the cycle, because of a softening in bank lending standards, increased competition and the underestimation of risk<sup>15</sup>, loans are granted to investments with marginally positive or even negative net present value, while during the downturns, even investments with positive net present value do not receive bank financing. Indeed, it has been shown that loans approved in the upward phase of the cycle exhibit a higher probability of default (Jimenez and Saurina, 2006).
- Stakeholders' and especially supervisors' ability to control banks' management. This stems from the fact that problem loans tend to emerge with a lag (Berger and Udell, 2002).

## **6. Causes of procyclicality**

### **6.1 Procyclicality and deviations from the efficient market hypothesis**

In order to address the consequences of procyclicality effectively, we must first understand the factors that cause and / or enhance it. Banks' procyclical behaviour can be

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<sup>14</sup> For example, financial system volatility may be positive if it leads to long-term growth. According to the same rationale, procyclicality in the banking industry may be desirable, if it is solely the outcome of changes in the real economy, while it is not desirable if it is caused by the financial system itself (Landau, 2009a).

<sup>15</sup> Note that risk premia reached historically low levels over the five years that preceded the financial crisis.

explained by deviations from the efficient markets hypothesis (ECB, 2005). According to this hypothesis, market participants possess all available information and evaluate it rationally, distinguishing between temporary shocks and events with a long-lasting impact. Consequently, banks will have counter-cyclical behaviour and can appreciate the true state of the economy and reduce (increase) their loans by increasing (decreasing) loans interest rate when the economic cycle is reaching its maximum (minimum) point.

In reality though, markets may function in a less than efficient manner. Inefficient functioning of the markets can be explained by several hypotheses (Beattie et al., 1995), the most important of which are the following:

- Asymmetric information hypothesis: This hypothesis<sup>16</sup> rests on the fact that borrowers have more knowledge than lenders about a project. This fact, combined with the adverse selection hypothesis (i.e. the lender is unable to verify one or more of the project's key characteristics), affects banks' behaviour: banks are willing to grant more loans in the upward phase of the cycle and reluctant in the downward phase (thereby significantly reducing the level of competition). The asymmetric information hypothesis is also directly related to provisioning practices, since increasing provisions lowers banks' profitability and possibly their dividends, transmitting *negative messages* (signalling) to the market about their financial condition<sup>17</sup>. Even if dividends are not reduced, it is difficult for the management of a bank to make higher provisions than the rest of the industry, in view of the need to avoid giving a negative message about its loan portfolio quality. Consequently, banks will choose the level of provisions that minimizes negative effects (Rajan, 1994).
- Principal-agent hypothesis: There may be a conflict of interest between the principal and the agent, either due to their different risk profiles or due to the principals' difficulty in verify that the agent has acted in his interest or has made an "adverse selection" (Eisenhardt, 1989). This assumption leads to procyclicality when: (a) agents, because of high incentives from the principal (i.e. high bonuses), take excessive risks, which can lead to systemic instability; and (b) borrowers

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<sup>16</sup> Asymmetric information is considered as the main cause of procyclicality (ECB, 2005).

<sup>17</sup> At the beginning of this crisis, some banks distributed high dividends, despite the bleak industry outlook (Basel Committee on Banking Supervision - BCBS, 2009).

underestimate tail risk, retaining in that way the possibility for excess profits, while lenders risk losing their capital (Landau, 2009). Problems arising from the principal-agent hypothesis can only partially be addressed by loan commitments, and therefore borrowers usually pledge collateral<sup>18</sup>.

- Free-riding hypothesis: A bank's management may not consider the impact of their choices on the stability of the financial system, particularly in the upward phase of the cycle.
- Moral hazard hypothesis: A bank's management is convinced that, in the event of significant financial problems, it can rely on state support.
- Disaster myopia hypothesis: the behaviour of a bank's management (but also that of borrowers) is myopic (Guttentag and Herring, 1986), in the sense that only short-term risks are considered, assuming that they are able to cope with a significant recession, based on previous experience, while underestimating the likelihood of an extremely negative economic event. This happens because banks tend to "forget" problems in their loan portfolios as time passes since the last crisis, due to the gradual withdrawal of experienced personnel, the softening of bank lending standards and the decreased ability of stakeholders (e.g. shareholders, supervisors, etc.) to control the bank's management<sup>19</sup>.
- Cognitive dissonance hypothesis: A bank's management engages in justifying past choices, even if they have been proven wrong. Cognitive dissonance may arise from (voluntary or involuntary) misinterpretation, oversight or rejection of available information in order to justify past choices.
- Herding behaviour hypothesis: A bank's management and large institutional investors tend to follow their competitors, adding thereby to market volatility, in order:
  - firstly, not to jeopardize their position if they follow wrong personal choices (Scharfstein and Stein, 1990 and Rajan, 1994);

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<sup>18</sup> See Section 6.2.2 for possible consequences concerning irrational use of collateral.

<sup>19</sup> See also the institutional memory hypothesis (Berger and Udell, 2002). The authors use a sample of U.S. banks from the period 1980-2000 (including almost two economic cycles) and find evidence in favour of this hypothesis. Note that this hypothesis is linked to changes in bank financing during the credit cycle and not the business cycle.

- secondly, to look forward to government support in case of a severe crisis (Borio et al., 2001);
- thirdly, to take advantage of the situation, since it is common for executive remuneration schemes at banks to depend on the overall performance of the industry (Borio et al., 2001);
- fourth, to minimize the impact of adverse news spread from other (competing) banks on their cost of borrowing (Acharya and Yorulmazer, 2008).

Herding behaviour, which is the outcome of information and technology uniformity, can cause sudden changes in market liquidity. These changes are believed to have contributed to sharp price fluctuations<sup>20</sup> in some cases (e.g. the Black Monday incident in the New York Stock Exchange in October 1987, the devaluation of the Mexican peso in December 1994 and the currency crisis of Southeast Asia in October 1997 and Russia in August 1998) (Athanasoglou, 2004).

On this basis, it can be concluded that the main sources of procyclicality can be attributed to market imperfections<sup>21</sup>.

## 6.2 Factors affecting procyclicality

Procyclicality is affected by the following factors: First, those related to economic policy and banking supervision, second, those related to banking system's regulations and practices and third, some other factors.

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<sup>20</sup> The effect of herd behaviour on market liquidity and hence on market volatility has been highlighted by Rajan (2005) and Hardouvelis (2010).

<sup>21</sup> The Financial Stability Board (FSB, former Financial Stability Forum, 2009a), refers, inter alia, to the restrictions imposed by risk assessment methods and assumptions on which these estimates are based, which strengthen the banking sector's procyclicality. The significant under- or over-estimation of risk, depending on the current phase of the economic cycle, is the reason for large changes in prices of financial assets and is the outcome of market imperfections, as noted above, but is also associated with the fact that it seems to be more difficult to measure the time dimension of risk, than to estimate risk correlations within the financial system (Borio and Zhu, 2008).

### **6.2.1 Economic policy and banking supervision**

- Fiscal policy. Fiscal policy must be countercyclical, in order to act as an economy stabilizer for the economy. Especially during recessions, fiscal policy (either by lowering taxes or by increasing government spending<sup>22</sup>) can increase aggregate demand<sup>23</sup> and give the necessary impetus to growth<sup>24</sup>. However, fiscal policy can cause the opposite effect, i.e. turn from being countercyclical to procyclical if public finances are not managed in prudently<sup>25</sup>. Indeed, it has been found that, while fiscal policy is countercyclical and is not affected by economic cycles in developed countries, it is procyclical in emerging countries<sup>26</sup>. In a crisis, the latter but also the former are likely to face higher costs or even major problems in financing their public sector, forcing their banks to raise lending interest rates and / or reduce loan supply, adding to procyclicality.
- Monetary policy. Monetary policy can contribute significantly to strengthening or mitigating procyclicality<sup>27</sup> (ECB, 2009c), through the following channels:

First, the interest rate channel through which loan demand is affected.

Second, the credit channel, which can be further broken down into:

- the bank lending channel (also referred to as the narrow credit channel), through which the cost of funding and the banks' capital base are affected (see ECB,

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<sup>22</sup> There is a debate as to whether fiscal policy is more efficient by reducing taxes or by increasing expenditure (Mankiw, 2010).

<sup>23</sup> There is evidence that fiscal policy in OECD countries can be more effective in increasing aggregate demand during recession with limited access to bank financing and less effective during expansion (Tagkalakis, 2008). Fiscal policy (especially tax cuts and increases in non-wage government spending) - except for an increase in aggregate demand - tends to increase consumer and business confidence (Konstantinou and Tagkalakis, 2010).

<sup>24</sup> An increase in public spending, even during recession, may have a negative effect, since taxpayers will be expecting an increase in taxes, which will lead to an increase in savings rate (see Gordon and Leaper, 2005).

<sup>25</sup> In the period 2001-2009 was procyclical as the budget deficit persistently exceeded 3%, while no systematic effort was made to reduce the debt ratio to GDP (Provopoulos, 2010). Moreover, an "unsustainable" level of debt is expected to render an expansive (i.e. countercyclical) fiscal policy in times of crisis harmful for growth (IMF, 2009c).

<sup>26</sup> See Cuarda et al. (2009) for a review of the relevant literature.

<sup>27</sup> Since this can affect both banks' ability and willingness to lend and the level of lending interest rates (ECB, 2009c).

2009c and Cappiello et al., 2010). This channel also includes the **bank capital** channel<sup>28</sup>; and

- the balance sheet channel (also called broad credit channel<sup>29</sup>), through which potential borrowers' property and collateral value is affected.

Third, the risk taking channel<sup>30</sup>. This transmission channel can be defined as the impact of changes in policy interest rates on risk perceptions or risk tolerance and operates through three channels: a) the effect of interest rates on cash flows, revenues and asset values of enterprises and households, b) the relationship between market interest rates and target rates of return<sup>31</sup>, and c) the strategy concerning monetary policy communication functions and the reaction function of the Central Bank (Borio and Zhu, 2008). Several studies (Altunbas et al., 2010, Adrian and Shin, 2009 and ECB, 2009a) show that setting short-term rates at low levels over the past decade contributed to the increase in the level of risk in the banking industry, providing evidence of this mechanism. Furthermore, it has been shown that the level of short-term interest rates reduces the incentive for screening potential borrowers (Dell'Arricia and Marquez, 2006). However, no matter how important the risk taking channel is, it is extremely difficult to use the same tool (i.e. interest rates) as a means of achieving both price and financial stability at the same time (Barrell et al., 2010 and Goodhart and Persaud, 2008).

- Banking supervision. Some studies have also examined the effect of supervision stringency on bank lending standards. Specifically, Krainer and Lopez (2009) have

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<sup>28</sup> A change in the interest rate causes a change in the value of financial assets, resulting in gains or losses on banks' trading books. This affects banks' capital adequacy and therefore their ability to lend (see ECB, 2009c, Sections 3 and 8.2 and Borio and Zhu, 2008 for references to studies that find evidence of this mechanism).

<sup>29</sup> A decrease in interest rates tends to increase the value of assets used as collateral by enterprises and households to obtain a loan, thereby reducing borrowing costs and offering the possibility of borrowing a larger amount. The opposite happens in the case of an increase in interest rates. See also Section 3 as well as ECB (2009c) for references to studies that find evidence of the balance sheet channel.

<sup>30</sup> This channel has been proposed by Borio and Zhu (2008), who argue that the importance of this mechanism has increased during the recent years due to changes in the financial system, its supervision, and the increasing role of market and funding liquidity.

<sup>31</sup> This relationship applies particularly for investment products with a guaranteed minimum return, e.g. bankassurance products.

found an inverse relationship between the economic cycle and supervision stringency in the USA for the period 1987-2004, which limited loan supply in the period 1989-1992 (Peek and Rosengen, 1997). However, Berger et al. (2000) found that this factor caused only a minor tightening of bank credit standards in that country for the period 1986-1994. Therefore, a very strict banking supervision<sup>32</sup> during recession may restrict bank loan supply, exacerbating procyclicality (Borio et al., 2001).

### ***6.2.2 Banking system's regulations and practices***

Factors related to the banks' regulatory framework (Basel II framework and accounting rules) and practices (borrowers' collateral, leverage and liquidity management) are the following:

- Basel II prudential regulations<sup>33</sup>.
- The application of accounting rules. This concerns mainly the fair value method, based on International Financial Reporting Standards (IFRS) and the accounting treatment of realized and expected losses in the loan portfolio<sup>34</sup>.
- Collateral. Procyclicality is strengthened by the change in collateral required during different phases of the economic cycle. Changes in collateral required have to do with:

First, the amount of collateral required: This factor can influence lending, since the collateral required may be so high, that a potential borrower may be unable or unwilling to pledge it.

Second, collateral valuation: Collateral valuation carried out by banks can be either at current market prices or (more conservative) at values which reflect fundamentals, thereby affecting the amount of borrowing, if this is directly related to collateral valuation.

Third, the loan to value ratio (LTV): It has been shown that the LTV ratio in some cases (for example in Japan and Great Britain in the decade of 1980) varies during the

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<sup>32</sup> A stricter supervision does not necessarily lead to a more stable financial system (Barth et al., 2004).

<sup>33</sup> See Section 7 for a more detailed presentation.

<sup>34</sup> See Section 8 for a more detailed presentation.

different phases of the economic cycle (Borio et al., 2001). More generally, collateral valuation carried out at market prices and a LTV ratio exceeding 100% can lead to increased procyclicality, especially in the case of a price decline in existing collateral and the requirement for an immediate pledge of additional collateral<sup>35</sup> (Financial Stability Forum - FSF, 2009).

- Leverage. During the period 2003-2007, the leverage of European banks rose, unlike that of U.S. banks. In fact, though, the leverage of U.S. banks was higher than shown in financial statements, due to structured products and off-balance sheet items. Maturity mismatch between assets and liabilities was significant, as banks financed long-term investments with short-term borrowing from the markets. After the outbreak of the crisis, a deleveraging process began, causing significant losses to banks. Six (6) market practices have been identified, which have contributed to an increase in procyclicality of leverage in the financial system<sup>36</sup>:
  - The use of the mark-to-market<sup>37</sup> valuation method in order to estimate the value of financial products, especially in illiquid markets.
  - The use of the Value at Risk<sup>38</sup> (VaR) and other market-sensitive methods, without taking into account the “through the cycle” volatility. According to the results produced by these methods, adjustments are made to banks’ trading and banking books.
  - The use of triggers in OTC derivative contracts usually activated during periods of stress, according to which the provision of higher margin or other form of collateral is required.

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<sup>35</sup> Loss given default tends to increase in loans secured by assets that are procyclical (Borio et al., 2001).

<sup>36</sup> See Joint FSF – CGFS (Committee on the Global Financial System) working group, 2009.

<sup>37</sup> It has been shown that leverage in conjunction with mark-to-market valuation is highly procyclical. U.S. banks tend to increase their leverage and their investments in risky assets in the upturns and reduce them in recession (Berger et al., 2008 for commercial banks and Adrian and Shin, 2008 for investment banks).

<sup>38</sup> See also Section 6.2.3.

- Margin requirements on derivatives<sup>39</sup>.
  - The recognition of unrealized profits on structured products, in spite of the associated risks still retained in the portfolio, and
  - The use of alternative accounting methods to hedge accounting.
- Market liquidity and funding liquidity. Regarding the latter, banks need to refinance their liabilities, the maturity of which is less than that of their assets. Therefore, banks need to have access to money and capital markets, especially when the ratio of loans to deposits is higher than one. Consequently, market liquidity (i.e. the ease with which a bank carries out transactions in it) is essential for the functioning of banks<sup>40</sup>. However, market liquidity (Jones, 2002) and funding liquidity are procyclical. This procyclicality is further reinforced by the fact that market liquidity risk, funding liquidity risk and credit risk are interrelated<sup>41</sup> (Andritzky et al., 2009). This became obvious during the last crisis: some banks were faced with substantial losses, which affected their capital base, and led to a loss of trust among the members of the financial system. International money and capital markets were transformed in very short time (especially after the collapse of Lehman Brothers) from liquid to illiquid, and the interbank market came to a halt. Forced sales of financial assets at extremely low prices by banks trying to acquire the necessary liquidity exacerbated the problem. The situation prompted central banks worldwide to intervene, to meet liquidity needs.

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<sup>39</sup> For example, IMF (2007) observed increased margins in most countries in the summer of 2007. Changes in margins reinforce procyclicality, particularly in combination with the creation of a self-reinforcing cycle of liquidity constraints and rising losses on existing positions (Brunnermeier and Pedersen, 2008). However, it is argued that the margin can also be counter-cyclical, when expressed as a percentage of the instrument's nominal value and not at its current market value (see Hardouvelis, 2010).

<sup>40</sup> However, increased market liquidity can lead banks to take up more risks, based on the assumption that it will be easier to liquidate risky assets in a potential crisis (Wagner, 2004).

<sup>41</sup> Brunnermeier and Pedersen (2008) examine the combination of market liquidity risk and investors' funding liquidity risk and argue that, during periods of increased market volatility, margins on naked positions also increase, reducing market liquidity and investors' funding liquidity, leading to their mutual reduction.

### 6.2.3 Other factors

The factors listed below refer to financial sector practices that tend to enhance the banking industry's procyclicality.

- Credit rating agencies assessments. Usually, credit rating agencies aim to rate borrowers "through-the-cycle". This means that credit rating agencies will take into consideration the downside scenario when assessing the probability of default. However, this does not imply that ratings by these agencies are acyclical: If the recession is worse than expected, there will inevitably be more downgrades. This partly explains the fact that both during the current crisis and in previous ones (such as the Mexican crisis in 1994 and the Asian crisis in the period 1997-1999), these agencies proceeded to relatively more downgrades, thereby enhancing procyclicality<sup>42</sup> (Borio et al., 2001). By contrast, during the upward phase of the cycle, reports with improved ratings increase asymmetrically. Moreover, these agencies tend to revise their assessments by more than one notch when there are significant changes in the rated companies' financial position, and these assessments are significantly influenced by the economic cycle (Amato and Furfine, 2003).
- The use of automated risk management systems and in particular VaR<sup>43</sup> (Value at Risk). The use of automated risk management systems can decrease (increase) investors' risk aversion in periods of high (low) volatility since, VaR (or alternatively a portfolio's potential loss) is typically calculated using recent data and current asset prices. Note that the calculation of VaR estimates is based on estimations about correlations between certain variables. However, it has been observed that correlation coefficients tend to increase in times of crisis or recession, meaning that the benefits of diversification tend to disappear when they are most needed (Longin and Solnik,

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<sup>42</sup> However, it is argued that credit rating agencies' assessments are less procyclical than provisions carried out by banks (Borio et al., 2001), since the former assess the probability of a firm's default over a longer time horizon (Borio and Zhu, 2008). Moreover, it is difficult for credit rating agencies to forecast a major crisis, so they are sometimes forced by the market to proceed to downgrades (Haldane et al., 2001).

<sup>43</sup> VaR is a portfolio's maximum daily loss for a specified time and with a specified confidence interval. For example, if a portfolio's one day VaR is 50 basis points with a confidence interval of 99%, then it is expected that this portfolio will on average exhibit losses of over 50 basis points in one out of a hundred days.

2001). Consequently, banks should calculate the conditional VaR (CoVaR), that is the VaR of the financial system, conditional on a number of institutions being in distress (Adrian and Brunnermeier, 2008).

Moreover, market volatility (and by extension procyclicality) is influenced by the fact that financial firms tend to use similar risk management systems, leading to uniformity in their investment choices and their reactions to changes in fundamentals, which partly explains banks' herding behaviour (Hardouvelis, 2010).

- Executive remuneration schemes in the financial sector. Remuneration schemes are based on the growth rates of revenues and profits, but the underlying risk tends not to be considered. There are indications that the U.S. wage structure and the amount of bonuses (mainly stock options) distributed to banks' executives induces risk-taking (Chen et al., 2006). This phenomenon became pronounced after deregulation in the U.S. banking industry and the efforts of banks to gain market share (Davis and Zhu, 2004). The unsatisfactory functioning of corporate governance (as shareholders demanded increasing returns at a time when the market returns were low) was also a factor.

### **6.3 Factors mitigating procyclicality**

It has been argued that market imperfections could also lead to the mitigation of banking sector's procyclicality. Specifically, Bikker and Metzmakers (2005) conclude that banks in OECD countries during the 1990s exhibit a positive correlation between profitability and their provisions, reflecting countercyclical behaviour. This positive correlation is called the income smoothing hypothesis and can be explained by the fact that a bank's management may wish to avoid major changes in profitability levels and, therefore, will choose to increase provisions in times of higher profitability, so that their net income does not vary significantly from year to year. Note, however, that increased profitability will not necessarily lead to increased provisions. The sum of provisions is influenced, among others, by the following two hypotheses:

- Capital management hypothesis: Banks with low capital adequacy ratio make higher provisions in order to improve this ratio, and
- Tax shield hypothesis: The tax deductibility of provisions from taxable income may be an incentive for banks to increase them.

## **7. Basel II and procyclicality**

This section deals with the question of whether Basel II amplifies banking system's procyclicality. In order to answer this question, one needs to examine:

- Whether Basel II causes procyclicality of regulatory capital, through its Pillar I capital requirements.
- Whether Pillar II may further amplify procyclicality.
- Whether the credit standards of individual banks and the banking industry as a whole are altered by the Basel II framework to such an extent that they can cause fluctuations to the overall economic activity.

### **7.1 Contribution of Basel II to procyclicality**

The Basel II framework has received significant criticism as regards its contribution to strengthening procyclicality (Report de Larosière, 2009). This criticism relates to the volatility of capital requirements and the relationship between capital buffers, provisions and equity and the business cycle.

The volatility of capital requirements depends on the approach according to which these are gauged. More precisely, when capital requirements are gauged using the standardized approach, asset weights are determined by the credit ratings of companies financed and are therefore as procyclical as the ratings from the credit rating agencies<sup>44</sup>.

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<sup>44</sup> There are three alternative approaches of varying degree of sophistication under Basel II for computing capital requirements: the standardized approach, the foundation internal ratings-based (IRB) approach and the advanced IRB approach. The standardized approach uses ratings from credit rating agencies in order to assess the credit risk of the financed companies. Basel II sets a weighting of 75% for loans to companies with an annual turnover of up to 2.5 million euros, and a weighting equal to that of the government's rating with a minimum of 100%, for loans to

The calculation of capital requirements for credit risk under the IRB approaches is based on six parameters, of which the following three are affected by the economic cycle (ECB, 2005):

- Probability of default<sup>45</sup> (PD).
- Loss given default<sup>46</sup> (LGD). The LGD tends to rise during downturns, amplified by the fact that recovery rates for defaulted loans are lower during recession than during expansion. Note that during recessions, the value of collateral, which is used to reduce the actual loss for a bank, tends to decrease.
- Exposure at default. This is higher during recessions, as customers tend to make full use of their credit lines (Jimenez et al., 2007).

The volatility of capital requirements due to Basel II (and the consequent exacerbation of procyclicality) has been confirmed empirically. More precisely, a study by Kashyap and Stein (2004) shows that according to Standard and Poor's model, the capital charge<sup>47</sup> is estimated at 30-45%, while according to the KMV model capital charge is estimated at 70-90% , keeping LGD constant. However, the latter tends to rise during recession, therefore capital charge is underestimated. The authors also estimated that any capital buffers created during expansion will not be sufficient to deal with procyclicality in a major recession. Therefore, Basel II enhances the banking sector's procyclicality, since it relates the capital requirements for a loan to its PD.

Studies by Erwin and Wide (2001), Segoviano and Lowe (2002), Peura and Jokivuolle (2004), Gordy and Howells (2006) and Repullo and Suarez (2008) reach a similar conclusion, although their estimates about the impact of Basel II on regulatory

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companies with an annual turnover of over 2.5 million euros. According to the foundation IRB approach, each bank estimates probability of default and exposure at default, while loss given default is estimated by the supervising authority. Under the advanced IRB approach, the bank also estimates loss given default.

<sup>45</sup> PD's cyclical pattern has been confirmed empirically (Altman, 2004, Fama, 1986 and Barnhill and Maxwell, 2002), although it is unclear whether it affects high-or-low-rated firms.

<sup>46</sup> LGD is related both to the state of the economy (Altman et al., 2002 and Acharaya et al., 2004) and PD (see Allen and Saunders, 2004 and the cited bibliography).

<sup>47</sup> Additional capital for banks in Europe and the U.S. needed in order to maintain minimum capital adequacy in the period 1998-2002, if Basel II had already been implemented. The amount of this additional capital emerges from models used by the credit ratings agencies Standard and Poor's and KMV.

capital vary considerably, probably due to different samples of banks and methodologies used. The latter concluded that Basel II is more procyclical than Basel I, although the former leads to a strengthened banking system. As mentioned in Section 3, capital adequacy rules tend to restrict loan supply (see also relevant literature in Borio and Zhu, 2008).

The relationship between capital buffers and the economic cycle has also been examined in the literature. Jokipii and Milne (2008) argue that there is a negative relationship between European banks' capital buffers and GDP over the economic cycle<sup>48</sup> (1997-2004), which is thought to amplify the procyclicality caused by Basel II. Likewise, Heid (2007), using a large sample of banks in OECD countries for the year 2004, establishes that Basel II strengthens banking sector's procyclicality - especially in those countries where companies rely on bank financing - even if banks retain considerable capital buffers.

The relationship between provisions and equity and the economic cycle has been examined by a series of studies, which usually lead to the conclusion that there is a negative relationship between provisions and GDP, which implies procyclicality (Bikker and Metzmakers, 2005, Borio et al., 2001, Laeven and Majnoni, 2003 and Craig et al., 2006). This problem is mitigated by the fact that banks tend to make more provisions when their profits grow<sup>49</sup> (this behaviour can be attributed to the income smoothing hypothesis). However, there is significant variation in provisions policies among banks of various countries (Bikker and Metzmakers, 2005).

Apart from Basel's II contribution to amplifying procyclicality, the framework has also been criticized in other areas. Persaud (2008a) argues that Basel II cannot protect against a crisis, as capital requirements' calculations are based on market prices, and therefore regulatory capital inevitably follows the pattern of the cycle. In the upward phase of the cycle, banks seem to face low risks, while during recessions they appear to face high risks. Furthermore, Persaud (2008a) argues that Pillar III will act as a means of pressure for banks with high capital adequacy ratios in the upward phase of the cycle,

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<sup>48</sup> See Ayuso et al. (2002) and Stolz and Wedow (2005) for similar conclusions about Spanish and German banks, respectively.

<sup>49</sup> See Arpa et al., (2001) for similar conclusions about the Austrian banks.

because shareholders will demand returns on capital equivalent to banks with lower capital, and therefore banks will rather be pushed to take on higher risks to achieve increased profitability, rather than to retain high capital adequacy ratios in order to address future downturns.

The de Larosière report (2009) states that the recent crisis has revealed the tendency for Basel II to generate procyclical behaviour (although it is recognized that Basel II is improved compared to Basel I) and that a “fundamental review” is required, since a series of false assumptions were made such as:

- Market volatility was underestimated, mainly due to the use of recent data, which did not capture fat tail outcomes;
- The ability of banks to manage risks was overestimated; and
- The assumption that risks would be distributed through securitization, reducing thereby systemic risk, proved incorrect on a global basis.

## **7.2 Arguments in favour of the counter-cyclical behaviour of Basel II**

It is argued that the proper implementation of the framework’s recommendations and guidelines does not necessarily lead to an exacerbation of the banking industry’s inherent procyclicality. To understand the debate, it is useful to recognize that Basel II can lead to an amplification of procyclicality when at least three causal links are present (Saurina, 2008):

- Capital requirements have to increase (decrease) in the downward (upward) phase of the cycle. However, Basel II contains the following mechanisms designed to dampen this problem:

First, it is recommended that banks use a time horizon of at least one business cycle<sup>50</sup> in order to estimate the PD and LGD<sup>51</sup> ("ideally cover at least one business cycle"), although banks are required to use only one year data. If banks follow this recommendation, the relative change in capital requirements between the peak and

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<sup>50</sup> Catarieneu-Rabell et al. (2005) point out that such a policy may limit Basel’s II procyclicality.

<sup>51</sup> Basel II requires the use of downturn LGD estimates at any time in the business cycle.

the lowest point of the cycle is reduced to almost 1 / 5 compared to the use of one year data.

Second, stress tests are proposed. The proper application of stress tests can offset Basel II's procyclicality (Taylor and Goodhart, 2004).

- Banks' capital adequacy - as set by Basel II (Pillar I) – has to be close to its minimum. In practice, however, banks hold capital significantly higher than set by capital requirements<sup>52</sup>. Moreover, because Pillar III requires improved transparency, it may be difficult for a bank to retain its capital adequacy levels near the minimum throughout the entire business cycle and not to provoke a reaction from stakeholders. The importance of capital buffers in mitigating significantly Basel II's procyclicality has been confirmed empirically (Peura and Jokivuolle, 2004, and Heid, 2007).
- Loan demand and supply may not depend directly on bank's capital buffers.

Zhu (2008) argues that studies which have concluded that procyclicality may be exacerbated by Basel II<sup>53</sup> should be examined with caution, because they: a) consider a passive and not an active portfolio strategy; b) consider only regulatory capital, although it is known that banks maintain higher total capital (part of which are capital buffers); and c) do not address the dynamic evolution of regulatory capital in the course of the economic cycle. The author notes that during recession, Basel II's increased volatility in regulatory capital requirements compared to Basel I, does not necessarily lead to a reduction in loan supply (i.e. there is not necessarily a procyclicality issue), since banks chose their lending portfolio before the crisis not according to minimum capital requirements. Furthermore, capital adequacy rules enhance the stability of individual banks and the financial system.

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<sup>52</sup> According to Jokipii and Milne (2008), the EU-25 banks' capital buffer amount on average to 3.77% (i.e. 3.77% higher than 8% defined as the minimum capital adequacy ratio). It is assumed that the size of the capital buffer is determined by factors such as the risks undertaken, the requirements of credit rating agencies, the imposition of fines for violation of capital adequacy rules, the need to borrow from the markets with a relatively low rate (Jokipii and Milne, 2008) and in order to prevent a dividend reduction in case of a profitability shortfall (Saurina, 2008).

<sup>53</sup> The number of empirical studies which have concluded that Basel II does not amplify procyclicality substantially is limited. Zakrajsek et al. (2001) find no significant amplification in regulatory capital procyclicality, while Ayuso et al. (2002) and Stolz and Wedow (2005) argue that it is not clear whether Basel II amplifies procyclicality. It is however expected that increased volatility in regulatory capital may also influence economic capital (Taylor and Goodhart, 2004)

In the theoretical literature it has been shown that the implementation of Basel II shall lead to a mitigation of procyclicality, because banks are expected to alter their loan portfolio according to the state of the economy (see ECB, 2009b and the literature cited there). This is explained by the fact that during recession, capital requirements for loans to firms with high credit ratings are expected to increase more than for loans to firms with low credit ratings<sup>54</sup>. Consequently, banks will reduce lending to creditworthy firms and increase lending to firms with lower credit ratings.

However, in reality, it is unclear whether bank access would be curtailed to firms with high credit ratings during recession. More specifically, it has been found that U.S. banks have increased interest rate margins on high-risk (low rated) firms more than the medium or low risk firms during the 2001 recession (Basset and Zakrajsek, 2003). Besides, there is a negative correlation between interest rates charged on loans to firms and their credit ratings (Bernanke, 2009). Therefore, firms with high credit ratings are not expected to face difficulties in their bank financing.

Basel II's procyclicality may also be attenuated by the counter-cyclical behaviour of capital requirements for operational risk: According to the Basic Indicator Approach and the Standardised Approach, capital requirements for operational risk are calculated as a percentage of total revenues. However, during recession, total revenues tend to decrease (mainly due to the decline in revenues from financial activities), and therefore capital requirements for operational risk will also decline (Allen and Saunders, 2004).

Finally, a study of the ECB (in cooperation with the Banking Supervision Committee (BSC) and the Committee of European Banking Supervisors<sup>55</sup> (CEBS)) concluded that Basel's II procyclicality was rather limited (ECB, 2009b).

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<sup>54</sup> See Kashyap and Stein (2004). This result is explained by the fact that the room for a further deterioration in the credit rating of firms with already low credit ratings is limited (since these firms will face bankruptcy), while higher rated firms have more room for their ratings to deteriorate.

<sup>55</sup> This committee is now called "European Banking Authority".

### **7.3 Conclusions on the procyclical behaviour of Basel II**

From the analysis in this chapter, we can conclude that Basel II seems to increase the volatility of capital requirements over the business cycle. Because capital plays a fundamental role in loan supply, we can conclude that the banking system's procyclicality tends to be amplified by Basel II. The magnitude and scale of this amplification depends on a number of factors such as: the size of capital buffers<sup>56</sup>, the approach adopted for computing capital requirements, the banks' portfolio composition during the business cycle and the appropriate use of the time horizon for the estimation of PD and LGD.

However, it should be recognized, that Basel II's risk sensitivity in the calculation of capital requirements is in the right direction and leads to a more stable financial system. Indeed, Basel II is considered as an important factor that led banks to improve their practices for monitoring and managing risks (Borio and Zhu, 2008). Moreover, Basel II has not been fully implemented, since it came into force on January 1<sup>st</sup>, 2008 in the European Union, while it had not been yet applied in the U.S. For this reason, BCBS (2009) notes that it is premature to determine whether Basel II is more cyclical than expected.

In any case, it is estimated that an optimal system of capital requirements that can offset procyclicality, should be able to track the economic cycle, i.e. capital requirements should be relatively higher in the upward phase and lower in the downward phase.

## **8. Accounting standards and procyclicality**

In order to determine the role of accounting standards (especially of fair-value accounting) in amplifying procyclicality, it should be examined whether they increase the volatility of banks' earnings and capital and whether this volatility affects bank credit standards. Moreover, current accounting standards should be compared with alternative accounting methods.

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<sup>56</sup> Basel II's procyclical behaviour affects mainly banks with marginal capital adequacy and liquidity, while banks with capital levels significantly higher than the minimum will only be affected during a major crisis (ECB, 2009b).

## 8.1 Potential drawbacks of current accounting standards

The main potential drawbacks of current accounting standards as regards procyclicality refer to: first, the increased volatility caused to banks' financial statements, second, the rules concerning the incurred and expected losses in loan portfolios and, third, the impact of accounting standards on banks' lending standards.

As far as the increased volatility in the banks' financial statements is concerned, there are indications that the use of fair value accounting by large European banks would increase volatility following shocks to interest rates, share prices and property prices (Enria et al., 2004). It is possible, however, that this increased volatility does not reflect a change in fundamentals, but may rather be the outcome of market imperfections (Borio and Tsatsaronis, 2006), random effects and / or speculation (Platin et al., 2008 Vinals, 2008). This problem is exacerbated in markets with limited liquidity and trading activity, due to the interaction of these factors, affecting both the speed and extent of changes in leverage and asset prices<sup>57</sup> and thereby increasing systemic risk (Shin, 2006). Therefore, banks with a short-term investment horizon may choose to act according to their expectations about short-term price movements, thereby amplifying the current trend in prices<sup>58</sup>. In this way, the fair value method leads to an endogenous volatility of prices (Platin et al., 2008a, 2008b), and makes procyclicality endogenous. Moreover, the volatility caused by this method may increase because of estimation errors, inherent volatility and the use of the mixed attributes model (i.e. the application of fair-value accounting to some instruments and amortized cost accounting to others) when preparing financial statements<sup>59</sup>, reducing the netting effect (Barth, 2004).

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<sup>57</sup> It is argued, that fair value accounting can significantly impair market liquidity, thereby affecting prices of financial assets, banks' capital adequacy and, ultimately, their solvency (Persaud, 2008b). In markets with limited liquidity, prices of financial assets are largely determined by the buyer's liquidity (Allen and Carletti, 2008).

<sup>58</sup> The amplification of the current trend in asset prices is examined by Boyer (2007). He refers to the existence of an accounting accelerator, which adds on the financial accelerator and strengthens the existing volatility. The accounting accelerator exists because fair value accounting mixes information on an asset's cash flows and the market's risk appetite and consequently asset valuation.

<sup>59</sup> For example, interest rate derivatives (used to hedge interest rate risk) appear in financial statements using the fair value method, while at the same time the loan portfolio (where the interest rate risk is present) is (usually) calculated on the basis of the historical cost method.

The use of fair value accounting is not limited to the banks' trading portfolio, but can also be applied to the loan portfolio. Therefore, changes in interest rates can lead to significant changes in the value of the loan portfolio<sup>60</sup>, although the bank's intention may be to hold these loans to maturity (Tumpel-Gugerell, 2010 and Enria et al., 2004). Because of this, mark-to-market rules may be ideal for investment banks and trading activities, but are not appropriate for the business model of commercial banks, since the latter are induced to operate with a short-term perspective<sup>61</sup> (de Larosi re report, 2009)

Regarding the accounting standards for incurred and expected losses in the loan portfolio, it is argued that these exacerbate procyclicality because incurred losses do not relate to expected losses, i.e. provisions for future losses are not allowed<sup>62</sup> (Saurina, 2008 and Tumpel-Gugerell, 2010). During recessions, non-performing loans tend to rise and banks exhibit losses that reduce their capital and their ability to lend. These problems are exacerbated during periods of sharp declines in liquidity.

Finally, regarding the impact of accounting standards on credit standards, the latter are expected to be directly affected by a change in both the regulatory and economic capital of banks (see Section 3 and Enria et al., 2004) and indirectly by an increase in the banks' cost of funding, due to the increased volatility in their financial statements<sup>63</sup> (Barth, 2004).

## **8.2 Advantages of current accounting standards**

The main advantages of current accounting standards have to do with the increased transparency of the banks' financial statements, which can enhance market discipline and

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<sup>60</sup> This is the case when the bank has chosen the fair value method rather than historical cost accounting for its loan portfolio.

<sup>61</sup> Platin et al. (2008b) concluded that the mark-to-market method is preferable in the case of relatively short-term and junior assets that are traded in highly liquid markets, while historical cost accounting is preferable in the case of senior assets with the opposite characteristics (like the majority of a commercial bank's assets).

<sup>62</sup> Note that the expected loss is taken into account when calculating an asset's net present value when fair value accounting is applied (via the discount rate), but credit risk is not separated from other risks (Enria et al., 2004).

<sup>63</sup> This increased volatility due to the application of the fair value method may be interpreted as an indication of increased risk, thus raising the cost of funding (Barth, 2004 and Platin et al., 2008b).

provide timely information to investors and stakeholders about potential financial problems (Vinals, 2008). Therefore, since banks' financial statements were procyclical even before the application of fair value accounting, this method is an ideal choice for financial sector companies, although its disadvantages should be corrected<sup>64</sup> (Novoa et al., 2009). However, when financial statements are published, they are already outdated, since they quote market prices one or more months before. Therefore, the provision of timely information to investors is questionable.

Furthermore, it has been argued that fair value accounting was neither liable for asset fire-sales nor did it add significantly to the severity of the last financial crisis (Laux and Leuz, 2009).

Finally, despite the fact that the use of the alternative historical cost accounting in banks' financial statements may be less volatile than fair value accounting, in the case of a financial asset's price fall, the relevant loss has to be presented in the financial statements, and the result will be similar to that of the fair value method.

## **9. Proposals to the banking sector's procyclicality issue**

### **9.1 General characteristics of the proposals**

The preceding analysis has shown that Basel II and accounting standards, despite criticism about their role in exacerbating banking sector's procyclicality, still constitute a notable set of rules for the operation of banks. For this reason, the proposals for mitigating banking sector's procyclicality which are presented in this Section seek to address their weaknesses while maintaining their positive aspects.

Depending on the source of procyclicality they are designed to address, the proposals may be grouped into those related to:

- the Basel II framework,
- accounting rules,

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<sup>64</sup> Note that if a bank's credit rating deteriorates, the present value of its debt will decrease (since this is estimated using fair value accounting), thereby increasing its regulatory capital (Novoa et al., 2009 and IMF, 2008).

- leverage and liquidity in the banking sector, and
- other proposals.

## **9.2 Proposals concerning the Basel II framework**

Proposals to dampen procyclicality attributed to the Basel II framework can be divided into two categories: first, those concerning capital buffers<sup>65</sup> and capital requirements, and second, those related to other aspects, such as insurance for banks, bond issuance, etc.

The first category can be further divided into: first, those relating to general rules for the banking industry (rules or system-wide variables); and, second, those relating to individual banks (discretion or bank-specific variables<sup>66</sup>).

There is an ongoing discussion in the literature about the positive and the negative aspects of rules and discretion. In the following text, we present the main proposals concerning rules and discretion. Some of these proposals were finally adopted by Basel III.

### ***9.2.1 Using rules to calculate capital requirements and capital buffers***

It is argued that capital buffers and capital requirements should be based on “built-in stabilizers” for the whole banking system. Built-in stabilizers limit the danger that, if a threat is identified, proper actions will be taken by supervisors, despite any reactions from the markets (Borio, 2009, IMF, 2009a, Caprio, 2010 and Caruana, 2010).

As far as the calculation of capital requirements is concerned, the main proposals are the following:

- The change in minimum capital requirements according to the current phase of business cycle, using different confidence intervals for their calculation (Kashyap and Stein, 2004 and Repullo and Suarez, 2008). The relationship between capital

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<sup>65</sup> Capital buffers should be adequate in order for banks to remain solvent (i.e. above the minimum capital requirement) in a “feasibly severe downturn” (BCBS, 2009).

<sup>66</sup> See Caruana (2010). There are also proposals that combine rules and discretion (Repullo and Suarez, 2008).

requirements for any loan and its probability of default may be reflected in a risk curve. In order to avoid the substantial increase in capital requirements in the downturns, Kashyap and Stein have proposed the use of different risk curves, depending on the phase of the cycle (e.g. a confidence interval of 99.9% in the upward phase and of 99% in the downward phase). This proposal can dampen the procyclicality without simultaneously compromising significantly the stability of the banking system. However, this proposal has the potential drawback of moral hazard on the part of supervisors.

- The smoothing of the minimum capital requirements, using either an autoregressive rule or a countercyclical indexing rule, which will adjust Basel II's capital requirements using an adjustment factor which is larger than one in the upward phase of the cycle and less than one in the downward phase (Gordy and Howells, 2006).
- The change in minimum capital requirements, based on the average observed ratio of equity to total assets in a country<sup>67</sup> (or equivalently individual bank equity should be based on average equity of the whole banking sector) (Gersbach and Hahn, 2010).

Note that capital requirements tend to reduce the effectiveness of the monetary policy transmission mechanism through the banking system (see Bliss and Kaufman, 2002). During recession, banks may not be able to make use of the central bank's liquidity (i.e. to grant loans), if they don't have the required capital adequacy (because of the increased PD and LGD). In this case, there is a need for minimum capital requirements to be able to change, so as to increase bank lending. In essence, a framework with varying capital requirements depending on the current phase of the economic cycle is suggested.

As far as the calculation of capital buffers is concerned, the following types of capital buffers have been proposed:

- The build-up of capital buffers in the upward phase of the cycle, which can then be used in the downward phase. This proposal had been supported by the International Monetary Fund (IMF, 2009a), the de Larosière report (2009), the Warwick Commission (2009) and Brunnermeier et al. (2009) and was finally adopted by Basel

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<sup>67</sup> This proposal can be considered as a rule (depending on the banking sector's structure) or discretion (according to each bank's size).

III. However, although this proposal is plausible, it should not be used in every country, since the relationship between GDP growth and the countercyclical capital buffer can be negative (Repullo and Saurina, 2011). In order to calculate banks' capital buffers, the use of the following macroeconomic indicators has been proposed:

- The weighted average of banks' assets rate of growth, where the weights are based on the inflation target, the average long-term growth rate of GDP and the ratio of total bank lending to GDP (Goodhart and Persaud, 2008).
- The deviation between the current and the long-term average growth rate of GDP (Repullo et al., 2009).
- The creation of a capital conservation range, i.e. a mandatory capital buffer above the regulatory minimum requirement, which can be used to absorb losses in a crisis. This range would be built up gradually and calculated as part of yearly net earnings, reducing the distributable profits<sup>68</sup> (BCBS, 2009).
- The increase in capital requirements for market risk in the trading portfolio, complex securitizations and resecuritisations, and the calculation of capital requirements based on VaR estimates for a period of twelve months, simulating significant financial stress (BCBS, 2009). It has also been proposed (see Section 6.2.3), that banks should calculate the conditional VaR (CoVaR) (Adrian and Brunnermeier, 2008).

### ***9.2.2 Using discretion to calculate capital buffers for every individual bank or country***

It is argued that capital buffers should be calculated separately for each bank (discretion), since:

- The impact of the business cycle on banks' financial statements is related to the quality of their assets (ECB, 2009b). Banks with assets of lower quality exhibit higher PD in the downturns, which, among other things, should be taken into account when calculating their capital buffers (Marcucci and Quagliariello, 2009).

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<sup>68</sup> Distributable profits include dividends, share repurchases, discretionary payments on Tier I capital instruments and bonuses to employees (non-distributed profits are included in Tier I capital).

- Many banks maintain significantly higher regulatory capital levels than those set out by Basel II (Gordy and Howells, 2006 and Jokipii and Milne, 2008).
- There is heterogeneity in the risk diversification of banks' portfolios, when capital adequacy rules are altered, due to individual bank's characteristics, banking sector characteristics and the macroeconomic conditions in each country (Delis et al., 2009).
- However, it is noted that discretion makes it difficult for the supervisory authorities to evaluate the size of the capital buffer and the banking sector's procyclicality may not be significantly attenuated (ECB, 2009b). Therefore, it is suggested that individual countries can use discretion, to some extent, when defining the size of the capital buffer.

Some of the proposals concerning each bank's capital buffer calculation are the following:

- Each bank's contribution to the overall systemic risk (Acharaya et al. 2009 and Adrian and Brunnermeier, 2008).
- The bank's credit growth and leverage ratio compared with industry average, and the maturity mismatch of assets and liabilities (Brunnermeier et al., 2009 and Persaud, 2008b), and
- The use of the average (or alternatively through-the-cycle) and/or the highest average estimate for the bank's PD<sup>69</sup>, separately for each exposure class (BCBS, 2009, Caprio, 2010).

A first step towards the use of discretion has already been taken, in the form of extra capital requirements for systemically important banks. However, we are sceptical about the wide use of discretion. Common monetary policy across European countries, as well as matters concerning the efficiency of the banking system and the ability to compare across banks may be hampered by using different rules for each individual institution, or even country.

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<sup>69</sup> I.e., the use of a downturn PD.

### ***9.2.3 Proposals unrelated to capital requirements and capital buffers***

Creating a safe banking system by setting high capital requirements may impose high costs on society and reduce the effectiveness of banking intermediation. For this reason, proposals have been developed that in normal periods will not impose “intolerably large” costs to banks:

- Private insurance for banks. It has been suggested that banks could buy private insurance<sup>70</sup>. In the case that a bank’s capital adequacy ratio falls below a threshold, the bank receives an amount of money large enough to restore it (Gersbach, 2004, Kashyap et al., 2008 and Repullo and Suarez, 2008). This proposal, however, has two major drawbacks: First, it is extremely difficult to determine at what level of capital adequacy and to what extent this private insurance will be activated, while moral hazard will increase significantly (since banks will take up high risks more easily). Second, this suggestion may solve a bank’s capital adequacy problem, by transferring it to another part of the financial sector (insurance companies and pension funds), which may be more vulnerable to a crisis.
- Convertible bonds. The relevant proposals are: (a) the issuance of bonds that will be automatically converted into ordinary shares (reverse convertible debentures - RDCs), when the market’s assessment for a bank’s capital to assets ratio falls below a threshold (Flannery, 2005); and (b) the mandatory issuance of convertible bonds (at a predetermined price) by banks deemed too big to fail (Vermaelen and Wolf, 2009). The difference between this proposal and other similar proposals is that existing shareholders are given the opportunity to buy these shares, so as not to transfer wealth from current shareholders to bondholders, while the interest rate on these bonds would be lower than those of common bonds.
- Changes to the objectives of supervision. In recent years, securitization was at the centre of banks’ activity in order to manage risk. In this way, however, banks changed from organizations managing credit risk (in which banks are specialized) to organizations managing market risk and liquidity. A supervisory body that focuses on the ability of financial sector firms to manage the risks they have undertaken in

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<sup>70</sup> This insurance may be provided by insurance companies, mutual or pension funds.

conjunction with the application of some methods to calculate counter-cyclical capital requirements, may lead to a more stable financial system overall, where the need for central bank intervention will be rarer (see Persaud, 2008b).

### 9.3 Proposals concerning accounting rules

In order to address procyclicality attributed to accounting rules, the following are proposed:

- The implementation of dynamic provisioning and through-the-cycle provisioning<sup>71</sup>. Dynamic provisioning generates a fund in the upward phase of the cycle (Novoa et al., 2009), which covers the losses incurred in the downward phase of the cycle, without affecting net earnings<sup>72</sup>. For maximum effectiveness, dynamic provisions should be tax deductible and presented in the financial statements (Andritzky et al., 2009). Finally, dynamic provisioning should be used not only in the loan portfolio, but also in the trading portfolio (see Landau, 2009b and Section 9.4.2)<sup>73</sup>, which, however, will inevitably compromise investors' information about the company's current financial situation (IMF, 2008).
- Replacement of IFRS 39 with IFRS 9 (IASB, 2010), so as to reduce complexity<sup>74</sup> (Grant Thornton, 2009). The differences between IFRS 9 and IFRS 39 relate to: (a)

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<sup>71</sup> Through-the-cycle provisioning refers to provisions made based on the expected LGD of a loan throughout its duration. Dynamic (or statistical) provisioning is an extension of through-the-cycle provisioning and is calculated using time series on PDs (Novoa et al., 2009). Dynamic forecasts have been applied in Spain since 2000, Colombia since 2008 and experimentally in Peru recently. Their calculation is based on the weighted average of general and specific provisions. Note, that while dynamic provisioning have proved useful in the current crisis, they are not a panacea, since there is no guarantee that they will be sufficient in a major crisis, and since they cover only a bank's loan portfolio and not its trading book (Saurina, 2009 and Brunnermeier et al., 2009).

<sup>72</sup> However, Pederzoli et al. (2010) argue that the use of estimates covering the entire business cycle by banks during recession may lead to higher levels of defaulted loans and lower profitability.

<sup>73</sup> This does not apply only to IFRS, but also to American Accounting Standards (US GAAP). Both address provisions in the same manner, but differ significantly in the way they are applied in various countries, which is due to tax and historical reasons, as well as the way supervision is exercised (FSF, 2009a).

<sup>74</sup> The process to replace IFRS 39 with IFRS 9 has been completed by the International Accounting Standards Board (IASB). The reduction in complexity results from the classification of financial assets either in amortized cost or in fair value depending on the bank's business model and each financial asset's cash flow characteristics, if this has not been designated at fair value through profit or loss. The proposed date for full implementation of IFRS 9 is January 1<sup>st</sup> 2013.

the application of fair value in financial statements, with an emphasis on the changes in the value of debt and the effect of these changes on net earnings; (b) the recognition of losses in the banking and the loan portfolio; and (c) hedge accounting. Regarding the recognition of losses in the portfolio, the IASB has proposed an alternative method to dynamic provisioning, namely the Expected Cash Flow Model. According to this method, provisions are formed on the basis of expected losses in the bank's loan and banking portfolio and a real discount rate is estimated. The European Commission considered, however, that dynamic provisions generated by this method would not be sufficient, although this method's contribution to dampening procyclicality has been recognized (Bank of Greece, 2010b).

- The use of transparent qualitative and quantitative notes supplementing the valuation of financial assets when using mark-to-model valuation, and taking into account the current phase of the economic cycle and the existence of outliers (IMF, 2008, 2009a, 2009b). In particular, in the case of a financial crisis accompanied by market illiquidity, Allen and Carletti (2008) have proposed that fair value accounting should be supplemented by mark-to-model as well as historic cost valuations.
- The use of assessments made by specialized companies (IMF, 2008, 2009a, 2009b).
- The accounting treatment of financial assets depending on whether they are financed with short-or long-term capital (Persaud, 2008b).

#### **9.4 Proposals concerning leverage, market liquidity and funding liquidity**

Addressing procyclicality deriving from the combination of leverage and funding liquidity is difficult because of their interaction. Proposals to attenuate procyclicality from this source are presented below.

The use of a maximum leverage ratio<sup>75</sup> for each bank has been proposed. The advantages of this ratio are the following: a) the riskiness of assets is not taken into

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<sup>75</sup> The leverage ratio is equal to the ratio of total assets (which include off-balance sheet assets) to the bank's equity (book value - CGFS, 2009). A maximum leverage ratio will be compulsory from January 1<sup>st</sup>, 2018.

account. Therefore, it is not affected by the pricing of risk over the economic cycle<sup>76</sup>, b) banks' capital structure is determined on the basis of specific cross-sectional determinants, which are similar to those of the non-financial business sector, except for banks with marginal capital adequacy ratios (Gropp and Heider, 2009), in conjunction with the fact that U.S. banks appear to actively manage their leverage ratio (Berger et al., 2008); c) it is transparent (Blum, 2008) and d) it is related to the bank's viability in extreme circumstances (Joint FSF-CGFS Working Group, 2009).

The disadvantages of this ratio are that: a) it is rather restrictive, especially in the case of hedging positions; b) it may lead to increased risk being undertaken by banks (in order to increase efficiency); and c) it may lead to a deleveraging process in the downturn phase of the economic cycle (IMF, 2009b).

Another proposal concerning leverage is to increase the margin requirements on OTC derivatives, along with the imposition of minimum haircuts for securities financing transactions (Joint FSF-CGFS Working Group, 2009).

The proposals concerning liquidity are the following (Joint FSF-CGFS Working Group, 2009):

- The promotion of through-the-cycle measures of market risk. Moreover, valuation reserves could be held in the case of weak data or modeling supporting the valuation.
- The imposition of stress tests for new risks or new financial products.
- The restricted use of contractual trigger (i.e. provisions in a contract that give a creditor extra protection if conditions deteriorate beyond a pre-determined threshold), and
- The improvement in methods of estimating the funding liquidity risk, by covering all the phases of the economic cycle.

## **9.5 Other proposals**

- A change in remuneration policies in the financial sector. Specifically, executive compensation in this sector should depend not only on short-term goals and annual

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<sup>76</sup> It is argued, that this ratio could have helped to prevent some bank failures (Banziger, 2009). See also Caprio, 2010, who suggests that capital adequacy should not be calculated as a function of risk.

profits, but also on the risk involved<sup>77</sup> (IMF, 2009b and BCBS, 2010c). Already some banks use risk-adjustment methods for determining bonuses (such as the RAROC method, accounting methods, the degree of adaptation to the rules, etc.<sup>78</sup>). However, the inclusion of risk for determining bonuses is expected to face difficulties in practice (Kashyap et al., 2008) for two reasons: First, risks are not necessarily known when the investment in a financial asset is made and therefore cannot easily be estimated accurately. Second, dealers can usually find ways to circumvent procedures and regulations. Note that in order to ensure that the attempt to change remuneration policy in the financial sector is successful, it should be accompanied by appropriate changes to the corporate governance of banks<sup>79</sup>. It is also proposed to pay bonuses to supervisors, when financial stability is achieved for a considerable time, combined with an evaluation of the supervisor's effectiveness by a qualified independent body (Goodhart and Persaud, 2008).

- An integrated approach to counterparty credit risk. This can be achieved by calculating capital requirements, reflecting periods of stress and the likelihood that either the counterparty's credit rating decreases or the counterparty defaults.
- The creation of a crisis management framework for financial institutions. The last crisis reached its peak after the collapse of Lehman Brothers, which shows how important this proposal is, particularly for systemically important institutions<sup>80</sup> (FSF, 2009). For this reason, capital requirements should depend on the bank's assets (Warrick Report, 2009), or additional capital could be required, according to each bank's contribution in the overall systemic risk (see Section 9.2.2).

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<sup>77</sup> The FSF (2009b) presented nine (9) guidelines for the rationalization of remuneration policies in the financial sector. This issue also concerns the European Commission (see 30.4.2009/384/EC), CEBS and the Financial Services Authority. The proposals refer to a maximum percentage of additional fees on top of the official wage, as well as a limit to bonuses paid directly.

<sup>78</sup> The methods of risk adjustment are usually announced in advance, but sometimes adjustments are made retrospectively - particularly when irregularities are identified on the part of the officer that is to receive a bonus (BCBS, 2010c).

<sup>79</sup> See BCBS (2010d) for guidelines concerning corporate governance.

<sup>80</sup> Not only too-big-to-fail banking institutions can affect financial stability. For this reason, the final decisions of the Basel Committee states that systemically important institutions should maintain a higher loss absorbing capacity (see Section 10.1).

- Reports of credit-rating agencies. The Eurosystem is aiming to improve the transparency of the methods used by these companies to ensure quality and reliability of their procedures and oversee their independence. In addition, these companies themselves have announced measures to improve their reliability (ECB, 2009d).
- Limit the Loan to Value (LTV) ratio: It has been found that a surge in property prices in OECD countries can lead to a crisis. To reduce the likelihood of a crisis in the banking sector, Barell et al. (2010) have proposed to put limits on LTV ratios in mortgage lending, when there are strong upward trends in property prices<sup>81</sup>.

## **10. Basel III and its implications**

### **10.1 Decisions concerning capital requirements, risk and liquidity**

In September 2010, the BCBS announced<sup>82</sup> its final decisions on a series of amendments to the Basel II framework so as to improve the quality and quantity of banks' capital, enhance liquidity, reduce bank's tendency to take high risks and to dampen procyclicality (BCBS, 2010a). This new and comprehensive framework, is known as the Basel III framework. The new framework is to strengthen banks, so that they can absorb potential losses, and to reduce the possibility of (new) financial crises. The proposals of the new framework will be implemented gradually from 2013 until 2019. However, banks can make the necessary adjustments in advance (See BCBS, 2010a). More precisely:

- As regards capital, the Commission decided:

First, to raise core Tier I Ratio<sup>83</sup> from 2% to 4.5% (Figure 1).

Second, to increase minimum Tier I capital from 4% to 6%.

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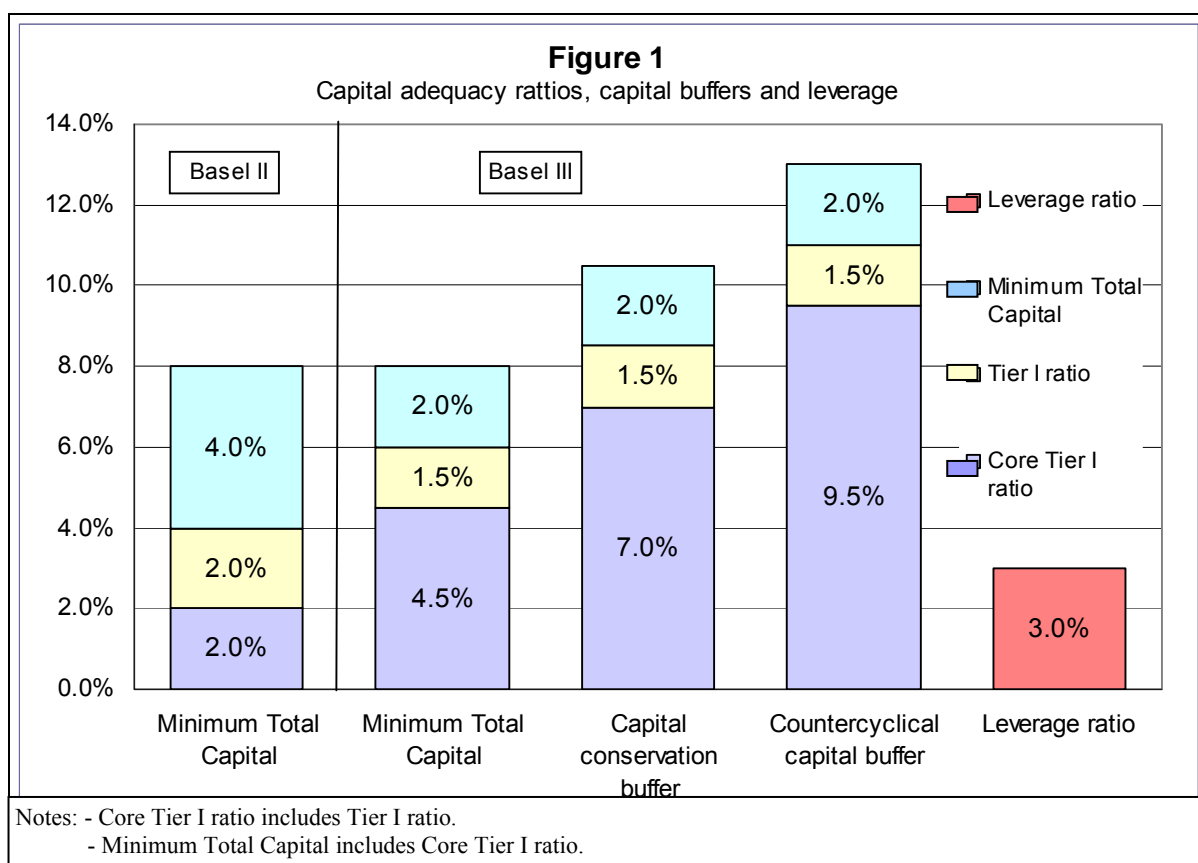
<sup>81</sup> Borio et al. (2001) provide a description of LTV ratios used in several countries.

<sup>82</sup> The final document of Basel III was published in December 2010 (BCBS, 2010e) and has only a few changes from the July 2010 Agreements amongst the 26 (of 27) members of the Basel Committee. The main difference is the longer transition period (different for each proposal) for full implementation of the new capital rules, which may be due to the finding that a longer transition period is expected to cause less impact on GDP and loan supply by banks (Macroeconomic Assessment Group (MAG), 2010).

<sup>83</sup> Referred to also as minimum common equity capital ratio.

Third, to impose stricter criteria on which financial instruments can be included in the Tier I capital requirement.

- As regards the leverage ratio, the decision was taken to test a minimum Tier I leverage ratio of 3% (non-risk-based) during the parallel run period, until its implementation on January 1<sup>st</sup> 2018 (Figure 1).
- As regards more extensive risk coverage, the Committee decided to increase capital requirements for the banking and the trading portfolio and counterparty credit risk, while efforts are being made to reduce dependence on credit-rating agencies for determining capital requirements for credit risk.



- As regards liquidity, the Basel Committee decided to establish two liquidity ratios:
  - The liquidity coverage ratio. This ratio is designed to ensure that a bank is able to meet its cash outflows during a crisis for 30 days; and

- The net stable funding ratio, as an additional long-term liquidity ratio<sup>84</sup> (its time horizon is one year).
- To address systemic risk, the Committee is moving towards a higher loss absorbing capacity (i.e. higher capital adequacy ratios), for systemically-important financial institutions.

## **10.2 Decisions addressing procyclicality**

As regards procyclicality, the Committee reached a group of decisions, aimed at:

- Mitigating the procyclicality of minimum capital requirements, by introducing a number of safeguards such as a longer period for calculating PD, downward LGD and basing their calculation on factors that cover the entire economic cycle<sup>85</sup>.
- The promotion of dynamic provisioning, by supporting the proposals of the IASB<sup>86</sup>.
- The introduction of the capital conservation buffer, which will be ultimately calibrated at 2.5% (Figure 1), and maintained by banks throughout the economic cycle, aiming to absorb losses on a major crisis.
- The introduction of the countercyclical buffer, which will be determined by national supervisory authorities, depending on the prevailing macroeconomic conditions (strong credit expansion) and can be calibrated within the 0-2.5% range, irrespective of the capital conservation buffer.

### ***10.2.1 Comments on the proposals concerning procyclicality***

The objective of the countercyclical buffer is to ensure the ability of the whole banking sector to provide loans to the economy during recessions (BCBS, 2010a) and to protect banks from taking significant risks in periods of excessive credit growth. The

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<sup>84</sup> The Committee has also decided to proceed to changes in the definitions of liquid assets, which are to be used to calculate these ratios. However, pending clarification of liquidity and leverage ratios, as well as the additional funds required by systemically important financial institutions. Moreover, at the end of 2011, increased capital requirements for the banks' trading portfolio are expected to be announced (including positions in derivatives and securitisations) (BCBS, 2010a).

<sup>85</sup> This proposals resembles that of Gordy and Howells (2006), presented in Section 9.2.1.

<sup>86</sup> See Section 9.3.

implementation of this buffer requires the selection of those factors (leading indicators) that will point to the large accumulation of risks, and when<sup>87</sup> and with what intensity this buffer should be used. The decision to implement the countercyclical buffer will be taken by each country's supervisory authorities, based on the deviation in the ratio of bank loans to the country's GDP<sup>88</sup> from its trend (BCBS, 2010e and 2010f and Drehmann, 2010). Banks will build the capital conservation buffer and the countercyclical buffer through retained earnings (BCBS, 2009), which are high quality capital (Tier I). Failure on the part of a bank to build these buffers will not affect its operation (in fact these buffers will be used in times of crisis), but the bank will not be allowed to distribute profits as dividends, engage in share buybacks, or discretionary payments to its staff<sup>89</sup>.

More generally, from the above suggestions of Basel III, we can say that:

- The countercyclical buffer is likely to be insufficient, because credit growth lags the economic cycle and because of the development of innovative financial products.
- The use of data from a longer time period in order to calculate PD is correct, but requires the optimization of weights for calculating risk weighted assets.
- The use of dynamic provisioning for the expected PDs of a portfolio is a move in the right direction.

### **10.3 Assessing Basel's III macroeconomic impact**

#### ***10.3.1 Basel's III macroeconomic impact during the transition period***

Decisions about banks' capital adequacy and liquidity ratios are expected to cause both positive and negative effects (BCBS, 2010b). Positive effects include the strength-

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<sup>87</sup> In order to determine the proper timing for the use of the countercyclical capital buffer, the use of indicators relating to the overall losses of the banking industry in conjunction with indicators on lending standards is proposed. The use of the countercyclical capital buffer should in general be immediate.

<sup>88</sup> This rate is the basic reference point, but it may be supplemented by other factors such as asset prices, yield spreads, credit default swaps, survey studies, the phase of the economic cycle and the possibility of misleading signals.

<sup>89</sup> The bank will have this possibility if allowed to increase its share capital, always after agreement with supervisors.

<b>Table 1: Basel's III macroeconomic impact during the transition period <sup>1</sup></b>			
	Mean yearly change (median <sup>2</sup> )		
	GDP (%)	Real cost of lending (in bps)	Total lending <sup>3</sup> (%)
Increase in capital requirements by one percentage point: <ul style="list-style-type: none"> <li>• Euro area countries and eleven more countries<sup>4</sup></li> <li>• Sweden<sup>5</sup></li> </ul>	- 0.04 -	+ 15 + 9	- 1.4 - 2.0
Increase in liquid assets by 25% <sup>6</sup> : <ul style="list-style-type: none"> <li>• Euro area countries and eleven more countries<sup>4</sup></li> <li>• Sweden<sup>5</sup></li> </ul>	- 0.02 -	+ 14 + 14	- 3.2 - 5.8
Implementation of Basel's III main proposals <sup>7</sup> : <ul style="list-style-type: none"> <li>• Euro area</li> <li>• Euro zone, U.S.A.<sup>8</sup> and Japan</li> </ul>	- 0.9 - 0.6	+ 134 + 132	- -
<sup>1</sup> The transitional period is set at 4.5 years from MAG (2010) and Sveriges Riksbank (2010) and 5 years from the Institute of International Finance (IIF, 2010).  <sup>2</sup> Median estimates across comparable studies. <sup>3</sup> End of period. <sup>4</sup> MAG (2010). Countries included: Australia, Brazil, Canada, China, India, Japan, Korea, Mexico, Russia, Un. Kingdom and U.S.A. <sup>5</sup> Sveriges Riksbank (2010). <sup>6</sup> Ratio of liquid financial assets to total assets. <sup>7</sup> IIF (2010). <sup>8</sup> In the case of the U.S., the effect of specific factors of the credit system was also estimated.			

-ening of the financial sector<sup>90</sup>, the reduced likelihood of a crisis and the relatively smaller impact on GDP when a crisis does arise. The negative effects include the increase in lending rates and the resulting decline in GDP, without however affecting its long-term trend. Specifically, it was estimated that during the transition period (4.5 years), a one percentage point increase in capital requirements (either in core Tier I or capital buffers)

<sup>90</sup> However, this possibility is disputed (see VanHoose, 2006), since the capital adequacy framework can either lead banks to engage in riskier activities, or to attempt to avoid regulations (regulatory arbitrage) or to nonbanks (unregulated or less regulated non-banking financial institutions) taking over part of banks' regulated activities (Caprio, 2010).

<b>Table 2: Basel's III long-term economic impact<sup>1</sup></b>			
	Mean yearly change (median <sup>2</sup> )		
	GDP (%)	Real cost of lending (in bps)	Total lending (%)
Increase in capital requirements by one percentage point: <ul style="list-style-type: none"> <li>• Euro area countries and eleven more countries<sup>3</sup>:               <ul style="list-style-type: none"> <li>- (BCBS)<sup>4</sup> - 0.09</li> <li>- (MAG)<sup>5</sup> - 0.10</li> </ul> </li> <li>• Un. Kingdom<sup>6</sup> - 0.08</li> <li>• Italy<sup>8</sup> - 0.10</li> <li>• Euro area countries, American continent and Un. Kingdom<sup>9</sup> - 0.09</li> </ul>			
Increase in liquid assets <sup>10</sup> by 25% <ul style="list-style-type: none"> <li>• Euro area countries and eleven more countries<sup>3, 5</sup> - 0.08</li> <li>• Un. Kingdom<sup>6, 11</sup> -</li> <li>• Italy<sup>8</sup> - 0.02</li> <li>• Euro area countries, American continent and Un. Kingdom<sup>9</sup> -0.08</li> </ul>			
Application of Basel's III main proposals <sup>12</sup> : <ul style="list-style-type: none"> <li>• Euro zone - 4.4</li> <li>• Euro zone, U.S.A.<sup>13</sup> and Japan - 3.1</li> </ul>			
<sup>1</sup> The transition period is included is set at 8 years by BCBS (2010β), MAG (2010) and Banca d'Italia (2010) and at 10 years by Barrell et al. (2009) και IIF (2010). <sup>2</sup> Median estimates across comparable studies. <sup>3</sup> Countries included: Australia, Brazil, Canada, China, India, Japan, Korea, Mexico, Russia, Un. Kingdom and U.S.A. <sup>4</sup> BCBS (2010β). <sup>5</sup> MAG (2010). <sup>6</sup> Barrell et al. (2009). <sup>7</sup> Refers to decrease in total assets, not just total lending. <sup>8</sup> Banca d'Italia (2010). <sup>9</sup> Angelini et al. (2011). <sup>10</sup> Ratio of liquid financial assets to total assets. <sup>11</sup> Increase in liquid ratio by one percentage point. <sup>12</sup> IIF (2010). <sup>13</sup> In the case of the U.S., the effect of specific factors of the credit system was also estimated.			

in the euro area countries and in eleven additional countries, is expected to cause a reduction in GDP from its trend by 0.04% per annum, while a 25% increase in the ratio of liquid assets to total assets will reduce GDP from its trend by 0.02% per annum (Table 1). Additionally, these two factors will increase the real cost of lending by 15 basis points (bps) and 14 bps, respectively and reduce total lending at the end of this period by 1.4% and 3.2% respectively. In Sweden, it is estimated that these two factors will increase the real cost of lending by 9 bps and 14 bps respectively, while at the same time reduce total lending by 2.0% and 5.8% respectively (Table 1). Moreover, it is expected that the implementation of Basel's III main proposals are expected to cause an average annual decline in GDP from its trend in the euro area by 0.9%, due to a 134 bps increase in the real cost of lending, while the decline in GDP in the U.S. and Japan is expected to be significantly lower (Table 1).

### **10.3.2 Basel's III long-term economic impact**

This period includes the transition period and covers 8 to 10 years. Table 2 shows that increasing capital requirements by one percentage point is expected to cause a reduction in GDP from its trend at the end of the period from 0.09% to 0.10% in the euro area countries and a group of other countries because of increased real cost of lending by 7 bps. In the UK, the decline is expected at around 0.08%, due to an increased real cost of lending by 18 bps and a reduction in overall lending by 1.2%, while in Italy the decline in GDP is expected to reach 0.10%. Also, the increase in the ratio of liquid financial assets to total assets by 25% will lead to a decline in GDP from its trend in the euro area countries and a group of other countries by 0.08% and in Italy by 0.02% (Table 2).

#### **10.3.2 Basel's III long-term economic impact.**

Moreover, it is estimated that the implementation of Basel's III main proposals will result in a GDP being 4.4% below its trend in the euro area at the end of the period, due to increases in the cost of loans by 97 bps, while the drop in GDP is expected to be significantly less in the U.S. GDP and Japan (Table 2). Finally, the implementation of countercyclical buffer is expected to reduce the volatility of GDP.

In general, it is estimated that the final net effect of the Basel's III proposals is positive (BCBS, 2010b and Barell et al., 2010).

## **11. Conclusions**

The recent crisis and the new decisions by the Basel Committee confirm that the banking industry's procyclicality is now in the limelight, as it exacerbates the current phase of the economic cycle, through a process of mutual reinforcement, with direct consequences for both credit standards and banks' viability and hence for financial stability.

The literature attempts to examine the determinants of banks' procyclical behaviour in credit. From the supply of loans side, the emphasis is mainly on the impact of banks' capital and economic activity. The literature examining the procyclicality on the demand side for bank loans, especially in times of economic crisis, is very limited. The number of studies attempting to distinguish the effect of the demand and supply of loans on economic activity is also limited.

The impact of procyclicality is particularly important, since banks are transformed from mitigation mechanisms to amplifiers of changes in economic activity, fail to perform properly their role as mechanisms for allocating resources efficiently within the economy, while the viability of individual banks and thus financial stability is hampered.

In the literature, there is a clear understanding about the causes of procyclicality. Procyclicality is an inherent feature of the banking sector and its causes can be found in deviations from the efficient market hypothesis. However, this study proceeded to separate the causes of procyclicality from the factors that can attenuate or intensify it. These factors include the monetary and fiscal policy, the regulatory and supervisory framework, and the practices of banks and other companies in the financial sector, such as remuneration policies, credit rating agencies reports, etc. The theoretical and empirical literature about the contribution of Basel I and II to the procyclicality of the banking system is extensive. Although some theoretical studies suggest that Basel II does not exacerbate procyclicality, the majority of the empirical literature agrees that Basel II does

amplify procyclicality. Although not all Basel II's recommendations were followed, it is estimated that the criticism about the role of Basel II to amplify procyclicality in the banking sector, is well-founded. However, it may be the case that this criticism underestimates, to a large extent, the contribution of this framework towards the direction of effective risk management in the banking sector and its role in financial stability. Finally, it is estimated that accounting rules can cause increased variability in banks' financial statements and delay the recognition of losses in loan portfolios, leading to an exacerbation of procyclicality.

Before the current crisis, but especially after its ignition, a series of proposals to dampen the banking sector's tendency to procyclicality were presented. These proposals are divided into those relating to general rules for the whole banking industry (rules) and those related to individual banks or countries (discretion). Some of these proposals have been adopted in the new Basel III framework, and they seem able to address the procyclicality issue. However, these proposals will lead to higher minimum capital adequacy ratios, which are expected to affect lending costs, the provision of loans by banks, and, hence, economic activity. But, the cost of the new proposals is expected to be lower than the cost of potential financial crises, if the proposals are not implemented.

In any case, the efforts to mitigate banking industry's procyclicality require a concerted effort from many sides. The analysis in this paper has shown that procyclicality is influenced by many aspects of the economic environment as well as financial sector practices, which makes it difficult to deal with it effectively. Consequently, efforts to attenuate procyclicality in the banking industry pose a risk of failure.

It is estimated that future research could focus on developing models to explain the phenomenon of procyclicality on the side of the relationship between economic activity and the banking system and to assess the impact of the Basel's III proposals for procyclicality alone.

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