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Regulatory framework of basel II and basel III and its impact on the economic developme

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REGULATORY FRAMEWORK OF BASEL II AND BASEL III AND ITS IMPACT ON THE ECONOMIC DEVELOPMENT

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REGULATORY FRAMEWORK OF BASEL II AND BASEL III AND ITS IMPACT ON THE ECONOMIC DEVELOPMENT

Dissertation

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Abstract

This study dealt with the regulatory framework of Basel II and Basel III and the impact on economic growth. According to the current economic crisis the impossibility of operating regulatory standards appears several issues regarding the regulatory framework.

Basel II consists of the members of the central banks and regulatory authorities worldwide and is responsible for the supervision of banks. More specifically, the work was completed within four chapters where more detail, the first chapter talked about the financial system.

The second chapter is focused on the supervision and theories of banking institutions primarily through its legal nature, objectives Basel I, the description of the regulatory framework of Basel I and II and the comparison by the rules.

Then the third chapter examine with the new banking system after the crisis and the market in general, the causes of the crisis and the new Basel III. Reference was made to financial institutions subject to Basel reforms, the implementation schedules of the various Member States but also on proposals for the necessary funds. The fourth and final chapter deepened in summary and comparison of Basel I and III.

The migration impact from Basel II to Basel III and the quantitative results, such as the International Standards liquidity was also discussed. Reference was made to the impact on GDP: significant deviations, the possible reactions on the part banks and finally analyzed the SWOT Basel III. Finally, the work ended with the conclusions.

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CHAPTER 1

INTRODUCTION

Nowadays the current economic situation has brought many discussions on the regulatory framework and has revealed the inadequacy of the current regulatory standards since they failed to predict or even to prevent the onset of such a crisis.

Therefore, among the various discussions, the increasing sensitivity to risk, the need for higher capital reserves, and the procyclicality of the regulatory framework currently in force, the Basel II came to light in mid 1990's. The form of capital adequacy was renewed to a more risk-sensitive version, which causes an increase of the required reserve capital during downturns and vice versa during the "sunny days". With increased capital requirements, the banks tend to grant fewer credits, leading the economy, directly or indirectly, to a deeper recession. At 2008 until 2012 was a period of general economic fall which observed in world markets.

Many research studies have been published comparing and pointing out the differences of the Basel II framework with the more neutral or less sensitive Basel I, which over time led to the improvement and further development of the regulatory rules. It is composed of members of the central banks and banking regulators worldwide and is also responsible for the rules concerning the banking supervision since 1988 when the first Basel Accord was published.

And despite the fact that Basel II came into force just before the onset of the financial crisis, the BCBS realized how much effort is still needed and the introduction of new and better regulatory standards. The Basel III starts in 2013 and with full implementation on 1st of January 2019.

THE FINANCIAL SYSTEM

According to Heffernan (2005, p317), the term bank may refer to a wide variety of financial institutions, from organizations for deposits and loans up to major investment banks in the US, or from smaller cooperative banks of a city to the large money-center commercial banks of the UK. However, their main activity is the intermediation between depositors and borrowers (commercial banking). An indicative classification of their activities can be: corporate finance, financial instruments trade and sales, retail banking, private banking, the process and settlement of payments, brokering services, asset and liabilities management and financial services.

There are three factors that contributed to the rapid development of the financial sector worldwide in the last 25 years.

i. The liberalization of the financial sector since the late 1970s (initially in the US). Also, the introduction of the Euro, a new single currency that accelerated the integration of the financial market in the European Union.

ii. The great technological advances in computing and communications. Without these, the huge increase in the number of financial transactions would not be possible, as well as the creation and pricing of complex products (such as derivatives) and international expansion. Technology accelerated the interconnection of the banking systems and the transactions are now carried out quickly and reliably.

iii. The favorable international economic conditions, such as the rapid rise in global economic activity and international trade, low inflation, low interest rates and low volatility of prices in financial asset markets (Frame & White, 2014, p1-37).

In particular, banks in recent years have expanded both the range of their activities and their geographical basis in order to exploit economies of scale and economies of scope (i.e. the range of activities) and to achieve the diversification of the risk. The international expansion can take place either through the export and sale of financial services abroad or through the establishment of subsidiaries, units and branches in other countries, which occur through new Greenfield investments and through mergers and acquisitions (Frame & White, 2014, p1-37).

The internationalization of the banking system has reinforced the stability of the individual institutions, especially in the case of minor disturbances, but has also increased the risk of major crises. At the domestic level, this underlines the need for the legislative, supervisory and regulatory

rules to evolve in order to meet the ever-intensifying international and complexity nature of the banks.

From the above, it can be concluded that banks have an impact in shaping the economic environment both in their home and internationally, since their role determines the financing of the productive activity, the efficient allocation of the financial resources and the orderly conduct of the economic transactions. This importance of the banking sector and the liberalization of its activities within a country and internationally, necessitated the adoption of rules for the operation, the transparency, the monitoring and the evaluation of the banks in order to protect the clients-consumers of the banking sector, the shareholders and the entire financial system in general. The next chapter will examine the supervision of the banking institutions and the regulatory framework.

The aim of this study is both the presentation of the regulatory rules of Basel III as well as its predecessors and the study of the qualitative and quantitative impact of the implementation and adoption on both the level of economic sectors (micro) and at the global or national level (macro). This study focuses on clarifying the function of Basel II and Basel III and their implementation in the current economic crisis, and especially on the need to develop the wider economy in the European Union. Essentially the question here is how Basel II and Basel III have been developed, their applications and their implementation to the wider economic growth of the EU.

CHAPTER 2

SUPERVISION THEORIES OF THE BANKING INSTITUTIONS AND THE REGULATORY FRAMEWORK
THE BASEL COMMISSION

The necessity of having a framework of rules and regulations governing the operation of the financial sector and banks in particular, is an issue that divides economists. The main argument for having a regulatory framework for the operation of banks is that the unregulated private activities of banks lead to results that have more social than private costs. To social marginal cost arises because the bankruptcy of a bank affects the whole economy.

However, bank supervision burdens the banking operations with direct cost plus a cost of compliance and the obligation to comply with increased regulatory capital. In addition, a hidden cost of overregulation is the possible loss of the dynamics of innovation (Berger, Demsetz and Strahan, 1999, p135-194).

An additional argument in favor of the existence of an institutional and regulatory framework is that unguaranteed deposits create a negative climate for consumers, so the existence of the framework works effectively as a means of protecting their money. The protective net serves as a means of providing information and also as a means of reducing risks.

This possibility increases the cost of bank intermediation for depositors, while it obliges them to monitor the banks and the banks because it requires them to maintain higher reserves.

The asymmetric information, namely the fact that the involved parties in a financial transaction do not have the same information, highlights the issues of adverse selection and moral hazard. The three concepts mentioned above largely shape the form of the supervision and regulation of the banking institutions.

There are eight main categories of supervisory and regulatory interference in the operation of banks: government safety net, restrictions on the values of the banks' portfolio, capital requirements, evaluation of risk management, information disclosure, certification and examination of banking institutions, consumer protection and restrictions in the competition (Kowalik, 2013, p65).

The use of the government safety net, and more specifically the state guarantee of deposits, have proved to be a particularly popular practice in the past two decades but has also been proven that it does not improve the performance of the financial sector nor prevents the banking crises.

These crisis episodes included among others the well-documented thrift crisis in the United States, banking failures in the Nordic countries, serious difficulties in (France, Hong Kong, China, Italy, Japan, Spain, Mexico and Korea, as well as banking sector problems in Turkey and in the transition countries of Central and Eastern Europe). According to a research conducted by the World Bank, the explicit state guarantee of deposits is associated with reduced stability of the banking sector and the frequent occurrence of banking crises while on average it seems to be associated with slower economic growth. However, the negative effects occur only in countries with a weak banking sector where there is lack of law enforcement, ineffective regulation and supervision of the banking sector and increased corruption (Arnold et al., 2012, p3125-3132).

As regards the financial institutions that operate internationally, the work of the supervisory and regulatory authorities is even more difficult. These bodies sometimes do not have the ability and other times the clear authority to monitor the activities that the subsidiaries of domestic banks are practicing abroad. Likewise, they cannot have total control over branches of foreign banks operating within their jurisdiction limits.

The practical implementation of the regulation and supervision of the banking institutions' activities does not mean that it is easy and the reasons are many. The main reason is that the financial institutions have strong incentives to evade any regulatory and supervisory restrictions (Bensakoz and Kanatas, 1996, p160-183). Banks constantly find new ways to circumvent the rules and restrictions, forcing the supervisory bodies to constantly modify their own activities.

The problem can be exacerbated if the supervisory bodies do not have the resources and experience to address this perpetual game of cat and mouse with the banks. Another important reason is that in some countries, the supervisory bodies may be vulnerable to political pressure and do not perform their job properly. Finally it is important that regarding the issue of supervision and regulation it's the details that make the difference. Subtle differences in the details of the provisions may have unintended consequences and hinder the work of the authorities to limit excessive risk-taking (Kowalik, 2013, p65).

According to the views of "free banking", the guarantee of the deposits leads to the negative effect of the need for regulation and supervision. When a government has set up a deposit guarantee system it is politically impossible to restrict it only to a group of banks that have a good risk management. The only functional measure that can be implemented is to force the banks to maintain high capital reserves to absorb the potential losses.

In the case of “free banking” and with the absence of the lender of last resort, it is expected that the capital adequacy ratios and reserves of banks will increase, like the spreads on interest rates compared with the case of the supervision and regulation of the banking sector. The lower interest rates will occur in the case of a regulated banking sector that will foster liquidity but the price for this will be the increased risk and the probability of a banking crisis.

According to Beck, Demirguc-Kunt and Levine (2003, p1-39), the existence of a strong state banking supervision is associated with the emergence of obstacles to business finance, while as the independence of the supervisory bodies from the state increases, the more these obstacles will tend to decline. Also in countries where the supervisory bodies require banks to publish accurate information thereby facilitating the monitoring by the private investors and entrepreneurs, business financing becomes less problematic.

Similarly, Baker (2013, p112-139) argues that the regulatory and supervisory practices that impose the publication of the correct information, which strengthen the monitoring of banks by private companies and provide incentives to independent operators to exercise control over banks, are more conducive in the stability, growth and performance of the banking sector.

2.1 Legal Nature

The Basel Committee:

a.) The agreements of the Basel Committee are not official binding conditions and the countries-members of the Commission do not always fully incorporate the rules in their national laws or the respective national regulatory and supervisory framework. A characteristic example is the US which had not yet implemented the Basel II at the time the recent financial crisis appeared. In practice, very few countries are choosing to implement the Basel agreements in detail, and often interpret the proposed rules in a completely unexpected way (Berger, Molyneux & Wilson, 2014, p564-565)

b.) The rules contained in the reports are not legally binding, but are general guidelines on best practices.

Despite the above, the adoption of the Basel agreements has led to a more uniform treatment of the issue of capital requirements of banks worldwide, since most countries with developed banking sectors have adapted their regulations to the rules of the accords of the Basel Committee.

2.2 Objectives of the Basel Accord

The two main EU instruments with which the integration of the new framework occurred is the Directive 2006/48/EC on establishing and exercising the activities of the credit institutions and Directive 2006/49/EC on the capital adequacy of investment firms and credit institutions.

2.3 The Basel I Accord

2.3.1 Description of the Basel I regulatory framework

The Basel Accord of 1988 is the Basel Committee's capital adequacy framework, consisting of the following: the Capital Requirements and Off Balance Asset Offset Assets (Berger, Molyneux & Wilson, 2014: p564-565). The practice of risk management in financial institutions has evolved rapidly from the late 1970s to the present day.

More specifically, this Agreement specifies the elements and quality of banks' own funds and group these items into off-balance sheet and off-balance sheet items in accordance with presumed credit risk. Thus, the Basel Accord imposed a minimum capital adequacy ratio of 8% and harmonized for the first time the international regulatory system (Berger, Molyneux & Wilson, 2014: p564-565)

The Basel Committee was established in 1974 by the Governors of the Central Banks of the G-10 member countries and meets four times a year. Its members represent banks and supervisors from the US, Germany, Japan, France, Great Britain, Canada, Italy, Spain, Holland, Switzerland, Sweden, Belgium and Luxembourg (Berger, Molyneux & Wilson, 2014: p564-565)

With the introduction of the Basel Supplementary Accord and its subsequent incorporation into the Community and national law of the member states, the supervisory framework on capital adequacy was studied, as the financial institutions were required to hold enough equity for their exposure in relation to credit risk and industry risk. More specifically, a small capital adequacy ratio was set at a rate of 8% (Berger, Molyneux & Wilson, 2014, p564-565)

The regulatory capital is classified in Tier I and Tier II, while Tier I needs to be over 50% of the total (Tier II cannot exceed 100% of Tier I). The Tier I capital consists of the value of the share capital, the difference of the share issue premium, retained earnings reserves, current and past years.

The capital for general banking risks under condition. The aforementioned do not include the book value of own shares held by the financial institution, nor the retained losses, nor the temporary

negative operating results of the current fiscal year.

Fixed term subordinated loans under conditions. The assets are the sum of the credit risk weighted assets plus the off-balance sheet credit risk weighted data by the measurement of market risk (Berger, Molyneux & amp; Wilson, 2014, p564-565).

The accord specifies the elements and quality of the capital of banks and groups the elements outside the balance sheet in key categories depending on the deemed credit risk associated (Table 2-1 and 2-2).

Table 2-0-1 Risk-weighted Assets (PD/TE. 2054/19.3.1992)

Risk weight %	0%	20%	50%	100%
Assets – liabilities	All liabilities towards the central governments and banks of the A zone countries	All liabilities towards the European Investment Bank, multilateral development banks, local governments, regional governments	Loans and securities backed by mortgages	All liabilities of the States of the B Zone

Table 2-0-2 Risk-weights of items outside the balance sheet (PD/TE 2054/19.03.1992)

Risk weight %	0%	20%	50%	100%
Off-balance sheet assets - liabilities	Unused liabilities with original duration of less than one year	Commercial transactions with letters of credit and unused levels wtih original duration of less than one year	Other liabilities related to commercial transactions	Other off-balance sheet items

Therefore, according to the Basel I, given the risk weights, the solvency ratio is:

$$\frac{\text{Tier I + Tier II}}{\text{RWAcredit risk + RWAmarket risk}} \geq 8\%$$

For the calculation of the RWA on credit and market risk, the following formula is used:

$$\text{RWA} = \sum_{i=1}^{n} wi * ai$$

Where ai = the book value of the item I of the assets on the balance sheet of the bank and wi = the weight of the item I as seen from Tables 1 and 2.

The Basel II provisions have been incorporated into the Community institutional framework of banking supervision, resulting in the undeniable enhancement of bank solvency over the past and present decade.

In the 1990s, there were cases of catastrophic losses to credit institutions due to risks stemming from deficiencies in the operating framework. Due to some financial dysfunctions and bankruptcies in credit institutions, the need for managing a newly emerging type of risk, the so-called Operational Risk, was born. In 1999 the Basel Committee published the revised 1988 document for comment on credit risk issues. The design of the capital adequacy rule of 1988 took exclusively into account the features of the banking system of the 1980s. This is why it is considered inadequate for the needs of the international financial sector of the 21st century. More specifically, the criticism focuses on the following.

2.3.2 Review of Basel I

With the advent of the Basel Supplementary Accord and its subsequent incorporation into the Community and national law of the member states, the capital adequacy framework was expanded as financial institutions were now obliged to hold sufficient own capital for their exposure not only against the credit risk, but also against market risk. In particular, as mentioned above, a minimum capital adequacy ratio was set at 8% (Wipplinger, 2007).

The capital for general banking risks under condition. The following do not include: the book value of own shares held by the financial institution, the retained losses of current and past years, the establishment and installation costs, and intangible assets, the temporary negative results of current year (Daffey & Abratt, 2002).

The secondary or supplementary capital includes, amongst others: the asset revaluation reserves, the preference shares of fixed or indefinite duration with cumulative dividend right, the receivables value adjustments to credit institutions and customers, and shares, bonds and other fixed or variable return assets under conditions, the fixed term subordinated loans.

The weighted assets include the sum of credit risk weighted assets plus the off-balance sheet credit risk weighing together with the measurement of the market risk (McAleer, Jimenez-Martin and Amaral, 2010, p1-34).

2.3.3 Description of the Basel II Accord (4.5.1)

The Basel Committee, recognizing that Basel I had become obsolete and inadequate to meet the new challenges in the financial world, began the consultation process for its revision, with the publication of the first Advisory Document.

The three Advisory Documents (second-January 2001, third-April 2003), the four Quantitative Impact Studies, and the published studies of the relevant specialized working groups, constituted the complex and extensive set of new proposals for the revision of the capital adequacy regulatory framework, more commonly known as Basel II (Claessens and Laeven 2005, p179-207).

One of Basel I's main objectives was to create the conditions of equal competition between the credit institutions due to the different regulatory regimes that applied internationally.

The proposed Basel II moved away from the idea that the regulatory rules should be the same for everyone as set out in Basel I, and recognized that the more effective a credit institution is in assessing and managing risk, the less capital it should retain for a specific activity.

The new proposals of the Basel Committee were based on three interdependent and complementary pillars that contribute to the security and stability of the financial system:

i. Pillar I: Imposition of minimum capital requirements to cover the risks assumed and introduction of operational risk measurements.

ii. Pillar II: Regulatory procedures for the review and assessment of the credit institutions' capital adequacy.

iii. Pillar III: Market discipline by disclosing data on the structure of the risks assumed and the capital adequacy of the credit institutions.

With regard to the credit risk, the Basel Committee proposed two approaches for the calculation of the capital that a financial institution should hold for regulatory purposes.

The standardized approach was essentially an improvement of the current one, reflecting more accurately the changes in the credit risk. Contrary to the current regime, where the main criterion for determining the credit risk weights was the distinction between OECD and non-OECD member countries, in the proposed framework these factors were determined using the creditworthiness ratings of the counterparties by external rating agencies.

In particular, the weighting of a bank's assets depended on the nature of the counterparty, the type of the claim (mortgage or consumer loan, bond) and the creditworthiness rating of the debtor-issuer by external rating agencies.

Thus, the current weighting with a 0% rate for claims against the Greek government (sovereign bonds) has been maintained, but the level of the risk weight for the debt of other countries depends on the creditworthiness quality grade (20% for the second grade, 50% for the third grade, 100% for the fourth and fifth grades, and 150% for the sixth grade).

Then, the fully residential mortgage-backed loans are weighted at a 35% rate, while the commercial mortgage-backed loans are weighted at 100%.

In addition, due to the different nature of the retail banking operations (excluding mortgages), a lower risk weight (75%) was applied compared to the business lending (20% for grade one, 50% for grade two, 100% for the third and fourth grades, and 150% for the fifth and sixth grades).

The retail banking sector was characterized by a large number of loans and small balances per loan, thus achieving the natural diversification of the portfolio and thus the reduction of the risk assumed (Storey, Salaman & Platman, 2005, p1033-1054).

Finally, the unsecured portion of the overdue receivables over 90 days, after the deduction of special provisions, was proposed to be weighted at a rate of 100% and 150% respectively, depending on the coverage ratio of the overdue amount from specific provisions. In the same way, the over 90-day overdue mortgage loan claims will be weighted at 50% and 100% respectively

On the other hand, the approach of the internal ratings systems, which consists of: a) the basic approach, and b) the advanced approach, as opposed to the distinct function of the credit ratings with the five weighting factors (0%, 20%, 50%, 100%, and 150%) used a continuous weighting

function to reflect the full range of the counterparties' creditworthiness and the probability of default [PD] (Petrakis, 2001) - Probability of default [PD] is a financial term describing the likelihood of a default over a particular time horizon. It provides an estimate of the likelihood that a borrower will be unable to meet its debt obligations. PD is used in a variety of credit analyses and risk management frameworks. Under Basel II, it is a key parameter used in the calculation of economic capital or regulatory capital for a banking institution.

The function of the rating approach was based on four key stages. At the first stage, the assets constituting the investment portfolio of credit institutions were classified into five main categories:

i. Receivables from enterprises: these receivables include the financing of projects, commodities, physical assets, commercial properties, and commercial high-risk properties.

ii. Receivables from States

iii. Receivables from credit institutions

iv. Retail banking: housing loans, acceptable renewable credit exposures, purchase of assigned retail trade receivables.

v. Holdings and shares

In the second stage, the financial institution should produce specific credit risk assessment parameters for the above requirements using either standardized rates, which are determined by the regulatory authorities, or their own estimates. The credit risk parameters were as follows:

Likelihood of default by the counterparty: Defined as the highest value between the counterparty's probability of default over a one-year period and a minimum limit of 0.03%. However, the 0.03% limit does not apply to requirements from United States. All credit institutions, irrespective of the approach they follow, should provide the regulatory authorities with their estimates of the counterparty's default risk for each borrower rating

Expected loss in the event of default of the counterparty: This risk parameter represents an estimate of the average expected loss per requirement to be borne by the credit institution if the counterparty is unable to meet its contractual obligations. For example, a parameter value for a 45% requirement means that the credit institution estimates that it will suffer a loss of 45% of the value of the requirement (while recovering the remaining 55%) if that counterparty is not capable of fulfilling its obligations.

In the third stage, the aforementioned credit risk parameters are evaluated separately and subsequently entered as variables in the respective functions for the calculation of the credit risk weights and hence the related capital requirements.

Finally, in the fourth stage, the credit institutions that used the approach of internal rating systems for capital adequacy purposes should at least meet certain conditions. The national regulatory authorities would be responsible for monitoring the compliance of credit institutions with these conditions. The Basel Committee introduced the calculation of minimum capital requirements against the operational risk - "The risk of loss resulting from inadequate or failed internal processes, people and systems or from external events." by proposing three evolutionary approaches: (Lagos and Wright, 2005, p463-484).

i. The Basic Indicator Approach: According to the basic indicator approach, the capital requirement against the operational risk was determined as the product of a basic indicator, which represented the credit institution's total exposure to operating risk by a fixed rate *a* to be determined by the regulatory authorities.

ii. The Standardized Approach: The Standardized Approach was a sophisticated variation of the former, as it recognized that the operational risk was differentiated according to the business segment.

iii. The Advanced Measurement Methods Approach: The philosophy was that the credit institutions should develop in-house methodologies based on historical data which, if they meet specific regulatory criteria, may be used to determine the related capital requirements.

Basel II's Pillar II was related to the regulatory review process, thus ensuring the capital adequacy beyond the Pillar I mechanisms.

With the capital adequacy assessment system and with the determination of the capital required to cover their risks, the credit institutions assessed the risks and their monitoring and measurement procedures and required additional capital requirements when there was no full compliance with the provisions of the Pillar I or when certain risks were not dealt with the Pillar I, were not sufficiently covered by the credit institutions.

In relation to Basel II's Pillar II, the credit institutions should develop procedures for assessing the overall capital adequacy ratio in relation to the risks assumed and their operating environment and a strategy to maintain the level of capital adequacy. The capital adequacy assessment process included the following features (Ross & Wethersfield, 2002):

a.) Supervision and regulation by the senior management of the credit institution

b.) Sufficient and documented procedures for assessing the required capital against the risks assumed

c.) Evaluation and establishment of a monitoring system

d.) Internal audits

On the one hand, the regulatory authorities should examine and evaluate the internal ratings and the capital adequacy strategies of the credit institutions and on the other, the ability of the credit institutions to monitor and ensure their compliance with the process of calculating the capital adequacy ratios. The regulatory authorities had to take appropriate action if they were not satisfied with the results of the above procedures.

The regulatory authorities should have the possibility to require from the credit institutions to maintain capital adequacy ratios above the thresholds. The capital requirements of Pillar I aimed at providing an appropriate capital buffer to address the uncertainties affecting the entire banking sector. The Basel Committee argued that there was a need to hold an additional capital buffer, capable of addressing any specific risks and uncertainties on an individual basis.

Lastly, the regulatory authorities should intervene in a timely manner to suspend a possible reduction of the existing regulatory capital below the minimum thresholds. They should also require rapid remedial action if the capital is not maintained or restored.

Pillar III introduced provisions to inform foreign credit institutions of the amount of risk incurred, the capital requirements for these risks, and the strategy they follow to enhance the market discipline through the transparency.

In this way, the market discipline was strengthened by the disclosure of data and information on the correct assessment of the capital adequacy of banks in relation to the type and amount of risks assumed and the monitoring and management process followed by each bank.

The transfer techniques and practices for measuring the credit risk from compound financial instruments, as well as the credit derivatives, swap options, and asset securitizations were more closely reflected. At the same time, the range of the collaterals for risks and the guarantees for the requirements increased. The regulatory authorities were carefully monitoring the financial situation of each bank. The calculation of capital requirements was based on measurement methodologies, but there was a failure to measure the operational risk and there was no possibility of separating it,

namely the operational risk could not be characterized.

The Committee's rules related to the operational risk, the increased complexity and the wide range of banking operations and the use of computing systems. Also, a new methodology for the credit risk was proposed by the new regulatory framework, thus other forms of risk remained uncovered.

2.3.4 Objectives of the new Basel II Accord (4.5.2)

The main objectives of the revised agreement, the Basel II, are the following (Eubanks, 2010, p8-11):

i. The matching, where possible, of the banks' equity to credit risk, which is actually inherent in each exposure.

ii. The expansion of the supervisory recognized instruments and hedging techniques or transfer of credit risks.

iii. The establishment of specific capital requirements to cover the operational risk.

iv. Encouraging banks to use internal credit risk measurement and management systems.

v. The determination of basic principles and criteria governing the evaluation process by the supervisory authorities of the policy and mechanisms of banks to ensure their capital adequacy. This evaluation will take into account the nature and scope of activities of the supervised credit institutions and the type and level of the risks involved.

vi. The strengthening of the discipline that the market imposes on the credit institutions through the mandatory disclosure of qualitative and quantitative data to allow an objective assessment of capital adequacy and effectiveness of risk management systems. This assessment by the market basically determines the banks' borrowing costs and consequently the interest rate policy towards the clients (Young, 2012, p663-688).

2.3.5 The structure of Basel II Accord (4.5.3)

STRUCTURE OF THE NEW ACCORD		
PILLAR I	**PILLAR II**	**PILLAR III**
Minimum Capital Requirements	**Supervisory Control**	**Market Discipline**
▪ **Market Risk** - Minimum changes with respect to Basel I ▪ **Credit Risk** - Significant changes compared to Basel I -Three Different approaches to the evaluation of the minimum capital requirements. - Incentives directed to the financial institutions to adopt advanced credit risk management methods, based mainly on IRB methods. - Demand for the use of advanced information collection and control systems ▪ **Operational Risk** - A new feature of the supervisory framework	- Credit institutions must have reliable evaluation procedures for their capital adequacy and an effective strategy for maintaining the required level of regulatory capital - The supervisory authorities should supervise and assess internal systems of credit institutions and the followed strategies for maintaining their capital adequacy - The supervisory authorities should expect and require from the financial institutions to maintain an amount of regulatory capital significantly above the minimum required - It is at the discretion of the supervisory authorities to impose additional capital charges - The supervisory authorities should be involved in the early	- The market discipline strengthens the efforts to promote the security and credibility of the credit institutions - The increased requirements for the provision of main and additional information make the market's discipline more effective

-Three Different approaches for estimating the minimum capital requirements.	stages to prevent and address the lack of capital of the credit institutions	

Source: KPMG, 'The Basel Handbook: A Guide for Financial Practitioners', London, 2005.

Table 2-0-3 Structure of Basel II

The new regulatory framework is a comprehensive risk management methodology using credit ratings as a criterion for differentiation. It establishes the following three fundamental pillars of supervision that facilitate bank financing of small and medium enterprises by enabling banks to reward their loyal customers with attractive interest rates (McAleer, Jimenez-Martin and Amaral, 2010, p1-34). The main characteristics of the three pillars of the new supervisory framework (Basel Accord II) are summarized in the following table (Moosa, 2010, p95-114; Repullo, Saurina and Trucharte, 2010, p659-702).

2.4 General Review of the Basel II Proposals

New proposals on capital adequacy of the credit institutions, not only fulfil the goal of having a system that gives considerable risk measurements that in turn will lead to the establishment of a satisfactory amount of equity. Beyond that, they bring an entirely new concept in the management of the credit institutions. Essentially, the system will incorporate modern risk measurement systems in the administration of the credit institutions that have been developed in the last decade and are used by major banks (Repullo, Saurina and Trucharte, 2010, p659-702).

The internal consistency of the system requires that the sum of the individual limits allocated to the decision-making units should be summed up to the bank's total capital. The impact of these systems, on the active and the passive management of banks' portfolios, is evident. The allocation of the capital to the limits of the decision-making units expresses the top management's policy regarding the priorities of the bank (e.g. retail or wholesale banking). Also, the passive portfolio management is simplified since exceeding the limits will require corrective actions (Blundell-Wignall and Atkinson, 2010, p9-33).

The application of these methods has a positive impact on issues such as the quality of corporate governance of the credit institutions since the decision-making process is more visible. Also, the control of the processes becomes easier as well as the disclosure of an abundance of information to investors.

At the same time, the proposals have received much criticism that cover both topics of academic interest related to the consistency of the measures and their practical application, and the need for highly qualified staff. A generally acceptable criticism is the following. A key objective of the central banks participating in the Basel Committee is to establish common rules for the credit institutions so as to guarantee the principle of equal treatment and thus the fair competition (levelling the playing field). But we can observe that the proposals differ in some cases from that goal. For example several cases have been identified that lead us to the opposite direction, such as (Blundell-Wignall and Atkinson, 2010, p9-33):

i. The great powers assigned to the supervisory authorities of each country to control the risk measurement systems (second pillar of the proposals)

ii. The exceptions to each general rule instituted, usually after pressure from various parties, e.g. the ability given so that the mortgage business loans in developed real estate markets to be weighted at 50% rate instead of 100% which is the norm. This exception is expected to benefit specific banks such as the German Landesbank,

iii. There is no care for the unfair competition by the state banks or banks that enjoy state guarantees and may issue collateralized loans with high evaluation by the risk assessment companies or raise funds from capital markets at a lower cost (Repullo, Saurina and Trucharte, 2010, p659-702).

Also, what should be understood is that the risks are inherent to the system and for banks in times of crisis. Consequently the risk assessment cannot be accurate or protective in times of crisis. Finally, the proposed risk measurement systems calculate the maximum loss with a given error probability (i.e. 0.5% higher than estimated). But what is interesting is the amount of the suspected error. That is, we need to know the distribution of the damage exceeding the estimate (Andersen, 2011, p138-154).

2.5 Comparison of the Framework of Rules of BASEL I and BASEL II (4.6)

Comparing the Basel I Accord to the Basel II, it can be concluded that the Accord of 1988 focused on the total amount of the credit institution's capital, which is important in reducing the risk of bankruptcy and possible costs for depositors in case of collapse of the credit institution. The new framework focuses on strengthening the stability and security of the system by putting more emphasis on internal control and the effective management of the credit institution, in the supervisory review process and market discipline. The main differences are summarized as follows:

Table 2-0-4 Summary Comparison of the Basel I & II Rules

Basel I	**Basel II**
Unique choice in the calculation of the regulatory capital in relation to the credit risk. Substantial modification was made in 1996 with the introduction of internal methods for measuring the market risk.	A range of approaches for determining the regulatory capital in relation to the credit and operational risk.
The supervisory policy did not take into account the differences between credit institutions (one size fits all)	The use of methods that match the level of sophistication and risk profile of each credit institution is provided through the supervisory review process. Recognizes the role of the market discipline.
Non specific structure as to the diversification of the weights of assets in terms of credit risk.	A more accurate and a more sensitive structure to the changes of the credit risk is determined.

Apart from these differences, it would be interesting to see the comparison of the two Accords (I & II) on the risk weights of their assets under the different approaches analyzed in the previous section (Table 3-5).

Table 2-0-5 Comparison of risk weights of the assets (RWA) - Basel I vs. Basel II

Risk Weights Under Basel I and Basel II (Pillar I), %

SECURITY	BASEL I	BASEL II Simplified Standardised	BASEL II Standardised based on External Ratings		BASEL II Advanced: Internal Ratings Based (IRB) 2004-05 QIS 4 Avg % chg in portf. MRC	2004-05 QIS 4 Median % Chg in portf. MRC	Basel II Advanced IRB
Most Government/central bank	0	0			0	0	Comes close to letting banks set their own
AAA to AA-			0				**Pillar 1** capital, with supervisory oversight.
A+ to A-			20				Risk weights depend on internal estimates
BBB+ to BBB-			50				of a loan's probability of default; loss-given-
BB+ to B- (& unrated)			100				default; exposure to loss. These are based
Below B-			150				on the banks' own complex risk models,
Other public (supervisors discretion)	0-50	0			0	0	relying on subjective inputs and often on
Claims on MDBs	20	0			-21.9	-29.7	unobservable (e.g. OTC illiquid securities)
Most OECD Banks & Securities firms	20	20	<90days	Other	-21.9	-29.7	prices.
AAA to AA-			20	20			**Pillar 2** provides for supervisory oversight.
A+ to A-			20	50			With stress testing, and guidance from
BBB+ to BBB- (& unrated)			20	50			supervisors, banks can be made to hold
BB+ to B-			50	100			capital for risks not adequately captured
Below B-			150	150			under Pillar 1.
Residential Mortgages-fully secured	50	35	35		-61.4	-72.7	**Pillar 3** is disclosure and market discipline
Retail Lending (consumer)	100	75	75		(-6.5 to -74.3)	(-35.2 to -78.6)	which relies on some notion of market
Corporate & Commercial RE	100	100			(-21.9 to-41.4)	(-29.7 to -52.5)	efficiency. Rational markets punish poor
AAA to AA-			20				risk managers.
A+ to A-			50				
BBB+ to BB- (& unrated)			100				
Below BB-			150				

Source: BIS (1988), BIS (final version June 2006) and FDIC – Federal Deposit Insurance Corporation (2005).

From the above it can be concluded that in the case of Greece we refer essentially to a crisis in the demand. The Greek recession is not directly related to the primary causes of the crisis that occurred in the US and Europe, but it is related to the implications of the generalized crisis of the global economy, which found fertile ground in the unfavourable financial situation of Greece. The next chapter will refer to the new banking landscape formed after the crisis.

Risk Weights Under Basel I and Basel II (Pillar I), %

SECURITY	BASEL I	BASEL II Simplified Standardised	BASEL II Standardised based on External Ratings		BASEL II Advanced: Internal Ra 2004-05 QIS 4 Avg % chg in portf. MRC	2004-05 QIS 4 Median % Chg in portf. MRC
Most Government/central bank	0	0			0	0
AAA to AA-			0			
A+ to A-			20			
BBB+ to BBB-			50			
BB+ to B- (& unrated)			100			
Below B-			150			
Other public (supervisors discretion)	0-50	0			0	0
Claims on MDBs	20	0			-21.9	-29.7
Most OECD Banks & Securities firms	20	20	<90days	Other	-21.9	-29.7
AAA to AA-			20	20		
A+ to A-			20	50		
BBB+ to BBB- (& unrated)			20	50		
BB+ to B-			50	100		
Below B-			150	150		
Residential Mortgages-fully secured	50	35	35		-61.4	-72.7
Retail Lending (consumer)	100	75	75		(-6.5 to -74.3)	(-35.2 to -78.6)
Corporate & Commercial RE	100	100			(-21.9 to-41.4)	(-29.7 to -52.5)
AAA to AA-			20			
A+ to A-			50			
BBB+ to BB- (& unrated)			100			
Below BB-			150			

CHAPTER 3

THE NEW BANKING LANDSCAPE AFTER THE CRISIS

After a long period of favourable economic conditions, the International Financial System had to confront two shocks, which appeared in rapid succession: the crisis of the housing loans for low credit borrowers (sub-primes) and the significant rise in commodity prices. The two events, though disconnected, created pressures on the International Financial System, which had to deal with two conflicting problems: financial stability and inflation (Moravcsik, 2012, p91, 54). The central banks reacted by channelling liquidity into the system and lowered the interest rates at unusually low levels. The international financial crisis of 2007, which began from the US mortgage market, was originally limited to banks that had invested in securitization products of such loans (Popov and Udell, 2012, p147-161).

As the crisis unfolded, the practice of repeated securitization and the complexity and lack of transparency of the products resulted in the inability to identify the risk and reduced the confidence in the solvency of banks. The banks became very cautious and borrowed from each other for short periods. The banks with a low deposit base and the interbank market as their main financing source suffered a high impact. The crisis was then transferred to the entire banking system and soon affected the real sector of the economy (Hellwig, 2010, p1-21).

3.1 The Crisis in the Sub-Prime Market and the creation of the Financial Crisis

Historical review

An economic dysfunction, initially in the form of credit recession, emerged on July 2007, confirming the signs of the previous months. These had to do with the reduction in the US real estate market prices in early 2007 after five years of continuous growth, while during the same period (February 2007), the British bank HSBC was recording losses in the consumer credit department, which operates in the US, nevertheless, without expressing particular concerns. A month later, the head of the US central bank (Fed), Ben Bernanke, announced that the decline in the real estate market is limited and does not cause any concern. Despite the complacent statements, the US real estate market continued to decline rapidly and in July 2007 the first alarming sign appeared with the then investment bank Bear Sterns to cease the operation of two of its hedge funds that were exposed at the market bonds covered by collateralized debt obligations (CDOs), while similar

actions followed by other leading financial institutions (e.g. BNP Paribas). In August of the same year, the market for securitized loans with exposure to the sub-prime housing market received the first shock, recording a sharp drop (Shiller, 2012, p50).

World financial giants with exposure to the subprime market started to record losses gradually. Whilst the commercial banks in an effort to save their status, absorbed and integrated the injurious bonds on their balance sheet, and the investment houses experienced the depreciation of these assets and by expansion of their assets that allowed them to record supernormal profits in the previous years. This led to a climate of uncertainty about the extent of these undervalued assets (bonds) in the financial system that undermined the trust in the interbank market, increased the interbank interest rates (LIBOR, EURIBOR) and created a credit crunch climate. Faced with the phenomenon of an enlarged credit crisis, the central bankers both in the US and in Europe transferred liquidity to the market, while the Fed began to engage in a continuous and gradual decline of the short-term central rate, aiming at restoring the balance on the credit market. On 22 January 2008, the Fed lowered the short-term interest rate by 0.75% during an emergency meeting. Many banks with high financial leverage in their balance sheet began to have problems since they were already in the throes of a growing interest rate risk derived from high interbank rates and were unable to repay their debt which sometimes led to losses and in extreme cases to bankruptcy or nationalization (Northern Rock). Unsurprisingly, insecurity was transferred to the financial markets and investors. In the months followed, large investment banks, insurance companies and multinational companies with market exposure of subprime loans, observed their shares to note historically low records, while dragging the broad US and UH indicators down and with uncertain, until then, implications to the rest of the world and the real economy. In March 2008, the financial institution, Bear Stearns was on the brink of bankruptcy (bought by JP Morgan for $10/share, whereas before the crisis its price share was $100), and unable to raise funds from the thrift market (Financial Crisis Inquiry Commission and United States, Financial Crisis Inquiry Commission, 2011).

The situation exacerbated by the bankruptcy of the large investment bank Lehman Brothers, the acquisition of RBS and Fortis by their governments, the conversion of Goldman Sachs and Morgan Stanley into holding companies supervised by the Fed, and the bankruptcy of a large number of financial institutions worldwide, while state interventionism regained ground in order to rescue the global financial system and the economy. The uncontrolled increase in oil and food prices until the summer of 2008 and the rapid appreciation of the euro must be added to this instability.

The crisis shook the real economy and was expressed also through the business community's inability to raise funds, own or foreign, but necessary for their proper functioning. The immediate consequence was the shrinkage of the production, trade and consumption, increased unemployment and reduced national income of the country. Finally, the international trade also suffers greatly, while dragging down the shipping industry, exports and tourism currency. The above described the complete scene by the end of 2008, contributing to the rapid deterioration of the recession and heightening the great uncertainty in the global market for the duration of the crisis (Demyanyk and Hasan, 2010, p315-324).

The subprime loans refer to loans granted to people who did not meet the basic credit criteria (low and non-fixed income people, people with health problems, students) and thus associated with high floating interest rate. The financial institutions saw high margins in this category of borrowers (these loans were traded with a yield of 6% over LIBOR, ranking them as highly attractive), since in the period that followed the terrorist attacks of September 11 and the collapse of the dot.com, in an attempt to prevent the impending recession, the Fed gradually reduced the short-term central rate, which stood at the level of 75 basis points in 2002. This movement was strengthened from the ability of the subprime creditors to cope with the repayment of the expenses of the loan because of the low market interest rates, the rapid reconstruction in the US at that time, and the policy followed by the financial institutions to relax the criteria for granting mortgage and often ignoring the credit risk of borrowers. It is worth noting that in 2007, 13% of mortgage lending in the US was covered by subprime loans. The growing demand in the housing market fuelled the rise in property prices, and created the illusion of easy repayment of loans in the market (Reinhart and Rogoff, 2013, p4557-4573).

In recent years, the subprime housing market further swelled and took a new wider, global form through the securitization of these loans into bonds (CDOs) and their sale to investors around the world. The securitization was used as a tool for the continuous market supply with liquidity by banks as a means of increasing their profitability. Specifically, commercial banks, through the creation of special purpose entities (Spv), issued bonds (with the securitized subprime loans as collateral) which were then sold to investors and in this way the new capital was allocated in the market (Mishkin, 2011, p49-70).

The securitization of subprime loans offered advantages (Sapountzoglou & Petontis, 2006) to commercial banks, such as:

i. Improved the quality characteristics of the balance sheet and increased the turnaround of their stock, since the banks sold the subprime loans and thus the high risk in the form of special purpose vehicles (SPV), while achieving cost reduction of their borrowing.

ii. Improved the capital adequacy ratio, as defined by Basel II, by isolating the risky assets from current assets.

iii. The lower borrowing costs through the issuance of covered bonds with subprime loans. The isolation and segmentation of subprime items made these more clear in their analysis and valuation, thus increasing their creditworthiness. It is noteworthy that 80% of covered bonds were rated by the credit rating agencies (CRAs) as low credit risk securities.

iv. Finding alternative financing sources where conventional methods have been exhausted.

These techniques strengthened the market and acted as a driver for the economic boom in recent years. Since March 2004 when the global economy started to accelerate its growth rates, the first concerns were noted for the upward trend in inflation. This development led the central banks to the gradual increase in key interest rates, with the Fed to raise the short-term interest rate up to the level of 5.25% in July 2006, thus raising the cost of repayment of a loan, directly affecting their subprime lenders who looked forward to a continued low market policy (Demyanyk and Hasan, 2010, p315-324). This inability to repay existing subprime loans led to the increase of the non-performing loans and the freeze in the issuance of new. This led to a reduction in the US housing demand, coupled with the oversupply of real estates due to the foreclosures on the part of banks, which lured the housing market at very low levels. It is reported that the value of real estate was worse than the value of the loans. This development adversely affected the structured bonds (CDOs) that were based on the subprime housing market, losing rapidly their value and the high scores they had received from the CRAs. Therefore, the above raised the concern about the reliability of the evaluation systems used by the CRAs. The fact that the bonds under analysis were traded between investment banks and a wide range of institutional investors, pension and insurance funds, and investment companies shows how enlarged was the exposure to the crisis for everybody (Reinhart and Rogoff, 2013, p4557-4573)

3.2 Causes of the Crisis

The ample liquidity that existed in the system and the regulation and supervision environment of the banking activity can be considered as the primary causes of the crisis. The abundant liquidity

combined with a low interest rate environment led to excessive price increase (e.g., real estate) and to the relaxation of the credit criteria. Investors were seeking higher yields, without always understanding the basic relationship in finance, namely, that higher yields are accompanied by a higher risk, and the banks, while seeking for alternative sources of revenue, covered the demand by creating complex products with significant transparency problems.

Regarding the regulatory and supervisory framework, two observations can be made initially (Harvie and Van Hoa, 2016, p74):

- First, banking supervision was based on the financial strength of each organization separately (micro-prudential supervision), sometimes ignoring the influence of the external environment and the systemic risk (macro-prudential)
- Secondly, a non-supervised parallel and obscure banking system developed, with difficulties in identifying the risks (e.g., hedge funds), in many cases with the involvement of the banks themselves. Also, the financial crisis came in the beginning of the implementation of a major effort to amend the supervisory framework for the capital requirements of Basel II. In this sense, Basel II did not manage to be tested for its ability to mitigate the effects of a crisis. At the same time, however, the lessons from the crisis highlighted some obvious shortcomings of Basel II and the debate on the future shape of banking supervision and the necessary amendments to Basel II in the international fora had already begun.

Basel II underestimated some important risks and generally overestimated the ability of banks to manage their risks effectively. No matter the form of supervision in the future, it is certain that large and complex banking organizations (systemically important or too-big-to-fail institutions) will have stricter prudential supervision, with restrictions on the types of risk-taking and the better corporate governance (Lin and Chun-he, 2010, p23).

3.3 Microeconomic causes of crisis

The microeconomic causes of the crisis can in turn be divided into three areas:

a.) Incomplete incentives

b.) Failure in risk management and measurement

c.) Failure in timely regulation and supervision

So all these shortcomings allowed the entire financial sector to gain access to easy profits in a very short time since the appropriate adjustment as to the risk assumed was absent.

The crisis revealed the distorted incentives of consumers and investors, workers in the financial sector and of the rating agencies themselves. Consumers and investors borrowed rapidly by investing these funds in excessively complex and opaque financial products. On the other hand, compensation schemes and bonuses were such that pushed the managers of financial institutions to high-volume trading operations targeting short-term profit investments. This consequently led to increased leverage of these organizations and the accumulation of huge amounts of risk. The rating agencies for their part, overwhelmed by the avalanche of complex structured products, and failed to properly assess the actual probability of default by the debtor, namely the real risk that was lurking in these products (Birdsall and Fukuyama, 2011, p10-11).

The measurement, the pricing and the management of risk, require all those modern statistical tools which are largely based on historical data. Even for data series with long time depth, the belief that the world evolves slowly but steadily meant the downgrading of the importance of the distant past and its reclassifications. Therefore, the recent and extensive period of relative stability created the perception that the risk is almost zero. The result was a widespread tendency to buy and sell risk very cheaply. Unfortunately these statistical models and methods failed in the assessment and treatment of the stress tests, when their function is of major importance (Lederman, Mengistae and Xu, 2013, p3637-3649).

Inadequate governance of risk management created additional problems (Counterparty Risk Management Policy Group, 2008). The lack of support from the senior management burdened the risk managers even more, who were trying by all means to stop the further money creation.

Finally, the regulatory system proved to be very lenient and sometimes it could very easily escape completely. Excessive insistence on market discipline by the regulatory and supervisory authorities, led to what can only be described as an extremely light touch in some countries at the heart of the global financial system, the financial institutions within which could easily shift to activities outside the regulatory framework. Indifference or incorrect assessment by the regulatory and supervisory authorities, led to the creation of an uncontrolled risk level (Lee and Keen, 2004, p169-199).

3.4 Macroeconomic causes of crisis

The macroeconomic causes are divided into two broad categories:

a.) Problems related to the accumulation of imbalances on international claims

b.) Difficulties arising due to the long period where the real interest rates remained at very low levels.

The second set of macroeconomic causes stemmed from the protracted period (since 2001) where governments kept the real interest rates both short- and long-term to extremely low levels. The effects of the low interest rates were many (Holinski, Kool and Muysken, 2012, p94). Significant was the lending boom to households and businesses in most advanced economies that was partly fuelled by the continued rise in prices in the housing market. Additionally, the result of the low interest rates was the search for high returns which led the institutional investors to excessive risk-taking (Palley, 2011, p3-17).

3.5 Basel II & the Financial Crisis

The credit crisis, as discussed in the previous chapter in detail, has hit the reliability and predictive power of internal rating systems of banks and external rating agencies.

So, various attempts followed for the revision of the existing framework of Basel II since before it enters into force, it seemed inadequate. Thus, the focus was on:

a.) Strengthening the supervision of loan securitizations and credit derivatives

b.) Increasing capital requirements

c.) Enforcement of a maximum leverage ratio of the bank balance sheets

d.) Revision of the legal framework of the accounting provisions (IAS 39)

e.) Enforcement of rules for the supervision of the liquidity of the banking systems

The legal framework contained no provisions for the prevention of systemic risk in the financial system, although the influence of the evolution of the crisis was evident. Instead, the existing regulatory framework for capital adequacy, in particular where the calculation of capital requirements for coverage against credit risk was based on internal risk rating systems of banks (in accordance with the provisions of the Basel II), was considered to be one of the factors that exacerbated pro-cyclicality (see. Figure 4-1), as an incentive for banks (Baker, 2010: 647-663):

a.) In times of economic growth to further enhance their credit expansion, since the capital requirements for loans and credit are lower, and

b.) In times of economic recession to limit the granting of loan capital, since the capital requirements become more stringent.

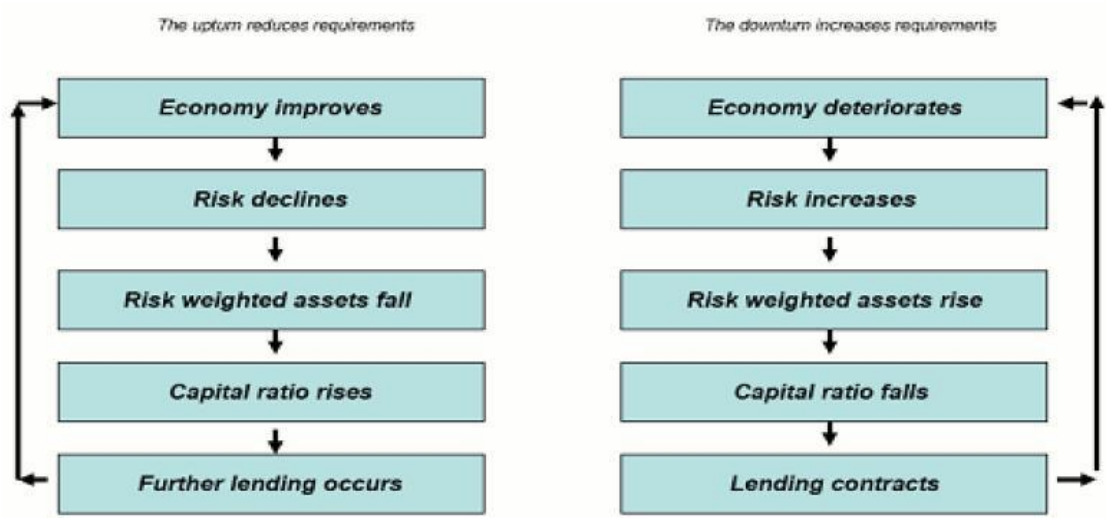

Figure 3-0-1 Pro-cyclicality

Source: voxeu.org

The consequence of the above facts is that many banks worldwide are not able to absorb the losses resulting from the crisis. At the peak of it, during 2008, the markets pressured the banks to reduce their lending which resulted in the widespread fall in the value of their assets and increased losses, while reducing their capital and limiting the possibility of granting credits and loans to enterprises and households (Arezki, Candelon and Sy, 2011: 1-27).

3.6 Case study: The impact of BASEL II limitations of the Greek crisis

Therefore, in the context of the international financial crisis, it was expected that the Greek economy would soon enter the recession phase. The aggregates reflect this trend with unemployment to be increasing, investments to continually shrinking and the circulation rate of money to slow down causing shortages. According to data of the Hellenic Statistical Authority, the unemployment in December 2008 stood at 8.9% from 7.8% in November, while at the same time the average unemployment rate in the eurozone was 8.1%. Also, the annual growth rate of total credit to all businesses and households in the same period (December 2008) was estimated at 16.4% from 21.5%, in December 2007. At the same time, the financial sector of the country is slowing. In

securities and derivatives exchanges the downward trends follow one another, with the foreign institutional investors to constantly liquidate their holdings in the Greek Stock Exchange and the HELEX to announce a reduction of turnover by 33% for 2008 (Triantafyllou and Angeletopoulou, 2011).

Also with regard to pension funds, these have experienced a reduction of their reserves in previous years because of management failures and therefore were unable to invest large funds in this market (Athanasatou and Lampousis, 2011, p1459-60). Nevertheless, it is worth mentioning that the decline of the public and the market's confidence to the financial institutions worldwide, which became obvious with the fall of the stock prices, the continued commitment of funds and the increase of interbank interest rates, affected the image of the respective Greek financial institutions.

In an effort to illustrate the economic crisis in the Greek reality, we imagine the Greek economy under the light of a globalized economic system. The most productive sectors of Greece (shipping, tourism, banking sector) have a high degree of correlation with other countries on abroad, thus some banks were exposed to the US - Subprime loans. At the same time, indicators such as the consumer confidence in the eurozone and the US, the orders of durable goods, investments etc. reflect the slowdown in global demand and consumption (Economou et al., 2013, p53-59), all evidence that support the view that it was inevitable for the Greek economy to be affected.

In recent years, the public debt of Greece continued to increase. By borrowing in previous years, were undertake investment projects in the context of the country's modernization and the obligations towards the 2004 Olympic Games, but mainly for meeting the needs of the high cost of the public sector. Unfortunately not much attention was paid in order for the money to be used in the improvement and proper organization of the frail productive sectors of the country (Zavras et al., 2012, p143). The high borrowing combined with recurring deficits in both the current account and the governmental budgets have reduced the solvency of the Greek state during the current period, as the surplus units are willing to lend their money to economically sound countries and not economically weak countries. The result was a large increase in the Greek borrowing interest rate, and a higher risk assumed by the lenders, which implies the increase of the required reward, thus creating further difficulties in securing the necessary resources for the financing of measures that would help to consolidate the economic sector with the implications to be noticeable to this day (Economou et al., 2013, p53-59).

As regards the Greek economic crisis, it appears to be associated with five main causes:

i. Budgetary diversion of the Greek state, whether in connection with excess government spending, or inefficiency of the state apparatus

ii. The limited exercise of national fiscal and monetary policy, thus throwing the pressure of the economic adjustment on the labour market, with unsatisfactory results in terms of competitiveness,

iii. The stable over time fall of the competitiveness of the Greek economy,

iv. The global economic crisis which worsened the financial coverage of the financial needs of the Greek public thus deteriorating public finances

v. The dramatic rise in interest rates.

According to the above, there are many reasons have led Greece to the economic crisis and this influenced several productive sectors but also on the whole country.

3.7 The new Basel III Accord

Basel III begins on the basis of the current economic crisis. In particular, at first everyone felt that the banks were, and for some, the banks are still the core of the outbreak of the global financial crisis.

Politicians and market factors with a safety margin from the financial system stressed the need for a new stricter regulatory framework so that the extreme speculation that led to the bankruptcy of large banks and the recession that followed will not happen again.

Based on this, the need for the so-called Basel III was developed, the need for a new and more demanding bank operating framework, which would update and increase the capital requirements of the banking institutions. As regards the bank capital and the bank liquidity, Basel III refers to the adoption of stricter capital adequacy requirements for the international banking system.

Basel III concerns the increase of the higher capital adequacy ratio to 4.5% of the assets, from 2% today, and the creation of a shock absorber of 2.5%, which is obvious that is needed during times of crisis and lack of capital.

The new rules will have to be implemented by January 1, 2019. Those who do not adapt will be faced with penalties for dividend cuts, etc. The major banks will not have to do anything to adapt to the new regime, because this new regime is adapted to their needs.

Today, most major lenders seem to have already made robust capital increases to meet the new rules. Basel III does not focus on the functioning of the banks on the basis of the socially painful experiences of the crisis that broke some years ago from the collapse of the Lehman Brothers, but is focused on a policy regulation on the laws of the banks (Slovik and Cournède, 2011, p1-15).

3.8 Purpose - Legal form - International application

3.8.1 Legal status of the standards of Basel III

Basel III was institutionalized to ensure that in the future banks would be exposed to the least possible risks that could lead to new crises when at least society succeeds to overcome the present. According to Yener, Manganelli and Marques-Ibanez (2011), after the financial crisis, own capital will become a decisive factor in assessing the quality of a financial institution

Based on this process, as well as the economic crisis experienced by society in recent years, the new Basel III framework was developed with the aim to shield the global banking system and prevent possible future actions (Nanda and Pring, 2012, p467).

3.8.2 Financial institutions subject to Basel III reforms

According to Pablo (2010) "Under Basel III, part of the capital will be covered by debt securities, but if the economic situation worsens, the securities will be converted into equity, which means that the risk of lending is now heavier for shareholders. Based on this strategy, it is clear that Basel III aims to make the shareholders more liable to the default of borrowers than the other creditors of the credit institution. The new order of things will surely protect banks and will reduce the risks but this change will affect other investments in products with increased risk but also the new lending process that is a traditional work of a bank (Blundell-Wignall and Atkinson, 2010, p9-33).

3.9 Basel Implementation Schedules from the various Member States

The sovereign states that have adopted Basel III were expected to introduce the reforms into national law by January 1, 2013 and the process of implementation of Basel III was expected to start on that date. Each country can decide independently about how and when to implement Basel III, including whether to join the transition timetable set by Basel III, or whether to proceed with the

implementation with a different schedule. For example, while the US has committed to the timetable of Basel III, in principle, it is likely that the US will go faster (or slower) with some of the reforms provided in the timetable of Basel III (Angelkort and Stuwe, 2011, p6-9).

As mentioned previously, the US regulatory authorities have already taken into account the capacity of the largest banks to meet the new standards when they determine whether or not to increase the dividends, to apply common stock repurchase programs, or redemption or repurchase of capital instruments. Banks may also face market pressures to comply with the capital requirements of Basel III, leverage and liquidity ratios before the dates set out in Basel III. Given the timely compliance probability of the States as to the deadlines and under the market pressures, some banks may not be able to secure funds slowly and naturally, as the Basel Committee intended (Verdier, 2012, p1-29).

3.10 Divergent approaches concerning the implementation - Geographic Disparity

Some countries consider the Basel Committee standards as “best practices” for dealing with capital adequacy issues, even for the most complex organizations. Others, however, believe that the standards should serve as a universal basis for all banks. For example, the Bank of England has expressed the view that Basel III should be regarded as a minimum standard, in which nations can build more stringent requirements. Similarly, Switzerland has proposed capital requirements for its larger banks which will be more onerous than the requirements of Basel III in their current form (UBS and Credit Suisse will need to increase their ratios of equity Tier 1 to 10% weighted to risk assets, and have an additional 9% of the capital in risk-weighted assets, which may include extraordinary capital instruments). The capital adequacy systems vary from country to country and could offer opportunities for geographic arbitrage, as well as the differences in the national implementation of Basel III could affect the global competitiveness (Trucco et al., 2010, p1-9).

Apart from the implementation of the Basel III rules in the case of the US and the EU, it is interesting to look at the differences presented in a wide geographical level in general (Figure 5-2). The extent, to which other countries in the world have adopted the Basel III rules, varies widely: Japan, Hong Kong, Singapore, and Australia are well advanced, in much the same level with the European Union. On the other hand, the picture in Russia and Eastern Europe, the Middle East, Africa and Asia Pacific, is less clear. Some may choose to start from scratch and implement all the rules, while others may choose to use the Basel III merely as a guideline, without adopting the full

package. For example, Russia recently announced that from 2015 will move to the standard approach for calculating the credit risk, to the IRB approach and already some of the Middle East countries are in the transition process to the IRB model (Guzman and Meyer, 2012, p514-535).

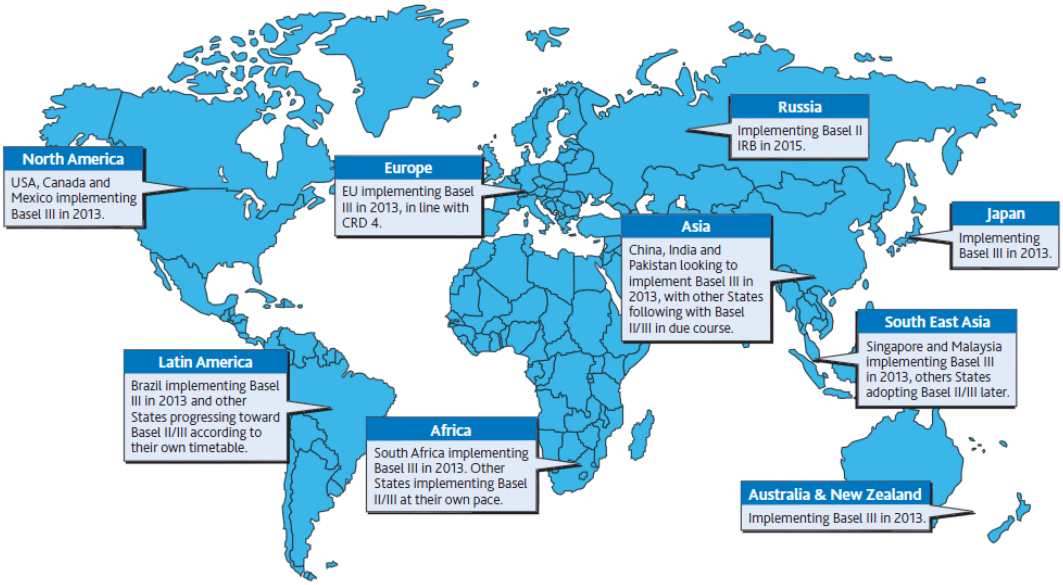

Figure 3-0-2 Geographical representation of the Basel III implementation

Source: Moody's Analytics, Sept 2011

Some countries may have other regulatory legacies, which in some cases may mean that some national rules will be replaced by Basel III, though which should perhaps be maintained in parallel. Some countries may choose to adopt the principles of Basel III, in their own way and embellish the requirements of Basel III, if they believe that they are not in line with the specific requirements of a country. But this could create idiosyncratic requirements and procedures that will need to be addressed during the implementation.

This global complexity adds more management and supervision difficulties as banks may need to manage different settings per country, while a bank may still be obliged to file a report in the context of the Basel II, in a country and as part of Basel III on a another, depending on where the bank is active (Wilkerson et al., 2010, p86-90).

Many regulatory authorities require banks to continue to file reports according to Basel I (using the standardized approach for calculating the credit risk), thereby adding greater multinational complexity. This would enable regulatory authorities to acquire a consistent comparison framework of all the banks they regulate; regardless of if the banks themselves use internally the IRB or the standardized approach. In Europe, for banks using the IRB, regulators

stipulate that this “ceiling” of Basel I, must range between 80-90% of the corresponding calculation obtained using the more expensive standard approach. In the US, the “ceiling” is at 100% (McCullagh, 2012, p87-93).

This may in fact mean that banks have to deal with compliance against a Basel I, II and III mixture, depending on where they operate and the demands of the local regulatory authorities. The reports should convey a consistent message so as not to mislead the regulator and the market.

Organizations with a fragmented data model will have to incur additional costs compared to those with a more centralized approach to the collection, consolidation and reporting under Basel I, II and III (Wond and Macaulay, 2010, p161-169).

3.11 Proposals relating to the necessary funds

Regulatory intervention in the context of Basel II that were completed in 2004, were based on two fundamental assumptions: in that the overall level of capital in the system is sufficient, but nevertheless there is a need to increase the sensitivity to risk within the framework to promote better management of risks and to reduce regulatory arbitrage. Therefore the focus of Pillar 1 under Basel II was the determination of the risk-weighted assets. The regulatory authorities agreed to improve the definition of the components of the capital, and also agreed to review the matter after the ratification of the Basel II (Becht et al., 2010, p3093-3129). The financial crisis has accelerated the need for a redefinition of the capital, as the elements that were considered as Tier 1 capital were unable to absorb the losses. The dominant form of Tier 1 capital must now be common shares and retained earnings, while the rest should consist of the subordinated instruments, have no cumulative dividends or coupons and have neither contractual maturity nor incentive to be redeemed. Also, the sensitivity cases to risk underpinning the various types of transactions, especially the securitization and derivatives, have proven insufficient during the financial crisis. With a letter, the Basel Committee in December 2009 referred to the strengthening of the resilience of the banking system, and revealed its intentions to increase the quantity, quality, and international consistency of the capital base, while increasing the capital requirements for certain types of transactions and debtors. Moreover, the regulatory authorities also introduced a leverage ratio, which is not based on the existence and addressing of the risk for reducing the accumulated leverage in the overall system. The BCBS also introduced rules to reduce procyclicality that is inherent in the regulatory framework of Basel II. This chapter summarizes the main points of the December 2009 proposals,

as well as the subsequent announcements related to the capital base, the coverage of the risk, the leverage ratio, the countercyclical “pillows”, as well as the systemic risk (Kim, 2011, p519).

It is clear that the financial institutions that were exposed to the so-called toxic products suffered heavy losses. There was a shift towards a new state interventionism which occurred through the interventions of the central banks to rescue the financial system and to resolve the crisis before it expanded to the wider real economy of the countries affected. It has been understood until now that the causes of the existing financial crisis can be traced back to the US housing market. At this point, for a better understanding of the causes of the crisis, we will try to analyze this market through the loans and the structured bonds. Surely all the causes which led to the onset of the current financial crisis are interrelated. Nevertheless, we could classify them into two broad categories: microeconomic and macroeconomic causes. In accordance with the above, the Basel II contributed somewhat to the onset of the crisis and the consequent negative impact on the real economy and therefore the Basel Committee proceeded to the adoption of a new international regulatory framework (Basel III) and intermediate settings until then (Basel II-5), which will be analyzed in the following chapters.

CHAPTER 4

METHODS OF ADDRESSING BANKING RISKS

Risk Management in the banking sector includes a combination of methods and models, the results of scientific research, in which banks rely on to implement risk-related policies and practices. Banks no longer conduct traditional activities as financial intermediaries in a low-risk environment. A wide range of innovative and sophisticated financial products are available worldwide now have turned the banking sector in a dynamic and proactive risk management process of the assets and liabilities in a high risk environment (Gooneratne & Hoque, 2013).

A complex technical and system management tools used by banks to measure, monitor and control the risks are mainly divided to credit risk, market risk, liquidity risk, operational risk, business and financial risk. As mentioned above, the risk refers to any uncertainty that can cause losses while its good management enhances bank portfolio returns (Abiola & Olausi, 2014).

The fact that today's risks can translate into losses of tomorrow, and this may not be something readily visible, making their measurement imperative for banks and the part that deals with this essential for the survival of the organization. The main reasons for the rapid development of risk management practices are as follows (Langfield & Pagano, 2016):

i. Banks have significant incentives to move in this direction as regulations have been developed with guidelines for risk measurement and

ii. The risk management toolkit has been considerably enriched with models for all types of risks, providing the tools for taking measures and thus making the integration of these processes possible in the bank.

The purpose of this chapter is to examine whether the risk management in the banking sector in the form of identification, analysis, evaluation, monitoring, control and communication of risks used by the Greek banking sector to ensure and maximize its revenue. Below, we will analyze the theory and research done so far on risk management and will furthermore analyze findings and conclusions.

4.1 Risk Audit: Its Importance, Evaluation and Minimization

The controlling stage intends to verify that the progress achieved at the planning stage is compatible with the available resources and that the implementation of the Risk Management plan has been coordinated (in harmony) with the program management activities. The best outcome is achieved when the Risk Management process is not considered to be additional but is fully integrated into the program management process.

The monitoring stage is the key that confirms the effectiveness of the implementation of the Risk Management plan as a whole, but also of each individual action to reduce the risk. At this stage, it is monitored and recorded which risk factors eventually occurred and when, as well as what their management actions were ultimately taken, by whom and what effectiveness they had. The recorded data are compared with those of the Risk Management Plan and any deviations from this are considered, together with the reasons that led to these differentiations (Calomiris & Carlson, 2016).

Finally, based on all the above, the need for a revision of the Risk Management Plan is also monitored. In particular, the revision of the Risk Management Plan is imperative when either an unforeseen risk factor appears or it can be shown that the existing assessment of the magnitude of the severity of the risk factors is systematically outside the tolerable range or whether it is finally established that the efficacy of the planned actions is reduced in relation to expectations (Calomiris & Carlson, 2016).

4.2 Audit of transactions

The foundation stone of the term "economic activity" is the transaction between natural or legal persons valued in financial asset values. The following statement is indicative and not restrictive of control, which in any case must take into account the sectoral particularities of each credit institution.

The exchange rate is very unstable for a financial institution to use exchange rate forecasts as the most important benchmark for its long-term mission and strategy. As a result, a bank should not build or change its strategic decisions based solely on foreign exchange risk management estimates. However, foreign exchange risk may have significant strategic implications for the company, and strategic decisions can play an important role in foreign exchange risk management

techniques. Consequently, the main objectives of foreign exchange risk management on the strategy the firm follows is (Kidwell et al., 2016):

i. Take account of exchange rate volatility as a first step in strategic decision-making.

ii. Identify existing strategic flexibility regarding exchange rate changes.

iii. Create new levels of flexibility strategy on exchange rates.

Searching for a bank's primary mission can lead to a number of decisions that change the exposure or reduce the sensitivity to currency risk.

4.3 Mandatory cash control

Liquidity risk management is an important financial management tool designed to ensure that the bank is always able to meet its obligations to customers and banks whenever those obligations become mandatory and overdue. As a minimum requirement, the bank aims to fully comply with the requirements of regulators, legislation and the group (Das et al., 2015).

Liquidity management not only ensures that the short-term liquidity factor is maintained within limits but also examines the impact of changing market conditions and the specific characteristics of financial products on the Bank's cash holdings. The financial institution's approach to liquidity management is the effective management of normal business activities and compliance with the requirements of the Bank of Greece. This is done in order to maintain a minimum liquidity level and to manage the maturity maturity of the bank's cash reserves in order to remain creditworthy in the event of a liquidity crisis in the market. Additionally, the bank aims to maintain a stable and diversified financial base.

4.4 Bank credit risk and its profitability

Bank credit risk is the main reason for the existence of a regulatory framework that states that depositors whose deposits are not guaranteed may cause a banking "siege" when they have information about negative developments in their bank balance sheet data. The financing of long-term assets (eg loans) from short-term deposits is the cause of a possible fragility of banks. Banks are exposed to the likelihood that a large number of depositors will decide to withdraw their deposits for reasons unrelated to their liquidity needs. This liquidity transformation operation makes banks vulnerable to such "sieges." According to the Waemustafa and Sukri (2015) theoretical model, such a banking "siege" can in itself cause a bank to bankrupt, without any other cause of bankruptcy. This is likely to increase the cost of bank mediation for depositors because it obliges

them to monitor banks for banks because it requires them to maintain higher reserves (Waemustafa & Sukri, 2015).

In the context of this paper, these methods will be classified into two broad categories, those based on borrower accounting and market data. Methods based on accounting data are (Gizaw et al., 2015):

i. Subjective analysis

ii. Credit & Behavioral Scoring Models

iii. Analysis of Financial Indicators

Methods based on market data are (Gizaw et al., 2015):

i. Option pricing models

ii. Yield spreads models

iii. Mortality rate models.

4.5 Subjective Analysis (Specialist Systems)

The subjective analysis of the borrower's creditworthiness is the traditional way of measuring credit risk where each borrower is judged on the basis of certain predetermined qualitative and quantitative characteristics. The decision whether or not to lend to the applicant depends solely on the subjective judgment of the financial institution's executive. Below are the following methods that are subjected to subjective analysis (Chorafas et al., 2016).

A) Five C credit (5 Cs of credit)

According to this method, the decision on financing is based on the following factors (Norden et al., 2014):

1. Character: The borrower is judged by his personality and his / her character, reputation, experience, professional ethos, etc. are assessed. It is worth noting that many directors of the banks' loyalty departments regard the character as the most important factor in the granting of the loan. This factor reflects the willingness of the borrower to timely payment of his obligations and is an expression of his honesty and integrity. Consequently, the character of the borrower refers to the reputation and the information about its integrity and the methods of its transactions.

2. Capacity: The borrower's payments come from the company's cash flow cycle, which starts from the stocks and ends up through receivables in the cash collection. Therefore, the ability to repay the

borrower's obligations in a timely manner can be determined by forecasting future cash flows and analyzing the financial ratios of direct liquidity and cash flow and collection rates.

3. Collateral: It refers to the collateral assets of the borrower, which provide additional collateral to the bank. These are collaterals such as personal guarantees, pledges or deposits, mortgages, etc.

4. Capital Structure: It refers to the borrower's own funds and examines the borrowing cost of the enterprise as well as the return on equity. In addition, leverage is a key factor in the company's probability of bankruptcy.

5. Conditions: refers to the conditions of integration of the economy or the sector in which the borrower operates, to the more general economic conditions prevailing therein. It examines the form of the company's market, the prospects of the sector to which it belongs, the characteristics of competition, etc.

B) CAMPARI & ICE

It is an alternative to the aforementioned, which is of the same philosophy and is known in the international literature as CAMPARI & ICE (Li, 2016). This method takes into account the following factors:

6. Character
7. Ability
8. Means
9. Purpose
10. Amount
11. Repayment
12. Insurance
13. Interes
14. Commission
15. Expenses

C) LAPP Method & Credit-Men Method

In addition to the aforementioned subjective analyzes, there are other traditional credit risk assessment methods, such as the LAPP method and the Credit-men method (Mishra et al., 2014).

The first method examines:

1. The liquidity

2. The activity
3. The profitability
4. The potential of the company that asks for credit.

The second method examines:

1. The capabilities of the management and staff of the enterprise requesting credit
2. The dynamics of the industry in which it operates
3. Its financial position (liquidity, working capital, debt burden, credit policy and inventory management policy).

The above methods for taking a decision to approve or reject a credit application are largely based on subjective criteria. Another simple process is to place the client from the Loan Analyst on a risk group (for example, customer X has a 10% chance of not paying out the credit he has been given). Then, this group is compared to the rejection point that the company has set (for example, groups of clients who have a probability of or less than 15% not repaying their liabilities) and either the credit is rejected or the credit is rejected (Mishra et al., 2014).

D) Rating Systems

An alternative way of calibrating the credit behavior of existing clients of a bank or organization is to develop a system that will classify customers in specific risk-group groups according to some criteria. For each system, there are a number of credit risk categories (eg AA, A, BB, B, CG, C, etc.) in which borrowers are ranked, based on qualitative and quantitative criteria that determine their creditworthiness (Huang & amp; Winton, 2016).

The Credit Rating method is applied to the assessment and classification of credit risk categories of mainly large companies, ie a small number of borrowers, but with a high level of funding, individually and collectively. The assessment is carried out by specialized executives of the bank based on the experience, knowledge and continuous monitoring of the borrower and is therefore subjective. It should be noted, however, that in subjective evaluation systems, electronic evaluation programs or packages can be used in parallel, with the ability of the evaluator to intervene and modify these parameters. Thus, a mixed system is formed that includes elements of objective and subjective evaluation (Golin & Delhaise, 2013).

Classification systems are distinguished in internal and external systems.

Internal Systems: These are the systems developed and used by banks to assess and categorize their clients. They are tailored to the specific needs of each organization and are not made public. In these systems, specialized statistics make it possible to predict the future behavior of customer groups with specific characteristics based on past behavior, similar customer groups with similar characteristics. All customer group attributes are compared and combine statistics to find those features that better interpret and predict credit risk. Balancing their importance completes the development of a simple credit rating system (Peppard & Ward, 2016).

Table 4-0-1 below gives the individual weighting factors based on the default rate of each grade of an internal rating system and the final variation of 8% of each grade

(1) PERFORMANCE PERCENTAGE BASED ON THE INTERNAL RATING SYSTEM	**(2) WEIGHTING FACTORS**	**(3) CAPITAL ADEQUACY (2) * 8%**
0,03	14	1,12
0,05	19	1,52
0,1	29	2,32
0,2	45	3,60
0,4	75	5,60
0,5	81	6,48
0,7	100	8,00
1	125	10,00
2	192	15,36
3	246	19,68
5	331	26,48
10	482	38,56
15	588	47,04
20	625	50,00

Sourse: Kourtis GA: "Calculation of Capital Requirements for Credit Risk based on Internal Classification Systems", EET Bulletin, 2nd - 3rd Quarter 2001.

Initially, the financial institutions have resorted to the development of internal rating systems because it was dictated by the Basel Committee in its Capital Adequacy Accord. Since then, however, these systems have an important place in the day-to-day banking practice, serving a variety of purposes.

External systems: They concern classifications of businesses, organizations and even states according to their creditworthiness. These rankings are made by specialized credit rating agencies such as Moody's, Standard & Poor's and Fitch and are made public. These classifications typically concern debt securities, ie bonds and shares, and not the issuers of these securities. The risk of each debt depends on whether it is collateralised or not, as well as on the priority of redemption in the event of the bankruptcy of the issuer. However, these securities, which are rated by the rating agencies, have been issued by large corporations and therefore the resulting statistics are not a representative sample and can not be used for portfolios of banks usually lending to smaller companies. The criteria used by both internal and external classification systems are divided into three broad categories (Angelopoulos, 2008):

• Quantitative
• Quality and
• Behavioral behavior.

Quantitative criteria are based on the financial statements of the borrower (business or private), such as the balance sheet, the profit and loss account, the balance sheet, the profit distribution table, the balance sheet, the table of cash flows, Form E3, the tax declaration statement, etc. Through these situations, financial indicators are also presented that reflect the profitability, liquidity, functionality, coverage of financial liabilities, and the capital structure of the company. The indicators are compared with a predetermined acceptable height, as well as with the corresponding indices of the sector (Kourtis, 2001).

Qualitative criteria relate to the operation of the business and the environment in which it operates. More specifically, they refer to the ability of the operators and to the quality of the business such as: organization and management, management experience, the adequacy of control systems, distribution network, machinery technology, product competitiveness, design capability, ability in marketing, ability in financial management, etc.

The transaction behavior criteria are related to the consistency in meeting the obligations of the borrower arising from its transactions in general. The criteria are graded and the participation of each criterion in the ranking is weighted according to the importance attributed to it. In most rating

systems the borrower's final rating is shaped to predict the "quality" of his / her statistically anticipated behavior. The higher the score, the higher and the likelihood of being creditworthy (Kourtis, 2001).

Development of a risk rating system

For the development of a risk rating system, they should describe the criteria that the bank or financial institution considers important for the valuation of its clients. Such criteria may be (Angelopoulos, 2008):

• The time of presence in the portfolio

• The current state of behavior (informed, delayed, etc.).

• Payback behavior over a specific time period (e.g., how many times a customer has been delayed over 60 days in the last 18 months, etc.).

• Credit limit overruns.

• The use of the credit card, etc.

It is obvious that each organization can develop a rating system according to the rules it considers important in order to determine the transaction behavior of each client. The simplest risk rating system can include two risk groups, and separate customers of a portfolio into "good" and "bad", according to the definition used by the bank.

A risk rating system should allow for a sufficient number of groups so that there is a smooth grading of each client's behavior while on the other hand it should not have a large number of groups, which will make it difficult to monitor it. Most risk rating systems that currently exist include 7 to 9 groups. In addition, the distribution of the population should be as uniform as possible between the risk groups. Finally, it is appropriate for the risk rating system to be built on a customer-centric basis or at least to take into account the overall position of the client in the bank. In this way, a single rating collects all the customer's information as a whole (Angelopoulos, 2008).

Advantages & Disadvantages of the rating systems

Advantages:

- It is not based on a statistical model, so it is not affected by sampling errors, predictions of the model, assumptions that need to be met, etc.

- There is no rating, so there are no weights nor statistically significant features. Consequently, validation studies are not needed to investigate the statistical significance of the weights of the characteristics.
- Provides ease of definition and interpretation of groups of different risk. B.C. the bank is aware that individuals of this rating aggregate certain specific characteristics and behavior that the bank has described and defined.
- Any changes can be made without having to reassess the entire algorithm.
- Each group can accurately describe the characteristics of the individuals it contains, as opposed to the rating that provides an estimate of the probability of default (Angelopoulos, 2008).

Disadvantages:

- The criteria that a bank or organization uses to define groups does not necessarily mean that they are the most important for predicting customer behavior.
- The risk rating system classifies clients into a desired number of groups (eg 9 groups). Instead, the score is more informative, classifies customers into more risk groups (each score is also a different chance of default).
- Grading is determined on the basis of subjective criteria and not objectively.
- With the behavior rating model, one can conduct behavioral predictions, which is not entirely feasible with the risk rating system (Angelopoulos, 2008).

Credit Scoring & Behavioral Scoring Models

In terms of credit scoring, we refer to all those methods
modeling the customer's creditworthiness, while behavioral scoring methodologies mainly refer to the study of customer behavior (methodologies for delayed claims recovery, customer retention, redefinition of credit limits and vertical products) (Sohn & Kim, 2013)

Their growth is based on a sample of existing customers for which their behavior has been recorded over a period of time that may coincide either with the duration of the customer's relationship with the bank or with a time period in which there will be a stable view of his behavior. With the help of scientific techniques, the main factors that explain this behavior, as well as the specific weight for each of the levels of the factors, are highlighted. The final score usually results from the sum of the individual special weights (Zervas, 2002).

Example of a Credit Rating Card	
Age	Weight
<25 years	10
25-45 years	20
>45 years	30
Type of residence	
Owned	20
Rented	10

Source: Zervas Christos, Credit Risk Management of Consumer Loans, Bulletin of the Hellenic Bank Association, 1st Quarter 2002

- The Credit Scoring method is suitable for borrowers who use a small amount of financial products but which are a large crowd (retail banking). The procedure requires an evaluation program to be set up in an electronic application which, after inputting some information from the evaluator, automatically results in a rating and rating of the borrower in a credit risk category. The credit scoring method can be characterized as an objective method, since the result is derived from the standard criteria and the resulting rating without the intervention of a qualified executive (Angelopoulos, 2008).
- In addition, with the adoption of credit scoring models, each bank can assess the probability of non-repayment of the loan, thus measuring the credit risk that exists if the loan or card application is finally approved. Depending on the credit risk that the bank is prepared to take, it prefers or rejects the request (Addrastas & Anagnostopoulos, 2004).
- Behavioral scoring is defined as the scientific method where the use of appropriate statistical models can accurately predict the future behavior of a customer or group of clients (over a given time horizon). The process of predicting the behavior of a client or group of customers enables banking organizations to rank their clients in different segments. Such tools are considered to be of major importance for today's bank executives who are required to

monitor the exposure to their credit risk portfolio but also to manage the funds allocated to their department budget in the best possible way (Addrastas & Anagnostopoulos, 2003) .

- The advantages of these methods, compared to subjective methods, are (Zervas, 2002):
- Speed, decisions require minimum times
- Impartiality, the same criteria apply to all customers
- Consistency, the relative weight of the criteria remains stable
- Direct control of credit policy
- Risk reduction.

The validity of methodologies can be adversely affected by poor data quality as well as by sampling bias.

With the gradual reduction of profit margins, the need for full use of credit & behavioral scoring methodologies that will contribute to the rational development of credit institutions' portfolios becomes more imperative. Credit risk monitoring extends to all stages of a bank's credit policy, from attracting customers to recovering claims to a final delay. Therefore, it is directly related to departments of banking institutions such as those of Marketing, customer service, collection of arrears. A critical point in the management of credit risks and the work of consumer credit in general is the existence of organized customer-centric databases that will be able to support any decisions (Zervas, 2002).

4.6 Strategic risk management

Risk management involves primarily four types of risk for banks: credit risk, interest rate risk, liquidity risk, and off-balance sheet activity. Credit risk assessment is a key banking function. So the assessment of whether or not to repay the loan is essentially the art of banking. The interest rate risk is also matched by the conversion of the maturity dates of the capital assets. So if short-term interest rates differ from long-term then it is not unlikely that a situation where deposits and inflows generally have higher costs than lending. On the other hand, the bank may face an unexpected massive withdrawal of deposits and due to the non-marketability of lending, it is impossible to satisfy this situation, which introduces the liquidity risk

Inappropriate risk management could threaten a bank's creditworthiness, where the lack of

solvency is found in the negative equity position, ie a larger asset liability, or the inability to meet its obligations (McNeil et al., 2015).

Credit risk is the risk of becoming an asset (eg a loan) irrecoverable due to the debtor's default, or delaying the repayment of a loan. In both cases, the present value of the asset diminishes, undermining the bank's creditworthiness. (Crawford & amp; Nilsson, 2017).

Liquidity risk is the expression of insufficient liquidity for the bank's normal operational needs, ie the ability of the bank to meet its obligations when it becomes due. Customers make deposits with a bank, since they are sure they can withdraw whenever they want. If the ability of a bank to meet the requirements of its clients is questioned, it may lose all its clientele overnight. Since the bank will not be able to reduce its overheads in such a short time, it will suffer losses and may become insolvent.

Within just one and a half days, an amount equal to the GDP of a large country can be transferred. With such a high volume of transactions, banks trade more than their capital. Since payments are interbank, a single bank problem can cause a domino effect. (Calomiris & Carlson, 2016).

An unexpected interest rate can significantly affect a bank's profitability. The traditional focus of a management team within a bank on managing assets and liabilities is basically risk-of-interest rate management.

Banks face price risk in securities traded on statutory markets. The value of each title is a function of price, coupon, coupon rate, interest rate, and other factors. If a bank holds securities on its behalf (for example, for stocks or bonds), then it is exposed to market (or price) risk since securities prices will be volatile (Andersen, 2004).

A globally active bank is exposed to multiple monetary risks. Exchange rate risk is due to exchange rate fluctuations that affect foreign currency positions taken by the bank either on its behalf or on behalf of its clients. Because banks are active both in the current, futures and exchange markets, they have large positions that change every minute dramatically.

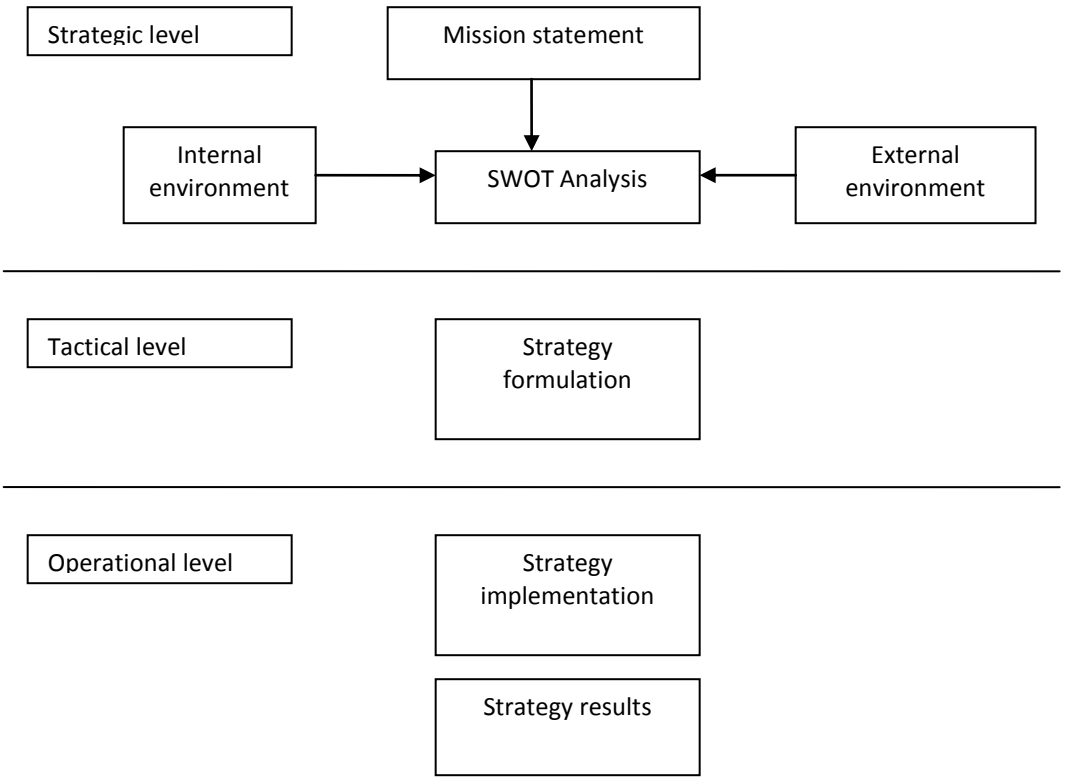

Figure 4-0-1 Incorporation of the risk aspects into the strategic process
Source: Andersen (2004)

The term "seniority risk" refers to the case where the government will not pay its debt to a private bank while political risk is the risk of political intervention in the operations of a private bank. Such intervention may involve the imposition of specific interest rates and control regulations for foreign exchange until nationalization of a bank. Operational risk is the risk of fraud or extraordinary expenses such as litigation costs.

Capital spreading globally allows the bank to improve risk management many times, thereby increasing its profitability and the added value of its shares.

The risk of the highest authority may be more threatening at a multinational level if top authorities in foreign countries leave their debts more often unpaid than in the parent country of the bank. Finally, fraud and maladministration are more difficult to locate at a multinational operating level, so operational risk (Andersen, 2004).

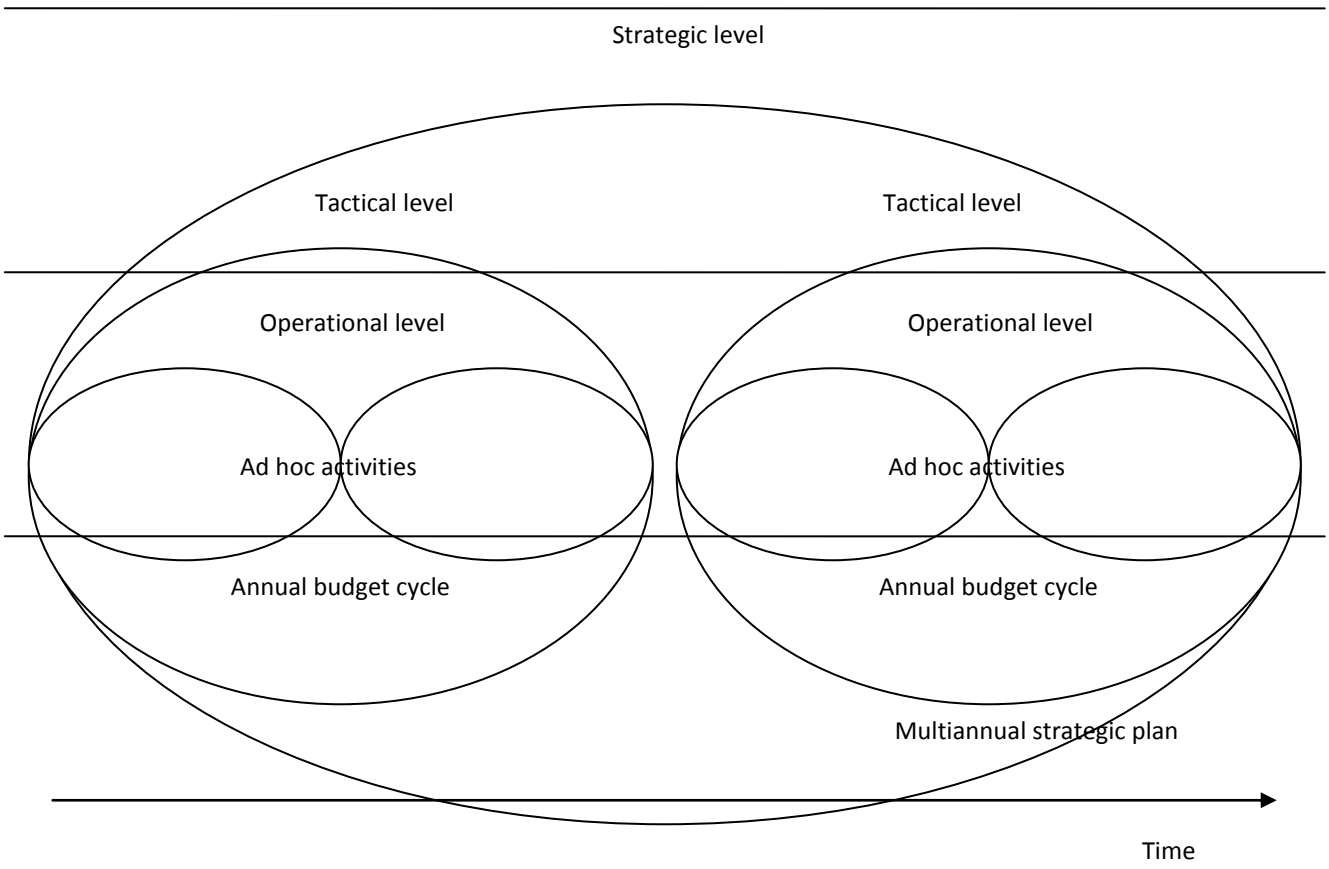

Figure 4-0-2 The time horizon of activities in the risk management strategy
Source: Andersen (2004)

The Bank monitors on a day-to-day basis all the market risks of its current portfolio, which are defined as potential losses from fluctuations in interest rates, exchange rates, stock and commodity prices and volatility. In addition, the Bank monitors the potential losses resulting from qualitative changes in the issuers of securities.

Banks have implemented a Potential Damage Model to calculate the Market Risk. By using the system internally, each Bank estimates on a daily basis the Maximum Potential Loss that may arise under normal circumstances from the current portfolio. The method applied is Historical Simulation, using a 10-day time frame and a 99% confidence interval according to the BIS rules. The Historical Simulation is based on observations of 1 year duration, each of which has the same specific weight. For the control of the risks assumed, the Bank imposes risk limits based on the data of the Potential Loss Pattern. The limits are specified by a risk factor (interest rates, exchange rates, stock prices) and for the entire current account portfolio.

To confirm the effectiveness of the Potential Loss Standard, ex-post testing is carried out. To

assess the risks that may arise from market fluctuations, the Bank has developed a crisis simulation program (Testing Test), which is regularly applied to the current account.

Each Bank's mission regarding operational risk is to monitor the risk of losses from inappropriate or unsuccessful internal processes, human errors, interruptions in technological equipment or from external events. At this time, a database has been created in which the loss data is transmitted by the Audit Directorate and the Branches. In addition, each Bank has developed an operational risk strategy (Bower et al., 2005).

A. Discussions on strategic planning give inspiration for new decisions and initiatives

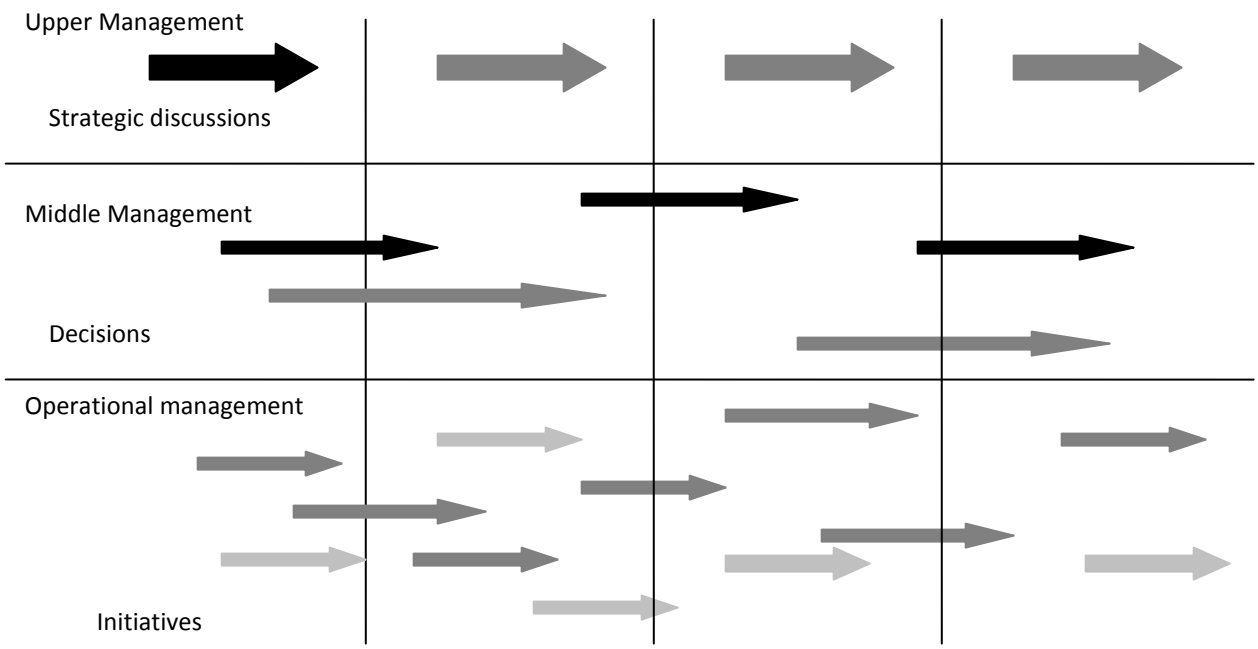

Figure 4-0-3 The two sides of the strategic management

Source: Andersen (2004)

The benefits of risk management in the banking industry are many for both consumers and businesses at its various levels. Marketing is a competitive advantage over other businesses. It contributes to upgrading the image of the company, increasing consumer confidence in the product and gaining more satisfied customers while reducing complaints. On the sales side, it is easier to approach the markets, simplify the procedures for concluding agreements, particularly on quality control issues and, finally, to increase sales and exports. In terms of production, the system helps to effectively prevent errors and reduce defective products, reduce dead times and costs, provide immediate product improvement, reduce production costs, write procedures, record methods to avoid mistakes and work circles that constitute the company's know-how. This material is also training material for newly recruited employees. Also, from the point of view of staff management, the administrative organization and the recording of procedures help to delegate responsibilities, responsibilities and powers to lower grades of staff, resulting in a reduction in the daily frictions of employees for decision-making, increased employee responsibility, trust and communication with each other. Another important element of the system is the development of an internal learning

mechanism in the enterprise. In addition, in terms of the product itself, the implementation of the system ensures the continuous improvement and development of the products produced and the production processes, planned internal inspections, system reviews, corrective actions and employee training. Finally, with regard to the customer, every market enjoys the specified quality and is confident about the suitability of the product.

There are prospects for further development of the Risk Identification and Risk Assessment stages and the discovery of new risk assessment methods, qualitative and mainly quantitative, easily usable, proven and tested through sufficient implementation time. Also, over the years, software tools, programs and integrated information systems will be developed to accurately, easily and validly implement risk analysis and risk management methods and methodologies. Finally, another area with growth prospects is collective decision making and, in particular, the composition of individual decisions.

While the formal programming cycle deals with the activities pursued, the management of risk events is linked to ad hoc procedures related to revisions to short-term action plans.

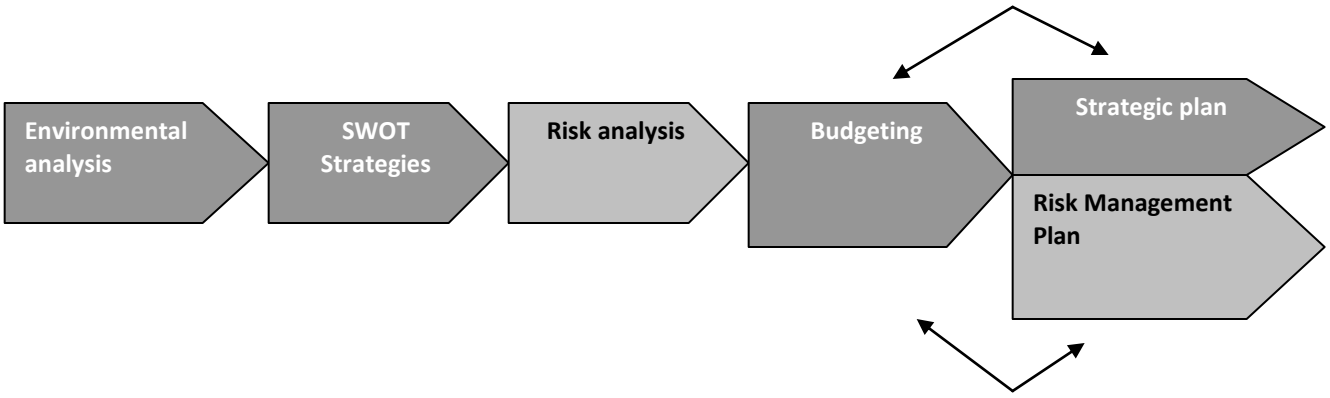

Figure 4-0-4 Consolidation of strategic management and risk management processes

Source: Andersen (2006)

DISCUSSION & CONCLUSIONS

Ensured financial supervision, which aims at ensuring stability in the financial system, has been a field of debate and dispute in the last century. It is an issue that is at the forefront, constantly changing forms depending on the requirements of the day, and it is certain that in the current days, an increasingly stringent regulatory environment is required, compared to what was in place during the first decade of 21th century, which was characterized as deregulatory framework.

The reason for this shift in the banking supervision framework was none other than the recent financial crisis of 2007 in the US, which peaked worldwide in 2008 and with the results of this diffusion still visible to this day.

The financial crisis of 2008, therefore, changed much of the data in the global financial system. A strong tendency appeared to create a more strictly institutionalized and pervasive capital market, a phenomenon that was called as overregulation or otherwise overshooting. Changes were observed in the attitude of the institutional investors towards more conservatism, with regard to seeking high returns. The importance of the role of central banks was highlighted in maintaining global financial stability by ensuring liquidity and regulation of the system functions by taking basic financial measures and implementing long-term financing strategies. The American public opinion and the European authorities seemed to highly dislike the rescue programs (bail-out plans) of those responsible at the expense of the many. Thus a stronger need emerged to create and implement a more stringent regulatory and supervisory framework for the operation of financial institutions, and the coordination of the supervisory and regulatory agencies worldwide. It was decided to harmonize the regulatory measures to ensure their uniform, as much as possible, implementation and integration into the national law of each country. Alongside, the financial institutions operating internationally were selected, which will be subject to special supervision because of their particular importance.

The causes of the crisis are many and the criticisms even more. However, what is worth to emphasize at this point is that the banks and organizations that recovered faster or were less affected, were those that had more advanced risk management expertise in relation to their competitors. At the same time, these banks better capitalized whatever opportunities emerged because of the crisis. They reduced the costs where the risk measurement allowed it and increased the costs where the risk measurement required it (Prasad, et al., 2005:201-228).

Therefore, in the wake of the economic crisis and without even having had time to fully implement the regulatory framework of Basel II, the new supervisory and regulatory framework of Basel III occurred. This new framework, with gradual full implementation until 2019, focuses briefly on the following points:

a.) Higher capital ratios on core equity

b.) Stricter definition of capital giving importance to enhancing its quality

c.) Introduction of the leverage ratio

d.) Introduction of two liquidity ratios in the short and long term respectively (LCR & NSFR)

e.) Additional capital reserves to address the capital conservation buffer and the countercyclical capital buffer

f.) Opening of consultations on the coordination of complex issues of global and international scope and liability, such as the establishment of a single framework for the management of the financial crises, and to address the moral risk stemming from the important systemic institutions (the so called "too big to fail" institutions).

As see from the above analysis, this new regulatory framework, in contrast with those of the Basel I and II, will change the way the banks operate, because it is a set of proposals in response to the recent financial crisis. The regulatory framework of Basel III aims to achieve economic stability by emphasizing on the systemic aspect of preventing the threat of systemic risks, a result reached by the quantitative impact study that we saw in the preceding analysis. The issue though is that apart from the chance of achieving financial stability, banks are faced with the challenge to pay the price through higher financing costs brought about by the need for holding higher and more stringent capital adequacy. Certainly, the financial cost of the macro study in which we discussed above, is the minimum cost since a number of other factors such as banking taxes or additional capital requirements in the case of systemically important institutions, have not been taken into account, while the lack of a precise definition of the liquidity levels is another important issue in this direction. More specifically, the increase in the financing costs raises a series of distortions in the real economy, with the intermediation cost to increase by reducing the profit margin for the financial institutions. This is the point where special emphasis should be placed since the supervisory authorities should prevent these organizations from incentives to assume excessive risk in search of higher profit margin. In this context, therefore, the conditions of imperfect competition (nationally and internationally) are strengthened, leading to more oligopolistic structures while

setting entry barriers to the market, due to the financial indivisibility of the capital while it triggers a domino of bank mergers & acquisitions.

Therefore, the right balance between the benefits from a higher medium-term stability of the system and the short-term (mostly) adaptation cost should be found in this new situation in terms of influence on the real economy, especially in terms of GDP.

Of course what is worth mentioning at this point is that the existence of financial (banking) stability does not mean absolute economic stability since the regulations do not eliminate any opportunities of regulatory arbitrage between the regulated and the non-regulated economic sectors.

In conclusion, the major challenge to be addressed is how to reshape the financial system to make it more robust, while ensuring that it will maintain its potential in terms of innovation and support of the economic growth. In other words, a financial system that will not work to the detriment of the citizens, in the sense of state intervention if a credit event occurs, but instead will be driven to operate as best as possible to serve them (Jensen and Beres, 2010, p1-7)

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