

DIPLOMARBEIT

Titel der Diplomarbeit

„Credit Risk Management in Banking“

Verfasser

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Angestrebter akademischer Grad

Magister der Sozial- und Wirtschaftswissenschaften
(Mag. rer. soc. oec.)

Wien, im Jänner 2010

Studienkennzahl lt. Studienblatt:
Studienrichtung lt. Studienblatt:
Betreuer:

A 157
Diplomstudium Internationale Betriebswirtschaft
o.Univ.-Prof. Dr. Jörg Finsinger

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1 Introduction

The well established and as it seems “modern” approach of financing everything with a bank loan steadily supports the social mess in which many people slither nowadays. In the recent worldwide credit economy and U.S. real-estate sector this dangerous trend should have been identified and hence prevented much sooner. Aside from banks’ own responsibility in achieving positive business results, most importantly for the customers and shareholders, their immense macroeconomic responsibility is clearly visible momentarily. Without a functioning banking system the worldwide economy is seriously threatened. This justifies the incredible amounts of money that countries across the world spend in their battered bank institutions.

The dynamics of the financial markets and the overall economic environment have suffered through the turbulences caused by the recent events. The worldwide financial crisis has once again drastically changed the financing environment, which has evolved to a point at which awareness is (re)created, that international bank lending comes hand in hand with a wide variety of types of risk. These include operational, market, interest rate, liquidity and most crucially credit risk, which is the main focus of this paper.

Recognizing the potential financial vulnerability of credit applicants and specifically counteracting this threat with the correct (credit) risk management strategy will be more important than ever. In their business operations from now on, banks will need to strictly fulfill their responsibilities in order to restore trust and hence stability and to adequately meet the expectations of the participants in the financial system.

The goal of this paper is to provide an explanation of the processes by which banks systematically assess, manage and counteract credit risk, defined as “the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms”¹ and to display the credit risk management procedure from the perspective of commercial banks in practice.

The following second chapter provides an overview of the term “banking” by giving a brief historical overview and presenting the role and activities of banks in modern economics. In the third chapter the main sources of risk in banking and the general risk management functions and processes are described. The fourth chapter

¹ See <http://www.bis.org/publ/bcbs75.pdf>

is an introduction to the concept of credit risk management, displaying the basic elements of the credit process, credit philosophy and culture of banks and explaining how banks determine their specific credit risk strategy. Following, the external and internal credit rating systems will be analyzed, giving an overview of the key elements of the rating processes. The sixth chapter is dedicated to the regulative measurement of credit risk, the Basel II Capital Accord. Finally, future prospects of (credit) risk management will be discussed, including critical remarks concerning the current risk management practices as well as the regulatory framework of Basel II.

2 Banking

2.1 Introduction

“Banking” is the general term for the business of providing financial services. The modern and interactive banking services called e-finance, due to improvements in information technology, continuously provide advantages that to a certain extent have superseded the need for classical counter banking. Even though traditional banking has declined, banks (in a physical sense), being “a deposit-taking institution which is licensed by the monetary authorities of a country ... to act as a repository for money deposited by persons, companies and institutions, and which undertakes to repay such deposits either immediately on demand (current accounts) or subject to due notice being given (deposit accounts)” (Pass, Lowes & Davies, 1993, p. 32) are nonetheless available for customers requiring financial consulting.

With the worldwide financial system being so immensely complex, banks are certainly “the most important source of external funds used to finance businesses” (Mishkin, 2007, p. 183). Banks therefore have a significant position in the worldwide economy, acting as a financial intermediary for private customers, businesses and governments.

The following chapter discusses the history of banking, explaining how the industry emerged, and then displays the general role of banks, describing its key functions, activities and principles.

2.2 History of Banking

The roots of banking go back to the ancient world, around the third millennium B.C.. Van Gestel and Baesens (2009) state that the development of the banking industry is clearly associated with the development of money.

Before money was invented as a medium of exchange, the oldest form of commerce, namely barter, flourished. Defined as “the direct exchange of goods or services”², barter, however, had certain inconveniencies. Some goods were not divisible and a precise profit calculation wasn’t possible, as there was no explicit unit to do so. The introduction of money solved these problems and fundamentally laid the foundation for economic development.

² See <http://www.britannica.com/EBchecked/topic/54263/barter>

Gold, being relatively scarce and stable, has always been regarded as a symbol and measure of wealth. Gold deposits in early civilizations like Egypt and Mesopotamia were usually placed in sacred temples, which were less of a target for ordinary thieves. However, the lack of flexibility when the government needed gold was the main problem with the temple-storage. The concept of banking first really appeared with the first records of loans from the Babylonian reign in the eighteenth century B.C..³

In Ancient Greece and during the Roman civilization financial transactions became more common and the concepts of loans, deposits and credits evolved further. Banking became more sophisticated with the development of book transactions, allowing people to find lenders in one city and arranging for credit in another.⁴ The banking system that was developed in the Roman Empire was even more refined as it improved the administration of the Greek financial processes. One development was that bankers started to purchase mortgages.⁵ Nonetheless, when the Roman Empire perished in 476 A.D., trade collapsed and banking lost importance in Europe for quite a long time.

Not until the twelfth century A.D. did banking in Western Europe revive. The Jews, who at that time were banned from most labor by the Christian Church, followed the need of financial services and began “to provide banking services to finance the economic welfare” (Van Gestel & Baesens, 2009, p. 3). Also the so called Knights Templar provided banking services to kings and wealthy families.

Problems due to these religious backgrounds accompanied these groups in exercising the profession, which ultimately led to banking going into the hands of ordinary people. First among them, in the thirteenth century, were North Italian bankers called Lombards. They invented double-entry bookkeeping and improved banking concepts due to their outstanding sense of business.

Between the fourteenth and fifteenth century, with Florence being the financial centre of Europe, prominent Italian families such as the Bardi, Peruzzi, Pazzi and Medici expanded banking across Europe.⁶ As moneychangers did their business on benches on Italian squares, the term “bank” emerges from the Italian word “banca”, meaning bench.

³ See <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?historyid=ac19>

⁴ See <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?historyid=ac19>

⁵ See http://encarta.msn.com/encyclopedia_761575515_4/Banking.html#s32

⁶ See <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?groupid=2451&HistoryID=ac19&track=pthc>

Between the fifteenth and sixteenth century, during the Habsburg reign over Europe, the Fugger family from Germany controlled the banking industry. Their success lay in giving secured loans to local and national governments (Van Gestel & Baesens, 2009, p. 4).

As interest taking was still controversial by the Christian Church and therefore illegitimate, it was an important step for the development of banking when in 1545, for the first time, interest rates were legalized in England by King Henry VII. International trade flourished due to the discovery of new continents, which allowed foreign exchange markets, large-scale lending and joint stock companies to develop (Van Gestel & Baesens, 2009, p. 4).

In the mid-sixteenth century the London Royal Exchange was established and the term “banker” was already steadily used for the moneychangers.

In the early seventeenth century, after almost a century of constantly high inflation, banking slowly became available to public customers, rather than only to aristocrats. Modern commercial banking developed with the organization of banks into pawnbrokers and private banks, providing financial services for ordinary citizens, and city exchanges and state bankers, doing business with governments (Van Gestel & Baesens, 2009, p. 5). The centers of trade in the seventeenth century were Amsterdam, London and Hamburg, whose large harbors made them attractive for the placement of large banking offices. Also the concept of city banks became popular, starting in Venice, Barcelona and Genoa. During this time the cheque was developed as a bill of exchange.⁷

The next phase in the modernizing banking industry was the establishment of national banks in agreement with the corresponding responsible State. The first and therefore oldest national banks were the Bank of Sweden, beginning operations in 1668, and the Bank of England, established in 1694.

In the mid-eighteenth century the British industrial revolution started, followed by a variety of banks specializing in lending to certain industries (Van Gestel & Baesens, 2009, p. 6). The first form of “capitalism” appeared at that time, meaning that entrepreneurs had access to capital for their business, without the state interfering in the activities. Banking boomed at the end of the eighteenth-century, spreading across Germany, England, Wales, Russia and the United States.

⁷ See <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?groupid=2453&HistoryID=ac19>rack=pthc>

During the following Rothschild Dynasty from 1801-1815 banking further expanded across all major European financial capitals and played an important role in the war against Napoleon.⁸

In the nineteenth century the worldwide banking expansion proceeded. The establishment of banks in the U.S., India, Asia (in particular Singapore, Tokyo and Hong Kong), Belgium, France, Netherlands, Austria and Germany substantially supported the economic development of these countries. As the financial capacity of many successful private banker families (i.e. Rothschild, Oppenheim and Mendelssohn) didn't suffice in times of quickly growing economies during the Industrial Revolution, large joint-stock banks were founded. The downside of this gradually growing industry, however, was the inevitable strike of a variety of banking crises. Between 1825-1826 many little banks in England and Wales emitted too many small notes, which according to Van Gestel & Baesens (2009) consequently lead to a "liquidity shock". The U.S. suffered two major crises in the nineteenth century, namely in 1837 when the Second Bank of the United States crashed and in 1857 when banks had to withhold payments, drastically hitting a number of UK and German banks as well. To backup notes from this point on, silver and gold became popular (Van Gestel & Baesens, 2009, p. 7). In 1863 the U.S. National Banks were founded and interbank transactions were increasingly conducted with notes.

With the observation of increasing deposits and loans from all around the world, New York turned into the worldwide financial center around 1900. This function, however, was threatened by the financial crisis in 1907 when hundreds of banks in New York failed, causing great damage mainly in the U.S. itself. As a consequence of these dramatic events the system of central banks was introduced in the U.S. and the Federal Reserve Banks were founded in 1913.

During the First World War from 1914-1918 there was high inflation in the U.S. which caused an economic slowdown.⁹ Nevertheless did U.S. stock markets boom until the speculative activities finally resulted in the Great Crash in 1929. Thousands of commercial U.S. banks failed due to a wave of borrowers defaulting during this period, clearly displaying that the Federal Reserve System hadn't provided bank stability.¹⁰ Due to these dramatic events, U.S. governments decided to intensify banking regulation to restore public confidence. Commercial banking and securities

⁸ See <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?groupid=2453&HistoryID=ac19>rack=pthc>

⁹ See http://encarta.msn.com/encyclopedia_761575515_5/Banking.html

¹⁰ See http://encarta.msn.com/encyclopedia_761575515_6/Banking.html

activities were separated, the Federal Deposit Insurance Corporation (FDIC) was created to insure bank deposits and banks were constrained to keep a fixed level of capital as an “equity buffer to protect depositors in adverse economic conditions and severe bank losses” (Van Gestel & Baesens, 2009, p. 8). Around the 1920's, with corporations beginning to issue bonds, specialized firms also started to diagnose the financial strength of companies on the basis of ratio analysis. Moody's (1909) and Standard & Poors (1916) belong to the first major agencies that started to rate public debt issues. To support Europe in reconstruction after the First World War the Bank of International Settlements (BIS) was established in 1930. Later the responsibility of this institution broadened into keeping general “financial and monetary stability” (Van Gestel & Baesens, 2009, p. 9).

After the Second World War the military regime closed the large German banks and around thirty new banks were established in Germany alone. In 1952 these banks were merged and finally turned into the Deutsche Bank, Dresdner Bank and Commerzbank.

U.S. banking continuously expanded and modernized beginning in 1960, due to immense growth in global trade and multinational corporations operating internationally, rapid activity in global investment banking and the creation of Eurodollars, which are “dollar-denominated deposits in foreign countries” (Mishkin, 2007, p. 272).

In 1962, with the first proposal of the European Commission for economic and monetary union, the foundation for the European Economic and Monetary Union (EMU) was laid. The European Monetary System (EMS) was created in 1979, the Single European Act (SEA) was signed in 1986 and a few years later, in 1992, the Treaty on European Union (the so-called “Maastricht Treaty”) was signed. By the end of the twentieth century the EMU was achieved, introducing “a new monetary regime with a single currency for a large part of Europe.”¹¹ This historical change ultimately required changes in the European central banking framework. The European Central Bank (ECB) was founded in 1998 as a “supranational monetary organization.”¹² European markets and the banking industry in the twentieth and early twenty-first century have hence been affected by the creation of the single market, the European Union, as well as by the creation of the single currency, the Euro.¹³

¹¹ See <http://www.ecb.int/pub/pdf/other/ecbhistoryrolefunctions2004en.pdf>

¹² See <http://www.ecb.int/pub/pdf/other/ecbhistoryrolefunctions2004en.pdf>

¹³ See http://www.ecb.int/events/pdf/conferences/dermine_comp.pdf

An example of “a change in the financial environment ... [that] stimulate[s] a search by financial institutions for innovations that are likely to be profitable” (Mishkin, 2007, p. 250) is the recent rise of electronic business. This development has clearly modernized the banking industry. The emanating reduction of transaction costs and overall faster processing of transactions brings forth immense advantages for the customers as well as for the banks themselves. The technological advances, however, naturally cause challenges, most crucial being security issues. Especially due to the sensitive data in the banking industry does information-security have absolute priority.

A further development trend due to the international economic interdependencies and constantly evolving competitive environment is the internationalization of the banking industry. With the recent crash of the investment banking industry and failure of the largest banks in 2008, did the U.S. suffer its worst financial crisis since the Great Depression, and the effects on the worldwide economy were staggering. If and when the financial markets will fully recover, only time can show.

2.3 Role of Banks

2.3.1 Financial Intermediaries

While some investors in the financial markets make their own investment decisions, others may seek advice from a financial intermediary, i.e. depository institutions (commercial banks, savings and loan associations, credit unions), contractual savings institutions (life insurance companies, pension funds and government retirement funds) and investment intermediaries (finance companies, mutual funds, investment banks). These bring together the participants in financial systems, namely lenders and borrowers, who interact to ultimately maximize their own objective(s). This moving of funds is called indirect finance, which a financial intermediary does “by borrowing funds from the lender-savers and then using these funds to make loans to borrower-spenders” (Mishkin, 2007, p. 35).

The standard market-based theory, following Arrow-Debreu, states that “when markets are perfect and complete, the allocation of resources is Pareto efficient and there is no scope for intermediaries to improve welfare” (Allen & Santomero, 1996, p. 2). It is implied that all real-world deviations from this model, caused by financial intermediaries, are market imperfections. This, however, isn't reflected in economies

in practice. Banks and other financial intermediaries clearly do have an essential role in the financial sector, displayed by the so called intermediation theory.

Intermediaries exist because transaction costs restrict the ability of direct financing and due to the incomplete information among the participants in the financial markets. Financial intermediaries assume certain risks in borrowing from units with a surplus and lending to units with a deficit. From the banks point of view, the involved parties need to find the transaction more promising having an expert intermediary than dealing directly with each other. Because intermediation ultimately makes financial transactions more efficient and therefore more useful for the participating parties, well-developed financial markets have always included institutions offering these services.

Due to the immense amounts of money they deal with, banks assume a key role in every economy. Banks provide financial services for profit and guarantee the flow of funds from savers to borrowers. "Their central role is to make the community's surplus of deposits and investments useful by lending it to people for various investment purposes" (Van Gestel & Baesens, 2009, p. 9). Mainly by charging transaction fees, provisions, caps, foreign exchange spreads and interest banks generate their income.

Figure 1 shows the general flow of funds through the financial system, in which banks as financial intermediaries take a decisive role. Financial markets have a critical function in the economy, because they "allow funds to move from people who lack productive investment opportunities to people who have such opportunities" (Mishkin, 2007, p. 25). If financial markets function efficiently, they improve the overall economic welfare.

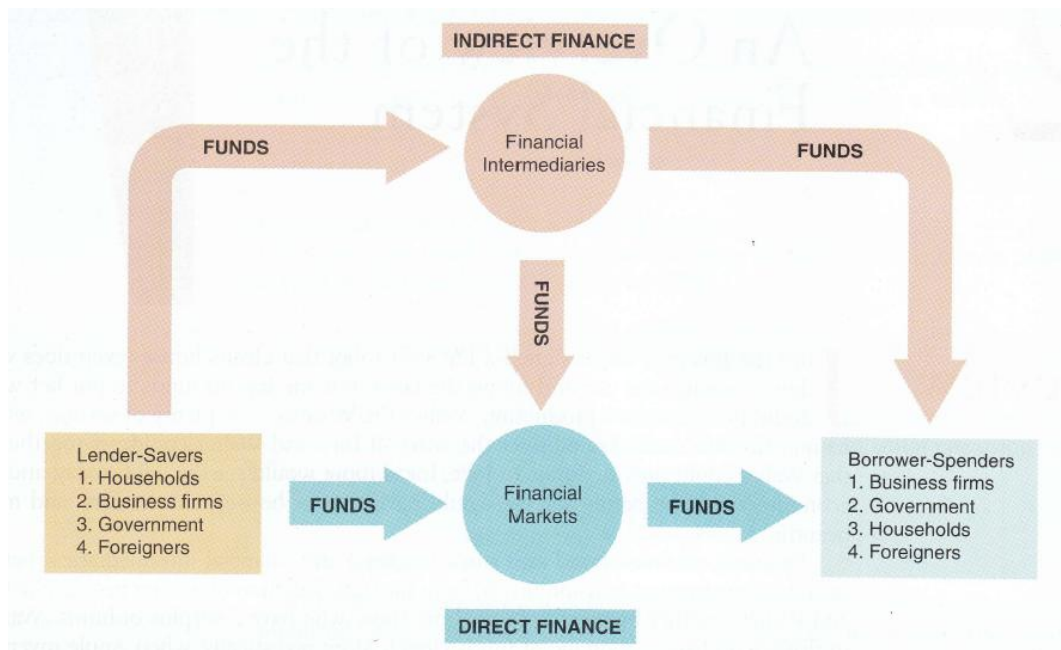


Figure 1. Flow of funds through the financial system. Mishkin (2007), p. 24

Because banks process most of the payment transactions in an economy, the already mentioned issue of transaction costs in financial markets is enormously influential. These are defined as “the costs incurred in using the market system in buying and selling factor inputs and final products” (Pass, Lowes & Davies, 1993, p. 539). Van Gestel and Baesens (2009) argue that financial intermediaries, such as banks, can substantially reduce transaction costs by creating economies of scale in their main functions, which are linked to the two fundamental aspects of intermediary activity, namely brokerage function and asset transformation.

In general banks can create economies of scale by, for instance, bundling funds of a variety of investors, hence increasing the scale of total transactions. This method is beneficial to every investor from this group, because it results in the (average) transaction costs for each individual one to decrease. By developing expertise in the financial markets, financial intermediaries can also gradually reduce transaction costs. One focus of attention lies on expertise in information technology, which allows banks to offer customers services that make transactions easier, faster and more controllable.

In the brokerage function, banks provide transaction services, financial advice, screening and certification, origination, issuance and funding. Friedman (1985) elaborates on the benefits of size and specialization. He displays that one economic effect of financial intermediation is the exhibition of economies of scale and therefore

considerable reduction of transaction and information costs, due to specific activities in financial markets such as information gathering and transactions-processing.

Asset transformation consists of monitoring, management expertise, guaranteeing, liquidity creation and claims transformation. It is also known as risk sharing and Mishkin (2007) points out that it is the process by which financial intermediaries try to help reduce the exposure of investors to risk. As displayed by Van Gestel and Baesens (2009) banks are forced to constantly react to the varying preferences of savers and borrowers in an economy. Certain savers prefer products with lower risk, while certain borrowers may prefer long-term debt with higher levels of risk. "Banks transform the safe, short-term and liquid small amounts of savings deposits to the risky long-term debt to firms or firm borrowers. In the asset transformation process, the characteristics of the funds that flow from savers to borrowers is changed" (Van Gestel & Baesens, 2009, p. 11). Banks are able to offer liquidity services to a large number of investors, hence reducing the exposure to potential risks and achieving significant diversification with a high volume of transactions. Friedman (1985) illustrates the diversification of specific asset risks, for risk averse asset holders, who aim at reducing the level of uncertainty associated with the return to their overall portfolio(s). In this context he also describes the concept of risk pooling as combining individual and group risks to insure against specific contingencies.

Aside from existence of transaction costs, the concept of asymmetric information is another reason why financial intermediaries play a significant role in financial markets. The inequality of information between parties acting in financial markets appears either before (adverse selection) or after the actual transaction (moral hazard).

The problem created by asymmetric information before the transaction occurs is called adverse selection and appears "when the potential borrowers who are the most likely to produce an undesirable (*adverse*) outcome – the bad credit risks – are the ones who most actively seek out a loan and are thus most likely to be selected" (Mishkin, 2007, p. 37). This threat might cause institutions to not give out any loans at all, which clearly disables the good credit risks available in the market.

The second problem, namely after the transaction occurs, is called moral hazard. It is "the risk (*hazard*) that the borrower might engage in activities that are undesirable (*immoral*) from the lender's point of view, because they make it less likely

that the loan will be paid back” (Mishkin, 2007, p. 38). Lenders might therefore not give out loans, because the loan is less likely to be repaid.

According to Mishkin (2007) financial intermediaries can mitigate the problems created by adverse selection and moral hazard and therefore help improve economic efficiency.

Banks bring together lenders and borrowers of money and provide convenient products, in general accepting deposits and making loans. Because banks are the largest financial intermediaries in the worldwide economy, they deserve special attention. As the repayment of loans is essential for banks, the careful choice of borrowers is crucial (taking into consideration the moral hazard problem). By monitoring the performances of businesses and evaluating private customers carefully, it is (theoretically) ensured that only the best applicants receive loans, creating an efficient and healthy economy.

The momentary worldwide economic situation, however, with (financial) distrust among banks, governments and customers, has confirmed that problems in the banking sector can also be a catalyst for financial crises. As seen in the “hand in hand” breakdown of the U.S. real estate and banking sector, banks and regulatory authorities have obviously failed to apply the natural precaution-practices. Mishkin (2007) discusses problems in the banking sectors leading to a reduction in lending, decline in investment spending and ultimately diminishing economic activity. Higher interest rates are caused by banks reducing their lending activities, hence decreasing the supply of funds available to borrowers (Mishkin, 2007, p. 207). This obviously doesn’t make the situation appealing, in many cases even dramatic if the customers’ ability of credit repayment is at risk or if borrowing under the worst terms of credit is unavoidable.

2.4 Types of Banks

There are several types of banks worldwide, each operating in a variety of areas, having individual functions and pursuing different activities. The main groups of banks include retail, savings, commercial, investment, merchant and private banks. A universal bank, like most large banks today, combine some or even all of the previously mentioned categories. Often, the banking activities between specialist banks overlap, as the banking environment is fiercely competitive and banks need to

build strong customer relationships offering a sophisticated service and product portfolio.

Retail banks deal with retail clients and typically focus on offering savings and checking accounts, residential mortgages, payment systems and personal loans. Due to the large number of transaction they tend to be mass oriented (Bessis, 2002, p. 3). Savings banks, who also conduct retail banking, provide savings deposits and mortgages to a wider range of customers. Commercial banks, specialized in small and large companies, concentrate on pure banking aspects, meaning deposits, loans, trade finance, cash management and payments, and commercial mortgages.

As analyzed later on in the risk aspect of commercial banking business, a quick glance at an essential banking business aspect should be made at this point: “borrowing short and lending long” (Mishkin, 2007, p. 226). This is generally true and called arbitrage business in treasury departments. As long as there is no inverse yield curve, meaning that money market conditions (short-term) are less expensive than capital market conditions (long-term), there is obviously no risk to go short. However, in an inverse yield curve situation (as was the case in the recent financial crisis) the risk can be substantial, and even long lasting banks in the banking industry have therefore gone bankrupt. Treasury departments nevertheless are partially required to use the gap between short-term and long-term money, to improve overall profitability of any given loan. In fact, due to the competitive environment, some banks used this concept excessively and were even facing bankruptcy within a couple of months.

Investment banks on the other hand concentrate on investment banking and financial market activity, meaning they raise money on the capital markets. It is referred to as “the domain of large transactions customized to the needs of big corporate or financial institutions” (Bessis, 2002, p. 4). They also help companies acquire other corporations through mergers or acquisitions, which has also become a “conjuncture-dependent activity of commercial banking” (Van Gestel & Baesens, 2009, p. 15). Merchant banks, sometimes also called wholesale banks, focus on large financial institutions and offer international finance, long-term company loans and underwriting. Private banks offer a broad variety of services in terms of personal wealth management for financially strong private individuals.

By differentiating banks in terms of ownership, the role of central banks has undergone a major transition lately in Europe. In particular the formation of the single

European market, with the establishment of the European Central Bank, responsible for all twenty-five present members of the European Union, the role of single central banks within the member countries has lost momentum. The European Central Bank is mainly responsible for the interest rates, EURO fluctuations and money supply. The main goals of all central bank activities worldwide focus on international financial stability and stable economic growth.

2.5 Banking Business Lines

As already discussed, a clear categorization between banks is possible, but in practice the banking operations overlap and makes a clear simplification difficult. Figure 2 displays one way of categorizing a typical bank portfolio along organizational dimensions, as illustrated by Bessis (2002).

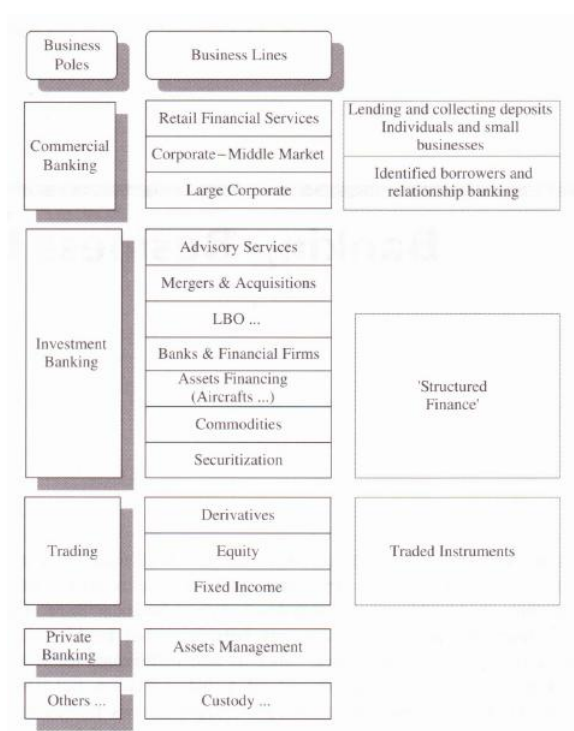


Figure 2. The bank portfolio and its organizational dimensions. Bessis (2002), p. 4

From the above figure one can see the combination of the previously mentioned types of banks as subdivision business lines. Naturally the management and therefore also risk management techniques across the wide array of business lines varies significantly, as each area has different types of risks. In accordance with Bessis (2002) this paper supports the view that the “main business lines share the common goals of risk-expected return enhancement, which also drives the

management of global bank portfolios” (Bessis, 2002, p. 5). Note also that treasury and risk management are key services in a bank. Treasury is responsible for the funding needs of the bank (primarily controlling the liability side of the balance sheet) while risk management focuses on the risks that a bank is exposed to (the asset as well as the liability side of the balance sheet).

2.6 The Bank Balance Sheet

The bank balance sheet ultimately shows the activities in which a bank is engaged in, as well as how these activities are (re)financed. Effective balance sheet management is crucial, especially with this momentary market uncertainty, and essential in maximizing the bank’s current (short-term) and future (long-term) performance while managing risk.

The asset side of the bank balance sheet represents the uses of funds (mainly short and long term loans to clients, interbank loans, cash, deposits at other banks, investments and securities). The liability side of the bank balance sheet shows the sources of the funds (short and long term deposits, bonds issued by the bank, borrowing from the central bank and of course the capital base, meaning equity). The general equation characteristic for the necessary balancing of the list is

$$\textit{Total Assets} = \textit{Total Liabilities} + \textit{Capital (Equity)}$$

Banks provide loans to clients, make investments and purchase securities. “Banks make profits by charging an interest rate on their asset holdings of securities and loans that is higher than the expenses on their liabilities” (Mishkin, 2007, p. 219). This allows the bank to pay dividends to their shareholders (ROE, return on equity). This ratio is an essential measurement of a bank’s profitability in comparison to the competitors.

A special focus has been made on off-balance sheet items. Contingent assets and liabilities have caused serious problems to present a fair evaluation of a given balance sheet. Problems primarily evolved from derivative banking products, which were not directly shown in the asset-liability categories, disabling auditing companies from evaluating the balance sheet in all its facets. Even though authorities have implemented specific auditing regulations in the meantime, there is a continued need for action.

2.7 Principles of Bank Management

In order for banks to maximize their profit, paying close attention to the management of assets and liabilities as seen in the previous demonstration of the bank balance sheet, is of enormous importance. The four primary activities that bank managers give their attention to, as displayed by Mishkin (2007), are as follows:

2.7.1 Liquidity Management

Having sufficient cash reserves at hand to pay depositors in case of withdrawals is the first concern of bank managers. According to KPMG “cash is the lifeblood of organizations.”¹⁴ The goal is to maintain sufficient liquid assets to meet the banks obligations to depositors at all times. Therefore cash optimization is essential for all organizations in a dynamic economy. Liquidity management includes a wide range of activities, thereunder account management, cross-border management, infrastructure management, reconciliation management, risk management and working capital management. KPMG names the key benefits for organizations to be improved cash flow, enhanced profitability and reduced reliance on short-term debt.

Should a bank fail to keep sufficient cash reserves nonetheless, there are a variety of possibilities available to receive cash: borrowing from other commercial banks or corporations, borrowing from the central bank, selling securities and reducing loans, either not renewing loan contracts or selling loans to other financial institutions.

2.7.2 Asset Management

Striving for a low level of risk, banks follow their strategy of obtaining assets with low rates of default and diversifying their asset portfolio. “To maximize its profits, a bank must simultaneously seek the highest returns possible on loans and securities, reduce risk, and make adequate provisions for liquidity by holding liquid assets” (Mishkin, 2007, p. 229). There are four ways by which banks try to achieve these goals: lending to firms and private customers with low risk of default, purchasing securities with low risk and high returns, diversifying the assets, and finally holding liquid securities to meet the reserve requirements at lowest possible costs.

¹⁴ See http://www.kpmg.com.sg/brochures/BPS_Brochure_Liquidity_Mgmt.pdf

The Deutsche Bank's Asset Management (DBAM) division offers a wide spectrum of products, offering mutual funds, structured products, separate accounts and hedge funds.¹⁵ The strategies cover traditional and alternative asset classes (i.e. equity, fixed income, real estate, private equity, commodities and currencies) and a wide field of geographic areas and industry sectors. DBAM is divided into four business channels, namely retail asset management, institutional asset management, insurance asset management and alternative investments.

2.7.3 Liability Management

Acquiring funds at low costs is the third main concern of bank managers. Since banks in the 1960's found "ways in which the liabilities on their balance sheets could provide them with reserves and liquidity" (Mishkin, 2007, p. 230), bank management has developed towards the aggressive setting of goals for asset growth by trying to acquire funds by issuing liabilities when necessary.

Banks make the most out of their liabilities by borrowing to other banks, issuing new instruments such as the negotiable cash deposits and investing newly acquired funds using asset management.

Liability management ensures banks to maintain continuity and cost effectiveness of funding assets. Three main issues include the diversification to reduce liquidity risk, the correct configuration of liability mix and consideration of maturity structures.

2.7.4 Capital Adequacy Management

Managing the bank capital is crucial, because it is what ultimately keeps it solvent and therefore in business. The amount of capital available also influences the returns on investment for the shareholders/owners of the bank. Understanding the importance of bank capital, regulatory authorities have implemented the Basel Capital Accords as capital requirements to ensure a minimum amount at hand. These will be discussed in Chapter 6 in regard to credit risk.

¹⁵ See http://www.db.com/en/content/company/private_clients_and_asset_management.htm

3 Risk Management in Banking

3.1 Introduction

Participants of the worldwide financial systems and markets, no matter whether large or small corporations, banks, insurances or private investors, are all influenced by one fundamental element, namely risk. The proper identification, analysis, measurement, management, and control of risk are essential when making financial decisions aiming at sustainability. Crouhy, Galai & Mark (2001) identify the importance of risk management, especially with evolving technologies and the increasing volatility on financial markets. They state that “the savvy corporate leader uses risk management as both a sword and a shield” (Crouhy et al., 2001, Introduction xvii). Financial institutions and companies all need to face that risk is a cost of doing business and its adequate management is essential for increasing value for the shareholders.

“Risk management involves the identification of the key financial risks, deciding where risk exposure should be increased or reduced, and finding methods for monitoring and managing the bank’s risk position in real time” (Heffernan, 2005, p. 103). The key financial risks that the banking industry deals with include credit, interest rate, market, liquidity and operational risk. Managing these risks is crucial for banks to stay in business and bottom line a key issue directly linked to stability in the financial system. It is an integrate part of the service lines of banks nowadays, with financial markets getting more complex and competitive.

A publication from KPMG in January 2009¹⁶ describes how the recent credit crisis has influenced risk management procedures within the banking industry. KPMG states that “the credit crisis has forced banks to take a critical look at how they manage risk and has exposed some significant weaknesses in risk management across the financial services industry.” They argue that besides the potentially dangerous interdependencies in the global banking system, weaknesses in risk culture and governance, gaps in risk expertise, lack of influence of the risk function, in summary a lack of discipline in the risk management have caused the worldwide financial crisis. The survey of KPMG suggests that “financial institutions should get back to basics through a renewed focus on understanding the risks that they take.”

The comments of KPMG are reasonable, however rating agencies, auditors and regulators have to accept their share in the recent crisis of the banking system

¹⁶ See <http://www.kpmg.com/SiteCollectionDocuments/Risk-management-in-banking-beyond-the-credit-crisis.pdf>

as well. For instance risk managers have relied on the “positive” evaluations of renowned rating agencies, in cases such as the meanwhile bankrupt Lehman Brothers and other major investment banks, which turned out to be worthless. Regulators as well as auditors had troubles to estimate the influence on risks of quickly developing financial products, partially not even shown on annual reports.

In the following chapter the most common sources of risk that banks are exposed to will be described in short, the fundamental meaning of the term risk management will be displayed, a general overview of risk management processes in banks will be given and the concept of integrated risk management will be presented.

3.2 Sources of Risk

For the purpose of this paper “banking risks are defined as adverse impacts on profitability of several distinct sources of uncertainty” (Bessis, 2002, p. 11). Banks acting as financial intermediaries need take risks in order to sustain their margins and to maintain their important role and position in the economy. To control the risk(s) as good as possible is the main responsibility of risk management in banks.

Crouhy et al. (2001) state that bank management’s attention has strongly turned toward risk intermediation, focusing not solely on profit and maturity, rather on the profits and risks associated with the banking activities. Figure 3 illustrates the main bank risks which will be discussed in this section.



Figure 3. Banking risks.

Balthazar (2006) conducted a study of ten large banks, aiming at determining the different risks mentioned in the annual reports. Following, a general overview of these risks will be given.

3.2.1 Credit Risk

As this paper is about credit risk management in banking, specifically about the assessment and management of credit risk, a general summary of the term credit risk is necessary at this point, before delving deeper into this subject in the following chapters.

Credit is given to borrowers who need money for certain investments which in return, after a certain period of time, should generate additional income, respectively profit. Financial intermediaries such as banks are in the business of supplying credit and generate their income by charging interest from the borrower(s). “This process for extending credit has a multiplier effect on the global money supply, so this is why credit is a powerful driver of our economy” (Colquitt, 2007, p. 2).

Credit risk is defined by JP Morgan Chase as “the risk of loss from obligor or counterparty default” (Balthazar, 2006, p. 251). This implies that a customer is not able to meet its obligations, which is a critical aspect which banks need to pay close attention to, as the default of too many customers can lead to large losses and in the worst case scenario result in insolvency.

According to Balthazar (2006) credit risk can be divided into three types:

- **Counterparty risk:** “the risk associated with the decrease in quality of a counterparty on which the bank has exposures” (Balthazar, 2006, p. 249).
- **Country risk:** the risk “associated with investing in a foreign country”¹⁷ including political risk, exchange rate risk, economic risk, sovereign risk and transfer risk.
- **Settlement risk:** “the risk that one party may perform on its obligations but the other might not.”¹⁸

Credit risk is the most important type of risk in banking, which explains why regulators continuously attempt to improve its measurement and implement corresponding regulations such as the Basel Capital Accords. Also, integrative rating and scoring processes is an essential factor of credit-risk quantification in banks according to Balthazar (2006). For a long time now banks have developed specific methods to assess the borrower’s creditworthiness and today modern “risk evaluation and measurement methodologies [are available] ... to analyze, measure, and manage [credit risk]” (Colquitt, 2007, p. 2).

¹⁷ See <http://www.investopedia.com/terms/c/countryrisk.asp>

¹⁸ See http://www.riskglossary.com/link/settlement_risk.htm

3.2.2 Interest Rate Risk

“The interest rate risk is the risk of a decline in earnings due to the movements of interest rates” (Colquitt, 2007, p. 17). Assets, liabilities, capital, income and expenses can be affected by changes in interest rate levels, as most of these figures are interest-rate driven. Due to these fluctuations in interest rates, bank earnings are naturally unstable, bearing the risks of generating losses on one side and chances of generating revenues on the other.

There are four types of interest rate risks that banks face, which have been identified in 2004 by the Basel Committee on Banking Supervision:

- **Repricing risk**, which “arises from the difference in maturities between assets, liabilities, and off-balance sheet items” (Balthazar, 2006, p. 257).
- **Yield curve risk**, measuring “the adverse effect that changes in the shape of the yield curve may have on the bank’s operation as maturity transformation and profits” (Van Gestel & Baesens, 2009, p. 36).
- **Basis risk**, which “arises from imperfect correlation in the adjustment of rates earned and paid on different instrumentals with otherwise similar repricing characteristics” (Balthazar, 2006, p. 257).
- **Optionality**, which is “the risk linked to the implied options given in many products ... leav[ing] the bank vulnerable to unexpected interest rate positions” (Balthazar, 2006, p. 257).

According to Balthazar (2006) banks usually consider the effects of interest rate risk from the points of view of their impact on earnings and on economic value. The management of interest rate risk is mainly concerned with setting limits on risk positions. Measuring interest rate risk is very complex, covering techniques such as gap analysis, duration and simulation approach.

3.2.3 Market Risk

“Market risk is the risk of adverse deviations of the mark-to-market value of the trading portfolio, due to market movements, during the period required to liquidate the transactions” (Bessis, 2002, p. 18). Marking-to-market simply means to calculate a market value for an asset. If a trader has a portfolio of forwards, the market value today is known, but not the future market value. This uncertainty is known as market risk and has following sources:

- **Equity risk**, denoting changes in equity prices, as volatility of stock prices over time is given.
- **Currency risk**, appearing when a bank makes investments in different currencies and the foreign exchange rates change during this period of time.
- **Commodity risk**, resulting from changes of supply and demand of goods, leading to uncertain market price changes.
- **Interest rate risk**, arising from changes in the level of the interest rates and “changes of interest rates between various products ... and at different maturities” (Van Gestel & Baesens, 2009, p. 30).

The Commerzbank states that “market risk covers the potential negative change in value of the bank’s positions as a result of changes in market prices – for instance, interest rates, currency and equity prices, or parameters which influence prices (volatilities, correlations)” (Balthazar, 2006, p. 254).

Value at risk (VaR) is a standard methodology for market risk aiming “at capturing ... deviations of prices during a preset period for liquidating assets, considering the changes in the market parameters” (Bessis, 2002, p. 19).

3.2.4 Liquidity Risk

Liquidity risk is defined by ING as “the risk that the bank cannot meet its financial liabilities when they come due, at reasonable costs, and in a timely matter” (Balthazar, 2006, p. 270). According to Bessis (2002) there are following three main aspects of liquidity risk:

- **Inability to raise funds at normal costs**, depending on the market perception of the issuer and its funding policy (i.e. institutions frequently needing funds unexpectedly send out a negative signal, and the bank’s credit standing influences the cost of funds as well as the company specific rating).
- **Market liquidity risk**, relates to the lack of money available in terms of volume in the market, therefore causing problems in raising money at a reasonable cost.
- **Asset liquidity risk**, “results from lack of liquidity related to the nature of assets rather than to the market liquidity” (Bessis, 2002, p. 17). Regulatory rules force banks to hold sufficient liquid assets in their balance sheet. Banks are required to “hold more short-term assets than short-term liabilities, in order

to meet short-run obligations” (Bessis, 2002, p. 17), which is the so called liquidity ratio.

The nature of liquidity risk is to appear mixed with other types of risk, making it difficult to be isolated and examined separately. Banks manage liquidity by counting on liquidity ratios, keeping plenty of liquid assets, and so called contingency reserves to be prepared for arising problems.

3.2.5 Operational Risk

Operational risk is defined by ABN Amro as the “risk of losses resulting from inadequate or failed internal processes, human behavior and systems, or from external events” (Balthazar, 2006, p. 262). Following classification of operational risk types is given by Van Gestel and Baesens (2009):

- Internal fraud
- External fraud
- Employment practices and workplace safety
- Clients, products and business practices
- Damage to physical assets
- Business disruption and system failures
- Execution, delivery and process management

Operational risk is measured by “assess[ing] the likelihood and cost of adverse events” (Bessis, 2002, p. 21). It is related with insurance risk, depending strongly on the activity type. Typically an increased control and supervision can reduce human errors, which was the incentive “of the Basel II Capital Accord to put in place a properly implemented operational risk management system that can manage and contain operational risk events at an early stage” (Van Gestel & Baesens, 2009, p. 33).

3.2.6 Other Risks

- **Foreign-Exchange Risk** is also referred to as currency risk or exchange-rate risk and denotes “the risk of an investment’s value changing due to changes in currency exchange rates.”¹⁹ Bank earnings may vary strongly according to the changes in the values of assets and liabilities held in foreign currencies.

¹⁹ See <http://www.investopedia.com/terms/f/foreignexchangerisk.asp>

- **Solvency Risk** is “the risk of being unable to absorb losses, generated by all types of risks, with the available capital” (Bessis, 2002, p. 20). It corresponds to the default risk, which regulatory authorities counteract with capital adequacy rules. These aim at defining amounts of capital that banks are required to hold in order to sustain possible losses.
- **Strategic Risk** is defined as the “current or prospective risk to earnings and capital arising from changes in the business environment and from adverse business decisions, improper implementation or decisions or lack of responsiveness to changes in the business environment” (Balthazar, 2006, p. 259). Strategic risk is defined by the Commerzbank as the “risk of negative developments in results stemming from previous or future fundamental business policy decision” (Balthazar, 2006, p. 262).
- **Reputation Risk** is the “current or prospective risk to earnings and capital arising from adverse perception of the image of the financial institution by customers, counterparties, shareholders/investors, or regulators” (Balthazar, 2006, p. 259). Reputation risk is defined by CSFB as “the risk that the group’s market or service image may decline” (Balthazar, 2006, p. 266).
- **Business Risk**, also called earnings risk, is “the risk of too low a profitability of certain business lines” (Balthazar, 2006, p. 267). This is generally managed by applying a volatility model for the Profit and Loss calculation (P&L) and by calculating costs, revenues and the resulting profitability. Business risk is defined by ING as “a result of management strategy (strategic risk) and internal efficiency (cost-efficiency risk)” (Balthazar, 2006, p. 268).

3.3 The Function of Risk Management

Risk management is “the process whereby organizations methodically address the risks attaching to their activities with the goal of achieving sustained benefit within each activity and across the portfolio of all activities.”²⁰ Its key functions according to Van Gestel & Baesens (2009) are:

- **Risk analysis,**
- **Investment and pricing decisions,**
- **Risk quantification,**

²⁰ See http://www.theirm.org/publications/documents/Risk_Management_Standard_030820.pdf

- **Risk monitoring and reporting,**
- **Strategic advisor,** and
- **Solvency.**

Even though an essential principle of banking is to have an independent risk management, the establishment of a sophisticated risk management framework which brings together the individual specific demands and requirements of the risk taker and those of the risk management is indispensable nowadays. Crouhy et al. (2001) state that banks need to develop policies, methodologies and infrastructure(s) to evaluate such a framework. In the following section this framework, in which the risk management functions are organized, will be described.

3.3.1 The Three-Pillar Framework

3.3.1.1 *Best-Practice Policies*

The first of the three pillars of the risk management framework is illustrated in Figure 4. The risk/return targets are the objectives set in the business strategy of the bank. It is crucial for banks to establish risk tolerance levels (or risk limits) congruent to the business strategy.

Besides the market and operational risk policies, the most essential one in every bank is the policy for credit risk. This policy covers issues such as the necessity for bank management to determine the tolerance to credit risk, the required establishment of reporting systems to discover exposures to credit risk and the specifications of the extent of diversification.

Best-Practice Policies

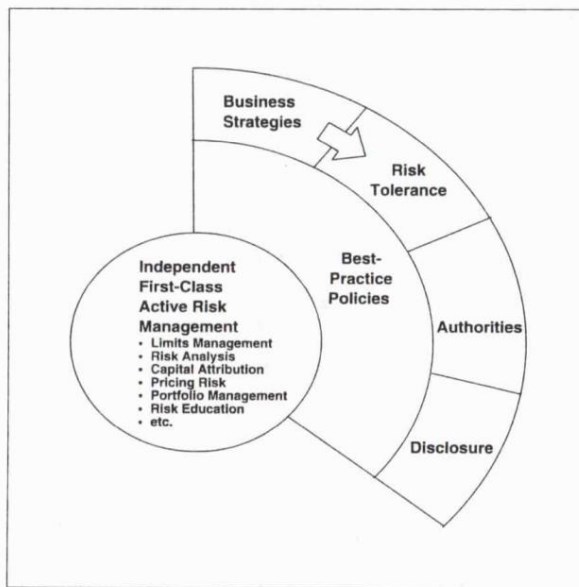


Figure 4. Best-Practice Policies. Crouhy et al. (2001), p. 101

3.3.1.2 Best-Practice Methodologies

As displayed in Figure 5, the best-practice methodologies “refer to the application of “appropriate” analytic models to measure market risk, credit risk, operational risk, and so on” (Crouhy et al., 2001, p. 103). These include VaR frameworks for market and credit risk. Also the trade-off between risk and return of the bank needs to be constantly observed for efficiency reasons, which can be achieved with the development of proper measurement tools.

Best-Practice Methodologies

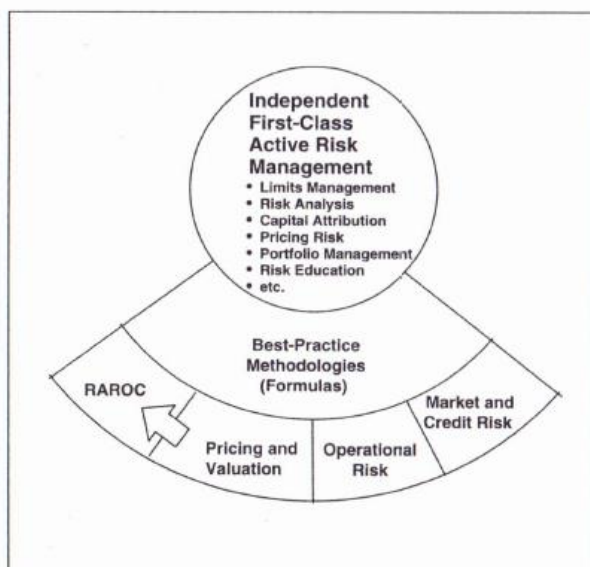


Figure 5. Best-Practice Methodologies. Crouhy et al. (2001), p. 104

3.3.1.3 *Best-Practice Infrastructure*

The development and implementation of a suitable infrastructure is necessary in order for the policies and methodologies to work. The best-practice infrastructure, as illustrated in Figure 6, is made up of various components, namely the people providing the input, the data which is translated into specific information for the risk management and finally the technology and operations

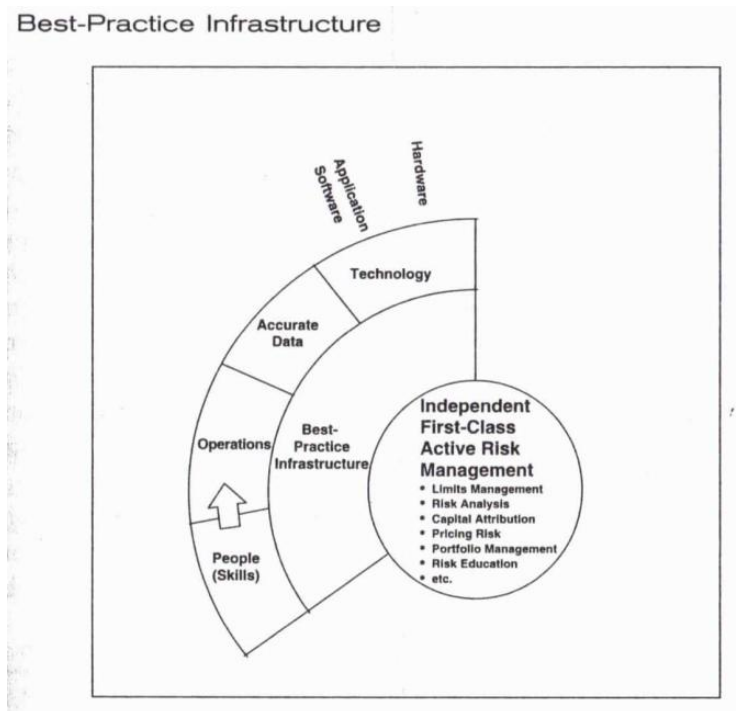


Figure 6. Best-Practice Infrastructure. Crouhy et al. (2001), p. 107

3.4 The Risk Management Process

In a dynamic economy the regulatory requirements for risk measurement and capital are only the basis for proper bank risk management. Risk management issues, however, go much further. Pyle (1997) states that reliable risk measures, estimates of potential losses and available liquidity, and overall monitoring mechanisms represent the necessities for bank managers aiming at creating sustainable value. In general, risk management can be viewed as “the process by which managers satisfy these needs by identifying key risks, obtaining consistent, understandable, operational risk measures, choosing which risks to reduce and which to increase and by what means, and establishing procedures to monitor the resulting risk position” (Pyle, 1997, p. 2).

In *Risk Management in Banking*, a paper written for the World Bank conference on “Advanced Risk Management: Assessing, Managing, and Supervising Financial Risk” in 2004²¹, E. F. Kupper elaborates on the importance of making consistent risk management decisions. Kupper states that banks need to be determined about the level of risk to accept in their business activities and therefore “need to develop management systems that provide a natural focus on risk as one of the drivers of performance.”²²

Kupper describes the components to the (risk) management process as follows:

- i. **Define the risk appetite:** define the desired buildup and risk profile of the institution;
- ii. **Manage at the business level:** manage the risk profile by line of business, however considering that the challenges may vary considerably between these;
- iii. **Monitor the performance:** build a management information system (MIS) for risk that oversees performance and corresponds to the individual requirements of each business;
- iv. **Provide incentives:** implement a performance management system that provides consistent incentives to drop undesirable risks.

Kupper points out that “for this framework to be effective, it needs to be supported by a strong and consistent risk culture.”²³

Another way to illustrate the risk management process is given by the Institute of Risk Management (IRM) in Figure 7. As one can see, the individual elements coincide with the main general functions of risk management.

The Institute of Risk Management claims that risk management supports the objectives of an organization by²⁴:

- providing a consistent and controllable framework for an organization,
- improving decision making, planning and prioritization,
- supporting the efficient use and allocation of capital/resources,
- reducing volatility in the non essential business areas, and
- improving overall operational efficiency.

²¹ See <http://info.worldbank.org/etools/docs/library/86143/rm20.pdf>

²² See <http://info.worldbank.org/etools/docs/library/86143/rm20.pdf>

²³ See <http://info.worldbank.org/etools/docs/library/86143/rm20.pdf>

²⁴ See http://www.theirm.org/publications/documents/Risk_Management_Standard_030820.pdf

2.2 The Risk Management Process



Figure 7. The Risk Management Process. Adapted from The Institute of Risk Management (IRM)²⁵

Bessis (2002) explains that modern risk management practices “consist of setting risk limits based on economic measures or risk while ensuring the best risk-adjusted performance” (Bessis, 2002, p. 53). The goal is to integrate “new risk-return measures into risk management processes, enriching them and leveraging them with more balanced views of profitability and risks” (Bessis, 2002, p. 53). As the risk-return profiles are the essential element of the system, they connect new risk models and risk processes. The interaction between risk measures and risk processes will be displayed in following section.

3.4.1 Basic Building Blocks

An ideally functioning risk management surveys processes, which include every management action and decision that influences the risk-return profiles of transactions. “Risk management combines top-down and bottom-up processes with ‘horizontal’ processes” (Bessis, 2002, p. 54).

²⁵ See http://www.theirm.org/publications/documents/Risk_Management_Standard_030820.pdf

3.4.1.1 Bottom-up and Top-down Processes

Bessis (2002) states that the vertical processes target the link between global goals and business decisions. These risk management processes permit the establishment of global guidelines announced and set from the top level to the individual business lines. Target revenues and risk limits are crucial signals, which assure that global targets stay in line with operations. As periodical reporting along the risk management pyramid is a fundamental element of these processes, any deviations from guidelines are detectable, which allows the prevention and correction of unfavorable events.

The pyramid of risk management is displayed in Figure 8 and illustrates the specific bottom-up and top-down processes.

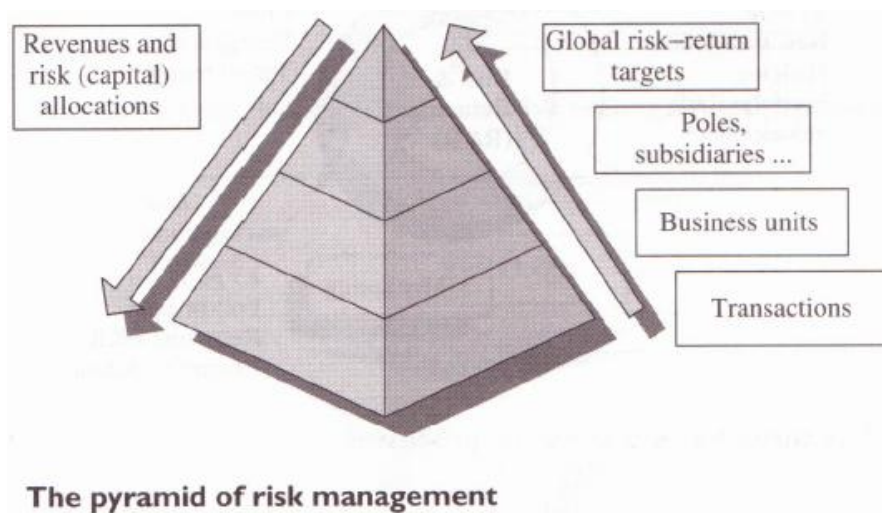


Figure 8. The pyramid of risk management. Bessis (2002), p. 55

The bottom-up process mainly includes the monitoring and reporting of risks, “starting with transactions and ending with consolidated risks, income and volumes or transactions.” (Bessis, 2002, p. 55). Ultimately the process involves the entire banking hierarchy and the pyramid displays “the risk diversification effect obtained when moving up along the hierarchy” (Bessis, 2002, p. 55). Each type of risk that banks encounter during operations is considered in this model and displayed in the individual faces of the pyramid.

3.4.1.2 Transversal Process Building Blocks

“Transversal processes address risk and return management at ‘horizontal’ levels, such as the level of individual transactions, at the very bottom of the management ‘pyramid’, at the intermediate business line levels, as well as at the bank’s top level, for comparing risk and return measures to profitability target and risk limits” (Bessis, 2002, p. 54). As illustrated in Figure 9, Bessis (2002) displays the three main blocks that transversal processes consist of:

1. **Setting up risk and return guidelines:** These include risk limits and delegations, and benchmarks for return. Establishing risk limits is crucial for banks, as these provide protection from suffering too great losses in case of unexpected events. Benchmarks of return state the target profitability of the bank and provide corresponding signals to the individual business units.
2. **Decision-making (ex ante perspective):** The goal is to support the business-decision process. The difficulty herewith is to capture the risks early enough before any false decisions are made. Decisions that need to be considered in this context are on-balance sheet (business) and off-balance sheet (hedging) decisions.
3. **Risk-return Monitoring (ex post perspective):** Monitoring risks by reviewing these periodically is an essential procedure to identify weaknesses or confirm existing guidelines. Measures of risk and return are required at all levels, across business lines and individual transactions.

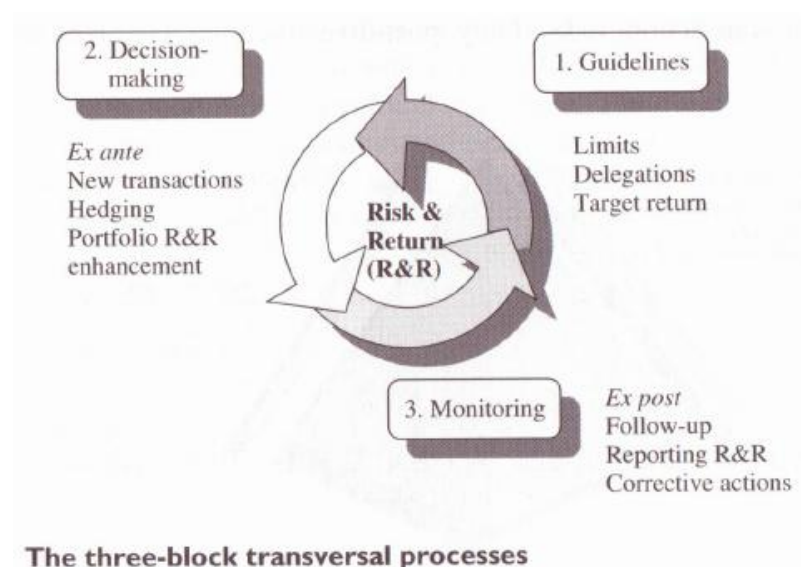


Figure 9. The three-block transversal processes. Bessis (2002), p. 56

3.5 Integrated Risk Management

According to Meulbroek (2008) risk management techniques have evolved due to the substantial developments in information technology. The integrated approach to risk management, possible only because of these improvements and innovations in financial instruments and markets, “involves the identification and assessment of the collective risks that affect firm value and the implementation of a firm-wide strategy to manage those risks” (Meulbroek, 2008, p. 63). By shaping its risk profile, meaning dropping certain risks and specifically holding others, banks are able to maximize value for their shareholders and customers.

Figure 10 displays the steps toward integrated risk management as described by Crouhy et al. (2001). They state that the arrow in the figure displays the best-practice risk management philosophy, whose “ultimate objective is to manage risks actively in a portfolio context” (Crouhy et al., 2001, p. 98).

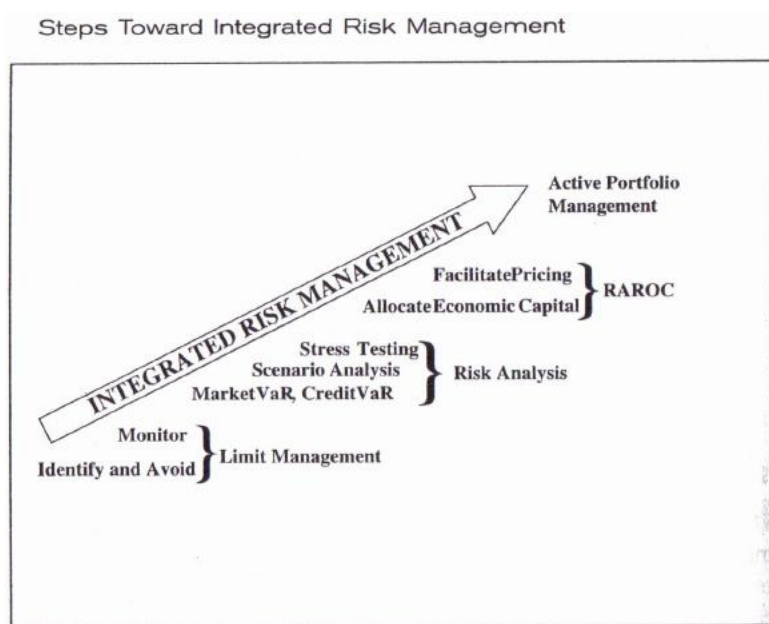


Figure 10. Steps toward integrated risk management. Crouhy et al. (2001), p. 98

The “integrative” character of risk management, however, also refers to the combination of the techniques by which banks can implement risk management objectives, namely by modifying its operations, adjusting its capital structure, and employing targeted financial instruments (Meulbroek, 2008, p. 63). This combination of mechanisms to continuously modify the firm’s risk profile ultimately forms the bank’s risk management strategy.

In opposition to the Modigliani-Miller Theorem, which “provides conditions under which a firm’s financial decisions do not affect its value”²⁶, Meulbroek (2008) exemplifies how risk management does in fact add (shareholder) value. As a fundamental principle it should be considered that because banks encounter varying benefits and costs of risk management, the individual banks must pursue a “tailored” risk management strategy. Her arguments include that corporate risk management can increase shareholder value by “assist[ing] investors in managing risk and thereby lower the [bank’s] cost of capital ... [and] increase shareholder wealth by reducing the costs associated with financial distress, moderating the risk faced by important non-diversified investors and stakeholders, decreasing taxes, reducing monitoring costs, and lowering the firm’s funding costs” (Meulbroek, 2008, p. 67).

When implementing a risk management system the question of whether risk reduction actually increases firm value needs to be considered. This is done by means of analyzing the actual cost of the risk reduction. The valuation processes which are necessary for bank managers to determine the optimal level of total risk, including the associated individual risks, are highly complex and require extensive knowledge on how the banking operations, financial policies and potential risks affect firm value.

Finally, one should highlight that all risks that banks face need to be taken into account when developing an integrated risk management strategy. “Integrated risk management extends across functional boundaries within the [bank]” (Meulbroek, 2008, p. 73). Due to the difficulty in predicting the interaction between risks, the challenge is the integration of various risks and the specific management of these risks across different business areas within the bank. Tradeoffs are usually necessary in risk management decisions, therefore according to Meulbroek (2008) managers need to broaden their view and comprehension of existing risk management practices, and establish a long-term strategic approach in securing the value of bank.

As the previous chapters were aimed at presenting an overview of banking, the types of risks which appear in this business and the purpose of risk management as a whole, the focus of the proceeding chapters from this point on will lie solely on credit risk, the classic and most important type of risk in the banking business.

²⁶ See http://www.econ.uiuc.edu/~avillami/PalgraveRev_ModiglianiMiller_Villamil.pdf

4 Introduction to Credit Risk Management

Credit is money lent or borrowed over a certain period of time at interest. “A bank loan is a form of credit which is often extended for a specific period of time, usually on fixed [and naturally also on floating] interest terms related to the base interest rate with the principal being repaid either on a regular instalment basis or in full on the appointed redemption date” (Pass, Lowes & Davies, 1993, p. 32). As is apparent from this definition there exists a potential risk and uncertainty throughout this process, resulting in a number of credit loss scenarios, the most common ones being defaulting on interest, on principal repayment, or on both.

Modern company funding strategies vary depending on the time horizon (maturity structures) and differ according to the specific needs of the borrower. Banks have structured their credit products to cover all aspects of modern corporate finance and constantly expand their portfolio to serve the customer demands. While short-term funding products (i.e. trade finance lines of credit, asset-based lines of credit and revolving lines of credit) are usually used to “finance seasonal inventory and temporary working capital needs for up to eighteen months or less” (Colquitt, 2007, p. 70), medium-term funding products (i.e. term loans) are “used for medium-term financing purposes, but are structured for longer terms of maturity” (Colquitt, 2007, p. 78). There also exist so-called bridge loans, which have the purpose to “bridge the waiting time between receiving permanent financing” (Colquitt, 2007, p. 79). Long-term funding products are necessary for borrowers who focus on long-term objectives, but these in general are more expensive (except in an inverse yield situation) as the risk exposure is greater. Structured finance (i.e. asset securitization) has developed for complex funding needs, project finance “has become widely used for high-profile corporate ventures” (Colquitt, 2007, p. 94), and syndicated loans furthermore prove effective, as this approach enables the transferring of risks between “several lenders agreeing to provide funds to a borrower under the same credit facility according to specified terms and conditions” (Colquitt, 2007, p. 82). Finally the development of credit derivative products and credit options has opened “the capital markets for financing long-term debt obligations” (Colquitt, 2007, p. 98).

According to Colquitt (2007) credit is such a powerful driver of modern economies, because the process of extending credit “has a multiplier effect on the global money supply” (Colquitt, 2007, p. 2). In general, credit is used by borrowers to

reinvest in their business, which ultimately should lead to a return. The application of credit as a financing method has settled in business minds, and it has therefore become evident that practically all business exchange is conducted on credit.

Extending credit as is the case today is only possible due to the immense technological developments, allowing precise measurement, management and control of the transactions. However, the problem of the momentary worldwide financial crisis is also an effect coming from the general worldwide credit culture. Critics say that the banking industry has grown more and more apart from its original purpose. Wild speculations at the risk and expense of the clients have allowed these institutions to earn immense amounts of money for a very long time. However, these institutions did not consider the effects of failures, specifically the tremendous losses that would follow and effects on the worldwide financial system. For example, banks and other financial institutions were able to systematically conceal credit risks through the previously mentioned credit derivative products such as collateralized debt obligation (CDO) packages. Ultimately what they were selling was a worthless pile of junk and credit rating agencies failed to account for these risks.

In the following chapter the credit process including the lending objectives of banks will be described, the elements of the credit philosophy and credit culture will be given and the corresponding formation of the credit risk strategy will be discussed.

4.1 The Credit Process

According to Colquitt (2007) innovative technologies, evolving financial products and new market participants have changed the worldwide financial systems and economies. These developments have also created a more efficient credit process.

The traditional credit process, illustrated in Figure 11, started with the transaction between the client (the borrower) and the account officer of the bank. After the preparation and presentation of credit requests, there followed the granting and monitoring processes. The problem herewith was that decisions were often based on unreliable indicators, due to insufficient financial analysis. Ensuring the availability of adequate capital and having sufficient reserves were the main functions of the traditional credit risk management concept. "The emphasis by most lenders was foremost on mitigating credit risks through risk disaggregation rather than

managing loan funding for liquidity purposes” (Colquitt, 2007, p. 8). This passive approach often led to insufficient capital allocation against rising unexpected losses and hence decreasing credit earnings.

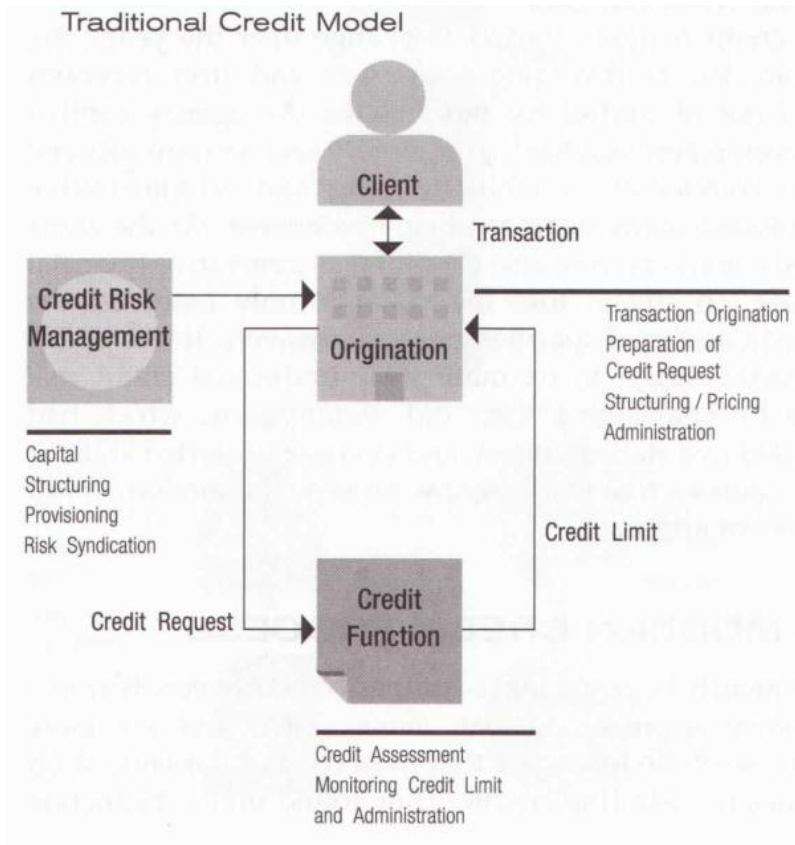


Figure 11. The traditional credit model. Colquitt (2007), p. 7

Banks therefore began to emphasize an active and a substantially more modern approach, which was based on portfolio management techniques. The focus lay on only extending credit requests that “earn a sufficient economic return so as to maximize the expected credit portfolio returns” (Colquitt, 2007, p. 9). This dynamic credit risk approach, based on a constant credit portfolio assessment and measurement process, is illustrated in Figure 12. The goals of reducing the banks’ cost of capital and increasing aggregate portfolio performance are supported by constant credit portfolio analysis.

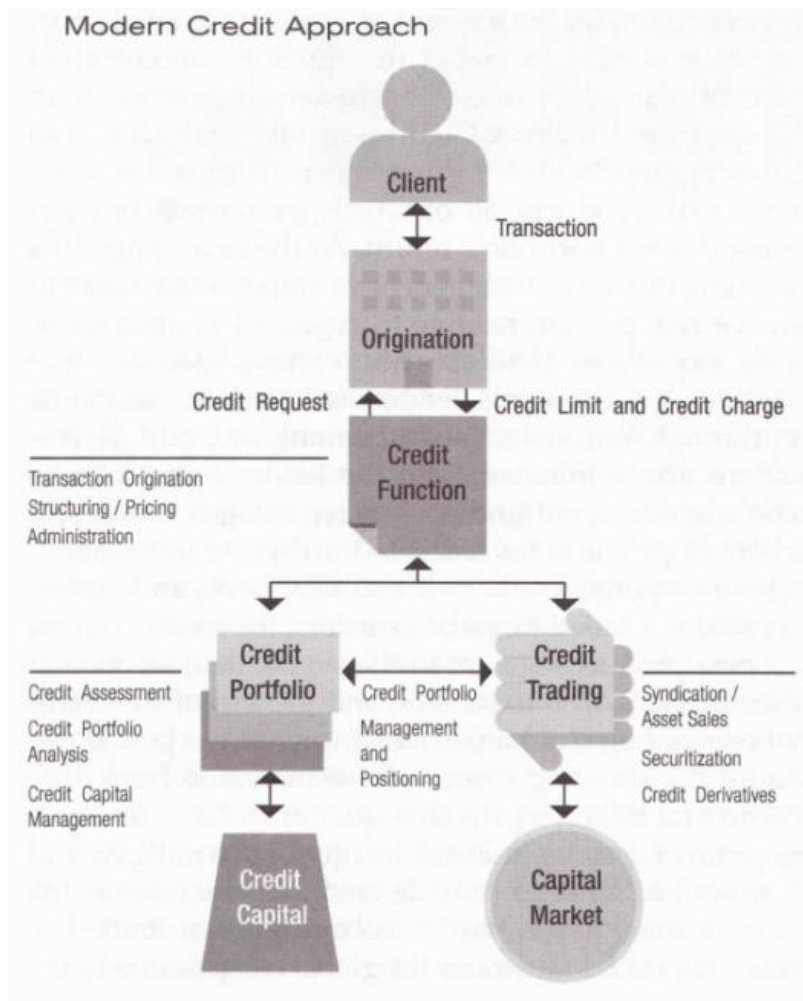


Figure 12. The modern credit approach. Colquitt (2007), p. 9

New businesses are developed by relationship managers depending on performance and achievement of a specific return. Portfolio managers aim at reducing credit risk exposures. Banks can transfer or mitigate exposures which are unprofitable or not value-added through loan sales, securitizations, or credit derivatives. This repacking of credit risk into new types of debt lead to new product segments, which was an enormously profitable business. As already discussed shortly in the introduction of this chapter the dangers of these new credit products (i.e. CDO's) available for resale to investors were not taken into account sufficiently, striking the worldwide financial markets with dramatic effects when it became clear that many of these packages had become worthless.

Colquitt (2007) states that the banking industry has become more "resilient in managing the deteriorating credit quality among corporate borrowers" (Colquitt, 2007, p. 11) by adopting modern credit risk management practices. I question whether risk management practices have weakened the impacts of credit defaults during the last

years and critically view their role in the failure of the banking system. I don't see where the so-called "tight credit standards" were applied in all instances, since the creation of new credit risks was only shifting the problem from one institution to another.

In general the fundamental lending objective of modern banks is to find the proper balance between portfolio growth and credit quality. This assures long-term profitability and increases shareholder's value. "Transactions that create value and yield adequate returns together with appropriate hedging strategies are the keys to extending business credit and maximizing earnings" (Colquitt, 2007, p. 52).

Even though the credit process may vary from bank to bank, the principle framework is similar. The primary concern is "the ability to earn profits while also ensuring that an organization has adequate regulatory capital for economic losses and shareholders' requirements" (Colquitt, 2007, p. 20). The typical functions that support the credit process are displayed in Figure 13 below.

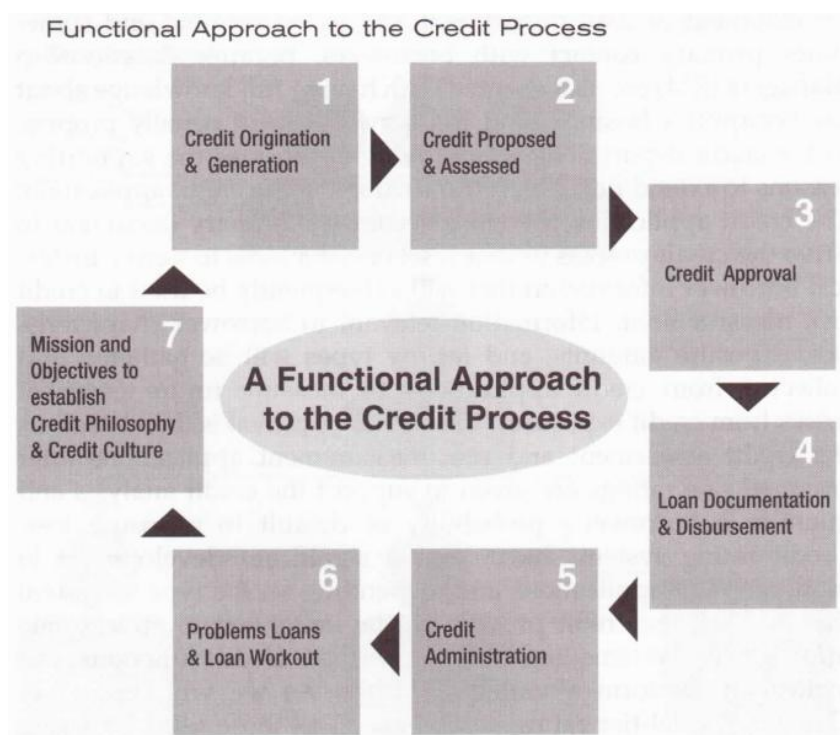


Figure 13. The functional approach to the credit process. Colquitt (2007), p. 24

Typically the marketing or relationship management department is first to come in contact with the potential borrower. Following the discussions and

negotiations there is an official credit application which is proposed to the credit department. This application is the first document in the credit process and will be used in credit risk assessment and measurement, as it includes all types of information on the borrower.

Credit risk assessment and credit risk measurement, however, are two fundamentally different applications. The process of credit assessment relies on information provided by the borrower and has three main targets as outlined by Colquitt (2007):

- Identifying and controlling risks by determining the borrower's probability of repaying the debt,
- Identifying a borrower's primary source of debt repayment that will be available to repay an extended credit obligation, and
- Evaluating the probability that a secondary repayment source will be available in the event that the primary source becomes unavailable.

In contrast, credit risk measurement depends on the techniques, analytics and tools of the lender, namely the bank. Colquitt (2007) presents the three goals of credit risk measurement as follows:

- Limit the credit risk exposures that the lenders accept when extending the debt,
- Ensure that adequate compensation is earned for the risk undertaken, and
- Mitigate the credit risk exposure by structuring transactions to protect against loss as well as into asset classes that can be marketed to third-party investors.

Risk ratings are determined for the borrower according to the outcome of the risk assessment and measurement, which finally determines the credit risk approval or denial. Once a transaction is approved banks require loan documentation to supervise the disbursement of funds.

Credit administration is the continuous loan monitoring and overseeing of the credit quality of transaction(s). By constantly monitoring the borrower's financial and operating situation banks are able to detect problems early on (even on a regular basis) and prevent the risk of credit loss. Because in some cases losses are nonetheless unavoidable, the formation of a specialized group is required to deal with these defaulted borrower transactions.

An essential and legally enforced (Basel II regulation for banks) element of credit administration is the segregation of duties, ensuring the required independencies between the participating individuals, namely those who approve the credits, review the loans, and those who audit the procedures. The ability of these professionals to “affect risk ratings can ultimately affect the capital allocations required for loan loss reserves” (Colquitt, 2007, p. 29).

Credit portfolio management is “charged with reducing the cost of capital while also increasing portfolio performance” (Colquitt, 2007, p. 24) and depicts the fundamental element that the modern credit process focuses on.

Depending on how banks define their credit philosophy/culture and accordingly specify their credit risk strategy, one can ultimately evaluate the overall effectiveness of their credit process. In the following section these terms will be regarded closer.

4.2 Credit Philosophy & Credit Culture

A bank’s credit philosophy and credit culture characterizes “the mission, objectives, and lending strategies to legitimize the value placed on credit quality and safe sound lending practices” (Colquitt, 2007, p. 30-31). This definition covers everything around how credit might be extended.

The bank’s goals in the market need to be communicated throughout the business lines in form of a top-down approach, meaning from the CEO down to the individual employees. Written policies should include “the corporate priorities to which the credit process and procedures will be applied relative to the credit risk strategy and credit portfolio management” (Colquitt, 2007, p. 31). This way the credit philosophy becomes a unique part of the bank and the basis for the establishment of a credit culture.

A credit philosophy needs to include following main points to be effective:

- Specifications of the lender’s business strategy,
- The upper-limit of annual growth rates for loans, credit quality goals for bonds, as well as the targeted returns,
- Tolerance of exposure levels for the loan mix of the portfolio,
- The desired portfolio composition, emphasizing on diversity,
- The desired portfolio growth and targeted earnings,

- The evaluation process including credit standards and underwriting guidelines,
- Lending authority and approval limits.

The credit culture of a bank specifically represents “the attitudes, perceptions, behaviors, styles, and beliefs that are conducted and practiced throughout the credit organization as a result of management attitudes towards credit risk” (Colquitt, 2007, p. 34). Sometimes certain inconsistencies or deviations from the credit culture can arise, when certain objectives are in conflict with the credit policies. This is the case if for example a very conservative bank wants to approve a speculative loan, even though the bank’s credit policy objects to such services. The market will negatively perceive this divergent procedure, seeing the high exposure to risk, which ultimately damages the reputation of the bank. Because of the market dynamics, however, it is sometimes indispensable for banks to change or revise its credit philosophy in order to reinforce ones position in the market. Figure 14 illustrates the different types of credit cultures.

Types of Credit Culture				
Characteristics of the Four Credit Cultures				
Characteristics	Values Driven	Immediate Performance Driven	Production Driven	Unfocused (alias Current Priority Driven)
Top Priority	Long Term Persistent Performance	Current earnings, stock price	Market share, loan growth and loan volume	Tends to change frequently
Driving Force	Corporate Values and Market Consistency	Annual profit plan	Commitment to the largest	Changes as priorities change; management is reactive
Credit Environment	Strong credit organization with few policy exceptions and excellent communication	Generally strong emphasis on credit quality when economy is strong and not much difference from a values driven culture, however, in periods of weak loan demand, there is a tendency to enter or increase into risky lines of business	Well managed, market-driven banks have strong systems, controls and good credit leadership; but as leaders are pressured to produce, line and credit will be in conflict over priorities, in very aggressive banks credit approvers find themselves increasingly limited in their influence on loan decisions as they are directed to “find a way to do the deal”.	Line units may have their own views of credit quality, credit risk management tries to respond to frequent changes in direction.
Hidden Policy	Not a factor - consistent with written policy.	Conflicts with written policy during soft loan market periods as lenders become confused over management priorities	Lenders understand that their job is to do the job regardless of the written policy.	Lenders are confused by inconsistency and shifting priorities
Success Factor	Balance between credit quality and revenue generator, avoids tendency to control lending function	Credit risk management must be strong enough to resist lender pressure to enter riskier markets in downcycles	Credit risk management must control the loan approval process, keep individual loan authorities low and resist production pressures.	Credit quality can be maintained if credit risk management policies, systems and leadership are strong.

Figure 14. Types of credit cultures. Colquitt (2007), p. 36

An indicator that the credit philosophy and credit risk management has been effective is if the bank generates stable earnings and loan portfolio profitability constantly grows over various credit cycles.

4.3 Credit Risk Strategy

The credit risk strategy of a bank is “the basis for how credit risk is monitored, controlled, and responded to” (Colquitt, 2007, p. 35) and emerges from its credit philosophy and credit culture. The bank’s risk appetite and the approaches to managing risks are reflected in the credit risk strategy and need to be understood by all levels of the bank in order to ensure proper protection. Depending on the size and lending objectives of the bank, the credit risk strategy will vary. Important for all bank institutions, however, is the consistent application of credit standards.

The bank management as well as the board should approve of the credit risk strategy in order for it to be effective. The subsequent implementation by all functions of the bank is essential, again to ensure full coverage of all business units/lines.

Another important point is segregating the credit process in order to prevent fraud or mistakes in terms of individuals exceeding their authorities and responsibilities. The individual who approves the credit applications needs to be different from the one who does the proposal. This way banks prevent account officers from approving low quality credits to generate high bonuses for themselves.

Colquitt (2007) illustrates the primary credit risk components, which shape the foundation of the framework for implementing a credit risk strategy, as in Figure 15.

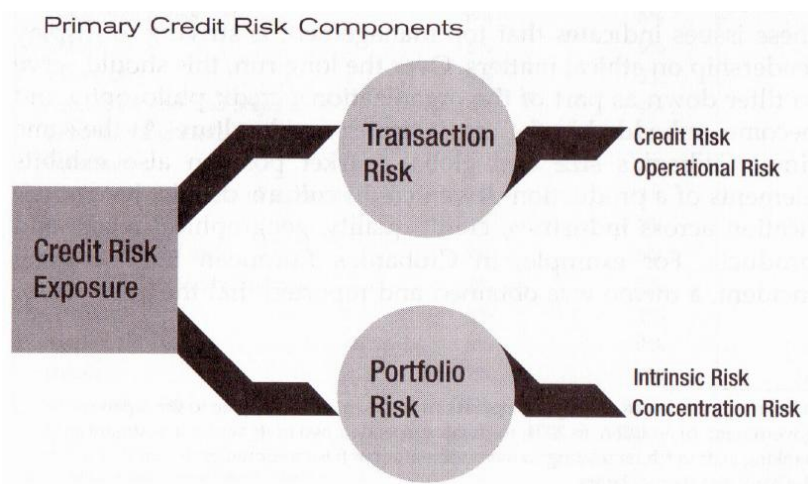


Figure 15. Primary credit risk components. Colquitt (2007), p. 40

Transaction risk is defined as “the credit risk exposure from extending a single loan asset and is incorporated into the loan portfolio as part of the cumulative portfolio risk” (Colquitt, 2007, p. 40). It can result from the types of funding the bank undertakes, for example when providing a specific loan that the bank is not normally specialized in and operational risk, when people, computers or processes fail.

The portfolio risk aspect consists of the exposure to intrinsic risk, in particular certain companies and industries, and concentration risks, “which are the proportion of loans across asset classes and credit products (real estate, project finance, leveraged transactions, derivatives, and emerging markets)” (Colquitt, 2007, p. 42).

There are various portfolio models for credit risk, including Credit Metrics, CreditRisk+ and Credit Portfolio View, that aim at measuring credit risk at an aggregate level, crucial for the strategic risk management of banks. The portfolio approaches, as being highly complex, will be neglected in this paper. However, the individual ratings and the elements of the rating process which are the basis for the aggregate portfolio view will be discussed in following chapter.

5 Credit Rating Systems

5.1 Introduction

Credit risk assessment or in other words the evaluation of a borrower's creditworthiness is the first step of the general credit selection process. While the classic credit analysis approach dealt solely with a highly subjective financial analysis on the basis of limited available information, such as the provided balance sheets and income statements of the potential borrower, modern credit risk evaluation integrates the classic analysis into modern internal and external rating systems.

Credit risk rating systems provide a framework for directing the credit process and are “used to monitor portfolio concentration limits, as well as for customer profitability analysis and management reporting” (Colquitt, 2007, p. 128). It is nonetheless crucial that credit specialists are proficient in intuitive and perceptive analysis, possess good judgment and common sense to read between the lines, and analyze the qualitative factors as well. These aren't necessarily taken into account by the quantitative measures derived from classic financial analysis.

Credit rating systems “assign the credit risk grades by ranking transactions according to the perceived credit risk and ... group credits to distinguish among possible outcomes by quantifying the default risk and loss estimates” (Colquitt, 2007,

p. 287). Credit rating systems enable banks to evaluate the general creditworthiness of potential borrowers, identify and monitor the risks on a regular basis and also to measure the probability of default according to the given risk ratings or grading scales. Colquitt (2007) explains that they are also used for portfolio optimization, by shedding light on the transactions' risk of default and therefore identifying the status in meeting the defined hurdle-rate in risk-adjusted pricing. "By differentiating the levels of risk through credit grades and scales, loan spreads are then based on the corresponding rated default loss probabilities and volatilities" (Colquitt, 2007, p. 288).

Banks depend on these systems as they provide the essential information for proper integrated management decision making, and this efficiently and less time consuming. Rating systems provide a single source of data for all banking applications, which improves the quality of the decisions made. "The most sophisticated rating systems are configured to integrate individual risk variables by using alternative analytic technologies capable of linking a range of data capabilities that include predicting default probability and pricing in loan originations, management reporting, portfolio monitoring, and allocating economic capital" (Colquitt, 2007, p. 289).

Along with the different types of credit cultures does specifically the credit risk architecture define the credit rating system implemented in banks. The enterprise risk management framework, of which an example is illustrated in Figure 16, consists of "risk architectures ... built into technology platforms that incorporate performance and strategy applications" (Colquitt, 2007, p. 291).

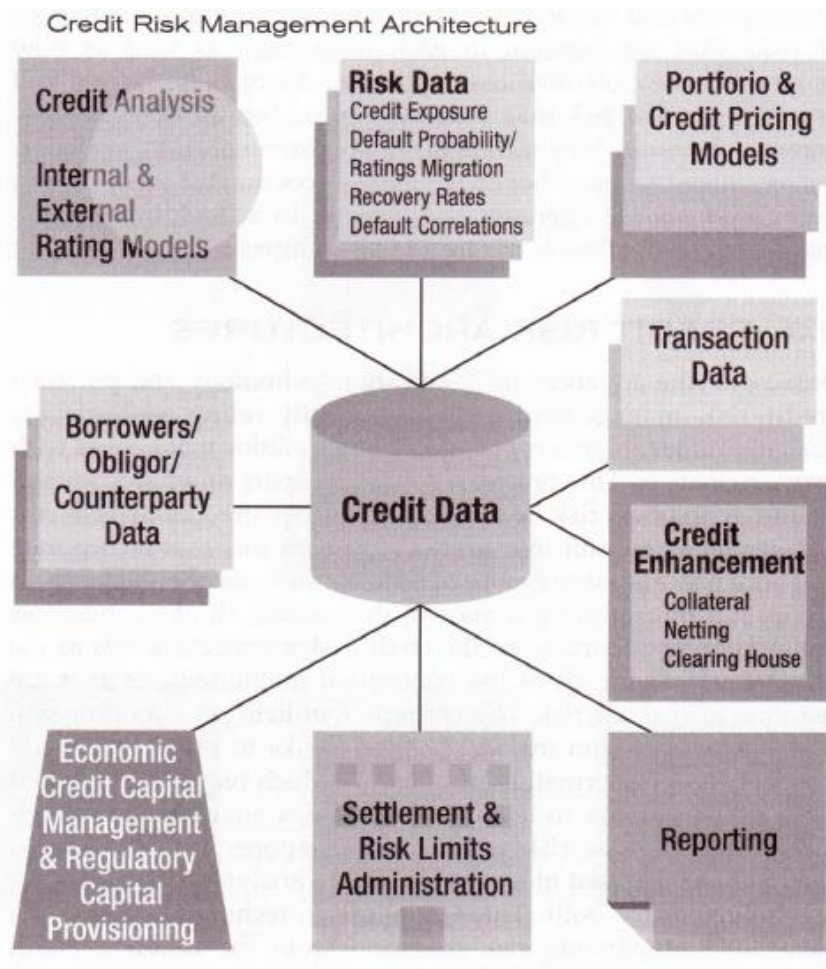


Figure 16. Credit risk management architecture. Colquitt (2007), p. 292

These integrated architectures function only under highly complex information-technology and simultaneously gather, store and process information from all departments of the bank. They build the backbone for methodologies required to assess risks and integrate analysis and modeling techniques. Expert judgment, analytic risk models, or a combination of both are components and possible application techniques of the risk architecture and “define the basis for summarizing risk measures from the different credit grades or rating scales that identify the varying degrees of risk, and also distinguish how transactions are risk rated” (Colquitt, 2007, p. 291).

Because technology cannot completely replace human know-how, it is important for credit specialists not to solely rely on the calculated indicators from the input data, but to include and incorporate their own knowledge of the borrower’s actual credit condition to receive a more realistic analysis rather than an automated approximation. The role of human judgment in this process, however, is disputed by

critics, who argue with the expert's subjectivity and the associated bias. This gave rise to the application of credit risk models to summarize credit risk transactions. These models are configured based on the variables such as the probability of default and apply mathematical equations defining default risk to compute the borrower's risk according to a credit grade and rating category.

5.2 Credit Ratings

By determining the basis on which banks evaluate potential borrowers, credit ratings support the credit assessment process. Internal and external ratings are the most common ratings systems used by banks. External ratings are provided by rating agencies and usually used by banks to evaluate large, international corporate borrowers. Internal credit rating systems are developed by banks themselves, though banking supervision authorities also set strict requirements concerning objectivity of the rating results and transparency of the rating process. Therefore the extent to which banks establish and implement internal rating systems depends among others on regulatory requirements, the composition of the banks portfolio and overall risk philosophy. Larger banks often base their internal ratings on those of the rating agencies (if available) due to regulatory reasons.

Most rating systems consist of quantitative and qualitative measures and are usually applied to non-financial institutions. The assessment of the company-specific financial performance on the one hand and company specific risks on the other allows banks to get a realistic overview of the potential borrower. Other important considerations in determining the creditworthiness of a potential borrower are features of the industry, effects of macroeconomic events on the company, country risk of the potential borrower and the existence of collateral as well as the quality of the guarantee. However, the rating evaluators ultimately need to base their final decision on their own judgment, as the rating results are only guidelines, on no account absolutely certain or guaranteed.

Even though internal and external ratings both aim at evaluating a borrower's repayment ability using similar approaches, there are certain differences, which will be discussed in the following section.

5.2.1 External Credit Risk Ratings

Moody's, Standard and Poor's (S&P), and Fitch Ratings are the main global rating agencies and classify companies "into discrete rating categories that correspond to the estimated likelihood of the company failing to pay its obligation" (Crouhy et al., 2001, p. 259). Even though the three largest rating agencies apply different rating scales, they are all used by investors and banks as an independent third party view on company's and financial institution's fundamental financial strength. According to Jorion (2009) one must keep in mind, however, that the rating agencies are beset by conflicts of interest, as they are paid directly by the companies/banks which they rate.

An important focus in the rating process of the large rating agencies lies on the human judgment that flows into the evaluation. Rating agencies have highly skilled analysts with extensive knowledge of the factors affecting the credit quality of a borrower. Their function is to "continuously monitor and rate the credit quality of corporate bond and security issuers" (Colquitt, 2007, p. 308). Rating Agencies base their ratings on official as well as confidential information provided by the company/borrower that is to be assessed. Based upon the information obtained and evaluated by the rating agency analyst, a rating committee decides upon the final rating. This is proposed to the rated issuer or issue, who can object and further discuss certain matters that in his opinion need adaptation. Once this has been done the rating agency publishes the rating and continuously monitors it.

"Although the rating agencies have never detailed the [actual] theoretical assumptions constructed in their rating models, they do emphasize qualitative and quantitative factors relative to their credit ratings" (Colquitt, 2007, p. 309). Even though these credit ratings are only opinions, the expectations of global capital markets rely on the judgment, meaning ratings, of the large rating agencies. Following the three main global rating agencies, namely Moody's, Standard and Poor's (S&P) and Fitch Ratings will be presented and their specific distinctive features, including rating processes, methodologies and scales will be illustrated.

5.2.1.1 Moody's

As outlined in the official company profile on the website, Moody's Corporation employs approximately 3,900 people in 27 countries worldwide and provides "credit ratings, research, tools and analysis that contribute to transparent and integrated

financial markets.”²⁷ Its two affiliated companies are Moody's Investors Service, providing credit ratings, research, and risk analysis, and Moody's Analytics, providing among others research, data, analytic tools to debt capital markets and credit risk managers worldwide. Moody's states that its credit ratings and research help investors analyze credit risks and contribute to efficiencies in fixed-income markets among others, by providing independent and reliable assessments of credit risk.²⁸

The purpose of Moody's rating is to “provide investors with a simple system of gradation by which relative creditworthiness of securities may be noted.”²⁹ Rating symbols indicate these levels of creditworthiness, depending on the time horizon, as indicated in Figures 17 and 18.

Moody's long-term ratings display “opinions of the relative credit risk of fixed-income obligations with an original maturity of one year or more.”³⁰ They address the possibility of failure to honor a promised financial obligation and indicate “both the likelihood of default and any financial loss suffered in the event of default.”³¹

Moody's Long-Term Rating Definitions:

Aaa	Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.
Aa	Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.
A	Obligations rated A are considered upper-medium grade and are subject to low credit risk.
Baa	Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.
Ba	Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.
B	Obligations rated B are considered speculative and are subject to high credit risk.
Caa	Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.
Ca	Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.
C	Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.

Note: Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

Figure 17. Moody's long-term rating definitions. Moody's Website³²

²⁷ See <http://v3.moodys.com/Pages/atc.aspx>

²⁸ See <http://v3.moodys.com/Pages/atc002.aspx>

²⁹ See <http://v3.moodys.com/ratings-process/Rating-Process/002>

³⁰ See http://www.rbcpa.com/Moody%27s_ratings_and_definitions.pdf

³¹ See http://www.rbcpa.com/Moody%27s_ratings_and_definitions.pdf

³² See http://www.rbcpa.com/Moody%27s_ratings_and_definitions.pdf

Short-term ratings of Moody's are "opinions of the ability of issuers to honor short-term financial obligations"³³, in general with a maturity less than thirteen months.

SHORT-TERM RATINGS

P-1	Issuers (or supporting institutions) rated Prime-1 have a superior ability to repay short-term debt obligations.
P-2	Issuers (or supporting institutions) rated Prime-2 have a strong ability to repay short-term debt obligations.
P-3	Issuers (or supporting institutions) rated Prime-3 have an acceptable ability to repay short-term obligations.
NP	Issuers (or supporting institutions) rated Not Prime do not fall within any of the Prime rating categories.

Figure 18. Moody's short-term ratings. Moody's Website³⁴

Moody's credit analysis methodology is based on two main questions³⁵: What is the risk to the debt-holder of not receiving timely payment of principal and interest on this specific debt security? How does the level of risk compare with that of all other debt securities?

The primary focus of Moody's analysis is the measurement of the future cash generating ability of an issuer, including an evaluation of the issuer (i.e. issue structure, company structure, financial/operating position and management quality/structure) and an analysis of external factors (i.e. macroeconomic analysis, industry trends and country developments).

Moody's states that because credit ratings are subjective "any attempt to reduce credit rating to a formulaic methodology would be misleading and would lead to serious mistakes."³⁶ Moody's therefore applies a so called "universal" approach to risk analysis, which includes all relevant risk factors in arriving at a rating opinion. Moody's describes the basic analytical principles it pursues in doing so as follows³⁷:

- Emphasis on the Qualitative
- Focus on the Long-Term
- Global Consistency
- Level and Predictability of Cash Flow

³³ See http://www.rbcpa.com/Moody%27s_ratings_and_definitions.pdf

³⁴ See http://www.rbcpa.com/Moody%27s_ratings_and_definitions.pdf

³⁵ See <http://v3.moodys.com/ratings-process/How-to-Get-Rated/002001>

³⁶ See <http://v3.moodys.com/ratings-process/Ratings-Policy-Approach/002003>

³⁷ See <http://v3.moodys.com/ratings-process/Ratings-Policy-Approach/002003>

- Reasonably Adverse Scenarios
- “Seeing Through” Local Accounting Practices

Moody’s KMV is a subdivision of Moody’s Analytics specialized in providing practical state-of-the-art (quantitative) credit analysis methods and tools to lenders, investors, and corporations. By forming partnerships with their clients, Moody’s KMV “incorporate [their] credit risk measurement and modeling capabilities into solutions that allow businesses to better manage credit exposures.”³⁸ Figures 19 and 20 illustrate the dimensions of and solutions for optimal credit risk management according to Moody’s KMV.

Dimensions of Optimal Credit Risk Management				Moody's K-M-V
STAGE		MOODY'S KMV APPROACH	BENEFITS	SOLUTIONS
CREDIT RISK ASSESSMENT	Active Portfolio Management 4	Moody's KMV insight and solutions allow clients to form efficient strategies and actively manage credit risk across the portfolio.	<ul style="list-style-type: none"> Establish portfolio strategy to maximize returns and minimize credit risks Risk-based pricing at the portfolio level Reduce credit concentration using credit derivatives 	<ul style="list-style-type: none"> RiskFrontier DealAnalyzer Portfolio Manager Professional Services
	Portfolio Risk Measurement and Reporting 3	Moody's KMV enables clients to measure, value and monitor credit risk at the portfolio level across multiple asset classes.	<ul style="list-style-type: none"> Understand portfolio risk/return characteristics Calculate, allocate and monitor economic and regulatory capital Mark-to-market and transfer pricing 	<ul style="list-style-type: none"> Portfolio Manager CreditMark Professional Services
	Single Risk Management 2	Moody's KMV solutions measure and identify key risk drivers for borrowers, allowing clients to identify strategies for risk-based pricing, limit setting and risk tracking.	<ul style="list-style-type: none"> Utilize leading-edge quantitative default probabilities and loss given default measures Implement risk-based pricing from origination through repayment Enhance internal ratings systems by blending quantitative and qualitative factors Track credit risk migration: early warning tools provide alerts to high-risk borrowers 	<ul style="list-style-type: none"> CreditEdge Plus RiskCalc LossCalc RiskAnalyst Professional Services
	Data Foundation 1	Moody's KMV helps connect essential data sources and deliver critical information throughout the firm to ensure proper risk measurement and management.	<ul style="list-style-type: none"> Build uniform infrastructure across entire firm Collect, organize and store borrower data and financial statements at one single source Develop internal ratings framework Test efficacy of internal ratings over time 	<ul style="list-style-type: none"> RiskAnalyst MappingEdge Credit Research Database Professional Services

Figure 19. Dimensions of optimal credit risk management. Moody's KMV Website³⁹

³⁸ See <http://www.moodykmv.com/about/index.html>

³⁹ See http://www.moodykmv.com/dimensions/MoodyKMV_DimensionsOfOptimalCreditRiskManagement.pdf

SOLUTIONS DETAIL				
CREDIT RISK ASSESSMENT	Active Portfolio Management	Credit Dashboard <ul style="list-style-type: none"> Stress testing and scenario analysis DealAnalyzer <ul style="list-style-type: none"> Risk-based pricing Transaction analysis 	Portfolio Manager <ul style="list-style-type: none"> Credit portfolio analysis Risk transfer services CDO analysis 	Professional Services <ul style="list-style-type: none"> Customization and integration Advisory and consulting
	Portfolio Risk Measurement and Reporting	Portfolio Manager <ul style="list-style-type: none"> Credit portfolio analysis and reporting Economic capital allocation 	CreditMark <ul style="list-style-type: none"> Mark-to-Market valuation Transfer pricing 	Professional Services <ul style="list-style-type: none"> Customization and integration Advisory and consulting
	Single Risk Management	CreditEdge Plus <ul style="list-style-type: none"> Public firm EDF model EDFs updated daily Daily updated independent source of credit spreads Data File Service Web services LossCalc <ul style="list-style-type: none"> Loss Given Default model 	RiskAnalyst (ratings package) <ul style="list-style-type: none"> Expert internal rating system Deploys PD and LGD models RiskCalc <ul style="list-style-type: none"> Private firm EDF model Monthly updates of default risk 24 models including 18 country-specific models 	Professional Services <ul style="list-style-type: none"> Customization and integration Advisory and consulting
	Data Foundation	RiskAnalyst (financial package) <ul style="list-style-type: none"> Data collection and analysis Financial spreading & scorecard deployment MappingEdge <ul style="list-style-type: none"> Cross reference client data from multiple sources Data cleansing 	Credit Research Database <ul style="list-style-type: none"> Largest global collection of clean private firm data More than 170,000 private firm defaults covering 22 countries 	Professional Services <ul style="list-style-type: none"> Rating model validation and calibration Customization and integration Advisory and consulting

Figure 20. Solutions for optimal credit risk management. Moody's KMV Website⁴⁰

5.2.1.2 Standard & Poor's (S&P)

Standard & Poor's (S&P) has offices in 23 countries and "strives to provide investors who want to make better informed investment decisions with market intelligence in the form of credit ratings, indices, investment research and risk evaluations and solutions."⁴¹ S&P Ratings Services for corporate and financial institutions consists of fundamental credit analysis together with quantitative models. S&P uses a framework which considers all necessary issues and splits the analytical task into two main categories, namely business and financial analysis, as displayed in Figure 21.⁴²

⁴⁰ See http://www.moodykmv.com/dimensions/MoodysKMV_DimensionsofOptimalCreditRiskManagement.pdf

⁴¹ See <http://www.standardandpoors.com/about-sp/main/en/us/>

⁴² See <http://www2.standardandpoors.com/spf/pdf/fixedincome/methodology.pdf>

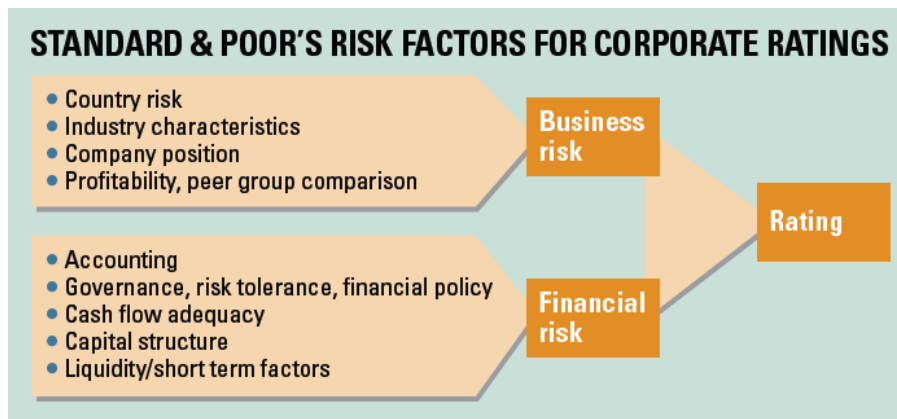


Figure 21. S&P's risk factors for corporate ratings. S&P's Website⁴³

Business risk evaluation typically covers industry dynamics (the company's operating environment, volatility, competitive factors, technological change, growth prospects, regulatory interference), country risk, competitive position (including market share analysis, profitability relative to other market players, product/service diversity, and cost efficiency), and management characteristics (i.e. management skills, philosophies, policies, consistency and credibility).⁴⁴

Financial risk is commonly displayed through a variety of quantitative measures, such as financial ratios.⁴⁵ Evaluating a company's accounting quality is the first step in assessing financial risk. Key financial indicators such as liquidity, leverage, and cash flow adequacy are the focal points of strong financial policy considerations. Profitability is a crucial point in the assessment of financial risk and often displayed in measures such as pretax preinterest return on capital, operating income as a percentage of sales, earnings on business segment assets, earnings before interest and taxes (EBIT), and earnings before interest and taxes and rent (EBITR).⁴⁶ Further elements of financial risk evaluation are the degree of leverage used by a company defining its capital structure (important aspects finding consideration in this context are asset valuation and off-balance-sheet financing), cash flow adequacy (displaying the most important aspect of all credit rating decisions, since "analysis of cash flow patterns can reveal a level of debt-servicing capability that is either stronger or weaker than might be apparent from earnings"⁴⁷) and financial flexibility ("the evaluation of a company's options under stress"⁴⁸).

⁴³ See <http://www2.standardandpoors.com/spf/pdf/fixedincome/methodology.pdf>

⁴⁴ See <http://www2.standardandpoors.com/spf/pdf/fixedincome/methodology.pdf>

⁴⁵ See <http://www2.standardandpoors.com/spf/pdf/fixedincome/methodology.pdf>

⁴⁶ See <http://www2.standardandpoors.com/spf/pdf/fixedincome/methodology.pdf>

⁴⁷ See <http://www2.standardandpoors.com/spf/pdf/fixedincome/methodology.pdf>

⁴⁸ See <http://www2.standardandpoors.com/spf/pdf/fixedincome/methodology.pdf>

The S&P rating process combines various financial measures with qualitative judgment on the company's competitive position and evaluation of management and its strategies. Because a rating ultimately is "only" an opinion, there is no standard formula for combining the business and financial risk rating results. It depends on the company and on the time-period reviewed whether a rating decision is influenced more by financial measures or business risk factors. All in all, however, the measures should be balanced accordingly to ensure a meaningful and reliable credit risk rating.

S&P offers a variety of credit assessment services, including the *Credit Assessment Templates* which provides "a formalized approach for assessing obligor and facility risks for specific industry segments"⁴⁹ and consists of qualitative and quantitative factors that generate a numerical score, which among others can be mapped to S&P's rating scales (illustrated in Figure 22 and 23).⁵⁰



General Summary of The Opinions Reflected by Standard & Poor's Ratings		
 Investment Grade	'AAA'	Extremely strong capacity to meet financial commitments Highest rating
	'AA'	Very strong capacity to meet financial commitments
	'A'	Strong capacity to meet financial commitments, but somewhat susceptible to adverse economic conditions and changes in circumstances
	'BBB'	Adequate capacity to meet financial commitments, but more subject to adverse economic conditions
	'BBB-'	<i>Considered lowest investment grade by market participants</i>
Speculative Grade 	'BB+'	<i>Considered highest speculative grade by market participants</i>
	'BB'	Less vulnerable in the near-term but faces major ongoing uncertainties to adverse business, financial and economic conditions
	'B'	More vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet financial commitments
	'CCC'	Currently vulnerable and dependent on favorable business, financial and economic conditions to meet financial commitments
	'CC'	Currently highly vulnerable
	'C'	A bankruptcy petition has been filed or similar action taken, but payments of financial commitments are continued
	'D'	Payment default on financial commitments
Ratings from 'AA' to 'CCC' may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the major rating categories.		

Figure 22. S&P's ratings category definitions. S&P's Website⁵¹

⁴⁹ See <http://www.standardandpoors.com/products-services/Credit-Assessment-Templates/en/us>

⁵⁰ See <http://www.standardandpoors.com/products-services/Credit-Assessment-Templates/en/us>

⁵¹ See http://www.gcc.standardandpoors.com/documents/ratings_list/S&P%20Guide%20to%20Credit%20Ratings.pdf

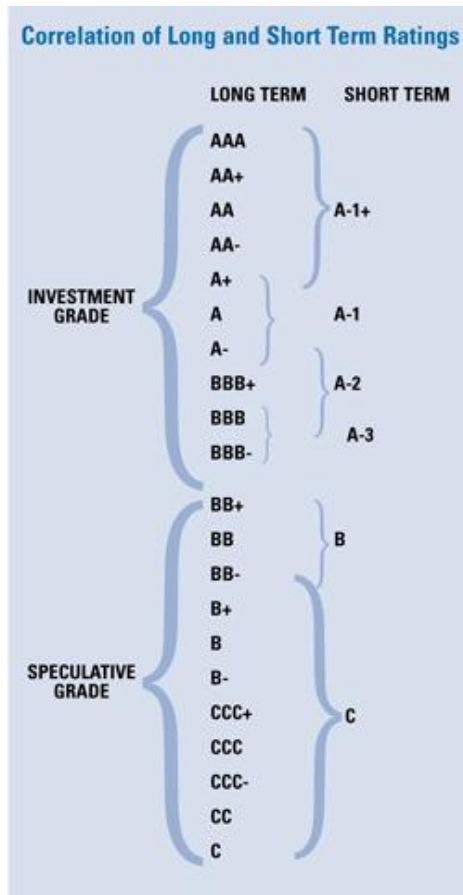


Figure 23. S&P: Correlation of Long and Short Term Ratings. S&P's Website⁵²

Quantitative credit risk models offer “analytical solutions to assist financial professionals with risk rating parameter estimation.”⁵³ S&P's *Credit Risk Tracker*, for instance, is “a Web-based tool that produces forward-looking, one-year probability of default estimates based on a time series of macroeconomic, financial, and industry-specific variables for privately held small and medium-sized enterprises (SME).”⁵⁴

The analyst driven rating process of S&P is illustrated in Figure 24.

⁵² See http://www.gcc.standardandpoors.com/images/ratings_chart.jpg

⁵³ See <http://www.standardandpoors.com/products-services/QCM/en/us>

⁵⁴ See <http://www.standardandpoors.com/products-services/CreditRiskTracker/en/us>

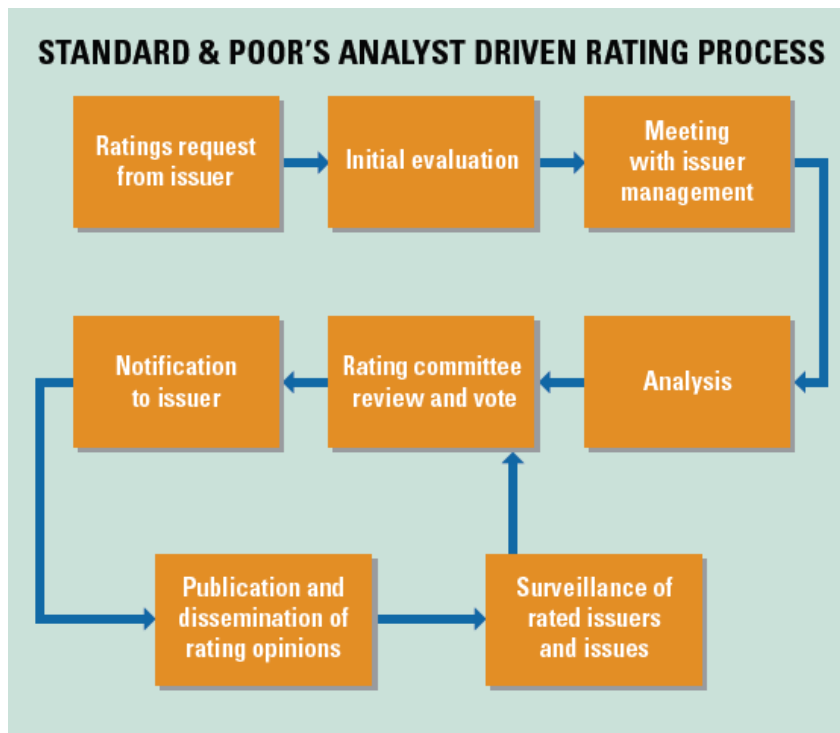


Figure 24. S&P's analyst driven rating process. S&P's Website⁵⁵

5.2.1.3 Fitch Ratings

Fitch Ratings is a global rating agency with 50 offices worldwide “committed to providing the world’s credit markets with reliable, timely and prospective credit opinions.”⁵⁶ It is part of the Fitch Group, which also includes Fitch Solutions and Algorithmics, two affiliates providing risk assessment, management and analysis services. The products of Fitch Solutions include ratings research, risk and performance analytics, surveillance and structured finance workflow solutions, pricing and valuation.

Fitch Ratings provides analysis of the global credit markets, including corporate finance, financial institutions, insurance companies, structured finance, public finance, global infrastructure and project finance. With their analysis Fitch Ratings “provides investors with an independent source of opinion and research to help them judge the credit quality of various investment options.”⁵⁷

The Corporate Finance analysis of Fitch Ratings continues to offer new methodologies and products, such as Recovery Ratings, which “provide investors with a consistent approach to measuring the primary components of credit risk:

⁵⁵ See http://www.gcc.standardandpoors.com/documents/ratings_list/S&P%20Guide%20to%20Credit%20Ratings.pdf

⁵⁶ See http://www.fitchratings.com/web_content/marcom/corporate_brochure.pdf

⁵⁷ See http://www.fitchratings.com/web_content/marcom/corporate_brochure.pdf

probability of default and loss given default.”⁵⁸ As already discussed in the description of the analytical processes of Moody’s and Standard and Poor’s (S&P), Fitch Ratings also consider both quantitative and qualitative factors in their assessments, analysis, and ratings. Fitch Solutions provides services such as the Fitch Risk and Performance Platform, which “provides market participants with a framework to measure and monitor credit risk and gain greater insight into the dynamics of the credit markets.”⁵⁹

The rating scale of Fitch Ratings is shown in Figure 25, which illustrates the relationship between Short-Term and Long-Term Ratings in Corporate Finance.

Rating Correspondence Table

Long-Term Rating	Short-Term Rating
AAA	F1+
AA+	F1+
AA	F1+
AA-	F1+
A+	F1 or F1+
A	F1
A-	F2 or F1
BBB+	F2
BBB	F3 or F2
BBB-	F3 or F2
BB+	B
BB	B
BB-	B
B+	B
B	B
B-	B
CCC	C
CC	C
C	C
RD/D	D

Figure 25. Long-term and short-term rating scales. Fitch Ratings Website⁶⁰

Credit ratings of Fitch Ratings “provide an opinion on the relative ability of an entity to meet financial commitments, such as interest, preferred dividends, repayment of principal, insurance claims or counterparty obligations.”⁶¹

The categories AAA to BBB imply investment grade, indicating relatively low to moderate credit risk, and BB to D speculative grade, either signaling a higher level of credit risk or that a default has already occurred.

⁵⁸ See http://www.fitchratings.com/web_content/marcom/corporate_brochure.pdf

⁵⁹ See <http://www.fitchratings.com/jsp/creditdesk/ProductsAndServices.faces?context=2&detail=112>

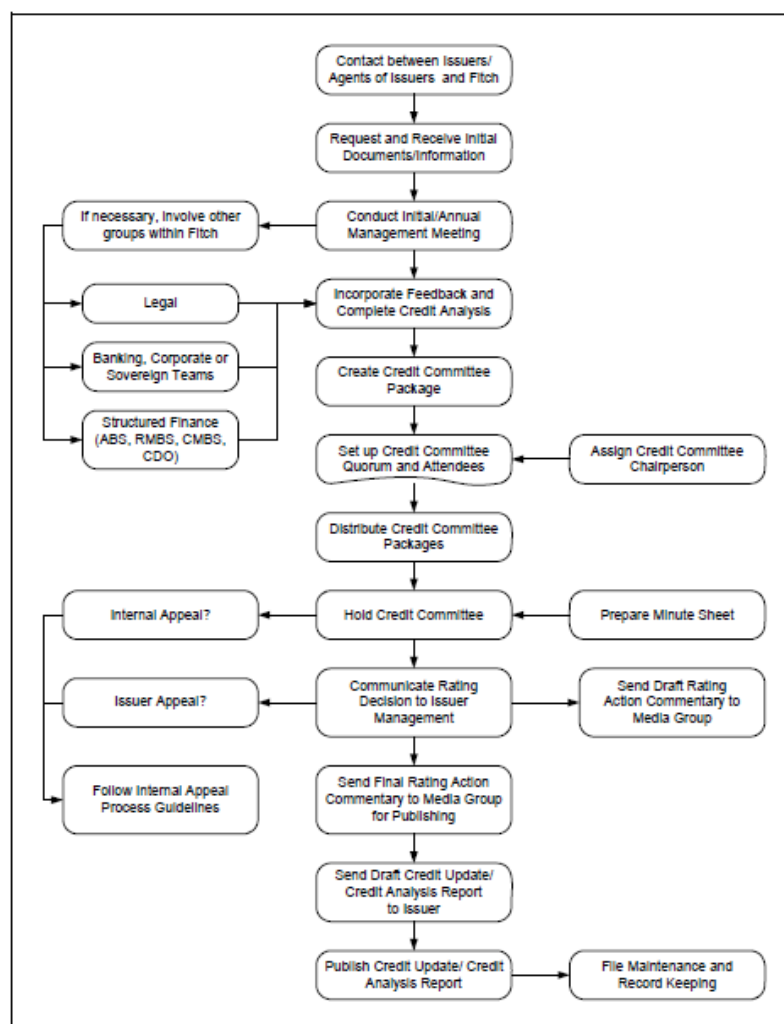
⁶⁰ See http://www.fitchratings.com/web_content/ratings/fitch_ratings_definitions_and_scales.pdf

⁶¹ See http://www.fitchratings.com/creditdesk/public/ratings_defintions/index.cfm

Fitch Ratings clearly states the limitations of credit ratings, as do all rating agencies. The limitations include that credit ratings are merely opinions based on established criteria and methodologies, forward looking and including views of future performance, not addressing any risk other than credit risk. They are opinions on relative credit quality, based on all information known to Fitch Ratings and believed to be reliable. They are not recommendations, they do not replace financial/legal/accounting/etc. advice, and they may be changed or even withdrawn for sufficient reasons.⁶²

Figure 26 illustrates the credit rating and appeal process of Fitch Ratings in more detail.

Credit Rating Process Flow Chart²



² Provided for illustrative purposes; timing and order of certain steps may vary

Figure 26. Fitch Ratings credit rating process flow chart. Fitch Ratings Website⁶³

⁶² See http://www.fitchratings.com/creditdesk/public/ratings_defintions/index.cfm

⁶³ See http://www.fitchratings.com/creditdesk/reports/report_frame.cfm?rpt_id=284030

The rating process begins with an entity or transaction being assigned to a Fitch Ratings analyst. The analysis and rating decisions are based on information received from a wide variety of sources, including publicly-available information on the issuer, as well as information received directly from the issuer. When the analysis has been conducted a committee process is applied to assign and review ratings. “The methodologies ... and the criteria that determine rating levels within each major methodology, are created and revised by the analytical teams.”⁶⁴ Fitch’s ratings are constantly monitored.

5.2.2 Internal Credit Risk Ratings

When implemented correctly, internal credit risk ratings systems of banks improve and simplify informed decision-making. They measure credit risk, group credits into risk categories, allow the monitoring of changes in the risk levels and finally support proper risk management to optimize returns. Credit risk rating systems also support other functions essential in banking activities, namely credit approval and underwriting, loan pricing, relationship management and credit administration, maintaining capital adequacy, portfolio management and the associated information systems.⁶⁵

The following internal credit risk assessment and rating procedure, which in general is of similar nature compared to those of external rating agencies, is described precisely at this point to transmit an in-depth understanding of the factors considered internally in bank credit risk rating systems. As credit risk practically exists in all income-producing activities, its identification and explicit rating are the essential primary steps in proper credit risk management. Where the large rating agencies are reserved in giving out specific information about the factors incorporated in their risk rating process, the following section gives detailed characteristics of the internal-rating methodology of banks.

One must bear in mind, however, that there is no single ideal credit risk rating system in practice for banks, as each institute reflects different complexities of its

⁶⁴ See http://www.fitchratings.com/creditdesk/reports/report_frame.cfm?rpt_id=284030

⁶⁵ See <http://www.occ.treas.gov/handbook/RCR.pdf>

lending activities and involves numerous levels of risk involved.⁶⁶ Nonetheless should all risk rating systems have following characteristics:⁶⁷

- It should be integrated into the bank's overall portfolio risk management,
- It needs to be approved by the board of directors and assigned clear responsibilities for the rating process,
- All credit exposures should be rated,
- An adequate number of ratings should be assigned,
- Risk ratings must be timely and accurate,
- Rating criteria needs to be clear and precisely defined using objective and subjective factors,
- Both the borrower's expected performance and the transaction's structure should be reflected by the rating,
- Ratings should change when risk changes,
- Independently validated risk rating process, and
- Saving of proper documentation and support of the assigned ratings.

Due to the dynamics of the financial markets and the vast developments in the financial as well as banking industry, banks continuously "implement advanced portfolio risk management practices and improve their processes for measuring and allocating economic capital to credit risk."⁶⁸ Banks therefore have adopted the application of two rating systems, so called dual-rating systems. These dual-rating systems are divided into one for the default risk (a rating of the general creditworthiness of the obligor) and the other for expected loss (a rating for each facility outstanding), which allows banks to apply an even more specific risk analysis. Furthermore, banks are increasingly using external ratings in their own internal risk management systems. Banks "use public ratings to create credit models, and to fill gaps in their own default and loss data."⁶⁹ Colquitt (2007) states that by mapping internal rating systems to the assigned default rates of the rating agencies banks can develop more consistent and verifiable risk rating methodologies.

⁶⁶ See <http://www.occ.treas.gov/handbook/RCR.pdf>

⁶⁷ See <http://www.occ.treas.gov/handbook/RCR.pdf>

⁶⁸ See <http://www.occ.treas.gov/handbook/RCR.pdf>

⁶⁹ See <http://www.occ.treas.gov/handbook/RCR.pdf>

5.2.2.1 Credit Risk Assessment with Risk Rating Systems (RRS)

Crouhy et al. (2001) refer to internal risk rating systems simply as risk rating systems (RRS), giving a definition consistent with the one of a typical dual-rating system as mentioned before. The objective of RRS is “to generate accurate and consistent risk ratings, yet also to allow professional judgment to significantly influence a rating where this is appropriate” (Crouhy et al., 2001, p. 270).

The internal ratings-based approach is also relevant for supervisors, specifically in terms of “the role that an RRS can play in attributing regulatory capital” (Crouhy et al., 2001, p. 271). According to the proposal for an internal ratings based (IRB) approach to capital requirements for credit risk, set out by the Basel Committee on Banking Supervision, “such an approach, which relies heavily upon a bank’s internal assessment of its counterparties and exposures, can secure two key objectives consistent with those which support the wider review of The New Basel Capital Accord ... [namely] *additional risk sensitivity*, in that a capital requirement based on internal ratings can prove to be more sensitive to the drivers of credit risk and economic loss in a bank’s portfolio ... [and] *incentive compatibility*, in that an appropriately structured IRB approach can provide a framework which encourages banks to continue to improve their internal risk management practices.”⁷⁰

As is apparent in the previously displayed rating approaches of the large rating agencies and the above explanation of the basic elements of internal risk rating systems, the general framework to assess the financial and competitive strength of a potential borrower in RRS covers following fundamental points:

- Quantitative analysis of the financial statement (providing an **initial obligor rating**),
- Assessment of qualitative company aspects such as the analysis of the management, business environment and industry, as well as the country risk and the quality of the financial information and accounting practices (depending on these factors, the initial rating may either be downgraded/upgraded to provide a **final obligor rating**), and
- Additional evaluation of the third-party support, term, structure, and collateral (these factors provide the **final facility rating**, which may be above/below the final obligor rating).

⁷⁰ See <http://www.bis.org/publ/bcbcsca05.pdf>

5.2.2.1.1 Financial (Quantitative) Assessment

Analyzing a borrower's financial statements is essential to determine the initial and ongoing repayment capacity. The quantitative assessment of the financial-specific performance should identify trends and inconsistencies that could possibly affect the performance of the borrower and ultimately provide information on the financial health of the organization. The ability to withstand possible unexpected financial setbacks is a crucial characteristic of strong companies in a dynamic economy. In the financial assessment process the bank credit analysts study the borrower's earnings, cash flows, asset values, liquidity, leverage, access to capital markets, and financial size (to name the main factors only).

It is crucial that the reported (and hence assessed) financial data are transparent, accurate and reliable in order for correct conclusions to be drawn. Professional risk analysts need to rely on their judgment and look beneath the surface due to several reasons, among others because of the subjectivity of financial statements and their representation of merely historical information. This is the challenge of (credit) risk management.

Just as important as the financial statement quality and understanding the borrower's need for capital, however, is the company's accounting quality. This credit factor needs to be evaluated as well, especially in a worldwide economy full of global companies interacting partially over networks with different accounting principles and standards. Whether a company uses the Generally Acceptable Accounting Principles (GAAP) or the International Accounting Standards (IAS), it is essential for the credit analyst to understand how the potential borrower generates and reports the financial data.

5.2.2.1.1.1 Ratio Analysis

Ratio analysis provides a wide variety of information about the borrower's balance sheet and income statement. There are several categories of ratios, however, one must keep in mind that financial ratios are only indicators of strength/weakness and historical snapshots. While some individual ratios might be misleading, the aggregate view can very well be meaningful. However, only when compared to a defined standard that is being analyzed. Following are the most commonly used ratio categories.

5.2.2.1.1.1 Profitability

The evaluation of earnings and profitability ultimately gives insights on the company's operations and the impact on the quality of earnings. It aims at finding out if a company's "profits generate sufficient cash flows to serve as a source of debt repayment" (Colquitt, 2007, p. 143). Companies with high profitability are naturally preferred by banks, as they tend to be better able to respond to business adversity.

Ratio	Calculation	Definition	Analysis
Profitability Ratios			
Gross margin	$\frac{\text{gross profit}}{\text{net sales}} \times 100$	Gross margin is the difference (spread) between the cost of producing the goods and the price at which they are sold.	An increasing ratio may indicate better control of production costs. It may also be the result of higher prices due simply to inflation, not management ability. A decreasing ratio may indicate problems with cost control or production efficiency, or the need to reduce prices due to competitive pressure.
Operating profit margin	$\frac{\text{operating profit}}{\text{net sales}} \times 100$	The percentage of profits retained from each sales dollar after the cost of goods sold plus operating expenses have been deducted.	This ratio should remain stable or increase over time. Understanding changes in the ratio requires a detailed breakdown of SG&A.
EBITDA margin	$\frac{\text{EBITDA}}{\text{net sales}} \times 100$	A proxy for cash flow to sales.	This ratio should remain stable or increase over time.
Net profit margin	$\frac{\text{net profit}}{\text{net sales}} \times 100$	Net profit margin measures the business' ability to generate profit from each sales dollar.	In general, this ratio should move in the same direction as the gross and operating profit margins. Variance requires a closer look at nonoperating expenses and the company's ability to manage its tax position.
Dividend payout ratio	$\frac{\text{dividends}}{\text{net profit}} \times 100$	Measures percentage of earnings, after taxes and extraordinary items, paid to stockholders.	Over time, this ratio indicates the division of earnings between payments to stockholders and reinvestment in the business.
Direct cost and expense ratios	$\frac{\text{Cost of goods sold}}{\text{net profit}} \times 100$	Indicates the percentage of each sales dollar used to fund expense.	Upward trends in any of these ratios may indicate reasons for declining profitability.
	$\frac{\text{SG\&A}}{\text{net sales}} \times 100$	Indicates the percentage of selling expenses used for net sales.	Downward trends may indicate successful cost control measures or economies of scale.
	$\frac{\text{interest expense}}{\text{net sales}} \times 100$	Indicates the % of interest costs for each of sales.	

Figure 27. Profitability ratios. Colquitt (2007), Appendix: Key Ratios (p. 170-171)

5.2.2.1.1.2 Performance

"Performance ratios serve as indicators for how well management is generating profits with the company's capital" (Colquitt, 2007, p. 144). In other words, how well a company turns its assets into revenue and therefore increases shareholder value.

Ratio	Calculation	Definition	Analysis
Performance DuPont Formula			
Return on sales (ROS)	$\frac{\text{net profit before taxes}}{\text{net sales}} \times 100$	Measures operational efficiency for the amount of profit produced for each dollar of sales	
Return on assets (ROA)	$\frac{\text{net profit before taxes}}{\text{total assets}} \times 100$	Measures the return on investment represented by the business' assets.	Always remember to use net profit before taxes to eliminate the effects of different tax rates on profit; otherwise, any comparative analysis could be distorted.
Return on equity (ROE)	$\frac{\text{net profit}}{\text{tangible net worth}} \times 365$	Measures the rate of return on shareholders' equity.	This ratio provides a good gauge of management's ability to operate a profitable business.

Figure 28. Performance ratios. Colquitt (2007), Appendix: Key Ratios (p. 172)

5.2.2.1.1.1.3 Liquidity and solvency

“Liquidity ratios indicate how quickly a company can convert the operating assets into cash. Solvency is the ability to meet cash obligations as they become due” (Colquitt, 2007, p. 145). By evaluating a company's liquidity and solvency, banks can assess the company's levels of debt. Banks determine if a company has sufficient cash (liquidity) or cash equivalent resources to meet its short-term obligations. Solvency, on the other hand, deals with the company's planning of having sufficient cash in the medium and long-run.

Ratio	Calculation	Definition	Analysis
Liquidity Ratios			
Current ratio	$\frac{\text{current assets}}{\text{current liabilities}}$	Indicates current asset dollars available to pay current obligations.	This ratio does not take asset proportions into account. It assumes asset convertibility into cash, on time. Because it relates only to balance sheet accounts, it measures only one moment in time. Look at seasonality and mismatches in financing and cash flow.
Quick acid (acid test)	$\frac{\text{cash} + \text{marketable securities} + \text{net A/R}}{\text{current liabilities}}$	More accurate measure of current liquid assets available to pay current obligations.	This ratio still does not take collectability or timing of accounts receivable into account. It does eliminate reliance on sale of inventory in meeting obligations to short-term creditors.

Figure 29. Liquidity ratios. Colquitt (2007), Appendix: Key Ratios (p. 174)

5.2.2.1.1.1.4 Efficiency

By operating efficiently, companies can maximize their profits for any level of risk. Efficiency ratios accordingly “measure how working capital resources are handled” (Colquitt, 2007, p. 146). Issues such as credit-policies, inventory management and cash management all belong to the efficiency-category and are analyzed very specifically by bank risk analysts.

Ratio	Calculation	Definition	Analysis
Efficiency Ratios			
Sales to assets	$\frac{\text{net sales}}{\text{total assets}}$	The sales to assets ratio indicates the dollar amount of sales generated by each dollar invested in assets.	To understand changes in this ratio, you need to analyze how efficiently management handles specific categories of assets (e.g., receivables, inventory, and fixed).
Inventory days on hand (inv. DOH)	$\frac{\text{inventory}}{\text{cost of goods sold}} \times 365$	Inv. DOH is an indicator of management's efficiency in managing inventory. As a general rule, low or declining DOH means greater operating efficiency than high or increasing DOH.	Analyze the breakdown of inventory. Raw materials and finished goods are easily liquidated. Work in process is more difficult to sell if liquidation becomes necessary. An increase may also indicate a deliberate management decision to make a bulk purchase in anticipation of a sales surge or disruption in the supply of raw materials.
Accounts receivable days on hand (ARDOH)	$\frac{\text{net acc. receivable}}{\text{net sales}} \times 365$	Indicates management's collection and credit-screening abilities. As a general rule, low or declining DOH means greater operating efficiency than high or increasing DOH.	Analyze accounts receivable to determine if there are any concentrations (accounts representing 10% or more of total (ARDOH) receivables). This represents a higher degree of risk even with a low DOH ratio. Analyze receivables aging schedule. Even with a low DOH ratio, if most past due receivables are 120 days or older, there is a greater likelihood of charge-off.
Accounts payable days on hand (APDOH)	$\frac{\text{accounts payable}}{\text{cost of goods sold}} \times 365$ <small>Note: time period needs to be adjusted when looking at 3, 6, or 9 month results.</small>	Measures trade creditor financing of inventory. Indicates management's paying habits Increasing DOH may be indicative of cash flow problems.	Compare DOH calculation to the company's terms of Sale: How fast are they paying their bills? Are they taking advantage of discounts? Are they incurring service charges? In general, a firm with cash flow problems leans on its trade creditors first.
Working investment on sales	$\frac{(\text{A/R} + \text{Inv} - \text{A/P} - \text{accrued exp})}{\text{sales}} \times 100$	Measures how effectively the working capital accounts are being employed.	A declining ratio indicates more efficient operations
Sales to net fixed assets	$\frac{\text{net sales}}{\text{net fixed assets}}$	Indicates how efficiently a business uses its fixed assets. Shows how many dollars of sales are generated by each dollar of fixed assets.	A declining ratio may indicate recent additions to fixed assets or excess capacity. An increasing ratio may indicate reliance on old plant and equipment.

Figure 30. Efficiency ratios. Colquitt (2007), Appendix: Key Ratios (p. 171-172)

5.2.2.1.1.1.5 Leverage and debt

When analyzing a company's capital structure, banks pay close attention that companies don't rely solely on debt, as having debt increases the risk. "The capital structure represents the proportion of a company's debt and equity financing mixture that comprises its total capitalization" (Colquitt, 2007, p. 146). Financial leverage is the extent to which a potential borrower is using borrowed money and directly linked to the financial flexibility of a company. The higher the financial leverage, the higher the business and financial risk of the company. In other words the more debt the company has compared to equity, the lower the company's financial flexibility is, as the financial leverage is high.

Ratio	Calculation	Definition	Analysis
Debt Capacity Ratios			
Debt to assets	$\frac{\text{total liabilities}}{\text{total assets}}$	Indicates the degree to which assets are funded by external creditors.	The lower the ratio, the greater the cushion against creditor losses in the event of liquidation. Remember, the greater the business risk, the larger the equity cushion required.
Total liabilities to net worth	$\frac{\text{total liabilities}}{\text{net worth}}$	Measures how many dollars of outside financing there are for each dollar of shareholders' equity.	This ratio compares all debt to permanent capital. It indicates the firm's ability to leverage (do additional borrowing). A high ratio means high leverage and high risk.
Bank debt to net worth	$\frac{\text{bank debt}}{\text{net worth}}$	Measures how many dollars of bank financing there are for each dollar for shareholders' equity.	A low ratio means the firm has greater flexibility to borrow in the future.
Debt to tangible net worth	$\frac{\text{total liabilities}}{\text{tangible net worth}}$	A more accurate measure of creditors' ownership.	Intangible assets are subtracted from net worth as they are not physical assets and their liquidation value can be negligible.
Interest coverage	$\frac{\text{net profit before tax} + \text{interest exp.}}{\text{interest expense}}$	Measure the degree to which earnings can decline without affecting the company's ability to meet annual interest costs.	This calculation does not include leased assets and obligations under less contracts.
EBITDA/Interest expense	$\frac{\text{earnings before interest taxes depr. \& amort}}{\text{interest expense}}$	Excludes other income and/or expense that may distort the ratio.	
Debt/EBITDA	$\frac{\text{debt}}{\text{earnings before interest taxes depr. \& amort}}$		

Figure 31. Debt capacity ratios. Colquitt (2007), Appendix: Key Ratios (p. 173)

5.2.2.1.1.1.6 Cash Flow

Analyzing cash flow ratios is necessary to gain deeper insights of a company's liquidity and solvency. They "determine the amount of cash that can be generated over time and compare that to near-term obligations and how the company can meet them" (Colquitt, 2007, p. 152).

Ratio	Calculation	Definition	Analysis
Cash Flow Ratios			
Cash flow/ interest expense	$\frac{\text{cash flow}}{\text{interest expense}}$	Where cash flow = net income + depreciation + change in deferred taxes	High or increasing ratio is an indicator of debt repayment ability
Cash flow/ long-term debt	$\frac{\text{cash flow}}{\text{long-term debt}}$	Measures time firm needs to repay long term debt from its cash flow	
Cash flow/ total debt	$\frac{\text{cash flow}}{\text{total debt}}$	Measures time to repay total debt obligations with cash flow	

Figure 32. Cash flow ratios. Colquitt (2007), Appendix: Key Ratios (p. 174)

From the derived information of the ratio analysis a bank risk analyst can evaluate among others the financial flexibility of the potential borrower, which is indicated by the number of available options in responding to critical business situations (i.e. new investment opportunities, unexpected changes in the operating

environment). Crouhy et al. (2001) state that there exists an inverse relationship between financial flexibility and risk: the risk to extending credit becomes lower if a company has a high financial flexibility, and vice versa. Additional questions that arise during the analysis of the financial flexibility of a potential borrower are for example a company's optional financing sources (to avoid that the bank is the last resort), a company's exposure to legal problems or environmental liabilities, accessibility to capital markets, investment strategies, structural changes, and capital commitments (which affect future cash flows and hence future financial flexibility).

5.2.2.1.1.2 Asset valuation

Banks are concerned about how companies value their assets (i.e. the company as a whole, individual investments, certain balance sheet items) because "the value of the company's net worth [is crucial] in the event of bankruptcy or liquidation" (Colquitt, 2007, p. 151). There are many different types of valuation methods that companies apply, including historical cost valuations, general purchasing power adjusted historical costs, net realizable values or market values, replacement or reproduction costs, future discounted cash flows, asset specific index number adjusted historical cost, and valuations based on intertemporal cost allocation methods.⁷¹ The credit risk analyst therefore needs to be familiar with the different methods, as these can get very complex.

5.2.2.1.1.3 Cash flow adequacy

Because banks view cash as the primary source of debt repayment, analyzing a borrower's cash flows (from operating, investment and financing activities) and hence evaluating the company's ability to repay future external funding obligations is one of the most important objectives and tools in credit risk assessment of companies. According to Colquitt (2007) cash flow analysis is the essence of corporate credit analysis, because it reveals the factors that lead to a company's financial position. First the quality of the company's earnings is generally identified, which provides indications if the "earnings are [essentially] being generated from ongoing operations or from nonrecurring gains" (Colquitt, 2007, p. 161). Furthermore cash flow analysis also provides important information about the company's

⁷¹ See <http://webs2002.uab.es/dep-economia-empresa/BECGroup/tutorial/EDiewertTutorial/BarcelonaTutorialCh03.pdf>

profitability, working capital, available funds to service debt and available sources to finance long-term growth. Because earnings don't always accurately display a company's actual debt service capability, credit analysts principally "separate and evaluate the cash flows by identifying the origins and flows of a firm's sources and uses of cash" (Colquitt, 2007, p. 155).

5.2.2.1.2 Management

The assessment of a company's management is the next step of the internal credit risk rating procedure of a bank. Because the management is ultimately responsible for the company's performance, a detailed qualitative evaluation conducted as objectively as possible is necessary. Following are listed the main questions/aspects which need to be assessed when determining the competence of a company's management:

- How does the management implement the company's strategy and how consistent is this strategy to the core business?
- Is the management credible in terms of integrity and does it have the required skills and character attributes for the size of the business?
- Does the management follow a perspective that yields steadily growing revenues and ongoing profitability?
- Does the management pursue a constant course and do what it says that it will do?
- Does the management evaluate the future developments realistically and accordingly implement reasonable plans and policies?
- Does the management introduce and update methods and technology to stay current in terms of business operation?
- Does the management address problems promptly?
- How well does the management understand/know the marketplace?
- Does the management have the required experience and accordingly leadership ability?
- How is the composition and competency of the board of directors?
- Is the question of management succession settled?
- What is the management's philosophy regarding leverage, risk tolerance, growth, and acquisitions?

- Is the company reliant on any one individual?
- How does the management perform globally?
- Is the compensation of the management appropriate to the size and financial strength/progress of the company?
- Do personal issues affect the exertion of the management function (i.e. problems with the family, health impairment, conflicts/disputes with other employees or management members)?

5.2.2.1.2.1 Measuring Management Results

Measures such as stock prices, operating profits and net operating cash flows among others are often used to determine the performance of a company's management. The problem with these measures is that they don't account for the costs of (equity) capital as well as debt and therefore don't reflect profitable growth accurately. Also the common compensation systems for management (i.e. variable compensation, stock options and periodic bonuses) are often linked to short-term performance, therefore managers may not invest in projects promising long-term success. Value-driven corporate governance is the modern and current strategic corporate management concept with the goal of creating sustainable value for the company by ways of profitable growth, efficiency improvement and/or portfolio management. In this regard Stern Stewart & Co has developed the Economic Value Added (EVA) or Economic Profit concept as the true measure of corporate success. EVA is defined as "operating profits less the cost of all the capital employed to produce the earnings" (Stewart, 1991, p. 2) and "is entirely consistent with the standard capital budgeting rule: Accept all positive and reject all negative net present value investments" (Stewart, 1991, p. 2).

By linking management compensation to, for example, EVA, companies can prevent the short-term focus and the bonus-hunting mentality. Payments must be tied to actual value contribution and this in the long-run. Also compensation under the EVA model is linked to business opportunities and threats, rewarding value creation on the one hand and sanctioning the elimination of value on the other.

The implementation of such a value-driven system indicates to bank credit risk analysts that the management is concerned about the long-run profitability of the company, which naturally will positively influence the company's rating.

5.2.2.1.3 Industry

The assessment of industry risk “evaluates the environmental factors that are likely to affect ongoing and future business operations” (Colquitt, 2007, p. 175). Industries have strong dynamic forces, similar to global financial markets, which require bank’s credit risk analysts to know the specific effects that the industry characteristics are going to have on a company’s creditworthiness. Companies need to be compared to companies within the same business category to obtain meaningful results. One possible approach according to Colquitt (2007) is an industry-specific ratio analysis, covering the financial ratios described in the previous section. Overall, “credit specialists should understand how the economic structure of borrowers can affect their creditworthiness and how transactions are underwritten in order to minimize some of the inherent risks of credit loss” (Colquitt, 2007, p. 178).

The first step of the assessment of industry risk is the analysis of market environmental factors that drive the economic structure of an industry. Some factors include regulatory changes, taxes, changes in demand, and input costs. It is crucial for the bank risk analyst to understand the business cycle, which rotates around its market demographics and economic structure of an industry to assess credit risk issues correctly. It is also necessary to consider “the specific variables inputs relative to the size and product mix used by the sectors within which firms operate” (Colquitt, 2007, p. 181). The evaluation of a company’s product line diversity is just as important as the various techniques that banks can use to assess a company’s competitive position. Following the fundamentals of these models will be presented.

5.2.2.1.3.1 Porter Model

The Porter Model, depicted in Figure 33, enables the analysis of competitive industry structure by evaluating “a firm’s industry position according to five competitive forces that Porter defines to be critical factors in determining the long-run profitability and industry attractiveness of a borrower” (Colquitt, 2007, p. 185). These forces are:

- Threat of new entrants,
- Bargaining power of suppliers,
- Bargaining power of buyers,
- Threat of substitutes and
- Industry competitors (Intensity of rivalry).

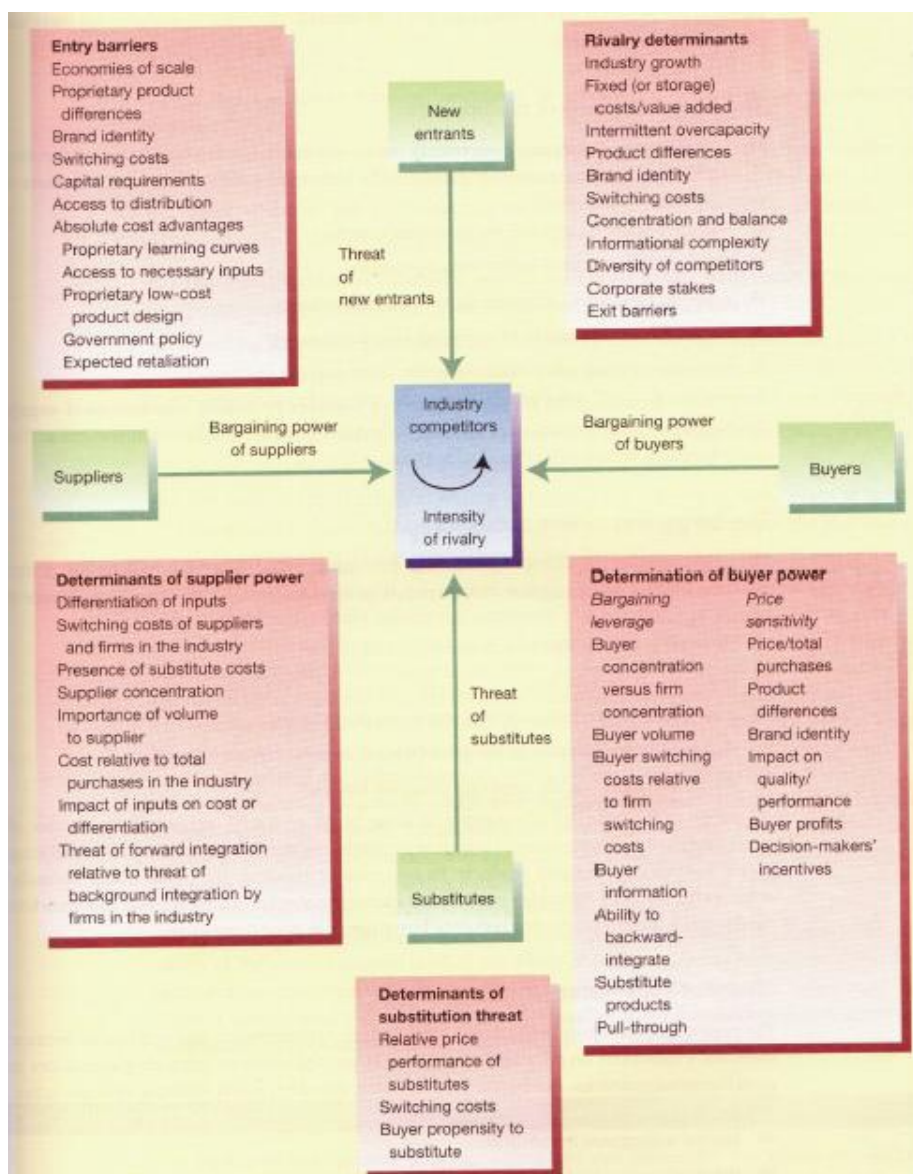


Figure 33. Porter model. Jobber (2004). p. 679

5.2.2.1.3.2 Pestel Analysis

The Pestel or Pest Analysis “evaluates the external forces that can impact an industry and gauges the future market potential for the growth or decline of a product or firm” (Colquitt, 2007, p. 191). Figure 34 illustrates the environmental factors that companies face, namely political, economic, social and technological forces. Most importantly for a company’s risk rating is how the bank’s credit risk analyst perceives and judges the company’s response to these risks.

Pest Analysis

Political (incl. Legal)	Economic	Social	Technological
Environmental regulations & protection	Economic growth	Income distribution	Government research spending
Tax policies	Interest rates & monetary policies	Demographics, population growth rates, age distribution	Industry focus on technological effort
International trade regulations & restrictions	Government spending	Labor/social mobility	New inventions & development
Contract enforcement law Consumer protection	Unemployment policy	Lifestyle changes	Rate of technology transfer
Employment laws	Taxation	Work/career & leisure attitudes Entrepreneurial spirit	Life cycle & speed of technological obsolescence
Government organization/ attitude	Exchange rates	Education	Energy use & costs
Competitive regulation	Inflation rates	Fashion, hypes	(Changes in) information technology
Political stability	Stage of the business cycle	Health consciousness & welfare, feelings on safety	(Changes in) Internet
Safety regulations	Consumer confidence	Living conditions	(Changes in) mobile technology

Figure 34. Pestel Analysis. Colquitt (2007). p. 192

5.2.2.1.3.3 SWOT-Analysis

The SWOT-Analysis is “a structured approach to evaluating the strategic position of a business by identifying its strengths [S], weaknesses [W], opportunities [O] and threats [T]” (Jobber, 2004, p. 44). While the strengths and weaknesses are internal forces under the control of management, the opportunities and threats are uncontrollable external forces. By assessing a company’s business strategy and product line, the bank risk analyst can get a good overview of the company’s position and the forces that it is exposed to.

Figure 2.2 Strengths, weaknesses, opportunities and threats (SWOT) analysis

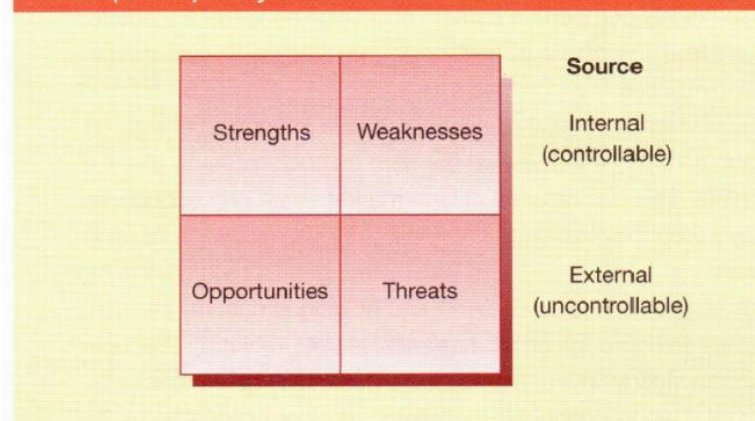


Figure 35. SWOT-Analysis. Jobber (2004). p. 44

Industry Life Cycle

The evaluation of the industry life cycle provides insights on a company's financial position as well as attractiveness in the industry. Depending on which stage the company is in, its financing needs and repayment ability will vary. For example during the maturity growth stage, when the market has become relatively saturated by the industry and market demand starts to decline, companies try to take over market shares from competitors "in an effort to stimulate growth. Often, bank loans are the largest source of capital at this stage, and most industries will usually have sufficient assets to support the loan financing" (Colquitt, 2007, p. 197).

Figure 36 displays the product life cycle, which is congruent to the stages of the economical life cycle of industries (development, rapid expansion, growth shakeout, mature growth, stabilizing/decline).

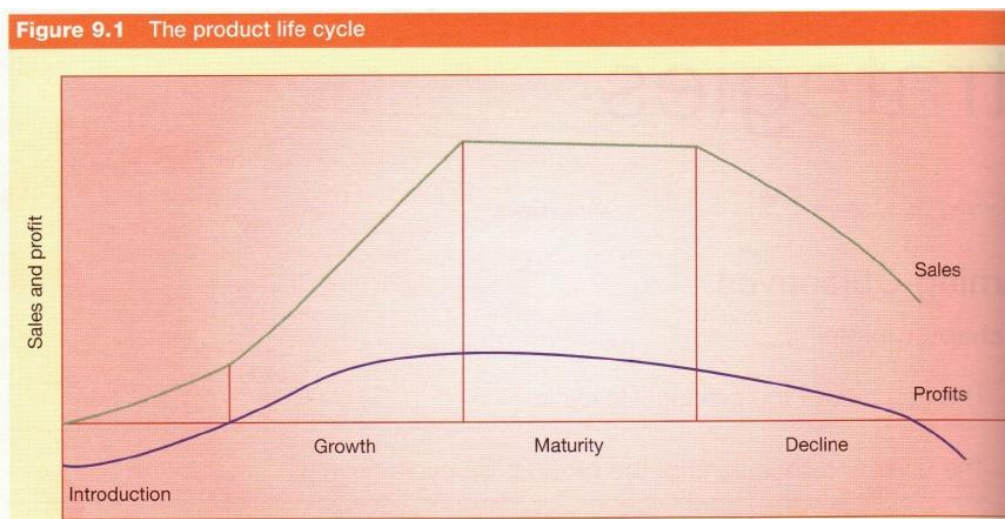


Figure 36. Product life cycle. Jobber (2004). p. 308

5.2.2.1.4 Country risk

As banks continue to pursue the strategy of diversification and expanding their sources of profitability by doing business abroad, they are increasingly exposed to country risk, which is "the risk that economic, social, and political conditions and events in a foreign country will affect an institution."⁷² According to Crouhy et al. (2001) country risk exists if a potential borrower or obligor has a certain percentage of its cash flow or assets located outside of the local market. By accounting for country risk as an additional risk that a company is exposed to in the credit rating

⁷² See <http://www.occ.treas.gov/handbook/countryrisk.pdf>

process, banks can assign certain necessary adjustments to the obligor rating. This way there is a “precautionary” ceiling (in terms of a specific rating) that a company cannot exceed (i.e. if the country rating is classified as deteriorating, then the best possible obligor rating is a lower average rating class as well). Likewise if for instance the rating of a mother institution is marginal, an affiliate cannot be classified any better.

5.2.2.1.5 Third-Party Support

If a credit rating is to be improved because of the existence of a guarantor, the bank risk analyst “must be convinced that the third party / owner is committed to ongoing support of the obligor” (Crouhy et al., 2001, p. 298). To assess the quality of the third-party support banks have different rules and may apply varying frameworks, which provide the basis for up- or downgrading the risk rating of a company. In any case “personal guarantors and other undertakings from individuals, and guarantees for less than 100 percent of the indebtedness, do not qualify for considerations in this category” (Crouhy et al., 2001, p. 298).

5.2.2.1.6 Term

Considering the maturities of transactions in the risk rating process is necessary, as long-term facilities are associated with higher levels of risk than short-term facilities. “A standard approach is to combine the adjusted facility rating (after any third-party support adjustment ...) with the remaining term to maturity in order to determine the adjustment to the facility rating” (Crouhy et al., 2001, p. 299).

5.2.2.1.7 Structure

In the process of generating a risk rating bank credit risk analysts also review how strongly the transaction or facility is structured. “Underwriting is the process by which banks structure a credit facility to minimize risks and generate optimal returns for the risks assumed.”⁷³ For example, certain conditions and covenants attached to the facility, or the priority of the security are important information that enable proper adjustments to be made to the initial rating. Crouhy et al. (2001) illustrate a few instances that fall under the category of structure adjustments. For example, if a bank

⁷³ See <http://www.occ.treas.gov/handbook/RCR.pdf>

needs to evaluate a corporate organization that is highly dependent on related operating companies who have their own financing, the only responsible action for the bank is to downgrade the company's rating accordingly. Also, if a bank's loan is subordinated, putting the bank's position (in terms of the security) significantly behind other creditors, the company also needs to be downgraded. Finally, credit risk increases if the pressure on banks due to competition causes them to reduce their underwriting and structural protections.⁷⁴

5.2.2.1.8 Collateral

"Collateral, the most common form of credit risk mitigation, is any asset that is pledged, hypothecated, or assigned to the lender and that the lender has the right to take possession of if the borrower defaults."⁷⁵ In case of default the collateral can be sold and hence reduce the loss of the bank. There are several other secondary repayment sources that can be arranged by the parties, including guarantees, letters of credit, credit derivative, and insurance. All of these mitigants need to be evaluated conservatively as it would be in a liquidation scenario, as they often depend on fluctuating market rates. The incentive for banks to hold collateral is that it can significantly reduce losses in case of a borrower's default.

⁷⁴ See <http://www.occ.treas.gov/handbook/RCR.pdf>

⁷⁵ See <http://www.occ.treas.gov/handbook/RCR.pdf>

6 The Basel II Capital Accord and Credit Risk

6.1 Introduction

Because banks have a key function in the worldwide economy and international banking is rapidly growing, it is no surprise that they underlie strict regulations at the global level, which extensively aim at controlling the risks of extending business credit. As credit risk management by now has arrived at a high level of sophistication, its regulation is a crucial aspect which “desire[s] not only to limit losses but to take an active part in the process of “shareholder value creation,” which is (or, at least, should be) the main goal of any company’s top management” (Balthazar, 2006, p. 1).

The goal of the 1988 Basel Capital Accord (Basel I) was to ultimately reduce the risk of the international financial system by establishing “a single set of capital adequacy standards for international banks” (Heffernan, 2005, p. 182), requiring these to hold a capital level equivalent to minimum 8% of their risk weighted assets (and at least half, 4%, in the core capital). Capital under this Accord was divided into two classes by function of its quality: Tier 1 (core capital), including the shareholder’s equity and retained earnings, and Tier 2 (supplementary capital), containing the additional internal and external resources available to banks. The risk weights were assigned to assets by credit type to reflect their assumed risk level, resulting in some assets not having any capital requirements whereas others did. Figure 37 illustrates the exposure classes in Basel I, from which ultimately the minimum capital requirements could be derived.

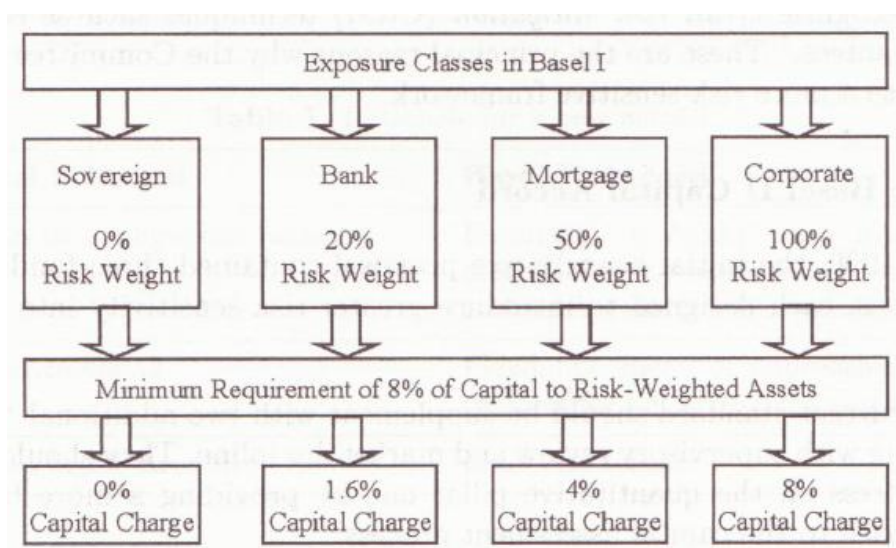


Figure 37. Exposure classes in Basel I. Benzin et al. (2003). p. 3

The mathematics underlying the Basel I approach are displayed by means of following example, pointing out the different results in terms of minimum capital requirements due to the different risk weights for claims on corporates and banks, given an equivalent exposure of EUR 1 Mio.:

Claims on Corporates:

Risk-Weighted Assets (RWA) = Exposure · Risk Weight

$$= \text{EUR } 1 \text{ Mio.} \cdot 100\% = \text{EUR } 1.000.000$$

Minimum Capital Requirement (MCR) = RWA · Minimum Requirement of 8%

$$= \text{EUR } 1.000.000 \cdot 8\% = \text{EUR } 80.000$$

Claims on Banks:

Risk-Weighted Assets (RWA) = Exposure · Risk Weight

$$= \text{EUR } 1 \text{ Mio.} \cdot 20\% = \text{EUR } 200.000$$

Minimum Capital Requirement (MCR) = RWA · Minimum Requirement of 8%

$$= \text{EUR } 200.000 \cdot 8\% = \text{EUR } 16.000$$

According to Benzin, Rachev & Trück (2003) Basel I also included a weighting scheme for off-balance sheet items, which required a relatively complicated approach: so called Credit Conversion Factors (CCF) were applied to transform the off-balance sheet items into their on-balance equivalents, and subsequently these items were weighted according to the counterparty's risk weight.

Even though Basel I was a benchmark for banking regulation, it had several weaknesses. Apart from the possibility under Basel I to “lower capital requirements while keeping the risk level almost unchanged” (Balthazar, 2006, p. 35), a process called “capital arbitrage”, its lack of risk sensitivity and diversification, limited recognition of collateral and incomplete coverage of risk sources (considering only credit risk and neglecting other important risk factors such as market, operational and strategic risk) were the main points of criticism.

The development of the Basel II Capital Accord published in 2006 was based on the integration of these missing factors and “involve[d] an important revision of the rules for credit risk towards higher risk sensitivity as well as greater reliance on the bank's internal expertise, internal historical databases, risk methodologies, models and risk-parameter estimates” (Van Gestel & Baesens, 2009, p. 347).

Basel II contains three essential innovations, which are summarized by Benzin et al. (2003) as follows: the implementation of two pillars dealing with supervisory review and market discipline, in addition to the existing quantitative pillar, provide a more balanced approach to the capital assessment process; the use of internal rating systems to evaluate credit risk is permitted for banks with advanced risk management capabilities; and the grading by the external rating agencies are allowed for classifying the banks' sovereign, corporate and bank claims.

While the previous chapters of this paper were dedicated to the theoretical and practical aspects of banking, risk management and specifically credit risk management, following section will focus on the Basel II Capital Accord concerning regulatory measurement of credit risk. The connection between the previously displayed (internal and external) credit risk rating systems and the regulatory framework will be provided, giving specific insights in how modern risk management methodologies are becoming part of the new regulatory and corporate risk environment.

6.2 Structure of Basel II

The Basel II Capital Accord is structured in three main pillars, illustrated in Figure 38, which according to Balthazar (2006) together aim at increasing the quality and stability of the international banking system, creating and maintaining a level playing field of internationally active banks and promoting the adoption of better risk management practices.

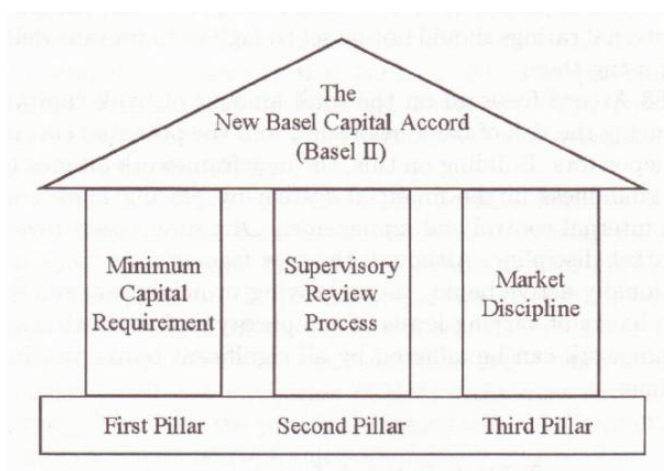


Figure 38. Structure of Basel II. Benzin et al. (2003). p. 6

6.2.1 Pillar 1: Minimum Capital Requirements

The first pillar deals with the minimum capital requirements (MCR) and defines the minimum ratio of capital to risk weighted assets (RWA). The main concern of the Basel II framework is therefore the adequate measurement of bank capital. Following, the capital ratio under the new Accord is displayed:

$$\frac{\text{Total Capital}}{\text{Credit Risk} + \text{Market Risk} + \text{Operational Risk}} = \text{Bank's Capital Ratio} > 8\%$$

It contains “both the current definition of the total capital and the minimum requirement of at least 8% of the bank’s capital to RWA” (Benzin et al., 2003, p. 6), however, the way the assets are valued has been fundamentally refined in the new Accord. An innovation of the first pillar is also that it provides banks an incentive to increase their internal risk management practices as “capital requirements should now be more closely aligned to internal economic capital estimates” (Balthazar, 2006, p. 44). Furthermore, it recognizes various additional types of collateral to balance the risks. The capital ratio formula specifically contains three different types of risk (namely credit-, market- and operational risk) that the capital ratio depends on. All of these types of risk will be presented in the following, however, as this paper focuses specifically on credit risk, only the credit risk measurement methods will be displayed in depth.

6.2.1.1 Credit Risk Measures

As illustrated in Figure 39, Basel II provides two approaches to measure credit risk, namely the Standardised (STD) Approach and the Internal Ratings-Based (IRB) Approach.

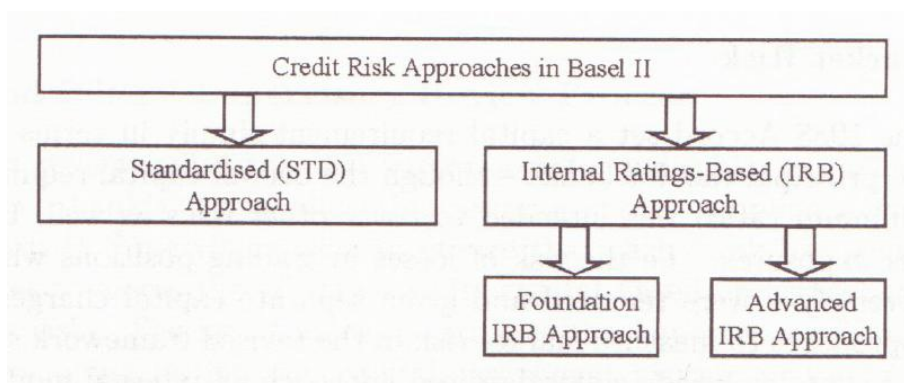


Figure 39. Credit risk approaches in Basel II. Benzin et al. (2003). p. 7

6.2.1.1.1 The Standardised (STD) Approach

“Banks lacking sophisticated models for assessing risk will be required to adopt the standardised approach under Basel 2” (Heffernan, 2005, p. 195). The STD Approach is more risk sensitive than the approach under Basel I, but follows the same concept. The most important modification is the application of a wider range of risk weightings (from 0% for very low risk to 150% for high risk loans), as illustrated in Figure 40. These “risk weights are no longer a function only of the counterparties’ types (banks, corporate ...) but also integrate their estimated risk level through the use of external ratings” (Balthazar, 2006, p. 50).

RWA	AAA to AA- (%)	A+ to A- (%)	BBB+ to BBB- (%)	BB+ to BB- (%)	B+ to B- (%)	Below B- (%)	Unrated (%)
Sovereign	0	20	50	100		150	100
Banks option 1	20	50		100		150	100
Banks option 2 (ST claims)	20 (20)	50 (20)		100 (50)		150 (150)	50 (20)
Corporate	20	50	100		150		100
Retail				75			
Residential property				35			
Commercial real estate				100			

Note: ST = Short-term.

Figure 40. RWA in the Standardised Approach. Balthazar (2006). p. 50

To understand the calculations behind these modifications, take for example two corporate lenders with varying ratings:

- Corporate 1: Rating **A+**
 - Risk weight: **50%**
 - 50% of 8% = **4%**
 - The bank is required to set aside **4%** of the value of the loan as capital.
- Corporate 2: Rating **B+**
 - Risk weight: **150%**.
 - 150% of 8% = **12%**
 - The bank is required to set aside **12%** of the value of the loan as capital.

As one can see from the calculations above, the bank is required to hold less of the loan as capital the better the corporate rating, respectively the lower the risk weight is. “The changes give banks an incentive to loan to more highly rated corporations, whereas under Basel 1, the amount of capital to be set aside was always the same, [namely 8%,] independent of corporations’ risk profiles” (Heffernan, 2005, p. 196).

The STD Approach also includes off balance sheet items as a category of risk, which “are converted into credit equivalent exposures through the use of a Credit Conversion Factor (CCF), as in Basel [1]” (Balthazar, 2006, p. 52). Figure 41 illustrates the CCF for the STD Approach.

%	Item
0	– Commitments unconditionally cancellable without prior notice
20	– Short term self-liquidating trade-related contingencies (e.g. documentary credit collateralized by the underlying goods). – Undrawn commitments with an original maturity of max. 1 year
50	– Transaction-related contingencies (e.g. performance bonds) – Undrawn commitments with an original maturity > than 1 year
100	– Direct credit substitutes (e.g. general guarantees of indebtedness ...) – Sale and repurchase agreements – Forward purchased assets – Securities lending

Figure 41. CCF for the STD approach. Balthazar (2006). p. 52

6.2.1.1.2 Internal Ratings-Based (IRB) Approach

The IRB Approach allows and encourages banks to use their own internal ratings to assess credit risk in their portfolios. “By forcing banks to “scale up” their risk-weighted reserves by 6% if they use the standardized approach, the Basel Committee offers banks the possibility of lower reserve holdings—and thus higher profitability—if they adopt these internal approaches” (Balin, 2008, p.8). The goal of this approach, hence, is to reward banks with sophisticated risk weighting systems by lowering the amount of capital they are required to set aside to cover credit risk. Also

this option should increase “the likelihood that ratings will be based on *economic capital*, the capital set aside to cover unexpected losses” (Heffernan, 2005, p. 197) rather than regulatory capital, based on regulatory requirements such as the risk weightings under Basel I or II.

Heffernan (2005) names some of the conditions that banks must satisfy in order to be approved the application of the IRB approach as follows:

- Differentiation of credit risk.
- Clear criteria for the internal rating system.
- The probability of default (PD) is estimated for each group of borrowers assigned to internal grades.
- Banks must have a certain amount of years of PD data.
- Internal validation.
- The bank can use its own risk components; however, supervisors must approve the method by which the risk components are converted into risk weights for the computation of risk weighted assets.
- A bank’s internal ratings and VaR must be part of an integrated risk management system.

“Consistent with the Basel Committee’s objectives, [the IRB approach] is intended to produce a capital requirement more closely linked to each bank’s actual credit risks – a lower-quality portfolio will face a higher capital charge, a higher-quality portfolio a lower capital charge” (Saidenberg & Schuermann, 2003, p. 8). The IRB approach is based on four key parameters used to estimate credit risks, illustrated in Figure 42.

Symbol	Name	Comments
PD	Probability of default	The probability that the counterparty will not meet its financial obligations
LGD	Loss given default	The expected amount of loss that will be incurred on the exposure if the counterparty defaults
EAD	Exposure at default	The expected amount of exposure at the time when a counterparty defaults (the expected drawn-down amount for revolving lines or the off-balance sheet exposure \times its CCF)
M	Maturity	The average maturity of the exposure

Figure 42. Parameters of the IRB approach. Balthazar (2006). p. 58

According to Saidenberg and Schuermann (2003) these parameters are used to estimate two types of expected loss (*EL*) for a given maturity:

- **Expected loss as an amount:**

$$EL = PD \cdot LGD \cdot EAD$$

- **Expected loss as a *percentage* of exposure at default:**

$$EL \% = PD \cdot LGD$$

To exemplify the practical application of these formulas, consider following situation: A bank gives a “BBB” rated company a EUR 10 Million, 5-year term loan. Assuming that the bank maps its internal credit rating to that of a rating agency, say S&P, it receives an equivalent PD of 1.8% (S&P 5 years cumulative default rate). The EAD is 100% as we assume for simplicity that the EUR 10 Million loan is fully drawn if default occurs, and the bank estimates LGD to be 50%.

- **EL** = 1.8% · 50% · 100% = EUR 90.000
- **EL %** = 1.8% · 50% = 0.9%

There are two IRB approaches available to banks, namely the Foundation and Advanced IRB Approach. Figure 43 illustrates the differences between these approaches.

- In the **Foundation IRB Approach** “banks, with the approval of regulators, can develop probability of default models that provide in-house risk weightings for their loanbooks” (Balin, 2008, p. 8). The assumptions of the risk parameters in these models, however, are provided by the regulators.
- The **Advanced IRB Approach** is basically the same as the first approach, except that “all four parameters are determined by the bank and are subject to supervisory review” (Saidenberg and Schuermann, 2003, p. 9). Hence, this approach can only be used by the largest banks that have the most complex and advanced systems.

Data Input	Foundation IRB	Advanced IRB
Probability of default (PD)	Supplied by bank-based on own estimates	Supplied by bank-based on own estimates
Loss given default (LGD)	Supervisory values set by Basel	Supplied by bank-based on own estimates
Exposure at default (EAD)*	Supervisory values set by Basel	Supplied by bank-based on own estimates
Maturity (M)**	Supervisory values set by Basel or at the discretion of national supervisors, supplied by bank-based on own estimates, with an allowance to exclude some exposures (e.g. make them fixed maturity)	Supplied by bank-based on own estimates, with an allowance to exclude some exposures (e.g. make them fixed maturity)

* EAD: refers to loan commitments – the amount of a loan or credit line that is likely to be drawn at the time of default, and equivalent to potential credit exposure (PCE) discussed in Chapter 3.

** In IRB, the average maturity is assumed to be 3 years, though under special cases, adjustments will be possible: a minimum of 1 year and a maximum of 7.

Source: BIS (2003a), p. 5.

Figure 43. Foundation and Advanced IRB Approach. Heffernan (2005). p. 197

Balin (2008) states that the reliability of the credit risk parameters listed above is a crucial issue with respect to the IRB Approach. This is so because banks base their capital charges on these parameters and hence depend on their accuracy and reliability. Therefore “it is essential that prior to IRB implementation supervisors ensure that a bank’s internal processes for determining internal risk ratings, *PDs*, *LGDs*, and *EADs* are credible and robust” (Balin, 2008, p. 11). To achieve this there are certain minimum operational standards, based on best practices in the banking industry, that Basel II requires banks to comply with.

Following are the main benefits of the IRB Approaches for regulators as well as bankers:

- “[T]hey encourage banks to take on customers of all types with lower probabilities of default by allowing these customers lower risk weightings” (Balin, 2008, p. 8), which ultimately translate into lower reserve requirements and higher profitability for a bank.
- They also “allow banks to engage in self-surveillance: excessive risk-taking will force them to hold more cash on hand, causing banks to become unprofitable” (Balin, 2008, p. 8). This self surveillance also decreases the costs of regulation.

- ““Poor” risks can no longer hide under a rather arbitrary risk “category,” preventing the tendency of banks to “wiggle” risks around category-based weights.” (Balin, 2008, p. 8).

6.2.1.2 Credit Risk Mitigation

Credit Risk Mitigation (CRM) is a decisive part of both credit risk approaches under Basel II as it “relates to the reduction of credit risk by – for example – taking collateral, obtaining credit derivatives or guarantees or taking an offsetting position subject to a netting agreement” (Benzin et al., 2003, p. 14). As under Basel I only certain credit risk mitigants of the highest quality were recognized, resulting in an “all-or-nothing” approach, Basel II recognizes a wider range of credit risk mitigants for regulatory capital purposes. However, the application of CRM techniques bears certain risks, two of which are the legal (un)certainty and the difficulty to manage the collateral.

Figure 44 illustrates the eligible collateral under the Standardised IRB Approach and the differences between the simple and comprehensive approach to integrate the use of collateral into the calculation of RWA.

Collateral approach	Simple approach	Comprehensive approach
Impact on RWA	Covered exposure receives the risk-weight of the collateral with a minimum of 20%	Exposures are reduced by the value of collateral and the net result is risk-weighted as unsecured
Eligible collateral	<ul style="list-style-type: none"> ■ Cash on deposits at the issuing banks ■ Gold ■ Debt securities rated by ECAI at least: BB– for sovereigns (and assimilated PSE), BBB– for other; A–3/P–3 for short-term ■ Unrated debt securities if they are: issued by a bank, senior, liquid, listed on a recognized exchange ■ Equities (including convertibles bonds) included in a main index ■ Undertakings for Collective Investments in Transferable Securities (UCITS) and mutual funds if: quoted daily and invested only in the instruments mentioned above 	
		<ul style="list-style-type: none"> ■ Equities (including convertibles bonds) not included in a main index but listed on a recognized exchange ■ UCITS and mutual funds which include such equities

Figure 44. Collateral approach under Basel II. Balthazar (2006). p. 54

Under the IRB Approach the main components of recognized financial collateral include those of the Standardised Approach and additionally other CRM

types such as Commercial Real Estate (CRE) and Residential Real Estate (RRE), equities traded on a main index, receivables, and other physical collaterals. In the Foundation IRB Approach, however, “the recognition of the effect of those [additional] CRM is rather limited” (Balthazar, 2006, p. 62), whereas in the Advanced IRB Approach all physical collateral is recognized.

6.2.1.3 Market Risk

With the 1996 Market Risk Amendment “market risk exposures ... were removed [from the Basel I Accord that set capital requirements solely in terms of credit risk] and given separate capital charges” (Benzin et al., 2003, p. 8). The approaches available to measure market risk under Basel II, namely Value at Risk (VAR) and Internal Models Approach (IMA), “attempt to quantify the reserves needed to be held by banks due to market risk, i.e. the risk of loss due to movements in asset prices” (Balin, 2008, p. 9).

6.2.1.4 Operational Risk

“Basel II extends its scope into the assessment of and protection against operational risks” (Balin, 2008, p. 9). The three available methods under Basel II, namely the Basic Indicator Approach (BIA), Standardized Approach (SA) and the Advanced Measurement Approach (AMA), “calculate the reserves needed to adequately guard against failures in internal processes, the decision-making of individuals, equipment, and other external events” (Balin, 2008, p. 9).

6.2.1.5 Total Capital Adequacy

“Once a bank has calculated the reserves it needs on hand to guard against operational and market risk and has adjusted its asset base according to credit risk, it can calculate the on-hand capital reserves it needs to achieve “capital adequacy” as defined by Basel II” (Balin, 2008, p. 11). As there are several methodologies available, Basel II is flexible in how banks ultimately calculate their reserve requirements. Balin (2008) displays the final calculation for the required reserves under Basel II as follows:

Reserves = 8% · Risk Weighted Assets + Operational Risk Reserves + Market Risk Reserves

6.2.2 Pillar 2: Supervisory Review Process

Even though the least amount of pages is devoted to Pillar 2, it is viewed as the most important element in the Basel II Capital Accords. “The goal of the SRP is to ensure that the bank has enough capital to cover its risks and to promote better risk management practices” (Balthazar, 2006, p. 90). It addresses the interaction between regulators and banks, as illustrated in Figure 45, and most importantly “provides a basis for supervisory intervention to prevent unwarranted declines in a bank’s capital” (Saidenberg and Schuermann, 2003, p. 12). Pillar 2 is based on four main principles:

- “Banks should have a process for assessing their overall capital adequacy in relation to their risk profile, and a strategy for maintaining their capital levels” (Balthazar, 2006, p. 90).
- “Supervisors should review and evaluate banks’ internal capital adequacy assessments and strategies, as well as their ability to monitor and ensure their compliance with regulatory capital ratios. Supervisors should take appropriate action if they are not satisfied with the results of this process” (Balthazar, 2006, p. 91).
- “Supervisors should expect that banks will operate above the minimum regulatory capital ratios and should have the ability to require banks to hold capital in excess of the minimum” (Balthazar, 2006, p. 91).
- “Supervisors should seek to intervene at an early stage to prevent capital from falling below the minimum level required to support the risk characteristics of a particular bank, and should require rapid remedial action if capital is not maintained or restored” (Balthazar, 2006, p. 92).

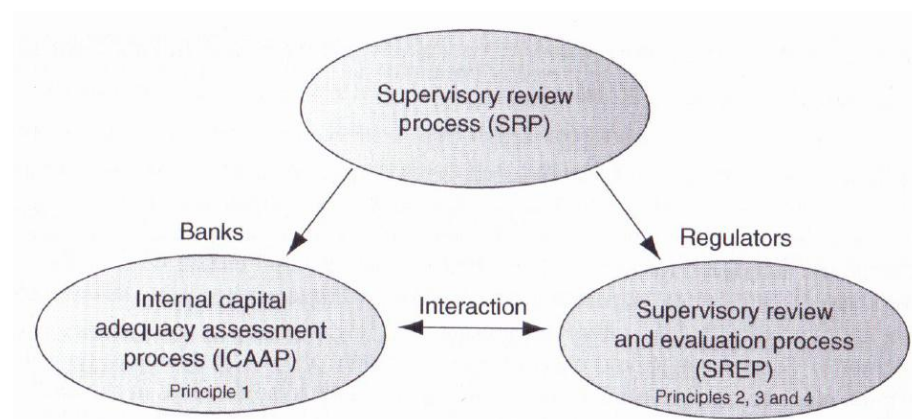


Figure 45. Supervisory review process. Van Gestel & Baesens (2009), p. 419.

6.2.3 Pillar 3: Market Discipline

“Pillar 3 represents the Basel Committee’s efforts to promote market discipline through enhanced transparency” (Saidenberg and Schuermann, 2003, p. 13) and aims at improving disclosures (in particular of capital levels, capital adequacy and risk exposures of banks) across markets. Market participants should be able to assess key information of the institution, and “Basel II hopes to empower shareholders to enforce discipline in the risk-taking and reserve-holding methods of banks, where banks seen to hold too few reserves and take on too much risk are punished by their own shareholders for doing so” (Balin, 2008, p. 12).

7 Criticism and Future Prospects of (Credit) Risk Management

While it seems that there has been steady progress with regard to controlling, auditing, regulation and risk management in financial institutions over the last decades, the recent banking crisis, however, has revealed the failure in several aspects to adequately counteract most importantly the exposure to credit risk.

In particular the blind belief on rating schemes from external agencies (i.e. investment-grade in 2008 for Lehman Brother's syndications), which are based on complex and almost incomprehensible assumptions, has lead to acceptance of these ratings without criticism and own judgment and even recommendation of the bank's internal risk management. Vice versa, from the point of view of a bank's business unit it is a major concern that a once stated negative risk management opinion, in general leads to an automatic rejection of the loan proposal by the bank's board. This means that a negative opinion is practically a killing argument to potentially profitable and risk-poor business.

A further conflict is seen in the fact that rating agencies advise the implementation of their risk management systems to banks, and are therefore tempted to rate these banks better than others. Also rating agencies, auditing companies as well as regulators have ongoing problems to track off-balance sheet items, derivative products, etc. and to evaluate the consequences of these products towards risk in the future. The rating process is more or less based on historical data (default rates) which per se may result in false assessments. Banks must be aware that external credit ratings don't guarantee the creditworthiness of an obligor, due to the assumptions on which they are based. They should rather be considered as an additional evaluation source that needs to be critically examined and questioned.

At this point some critical remarks should also be made concerning the Basel II Capital Accords. Specific criticism of the credit risk measurement approaches of Basel II are that the standardised approach allows rating agencies to receive a greater role, while the internal ratings-based approaches gives banks the possibility of too much discretion. Also the Basel II system of capital charge has failed to include liquidity risk. The main criticism, however, is that Basel II is pro-cyclical, i.e. the amount of capital required is low under strong market conditions and high during an economic downturn. In a recessionary climate there are higher default rates, resulting

in higher bank's capital needs, which is costly and will reduce the bank's willingness to lend money at all. This intensifies the negative development.

Another aspect and problem is that many U.S. banks still use Basel I, not implementing Basel II regulations. This is contrary to the European banking system and results in the different capital requirements and hence ratings. In this context another concern is that the large international ratings agencies (i.e. Moody's, Standard & Poor's, Fitch Ratings) are U.S. based and officially recognized by the Securities and Exchange Commission. One example for the misinterpretation of these rating agencies is the valuation of major European banks that have early entered the CEE market. It appears that the rating agencies classify business with CEE countries as risky, as they consider these identical to Southern and Central American markets. This results in downgrading of major European financial institutions while many of them have achieved considerable earnings in these markets, without accepting undue risks.

The outlook therefore is that the role of the rating agencies, auditing companies as well as supervisors definitely needs to be reconsidered. Bank strategies in the future will have to focus on their portfolio structure and the inherent risk classifications. The risk appetite is to be strictly limited with a percentage of the bank's capital resources. Such risk capital should be charged to the various bank business units according to their contribution to the total bank risk, and not according to the volatility of the business line's revenues.

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Appendix A: Abstract

Credit is a powerful driver of modern economies and the extent to which companies worldwide operate on credit is enormous. The recent financial crisis, with the failure of numerous large banks and companies from all sorts of industries and countries, has pointed out the weaknesses of the existing worldwide credit culture and (re)created awareness that international bank lending comes hand in hand with a wide variety of types of risk. These include interest rate-, market-, liquidity-, operational-, and most importantly credit risk, which is the main focus of this paper.

Banks act as financial intermediaries in the worldwide financial systems and need to face that risk is a cost of doing business. The adequate identification, analysis, measurement, management and control of risk is essential when making financial decisions aiming at sustainability. Banks need to be determined about the level of risk to accept and develop an integrated risk management strategy that considers all risk types and extends across functional boundaries.

Innovative technologies, evolving financial products and new market participants have changed the worldwide financial systems and also created a more efficient credit process. The fundamental lending objective of modern banks is to find the proper balance between portfolio growth and credit quality. Depending on how banks define their credit philosophy/culture and accordingly specify their credit risk strategy, one can ultimately evaluate the overall effectiveness of their credit process.

Credit ratings support the credit assessment process and are the basis on which banks evaluate potential borrowers. There are external ratings provided by rating agencies and internal credit rating systems, which are developed by banks themselves, though banking supervision authorities set strict requirements concerning objectivity of the rating results and transparency of the rating process.

The three large worldwide rating agencies (Moody's, Standard and Poor's and Fitch Ratings) all emphasize qualitative and quantitative factors relative to their credit ratings. They provide an opinion in terms of an independent third party view on company's and financial institution's fundamental financial strength.

The objective of so-called (internal) risk rating systems is to generate accurate and consistent risk ratings, yet also to allow professional judgment to significantly influence a rating where this is appropriate. The basic elements of internal risk ratings systems include the quantitative analysis of the financial statement (ratio analysis,

asset valuation, and cash flow adequacy), the assessment of qualitative company aspects (management, industry, country risk, and the quality of the financial information and accounting practices), and additional evaluation of the third-party support, term, structure, and collateral.

Because banks have a key function in the worldwide economy and international banking is rapidly growing, it is no surprise that they underlie strict regulations at the global level, which extensively aim at controlling the risks of extending business credit. As credit risk management by now has arrived at a high level of sophistication, its regulation is a crucial aspect which desires not only to limit losses, but to take an active part in the process of “shareholder value creation”.

The regulatory measurement of credit risk is provided by the Basel II Capital Accord. The three pillars of Basel II (minimum capital requirements, supervisory review process, and market discipline) aim at increasing the quality and stability of the international banking system, creating and maintaining a level playing field of internationally active banks and promoting the adoption of better risk management practices. An innovation of the first pillar (minimum capital requirements), which is the most important one concerning credit risk, is that it provides banks an incentive to increase their internal risk management practices as capital requirements should now be more closely aligned to internal economic capital estimates. Basel II provides two specific approaches to measure credit risk, namely the Standardised (STD) Approach and the Internal Ratings-Based (IRB) Approach. Furthermore Basel II recognizes a wider range of credit risk mitigants for regulatory capital purposes, and includes market risk and operational risk as well.

Finally, the recent worldwide financial crisis has shown that banks, auditing companies, rating agencies, and regulatory authorities have somewhat disregarded natural precaution practices and hence failed in several aspects to adequately counteract most importantly the exposure to credit risk. Their roles therefore definitely need reconsideration.

Appendix B: Zusammenfassung

Die Kreditvergabe im modernen Wirtschaftsleben ist ein wesentliches Element und die Abhängigkeit von Firmen in Bezug auf Finanzierung durch Dritte ist groß. Die kürzliche Weltwirtschaftskrise führte zu zahlreichen Zusammenbrüchen großer Banken und Firmen in allen Industriesparten und Ländern und zeigte deutlich die Schwäche der existierenden Kreditvergabe-Kultur. Es zeigte auch unmittelbar auf, dass die Kreditvergabe mit zahlreichen Risiken verbunden ist, darunter Zinssatz-, Markt-, Liquiditäts-, Operatives und am wichtigsten das Kreditrisiko. Letzteres ist das Hauptaugenmerk dieser Arbeit.

Banken agieren als Finanzintermediäre im weltweiten Kapital- und Geldmarkt und müssen erkennen, dass ihre Tätigkeiten mit Risikokosten verbunden sind. Die Identifizierung, Analyse, Messung, Management und Kontrolle der Risiken sind die wesentlichen Entscheidungsgrundlagen und essenziell für nachhaltiges Wirtschaften. Banken müssen den Grad der Risikoakzeptanz klar definieren und dazu eine entsprechende integrative Risikostrategie entwickeln, wobei alle Risikotypen in den verschiedenen Geschäftsbereichen abgedeckt werden müssen.

Innovative Technologien, neue Finanzprodukte und neue Marktteilnehmer haben die weltweiten Finanzmärkte beeinflusst und sukzessive auch zu einem effizienteren Kreditvergabeprozess geführt. Die Kunst moderner Banken besteht darin, eine ausgewogene Balance zwischen Portfoliowachstum und Kreditqualität zu finden. Je nachdem wie Banken ihre Kreditphilosophie bzw. -kultur und nachfolgend ihre Kreditrisikostrategie definieren, lässt sich schließlich die Effizienz des Kreditprozesses evaluieren.

Kreditratings unterstützen den Entscheidungsprozess bei Kreditvergaben und stellen die Basis für die Risikoeinschätzung potentieller Klienten dar. Dabei gibt es externe, von Ratingagenturen vergebene Einstufungen in Risikoklassen und darüber hinaus bankinterne Ratingsysteme, die strikten Auflagen unabhängiger Kontrollbehörden unter den Aspekten von Transparenz und Objektivität unterliegen.

Es gibt drei weltweite Ratingagenturen: Moody's, Standard and Poor's und Fitch Ratings. Diese verwenden in ihren Bewertungen qualitative und quantitative Faktoren und vergeben unabhängige Ratingeinstufungen, welche die fundamentale Stärke von Firmen sowie Finanzinstituten reflektiert.

Die Zielsetzung der bankinternen Ratingsysteme ist es, eine möglichst akkurate und dauerhafte Risikobewertung zu generieren und zugleich die Möglichkeit der Einbindung einer professionellen Einschätzung offen zu lassen. Die Basiselemente des bankinternen Ratingsystems stützen sich bei der quantitativen Analyse der Geschäftsberichte auf die Kennzahlenanalyse, Portfoliobewertung und einen ausreichenden Cash Flow. Die qualitative Einschätzung stützt sich hingegen auf das Management, Industrieumfeld, Länderrisiko und die Qualität der Geschäftsberichte. Desweiteren fließen in diese Bewertung Garantien, Fristigkeiten, Strukturierungen und gegebenenfalls Sicherheiten mit ein.

In Hinblick auf die Rolle von Banken im weltweiten Wirtschaftssystem ist es nur natürlich, dass die Banken strikten Regulationen unterliegen und dies auf einer globalen Ebene. Die bisherige passive Rolle dieser Regulationen, lediglich um Verluste zu vermeiden oder einzuschränken, wurde mittlerweile durch aktives, marktmäßiges Denken ergänzt.

Die Rahmenbedingungen für die Bemessung des Kreditrisikos werden zur Zeit durch die Basel II Bestimmungen festgelegt. Die drei Säulen (Mindestkapitalanforderungen, Bankaufsichtlicher Überwachungsprozess, und Erweiterte Offenlegung bzw. Marktdisziplin) zielen auf die Verbesserung der Qualität und Stabilität des Internationalen Bankensystems ab. Eine Innovation der ersten Säule (Mindestkapitalanforderungen) ist es, dass die Kapitalerfordernisse vermehrt an die internen Risikoeinschätzungen angepasst werden. Basel II gibt zwei Näherungsmethoden um das Kreditrisiko zu messen, namentlich den „Standardised (STD) Ansatz“ und den „Internal Ratings-Based (IRB) Ansatz“. Weiters berücksichtigt Basel II eine größere Auswahl an kreditrisikoreduzierenden Maßnahmen und inkludiert gleichzeitig Marktrisiko und operationelles Risiko.

Schließlich hat die weltweite Finanzkrise zuletzt gezeigt, dass Banken, Wirtschaftsprüfungsgesellschaften, Ratingagenturen und Regulierungsbehörden natürliche Vorsichtsmaßnahmen vernachlässigt haben und dadurch versäumt haben, adäquate Gegenmaßnahmen zur Reduzierung des Kreditrisikos vorzunehmen. Die Aufgabenstellung dieser Organisation ist daher neu zu definieren.

Appendix C: Curriculum Vitae

CURRICULUM VITAE

ANGABEN ZUR PERSON

Name

PESTA, Ferdinand Alexander

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ferdinand.pesta@gmx.at

ARBEITSERFAHRUNG

- Datum (von – bis)
- Name des Arbeitgebers
- Tätigkeitsbereich oder Branche
- Beruf oder Funktion

01.06.2009 – bis dato
Dr. Volker Pesta – Senior Advisor International Schools
Unternehmensberatung
Teilzeitkraft (8 St./Woche)

- Datum (von – bis)
- Name und Adresse des Arbeitgebers
- Tätigkeitsbereich oder Branche
- Beruf oder Funktion

02.02.2009 – 27.02.2009
Ungarische Volksbank AG
Rákóczi út 7, 1088 Budapest, Ungarn
Controlling
Praktikant

- Datum (von – bis)
- Name und Adresse des Arbeitgebers
- Tätigkeitsbereich oder Branche
- Beruf oder Funktion

21.07.2008 – 21.08.2008
Nooter Corporation – Nooter Construction Company (CIC Group Inc.)
1500 South Second Street, St. Louis, MO 63104 U.S.A.
Controlling
Praktikant

- Datum (von – bis)
- Name und Adresse des Arbeitgebers
- Tätigkeitsbereich oder Branche
- Beruf oder Funktion

01.02.2008 – 29.02.2008
Siemens AG Österreich
Siemensstraße 92, A-1210 Wien, Österreich
Corporate Finance, Corporate Controlling & Reporting
Praktikant

- Datum (von – bis)
- Name und Adresse des Arbeitgebers
- Tätigkeitsbereich oder Branche
- Beruf oder Funktion

30.07.2007 – 07.09.2007
Brabus GmbH
Brabus-Allee, D-46240 Bottrop, Deutschland
Vertrieb
Praktikant

- Datum (von – bis)
- Name und Adresse des Arbeitgebers
- Tätigkeitsbereich oder Branche
- Beruf oder Funktion

04.09.2006 – 30.09.2006
Tyco Electronics Austria GmbH
Pilzgasse 33, A-1210 Wien, Österreich
Accounting / Cost Accounting, Sales
Praktikant

- Datum (von – bis)
- Name und Adresse des Arbeitgebers
- Tätigkeitsbereich oder Branche
- Beruf oder Funktion

08.10.2004 – 08.03.2006
Immoconsult Leasing GmbH
Wasagasse 2, A-1090 Wien, Österreich
Abteilungen Leasing und Recht
Teilzeitkraft (10 St./Woche)

<ul style="list-style-type: none"> • Datum (von – bis) • Name und Adresse des Arbeitgebers • Tätigkeitsbereich oder Branche <ul style="list-style-type: none"> • Beruf oder Funktion 	01.09.2004 – 30.09.2004 Immoconsult Leasing GmbH Wasagasse 2, A-1090 Wien, Österreich Abteilungen Leasing und Recht Praktikant
<ul style="list-style-type: none"> • Datum (von – bis) • Name und Adresse des Arbeitgebers • Tätigkeitsbereich oder Branche <ul style="list-style-type: none"> • Beruf oder Funktion 	01.07.2003 – 30.09.2003 Immoconsult Leasing GmbH Wasagasse 2, A-1090 Wien, Österreich Geschäftsführung, Abteilungen Leasing und Recht Praktikant
<ul style="list-style-type: none"> • Datum (von – bis) • Name und Adresse des Arbeitgebers • Tätigkeitsbereich oder Branche <ul style="list-style-type: none"> • Beruf oder Funktion 	01.07.2002 – 02.08.2002 American International School of Vienna Salmansdorfer Strasse 47, A-1190 Wien, Österreich Sommer Camp Councilor
<ul style="list-style-type: none"> • Datum (von – bis) • Name und Adresse des Arbeitgebers • Tätigkeitsbereich oder Branche <ul style="list-style-type: none"> • Beruf oder Funktion 	09.07.2001 – 03.08.2001 Österreichisches Jugendrotkreuz Wiedner Hauptstraße 32, A-1040 Wien, Österreich Finanzabteilung Praktikant
<ul style="list-style-type: none"> • Datum (von – bis) • Name und Adresse des Arbeitgebers • Tätigkeitsbereich oder Branche <ul style="list-style-type: none"> • Beruf oder Funktion 	19.06.2000 – 31.07.2000 Immoconsult Leasing GmbH Wasagasse 2, A-1090 Wien, Österreich Geschäftsführung Praktikant

SCHUL- UND BERUFSBILDUNG

<ul style="list-style-type: none"> • Datum (von – bis) • Name und Art der Bildungs- oder Ausbildungseinrichtung <ul style="list-style-type: none"> • Bezeichnung der erworbenen Qualifikation 	Oktober 2003 – Jänner 2010 Fakultät für Wirtschaftswissenschaften an der Universität Wien Brünner Straße 72, A-1210 Wien, Österreich Diplomstudium Internationale Betriebswirtschaft (A 157) Abschluss mit Magister der Sozial- und Wirtschaftswissenschaften
<ul style="list-style-type: none"> • Datum (von – bis) • Name und Art der Bildungs- oder Ausbildungseinrichtung <ul style="list-style-type: none"> • Bezeichnung der erworbenen Qualifikation 	1990 - 2002 American International School of Vienna Salmansdorfer Strasse 47, A-1190 Wien, Österreich Matura US-Diplom IB-Zertifikate (Economics, Math Studies, French)

MILITÄRDIENTST

<ul style="list-style-type: none"> • Datum (von – bis) • Ort und Adresse 	01.09.2002 – 31.03.2003 Stabskompanie Panzerabwehrbataillon 1 Bechtolsheim-Kaserne, A-2700 Wr. Neustadt
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