The Credit Risk

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Abstract

At a conceptual level, the credit risk is a component of market risk. It can occur as a result of two causes: the issuing company does not want/can no longer meet its obligations; damage to the issuing company's rating, which results in lowering the price of shares in the company in question. Both of these causes are closely linked with the risk of default that is exposed when the investor invests in shares or bonds of a company.

Key words: credit risk, market risk, the Basel system, risk coefficients

As shown before, the credit risk is one of the most important risks faced by an investor on the capital market. This chapter’s main purpose is to understand the meaning of the credit risk on the capital market, what are the factors that conduct it, how it can be modeled in order to measure the portfolio of securities and what are the possibilities to improve the credit risk.

As the market risk represents the risk that occurs as a result of adverse changes in prices and volatility components of a portfolio of securities – including the securities’ default risk or the damage risk to a company’s rating–we can take into consideration the concept that the credit risk is part of the market risk. But the way to determinate the credit risk is far more complicated than the one used to calculate the market risk. Therefore, for the market risk, the dealers are using the mark-to-market method for registering daily the differences between the opening price and the closing price of a title, meaning that the price’s modification risk will be

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3The default risk is referring to a company’s probability of not being able to honor its payment obligations.
countered on short time frames, such as a day or a week. On the other hand, for the credit risk, the counteracting is not that simple and cheap. Usually the credit risk is accumulating over longer periods, such as until the maturity of the bond or of the swap. Also, the information needed for determining the credit risk are much difficult to obtain than the ones needed for identifying the market risk.

If in terms of market risk, the prices and the volatility of financial instruments can be observed directly on the market, for the credit risk we will need the probability of default of the issuing companies and the loss occurred as a result of loss given default (the LDG). Those two elements are hard to be identified and, in order to be able to do so, there has to be used several informational sources. On the other hand, the information regarding the two categories of risks have to be used together, just the same as the factors affecting the credit risk have to be correlated with the ones that influence the market risk.

If the credit risk of an instrument is not properly determined, than either the investor, either the issuing company will incur losses. Par example, if the credit risk is considered to be at a higher level than it actually is, than the investor will be able to purchase the title with a discounted rate from the correct price and will cause a loss to the issuing company. On the other hand, if the credit risk is considered to be lower than it actually is, than the price of the title will grow and the return of investment can become less in the future.

Strictly connected to the risk, there have been developed two important concepts that have to be presented, though we will not focus on them in our theme:

- **The adverse selection** – this is a term used initially in insurances and afterwards in the risk of management. This phenomenon implies the existence of asymmetric information (different information) between the buyer and the seller. This way, the low quality products or services are usually selected. Par example, a bank that applies the same costs (interests, fees) to all of its clientele, will be exposed to the risk that only low quality of clients will call on its services. This is how the capital market goes, where securities issuing companies have more information about their interests and their own actions, than the investors to which the companies are addressing to. This is just how it happens with the banks too: the borrowers knows their intentions much better than the banks themselves. This way, if the banks will increase their interests and fees, the ones interested in the offered facilities will
be the companies with a poor financial condition and no good perspective for the future.

- **The moral hazard** (including the principal-agent issue) – it refers to the possibility that, the company/individual’s behavior may change at the expense of its counterpart just after the transaction between the two parties involved has been finalized. This phenomenon is common in the insurance and banking industries. The principal-agent phenomenon is strongly connected to the moral hazard: on one hand the agent engages himself to act in the interest of the second part involved – the principal (for example, administrator-shareholders). But, due to the fact that the agent is more familiar with these actions than the principal, and the principal cannot actually follow the agent, the agent can easily act in his own favor and damage the principal’s interests, as long as their interests are not aligned. The moral hazard is considered to be one of the main elements that conducted to the 2008 economic crises. The banks were aware that they were too big and important to be allowed to collapse and that the state will always insure the necessary financing if cash runs out. Also, between 2000 and 2008 the state authorities have assumed a part of the bank’s risks (through less stringent obligations on banks capitals and through banking incentives), so that the banks decreased their risks, but also kept their entire profit generated by their operations. But the result was not a positive one, because the quality of all bank’s assets has been deteriorated due to the moral hazard.

Those two imperfections of the capital market are added to the reasons why the counterparts’ credit risk has to be constantly followed, analyzed and diminished.

Over time, the investors, most of them financial institutions, in order to identify the credit risk, have relied on five characteristics that define the quality of the counterparty, either if it is about a company issuing shares or bonds, either a company wishing bank financing. Those five characteristics, named the five “C” are:

- The Character – representing the company’s quality to wish and to be able to accomplish its obligations (returning of the loan, redemption of bonds, paying its coupons and dividends). Also, the analysis of the company includes its reputation analysis and its financial history.
- The Capital – in order to determine this characteristic, there has to be analyzed the shareholders engagement in the company through capital investment (capital, investments, loans associates) and the ratio between equity and financial liabilities.
- The Capacity – it can be measures by determining the company’s ability to honor its obligations, an independent capacity by the company’s character. Usually, in order to determine the volatility of earnings, the company’s history has to be analyzed. If we are taking into consideration a company that has always respected its contractual obligation, but with volatile revenues and profits, it is possible that in the future this company might face issues in acquitting its debts.

- The Collateral – it refers to the guarantees that a company brings at the moment of contracting different obligations. This factor is usually analyzed by the financial institutes and not by the capital’s market investors.

- The economic conditions – any company is addicted on the economy’s smooth running, even if there isn’t a high correlation between it and the economy’s status. Just as a financial crisis can affect both the suppliers and the company’s clients, it has an indirect influence on the company itself.

Those five characteristics can be used by the capital market traders, but also by banks, in order to determine the probability of a company’s insolvency. By applying a percentage according to the importance and the consistent scoring of each criteria, the analysis can lead to a scoring system through which they will be able to interpret and determine the probability of entry into insolvency.

The main players on the financial market, interested in calculating the credit risk, are the financial institutions. They have the obligation to determine this risk and to report it regularly to the higher authorities. This was the main purpose of introducing new international regulation regarding the manner of the credit risk’s determination, regulation that has to be applied uniformly to all international banks. The result of the regulation was the Basel I Agreement, followed by Basel II and by Basel III, detailed below.

The Basel Agreement and the exposure to the credit risk

Starting with 1988, the banks in the European Union and Switzerland have been required to comply with the recommendations issued by the Bank for International Settlements (BIS) from Switzerland. The recommendations were referring to the establishment of the equity taking into consideration the credit risk that they are regularly subjected. Up to now, more than 100 countries adhered to those regulations. Today it is recommended for each bank to hold at least 8% of its assets weighted with its credit risk. Each asset held (credit facility granted to the clients) is
weighted by a risk factor according to the category it falls in. This is a topic that we will return to further on the following pages.

The history of Basel Committee begins in 1974, along with the insolvency of a German bank due to the lack of liquidity. On the 26th of June 1974 occurred the sudden liquidation of Herstatt Bank from Frankfurt. Several German banks have changed DM for US dollars that were to reach to New York trough Herstatt. Because of the time difference, Herstatt bank was unable to perform the operations at the provided time. As a result, the banks involved in this trade have not received in time the required US dollars. This example has illustrated the risk of settlement and it led to the creation of the Basel Committee on Banking Supervision - BCBS. Another purpose of the BCBS’s occurrence has been to eliminate the differences between the banks and to establish an equal of the minimum capital that each of them must hold.

In time there have been developed three agreements that all the banks from the entire world have to comply with: Basel I, Basel II and Basel III. The Romanian banks have to comply with the provisions of the Basel II Agreement.

1. Basel I, presentation and characteristics

In 1988, BIS, through the BCBS, was developed and published a set for all banks’ minimum requirements. This was the way that the Basel I Agreement was created, known also as the 1988 Basel Agreement. The banks were obliged to held the capital at the 1st tier (calculated as their own capitals, less the commercial estate) with at least 4% of characteristic risk-weighted assets ratio and capital of tier 1 and tier 2 (Tier 2 – certain categories of subordinated loans) of at least 8% of the assets weighted by related risk factors. This document was referring to the credit risk and it classified the capitals that have to be held according to the bank’s assets, in five categories, according to its risks, in:
- 0% - for collateral cash, loans accorded to the central bank, Government and governments OECD;
- 0%, 10%, 20% or 50% - for loans accorded to the public sector;
- 20% - for loans accorded to the development banks, banks from the OECD countries, for banks outside the OECD - only if the debts were less than one year maturity, and to the public sector;
- 50% - for residential credits fully guaranteed with mortgage on the residential property itself that is rented or occupied by the borrower;
- 100% - for loans accorded to the private sector, the banking sector from countries outside the OECD system, banks that had more than one year
maturity to deal with real estate loans and loans for other banks’ instruments and equipment.

The problem regarding the adjustment coefficients of the assets held by the banks still exists. The coefficient to adjust a company’s credit is the same of 100%, no matter the company’s rating – even if it is a rated AAA or B company, there will be applied the 100% risk of coefficient. Also, a 20% of the risk coefficient is applied to the loans accorded to a bank from the OECD country, no matter what the country in discussion or its rating is.

Due to those imperfections, BIS has concluded that the introducing of a new more developed banking system was necessary, one to strengthen the capital held by banks and to confer a higher confidence to the depositors.

2. Basel II, presentation and characteristics

Due to the fact that Basel I was referring only to the credit risk and was partially covering the market risk, but with no preoccupation at all for the operational risk, and the risk coefficients were not established fair, BCBS decided to introduce a new more strictly regulation, the Basel II Agreement. Another reason for the emergency of creating a new agreement was due to the fact that the banks were able to jungle with their held assets, by transforming them in securitized assets and by including them in the off balance sheet assets. The new 2nd Basel Agreement was created in June 2004, with the same role to equalize all the banks with international branches, by holding a consistent capital in order to avoid the disloyal competition.

The main concept of this agreement was consisting into the fact that the existence of an appropriate level of the capitals can sustain the economy in case of an important banking institution fails. Indeed, the implementation of this agreement was very difficult until 2008, but after the installation of the financial crises more and more countries appealed to it.

The main objectives of 2nd Basel Agreement are:

- The safety that the banks’ capital allocation is sensitive to the risk assumed by those banks;
- The investors’ and the general public’s trust into a certain financial institution that it has an adequate capital according to the assumed risks;
- The unanimous quantification of the market risks, the credit risks and the operational risks;
- The tentative to reduce the regulators’ involvement in constituting the bank capitals through strict regulations regarding the risk categories of the assets held by the banks.

The risk coefficients used in this new agreement have been modified from those used in the Basel I Agreement, due to all observations
previously mentioned, highly referring to the 1988 Agreement. Therefore, there are two methods of determining the applicable risks factors for weighting the portfolio of assets:

- The first one is the standard method, through which the banks are using the same risk coefficients. In the table below those new coefficients are presented. With reference to the loans accorded to the banks itself, by using the first operation, the rating accorded to the credit is equal to the rating of the country that the bank belongs to. At the second option, the credit’s rating is equal to the one of the bank that has required the loan.

The determination of the risk’s coefficients by using the standardized method

<table>
<thead>
<tr>
<th>Credit</th>
<th>AAA until AA-</th>
<th>AA+ until A-</th>
<th>BBB until BB-</th>
<th>B+ until B-</th>
<th>Under BB-</th>
<th>Without rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sovereign (Government and central banks)</td>
<td>0%</td>
<td>20%</td>
<td>50%</td>
<td>100%</td>
<td>150%</td>
<td>100%</td>
</tr>
<tr>
<td>Banks, option 1</td>
<td>20%</td>
<td>50%</td>
<td>100%</td>
<td>100%</td>
<td>150%</td>
<td>100%</td>
</tr>
<tr>
<td>Banks, option 2</td>
<td>20%</td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
<td>150%</td>
<td>50%</td>
</tr>
<tr>
<td>Companies</td>
<td>20%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>150%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The disadvantage of the new system of risks factors is referring to the companies that have no rating at all. As you can see, the loans accorded to this category have ended with smaller coefficients than the ones for the BB- rated debtors. This way we can see that the companies prefer to remain without their rating or that the banks prefer to grant loans to those companies without rating, maybe with a lower quality than the ones under BB-.

- The second method is based on the each bank’s internal rating. According to it, each bank can adjust the assets from its portfolio with its own system of coefficients, according with its internal ratings. This method has to be based on the central bank’s approval. The banks have to be able to determine the probability of default (PD) of the credits from its own portfolio, the loss granted by the default (LGD) and the estimated exposure to the default (expected exposure to default - EED).

Another new entry for Basel II was the fact that it is based on the concept of the three pillars: the minimum necessary capital, supervising and market discipline.

- The first Pillar is referring to the determination of the minimum capital that a bank has to have, reported to the assets from its portfolio.
capital is calculated for all three risk categories: by credit, by market and operational. The credit risk is calculated through the previously mentioned methods (the standardized method and the one based on the banks’ internal ratings); the market risk is determined by using the value-at-risk (VaR); and the operational risk is determined by using one of the three existing methods (the basic indicator method, the standardized internal measuring method). As the analysis of banks’ capital is not the main subject of this theme, we will not detail the determination of the operational risk at a higher level.

Subsequently, after dimensioning the three risk categories, the lowest level of the banks’ required capitals is determined by the following formula:

\[ C_{\text{Required}} = 0.8 \times \{12.5(RO + RP) + 1.06 \times \sum p(i)A(i)\}, \]

where
- \( C_{\text{Required}} \) represents the minimum required capital that each bank has to have;
- \( RO \) is the operational risk;
- \( RP \) is the market risk (riscul de piață);
- \( p(i)A(i) \) represents each asset weighted by its coefficient risk.

- The second pillar is referring to the supervision of the banking risks, focusing on other risks to which it can be exposed, such as the systematic risk, the strategic risk, the liquidity risk and the legal one too.

- The third pillar is referring to the market discipline. Its main objective is to effectively implement the first two pillars, by imposing strict regulations through which the entire public is able to determine the appropriateness of the financial institutions’ capitals. This way, the banks are forced to present details regarding the methods of determining their own capitals, the transparency of the financial market is increased along with the investors’ trust.

The issues of this new Basel system are referring to the risks coefficients for adjusting the actives; they tend to be too high during the economical period of increase (when few companies/banks/states enter in default) and too small during recession when there exists the possibility that the high rated companies might face serious financial issues. This was the situation created when the economic crises started in 2008, when several banks weren’t able to sustain themselves due to the fact that their capitals were not appropriate to the market’s evolution. The result was to modify accordingly the Basel II Agreement, conducting to the third Basel Agreement (Basel III).
3. Basel III, presentation and characteristics

The Agreement Basel III, analyzed, introduced and applied in certain countries starting with 2011 has the purpose to solve some of the issues that the first one and the second Basel faced, by strengthening the theory of adequacy the capitals and by introducing new indicators for the banks to take into consideration: the liquidity and the indebtedness. In order to respect the requests of Basel III, until 2015 the banks are forced to:

- Hold their own 4.5% capital of risk-weighted assets along with 6% of Tier 2 capital of risk-weighted assets.
- The leverage has to be of a minimum 3%.
- The liquidity coverage ratio has to be located at a sufficient level so that the assets with high liquidity may cover cash outflows for a minimum of 30 days.

The advantages of introducing this new agreement are considered to be consistent. Among its strictly requirements, the third Basel assures a solid base for all future changes of the banking system and tries to restrict the past damages (damses that can be considered to be blamed for the actual economic crises), by modifying the way that the banks approach the management risk.

As mentioned before, the credit risk may appear as the result of two causes: the issuing company is not willing or is not able to assume its obligations; the decreasing of the issuing company’s rating, leading to the company’s share price dropping. Both situations are highly connected with the default risk, the risk to which the investor is exposed.

Bibliography

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