

TYOLOGY OF CREDIT RISK IN ECONOMY

Marinela BĂRBULESCU¹, Alina HAGIU²

¹ University of Pitesti, marinela.barbulescu@yahoo.com

² University of Pitesti, alina.hagiu@upit.ro

Abstract: Today, many techniques are known regarding credit risk management, starting from traditional techniques of risk exposure assessment, aimed at limiting excessive concentration at the level of the debtor, sector of activity, industrial branch, etc., until the new management techniques, modern, such as swap transactions and options, adapted to this type of risk.

Thus, the instability led to an unprecedented development of counterparty risk, in general and credit risk in particular, determined the concerns regarding the management of this type of risk by expanding and even applying more and more generalized performant techniques of credit risk assessment.

Keywords: Credit risk, Creditor, Debtor, Analyse, Bank.

JEL Classification Codes: G20, G21.

1. INTRODUCTION

If there are multiple risks in the economy and in finance, special attention is paid to credit risk. As it has been seen in the past few years, many financial institutions have faced major difficulties for multiple reasons, but one major cause of banking problems that no longer must be ignored continues to be directly related to lack credit standards for borrowers and counterparties, poor portfolio risk management. Also it must be taken to consideration the lack of attention to changes in economic or other circumstances that can lead to deterioration in the credit standing of a bank's counterparties.

If an economic agent grants a credit to counterparty, a risky relationship arises between the creditor and his debtor. The latter may, in good or bad faith, not pay his debt at the agreed due time. The hazard that weighs on the respect of a commitment to settle a debt constitutes the credit risk.

In another simply way to explain the credit risk is by defining it as the potential that a bank or economic institution borrower or counterparty will not be able to meet its obligations in accordance with the contractual obligations. I

In a traditionally way, it may be defined also as the risk that a lender may not receive the owed principal and interest, which results in an interruption of cash flows and increased costs for collection. Excess cash flows may be written to provide additional cover for credit risk. Although it is impossible to say in an accurate way who exactly who will default on obligations, properly assessing and managing credit risk can lessen the severity of a loss. Interest payments from the borrower or issuer of a debt obligation are a lender's or investor's reward for assuming credit risk.



This is an open-access article distributed under the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>).

2. EXAMPLES OF SIGNIFICANT RISK DATA

An important literature, academic and professional, conceptual and empirical, devoted itself to information likely to be significant in respect of risk (individually predictive and discriminating).

Some have an ad hoc approach, *spot*: the occurrence of an event translated by information is significant of risk. In other cases, it is the evolution of a data, reasoning in terms of flow, which reflects a deterioration of the risk of a borrower.

Financial information

By nature, the financial difficulties are perceptible through the accounting statements. The risk of default and/or bankruptcy presented by companies in difficulty is largely detectable by financial analysis.

Risk-expressing data may be measures in terms of inventory (for example: absolute weight of financial debts) or flow (for example: result or negative cash flow over a period). They may have an empirical and intuitive meaning with respect to a norm (for example: strongly negative net margin). It also happens that information has been given an announcing role in terms of statistical analyzes (for example: bankruptcy rates observed according to the value of a ratio).

Many companies have chosen to invest and establish departments that their main purpose is assessing the credit risk for present and potential/future customers. One important advantage to assess this responsibility to the department is also given by the development of the technology that has afforded companies the ability to quickly find and analyse data used to assess a customer's risk profile.

In our days, if an investor is taking into consideration to invest in a financial instrument (like a bond), he will likely review the credit rating of the financial instrument, to assess if his investment will be profitable or not. If the financial instrument has a low rating (B or C), the issuer has a high risk of default. Conversely, if it has a high rating (AAA, AA, or A), it's considered to be a safe investment.

Worldwide, there are bond credit-rating agencies, such as Moody's Investors Services and Fitch Ratings that evaluate the credit risks of thousands of corporate bond issuers and municipalities on an ongoing basis. For example, a risk-averse investor may opt to buy an AAA-rated municipal bond. In contrast, a risk-seeking investor may buy a bond with a lower rating in exchange for potentially higher returns.

Defaults and delays in the publication of information

The financial literature shows that in case of difficulties, a company is generally tempted, at least in a first phase, to hide them. This is due to several factors: an aversion to revealing a situation assimilated to a failure (sometimes personal) of the managers, the will to avoid negative environmental reactions which could increase and accelerate the difficulties, the wish to put in place measures of effective restructuring to solve the crisis without having to announce it and, possibly, to optimize the use of collective procedures.

Thus, financial difficulties lead to retention of information, in accordance with a cost/benefit analysis. This explains why companies in difficulty are distinguished by deterioration in the quality of their dissemination of information, whether this information is voluntary or mandatory:

- delays in providing information;
- decrease in the quality of information submitted (reduced completeness, changes in formats, reduction of the level of detail);
- non-dissemination of mandatory information.

This is particularly true for the annual accounts that companies must publish. In the case where they are not quoted on the stock exchange, there is a marked relationship between the delays and defaults of the accounts and the risk of bankruptcy. Thus, the vast majority of the companies that went bankrupt did not publish a recent balance sheet.

It must be mentioned also that another particular instance of credit risk relates to the process of settling financial transactions. If one side of a transaction is settled but the other fails, a loss may be incurred that is equal to the principal amount of the transaction.

Even if one party is simply late in settling, then the other party may incur a loss relating to missed investment opportunities. Settlement risk (i.e. the risk that the completion or settlement of a financial transaction will fail to take place as expected) thus includes elements of liquidity, market, operational and reputational risk as well as credit risk.

3. TYPOLOGY OF CREDIT RISKS IN ECONOMY

As soon as one agent extends a credit to another agent, a credit risk occurs.

In a very simplified approach, we consider that the economy includes four types of agents: the States, the companies, the banks and the households. These stakeholders are therefore voluntarily restrictive: E, Ent, B and M. If the real economy involves other stakeholders (media, pressure groups, local authorities, regulators, insurers, financial intermediaries, etc.), reasoning can be conducted on the four main agents.

These actors are likely to be both creditors and borrowers. However, the frequency and the share of these positions are not identical.

The following table shows that all agents can be involved in credit operations, voluntarily or not.

Table 1. Economic agents: creditors and debtors

Agents (simplified model)	Creditor	Borrower
States	Public credits Terms of payment for taxes	Public debt
Banks	Credit to households Corporate loans Loans granted to States	Refinancing Repayable advances
Companies	Credits to customers: Companies / households	Bank loans ¹ Supplier credit
Households	Savings investment ²	Bank loans Terms of payment ³

Source: Philippe Thomas, Cécile Kharoubi (2016), „Analyse du risque de credit banque et marches”, RB Edition, pp.20-21.

The credit risk arises from several factors.

First, there is the general risk to the overall economic situation for borrowers, sometimes due to “country risk”; insolvency is due to the geographic location of a borrower. This includes a political risk (sovereign) and economic risk (monetary situation preventing the transfer of funds).

Then, the occupational risk is related to the difficulties of the economic sector to which the debtor belongs.

¹Investments and activities.

²In State loans, bonds issued by banks or Companies and, implicitly, in financial products proposed by the banks.

³Of the State and the Suppliers on the occasion of important purchases.

Finally, the borrower's own risk depends on its specific economic and financial situation.

Formalization of credit risk

It is classically accepted that the components of credit risk are as follows:

- default: the event by which the borrower does not honor a fixed maturity, it is a "credit event";
- exposure on the date of default: this is the amount for which the bank is at risk and which includes the remaining due capital;
- the loss in the event of default: it corresponds to the fraction of the exposure that cannot be recovered; it is highly dependent on the rate of recovery (or recuperation) in case of default, which is itself related to the situation of the Company, to the legislation and to the presence of possible guarantees in favor of the financial creditor;
- default horizon that is the future moment when default can occur.

The contemporary approach to credit risk makes it possible to specify these components. To simplify, let's suppose a bank grants credit to a company. This credit is in amount M repayable at a due date t. It generates an interest rate i.

If there is no default, at maturity (t) the value of this credit is:

$$V_t = M \cdot (1 + i)^t$$

In the event of default at this horizon, the bank "recovers" only a fraction R of the credit, expressing the recovery rate. Then the value of the credit at maturity (t) is:

$$V_t = M \cdot (1 + i)^t \cdot R$$

At time 0, when the contract is signed, the default probability at time t and the recovery rate R in the event of a default are uncertain (random). We call p the probability of default at time t, its value is between 0 (no default) and 1 (default).

As a result, the value of the contract at maturity is:

$$V_t = M \cdot (1 + i)^t \cdot (1 - p \cdot (1 - R))$$

This simplified approach shows that the credit risk depends on:

- expected default frequency (EDF) or probability of default (PD);
- exposure at default (EAD), maximum loss in the event of default;
- loss given default: (LGD) equals to 1 minus the recovery rate: 1 - R.

Indeed, the expected loss on a credit (EL) is equal to:

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

The expected loss on a credit is a random variable which, combined with uncertainty over the default horizon, constitutes the credit risk.

The default (of payment) generally corresponds to an objective and measurable event by the financial creditor: the non-maintenance of a credit commitment, the borrower being unable to honor a maturity of his financial debt. However, the defect may take a broader meaning such as the violation of a covenant, the restructuring of the debt or a significant deterioration of the

rating of a company. The default of payment, strictly speaking, is a confidential event known only to debtors and creditors.

Since exposure to credit risk continues to be the leading source of problems in banks world-wide, banks and their supervisors should be able to draw useful lessons from past experiences. Banks should now have a keen awareness of the need to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred.

4. CONCLUSIONS

We are talking about a set of events that reflect a risk situation. Conceptually, the difficulties of the company are expressed through a series of signals of different natures; sometimes one refers to “indicators of risk”, very numerous.

Several studies have shown that a large part of this negative information can be observed from legal information, which offers both a channel for obtaining and a guarantee of reliability. For example, mention may be made of:

- the registration of privileges of the tax authorities;
- the repeated changes of managers;
- a decision to continue the activity despite losses exceeding 50% of the share capital;
- the negative opinion of the statutory auditors on the annual accounts (e.g. refusal of certification).

REFERENCES

1. Altman, E., Sabato, G. (2005), Modeling Credit Risk for SMEs: Evidence from US Market, SSRN working paper.
2. Altman, E., Sabato, G. (2005), Effects of the New Basel Capital Accord on Bank Capital Requirements for SMEs, *Journal of Financial Service Research*, Vol. 28, pp. 15-42.
3. Philippe, T., Cécile, K., (2016), *Analyse du risque de credit banque et marches*, RB Edition.
4. Fernandes, J.E. (2005), Corporate Credit Risk Modeling: Quantitative Rating System and Probability of Default Estimation, SSRN working paper.
5. Lehmann, B. (2003), It is worth the while? The relevance of Qualitative information in Credit Rating, Working Paper EFMA, Meetings Helsinki, pp. 1-25.
6. Moody's, (2004), Moody's KMVRiskcalc3.1 Model.
7. Ranjit, L. (2009), Why Basel I Failed and Why Basel III is Doomed, Working Paper.
8. Anghel, M.G. (2015), *Financial-monetary analysis*, Economic Publishing House, Bucharest.
9. Anghelache, C., Bodo, G. (2018), General Methods of Management the Credit Risk. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 8 (1), pp.143-152.
10. Anghelache, C., Sfetcu, M., Bodo, G. and Avram, D. (2017), Theoretical notions about bank risks. *Romanian Statistical Review*, Supplement, no. 11, pp. 33-42.
11. Anghelache, C. (2010), *Methods and models for measuring the risks and financial-banking performance*, 2nd Edition, Artifex Publishing House, Bucharest.
12. Cipovova, E., Dlaskova, G. (2016), Comparison of Different Methods of Credit Risk Management of the Commercial Bank to Accelerate Lending Activities for SME Segment, *European Research Studies*, vol. 19, issue. (4), pp. 17-26.

13. Delis, M., Kouretas, G. (2011), Interest rates and bank risk-taking. *Journal of Banking & Finance*, 35 (4), pp. 840-855.
14. Gasha, J.G. et al. (2009), Recent Advances in Credit Risk Modeling, International Monetary Fund in IMF Working Papers.
15. Gavalas, D., Syriopoulos, T. (2014), Bank credit risk management and rating migration analysis on the business cycle, *International Journal of Financial Studies*, vol. 2(1), pp. 122-143.
16. Popescu, A.M. (2018), The main theoretical aspects regarding bank risks: models for their management. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 8 (1), pp.153–160.
17. Sfetcu, M. (2008), Lending Risk – The quality function of banking loan portfolio, *Romanian Journal of Statistics - Supplement*, no. 10, pp. 29-48.
18. Basel Committee on Banking Supervision (2009), Findings on the interaction of market and credit risk, Working Paper No. 16.
19. Alessandri, P., Drehmann, M., (2007), An economic capital model integrating credit and interest rate risk, Working paper.