CONTINGENCIES FOR MEASUREMENT OF THE CREDIT RISK

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***Abstract**: The Global Financial Crisis, which affected various banks, some of them very important banks, highlighted the importance of an accurate credit risk measurement in order to be able to overcome it. There are a variety of such credit risk measurement models, so we can say that banks face a real dilemma when having to choose the most appropriate one. The aim of this paper is to examine the most popular methods used to measure the credit risk and to identify the strengths and the weaknesses of each one of it. The research was accomplished from a double perspective, in which the conceptual methodological approach is correlated to a variety of references to practical actions aiming the measurement and the prevention of credit risk. The study includes the presentation of the objectives of credit risk analysis, the most appropriate moments for doing such an analysis, the steps that have to be done in order to measure the credit risk, the errors that can overcome in the credit risk measurement system, generated by the misclassifications of the studied company, and the presentation of the specific information of financial creditors. The findings expressed in this paper were mainly the result of a qualitative analysis which showed that there is no best model for credit risk measurement, each one having both strengths and weaknesses, some providing a comprehensive analysis of the individual customer's financial strength others allowing banks permanently monitor fluctuating default risk and identify the possibly problems at an early stage.*

***Key words**: credit risk; global financial crisis; risk analysis; bankruptcy; measurement of a credit risk*

JEL Classification Code: **G32**

1. INTRODUCTION

The measurement of a credit risk of a borrower aims at assessing, more or less formally, and also more or less quantitatively, his or her likelihood of facing financial difficulties and of not honouring his or her financial commitments, in other words, the likelihood that his or her financial distress generates a "credit incident".

The risk analysis work implies professionals who can be:

- dedicated specialists for whom this is a job, who make it a profession to analyse the risk, employed by banks, financial institutions, or big companies;
- practitioners for whom risk analysis is a technical component of a global function and who perform this task among other tasks; this is the case of analysts who work in financial departments for example.

The credit risk analysis covers a wide range of cases: the person who exercises it implements it for a certain purpose. We should highlight the peculiarities related to

asymmetry, due to the fact that there are several factors that play a role: the available means (human, time, financial), the competence level of the analyst (cognitive problems), the information available and used, etc.

The credit risk analysis has several objectives:

- to assess the risk level posed by the debtor to his/her creditor at moment t (spot) and to anticipate its probable evolution (forward). In this case, the purpose is to assess the degree of randomness influencing his/her capacity to meet his/her credit commitments.
- to express this risk clearly and intelligibly on a scale by means of a rating system in a broad sense (quantitative or qualitative) which allows for emplacing it in the absolute and for relativizing it in time and space ;
- to examine its causality and its components in order to be able to explain the risk level;
- to attempt to measure the mathematical probability of default or failure, and therefore to translate the rate into probability of occurrence.

The credit risk analysis is performed in different moments: when an (implicit or explicit) request for a quotation is made, on the occasion of a periodic review of the engagements (annual review in banks), or due to the evolution of the debtor's situation (change of an item of processed information). For the creditor, it reveals a continuous approach, because it is necessary to know, at any time, the borrowers' level of risk.

The credit risk measurement implies following a specific procedure, defining a multi-step system.

Such a system operates in 3 steps (Chart 1):

1. The data are the inputs: they present, in an individual or close manner an individual capacity to perceive risk;
2. The data treatment corresponds to the methodology retained which is applied to the information;
3. The result of the treatment (raw or processed) is then changed in such a way as to express the credit risk level.

A credit risk measurement system can be built based on an empirical (intuitive) approach, or a scientific (modelled) one, defining the risk in a normative manner (a subjective definition a priori, whether empirical or theoretical), or positive (after the study of a sample of companies that have experienced default or bankruptcy).

Certain systems can be included in the company finance field, and specially that of the financial analysis, while others are based on the market finance, modelling the default risk starting from the financial theory. The development of a model is sometimes complicated and long, and the system must be tested (often by back-testing) in order to prove its entire predictive capacity.

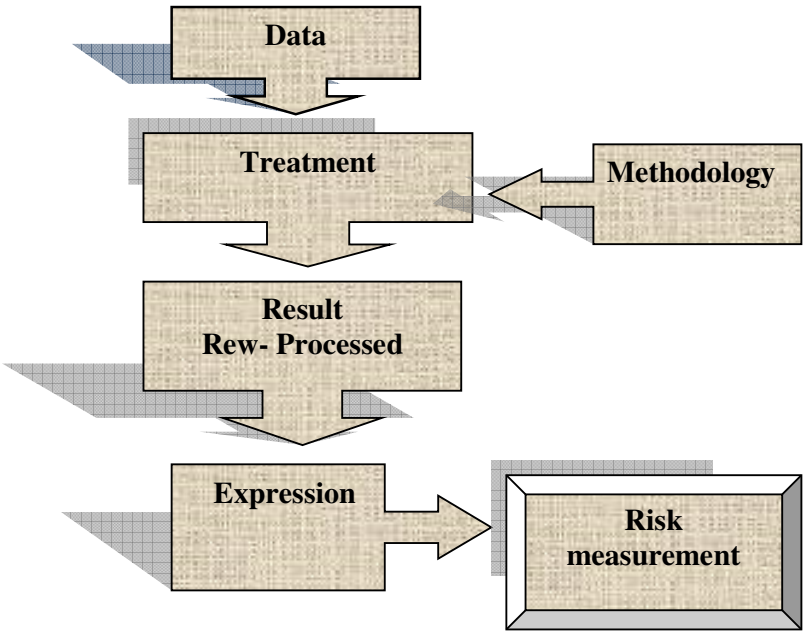

Chart 1. Credit risk measurement systems

Source: Analyse du risque de crédit, Cécile KHAROUBI et Philippe THOMAS, RB Édition, Paris, 39p, 2013

Consequently, depending on the results obtained, the risk evolution and its knowledge, the models constitute objects of monitoring and adjustments with the purpose of increasing its efficacy. In the model development stage, it is important to define the analysis horizon, i.e. the date of a risk measurement (the system is all the more efficient as it detects earlier).

The credit risk of a company depends on many endogenous or exogenous factors.

The latter continuously change and the risk level is susceptible to vary in one direction or the other.

Therefore, the model must be applied continuously or very frequently: one cannot limit himself at measuring risk at just one particular moment per year. The risk must be the object of monitoring: the model must be logically supplied with any development of the data processed, it must allow for an immediate calculation and must inform the users about the variations of the risk level.

Thus, the question of the measurement frequency arises. This frequency is closely related to the user's preoccupations, the frequency of updating the processed data, and the methodology retained by the model.

The expression of the risk level (the usable result of the risk analysis model) always refers to an assessment that corresponds to a method on a closed scale. The latter can be qualitative (low, average or high risk; green, orange or red risk) or quantitative (a numerical result interpreted on a scale).

A confusion is often noticed between a data processing model and the expression of risk. However, in general, the latter retains one of the following possibilities:

- a rating: i.e. a (qualitative or quantitative) grade on a closed scale which is interpreted directly in terms of risk (namely a risk class), for example: the ratings of the agency or a rating from 0 to 20;

- a scoring: the result of a statistical processing, corresponding directly to a mathematical probability of occurrence of an event;
- a ranking: a grading system which ranking the risks on a scale (classes), often qualitative.

In practice, a credit risk analysis model is a risk rating system. Certain approaches lead directly to the supply of a probability of default or bankruptcy; while for others it is necessary to "translate" the rating into a probability. The latter case requires defining the assessment horizon accurately.

Two systems are feasible:

- the "at the point in time" method anticipates the probability at a given day, often in the short term
- the "trough the cycle" method used in the medium term and which retains the impact of the reversal of the conditions on the health of a company.

It is important to highlight that the human intervention is not identical in all the systems. While it naturally concerns the design and development of the model, several cases are possible for its application. Some of them require a strong human intervention, which is the case with empirical models where an analyst is in charge with the assessment of the risk on the basis of a more or less constraining plan.

Others only require an intervention for the collection, verification and retention of the necessary data. Nevertheless, the decision that needs a risk analyst often lies with someone who takes over this responsibility in his or her organization.

All credit risk measurement system can imply misclassifications of the studied company. There are two types of such errors:

- type-1 error: failure to detect the bankruptcy risk: it is deemed that the company has no risk, although it has a risk. This error leads to a credit commitment for a bad borrower and generates a credit loss risk;
- type-2 error: classifying a company as incurring a bankruptcy risk when in fact the company has no such risk. It leads to not taking a credit commitment for a company that would have justified one and to the exposure of a loss of opportunity.

The model can be internal, in other words, it can be developed specifically for the institution that uses it. If it is external, it has been acquired from a provider who develops the parameters specific to the user's case. In the case of financial institutions, the rules require that the model should be validated by an independent relevant authority.

2. SPECIFIC INFORMATION OF FINANCIAL CREDITORS

The credit risk measurement is highly dependent on the level of information at the moment when the analysis is performed.

The information related to the company is distinguished, as highlighted above, by strong asymmetries: quantity, quality and depth of the information, and it varies strongly from one agent to another.

The leaders, otherwise in charge with generating and disseminating the information are logically the only ones who have complete and permanent information, at zero costs. All the other stakeholders, including the shareholders, have a lower level of information.

In addition to the public information accessible for the bank, the bank also has holds information that is often private, which makes it a genuine information broker. The specific relationship of banks with their clients provides them, by means of contractual and functional factors, with an advantage in terms of information (Table 1).

Table no. 1 Specific information of financial creditors

Elements of the banking relationship	Collected information
Loan file	Information related to the strategy and projects Scheduled investments Budgets and financial plans
Setting up guarantees	Market value of the assets of the company Established guarantees (other creditors) Signal on the investments to be made (obsolete)
Account monitoring	Monitoring cash on a daily basis Evolution of the commercial situation and of the fees Early detection of difficulties
Information covenants of loan agreements	Reporting availability Private meetings with the leaders Alert in the case of failure to observe the clauses
Mutualisation of inter-bank information	Consolidation of the commitments (all the banks) Payment incidents et credit accidents Market share of the bank

Source: Analyse Financiere. Approche Internationale – CFA, Philippe THOMAS, RB Edition, coll.Master, 222 p. 2011

3. CONCLUSIONS

The analysis shows that there is no one best model, with each model having its strengths and weaknesses.

External ratings based models (including transition models) and accounting models provide a comprehensive analysis of the individual customer's financial strength, but are static and don't fluctuate with the market.

The structural model provides the opposite. Banks should (and larger ones generally do) make use of more than one approach. The external ratings and accounting based models allow banks to measure and provide for individual customer circumstances, whereas the market based structural model allows banks to continuously monitor fluctuating default risk, thus detecting potential problems at an early stage.

While in the internal analysis or in the credit analysis, the risk notion is a relatively clear one, the contemporary spectrum of the performance analysis (especially by shareholders) gives the notion of risk a special definition.

In finance, in general, risk is the risk level affecting the future profitability. Thus for a shareholder, risk is the uncertainty that affects his expected rate of return per share.

Of course, the default risk and the bankruptcy risk are the components of this overall risk, which mainly depends on the volatility of the company results and on the stock price in the market. Conceptually, the credit risk could be approached in a similar manner. The financial creditor hopes to obtain a return on the loan granted by it to a company (measured by means of a TRI- *The total return on the enterprise*); the credit risk could thus be approached, through the forecast TRI dispersion, leading to a default or bankruptcy probability.

The risk studied in the traditional final analysis and in the case of the assessment of the credit risk, corresponds to the risk of the company to face cash which could determine it to cease payments.

The traditional financial analysis underwent profound evaluations through the standardization of a financial cash flow table: *the Free Cash Flow Statement,* which allowed for refining and supplementing the traditional measures.

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