

RISK MANAGEMENT AND BASEL 2

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***Abstract.** Economic life changed in the past years. In order to increase the opportunities of business enterprises have to get external money. On the other side banks have to decrease the risk of losing money which they gave as loans and credits to enterprises. Therefore it is necessary that both sides understand the business of risk management and the rules of Basel2. This paper presents an introduction in the rules of Basel2 and an overview of necessary topics which have to be considered in risk management.*

***Keywords:** operational risk, risk management, Basel 2, rating methods, statistical methods, financial rating.*

1. Introduction

In the previous paper¹, we have been introduced some considerations about risk causes and risk management in general. In this paper we present an overview about risk management, Basel 2 and risk management for financial institutions.

Before “the period of Basel 2” banks have not really been aware about risks. They gave loans to almost everyone in order to make money. They did a lot of “strange” deals in order to get “quick money”. And they did not really consider the value of collaterals.

So we can say that there was almost no risk management in banks before “Basel 2”.

2. Basel 2

If a bank gives a loan to a customer who will be not able or not willing to pay back the complete loan (including all fees) the bank will lose money. If a bank will make deals on the money market and the expected profit of the deal will not be reached the bank might lose money. In daily business it is normal that not each loan will be paid off by a customer or a deal will not result in the expected profit. In general it will be no problem if the own capital of a bank is big enough. The real problem is that all these events will be future events and have to be predicted.

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¹ W. Ecker-Lala, *Risk management for Enterprises*, in this Proceedings of ENEC- 2010, pp. 165-171.

The “Basler Ausschuss für Bankenaufsicht” (= regulators for banks and financial institutions) created a set of regulations and rules for bank's own capital (own funds) in order to stabilize the financial market and prevent it from some kind of collapse.

Originally this set of regulations and rules have been initiated by the USA. The USA did not follow this regulations and rules in the same strict way as the European Union did. Since 1st of January 2007 all financial institutions have to fulfil this regulations.

Basel 2 regulations and rules have been based on Basel 1 regulations and rules. Basel 1 caused following criticism:

- **misallocation**
There have not been any considerations about the credit rating on a customer. All considerations have been done on customer segmentations. So banks had a very big interest to give loans to “bad” customers because of receiving higher interest rates for such loans.
- **no operational risks**
Basel1 considered the amounts of own capital and control mechanisms which have to be done by the national regulators. Any kind of operational risk has not been considered – e.g. most of the main activities are done by a single trader (Nick Leeson).
- **no international standard**
Basel1 did not define common standards in control and reporting for the national regulators and even no reporting standards for the financial institutions.
So Basel 2 was supposed to repair the open issues of Basel 1.

3. Basics of Basel 2

The idea of Basel 2 is based on three pillars (Fig. 1):

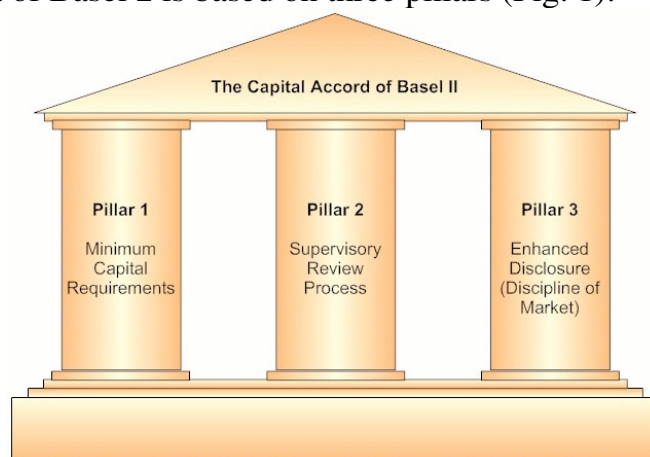


Figure 1.

- **Minimum Capital Requirement**

Aim of these pillar is to consider risks in accordance to the own capital. Three risk categories have to be considered:

- *risk of loan defaults*

The risk is defined by a rating which can be calculated by an external agency or by the bank (**Internal Rating Based**).

- *risk of market rates*

This risk is caused by unexpected changes of exchange rates, interest rates and all other prices on the money market which give a negative input on the bank's profit.

- *operational risk*

Even errors and defaults caused by systems and staff members (e.g. unavailability of a server, wrong decision of an employee of a bank) are risks in daily business.

- **Control process of regulators**

The national regulator has to check if all rating methods, risk controlling methods and reports are done according to the Basel 2 regulations.

- **Market Discipline**

This means that reporting has to fulfil all necessary requirements in order to provide all relevant information to externals. The publications have to provide information about:

- structure of the own capital

- identified risks and risk rating

- amount of the own capital.

Summing it up the ratio of own capital of a bank has to be at least 8% of the sum of all risk weighted assets.

Sum of all risk weighted assets:

= 1.06 * (Sum of risk weighted assets of loans);

+ 12.5 * (requested own capital out of market risks);

+ 12.5 * (requested own capital out of operational risks).

4. Ratings. Rating Methods

One of the most important information within Basel 2 is the rating of risks. As mentioned in previous chapter the rating can be done by external agencies (standard approach) or by the bank itself (**Internal Rating Based**).

The term **rating** has two meanings:

- The possibility of being able to pay future claims (based in future profit or income). It shows the degree of credit worthiness.
- The economic situation of a company or person.

The calculated rating is the base for all conditions for a loan or credit (duration, amount of a periodical payment, interest rate).

As mentioned in previous chapter the rating result shows the degree of credit worthiness. In order to be able to calculate the rating several rating methods have to be developed.

Three categories of rating methods can be found:

- **heuristic methods**

These methods are based on experiences, knowledge and observation of the past:

- *check list*

A list of all relevant questions to estimate the rating based on the past experiences of credit experts.

- *expert systems*

A kind of check list system which gives more flexibility in the estimation of different risk factors.

- *knowledge based systems*

These systems are automated expert systems – in general available in form of software. It gives more flexibility and performance in combining risk factors.

- **statistical methods**

These methods are based on historical data and use statistical methods:

- *discriminant analysis*

This method analyses differences within groups or classes (e.g. Z-Scores by Altman).

- *regression*

This method calculates the probability of a customer to be member in a specific rating class. It is based on a set of significant figures.

- *neuronal networks*

These methods try to simulate a biological workflow of information processing (like signal processing of a brain).

- *data mining*
Data mining is a very new discipline for banks. The importance is increasing within the next years. Data mining tries to detect patterns in data in order to get a base for a decision whether the loan can be paid off by the customer or not.
- **causal analytical methods**
These methods are based on economic theories:
 - *option price model*
It considers the value and volatility of foreign capital of an enterprise/company.
 - *cash-flow simulation model*
This model performs an analysis of the cash-flow under different situations.

5. IRB-Approach

In the Internal Rating Based (IRB) approach banks can calculate the ratings by their own. Therefore they have to collect all necessary and appropriate data, develop rating models and validate these models. It has to be approved by the national regulator that all the prerequisites are fulfilled and the complete process is done according to the Basel2 regulations and rules.

The bank can choose if the IRB will be done by following ways:

- **IRB-Base**

Here following figures has to be calculated or defined and constraints have to be fulfilled:

- *sufficient data history* (even for defaults)
databases has to be implemented.
- *probability of defaults have to be estimated*
This is the probability of a customer being unable to pay the assets.
- *LGD* (loss given default)
is assumed as 45% for unsecured assets and 75% for subordinated assets.
- *Collateralization*
can be done by financial collaterals or physical collaterals which have to be accepted by the market (e.g. house, flat, real estate).
- *Maturity*
is assumed as 2.5 years.

- **IRB-Advanced**

This approach is an enhancement of the IRB-Base approach. In addition following has to be calculated:

- *EAD* (exposure at default)
This is the amount value of the exposure in case of a default.
- *Collateralization*
unlimited, netting can be done.
- *maturity* (remaining)
can be calculated by the bank but has to be in the range between 1 and 5 years.

6. Financial Rating

A very important parameter is the financial rating based on balances. Banks developed their own financial rating methods based on the available data of the past.

A very well known method is the Z-Score developed by Edward I. Altman. It is a discriminant analysis based on financial statements.

Altman chose a sample of 33 companies which got bankrupt. Each of these companies had a total assets amount between 1 and 26 million US\$. He compared it with “good” companies having similar business and assets amounts. Using the paired-sample method he developed following formula:

$$Z = 0,012 \cdot X_1 + 0,014 \cdot X_2 + 0,033 \cdot X_3 + 0,0006 \cdot X_4 + 0,999 \cdot X_5$$

where:

X_1 – working capital / total assets amount;

X_2 – retained earnings / total assets amount;

X_3 – earnings before interest and taxes (EBIT) / total assets amount;

X_4 – market price of own capital / foreign capital;

X_5 – total revenue / total assets amount.

He found out that all companies having $Z < 1.81$ went to bankruptcy one year later and all companies having $Z > 2.99$ have been “good” one year later.

7. Rating Validation

If a bank is allowed to calculate the rating according to IRB approaches it is obligatory to validate the models every year.

Measures for the quality of the rating models are summarized under the term *rating accuracy*.

Rating accuracy distinguishes between:

- *discriminative power*
This is the measure for the quality of the separation effect of the methods.
- *calibrating power*
This is the measure for the exactness of the methods to predict future hazard rates within rating classes.

Even the accuracy of the implemented and used rating systems has to be checked.

8. Conclusion

Daily business is conducted by a lot of risks even in the sector of financial institutions. In order to be able to survive difficult economic situations and of course crises risk management and risk management methods has to be used.

Basel 2 provides a set of recommendations, regulations and rules to financial institutions in order to implement appropriate risk management systems. So financial damages can be avoided or at least minimized.

But in any case – risk can also be seen as the possibility of getting a chance. So let us looking forward in a more positive way for the future.

REFERENCES

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